

Satisfaction with maternity triage following implementation of the Birmingham Symptom-Specific Obstetric Triage System (BSOTS): Perspectives of women and staff

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ABSTRACT (ENGLISH)

Aim

To explore the satisfaction and experiences of women and staff with the BSOTS in an Australian hospital.

Design

Cross-sectional descriptive survey.

Methods

Surveys were distributed to women and staff between February and May 2022. Survey questions reflected satisfaction with triage and provision of care under the BSOTS system (for women) and confidence in using the BSOTS system and its impact on triage-related care (for staff). Survey data were summarized using descriptive statistics, and qualitative responses were analysed using content analysis.

Results

There were 50 women and 40 staff (midwives and doctors) survey respondents. Most women were satisfied with triage wait times, the verbal information they received and the time it took for them to receive care. Nearly all midwife participants indicated they had high knowledge and confidence in using the BSOTS. Most staff indicated that the BSOTS supported the accurate assessment of women and had benefits for women, staff and the hospital.

Conclusion

The findings showed that women and staff were satisfied with receiving and providing care in a maternity triage setting under the BSOTS system.

Implications for the Profession and/or Patient Care

Implementing standardized maternity triage approaches such as the BSOTS in health settings delivering care to pregnant women is recommended for improving flow of care and perceptions of care quality by women.

Impact

Quality of maternity triage processes is likely to impact the satisfaction of women attending services and the staff providing care. The BSOTS was shown to improve maternity triage processes and was associated with satisfaction of women and staff. Maternity settings can benefit from implementing triage approaches such as the BSOTS as it standardizes and justifies the care provided to women. This is likely to result in satisfaction of women and staff engaged in maternity triage and improve the birth outcomes of women and babies.

Reporting Method

The reporting of this paper has followed SQUIRE guidelines.

Patient or Public Contribution

Women engaged with maternity services were participants in the study but did not contribute to the design,

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conduct or publication of the study.

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The design of an Obstetric Telephone Triage Guideline (OTTG): a mixed method study

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ABSTRACT (ENGLISH)

Background

Clarifying the dimensions and characteristics of obstetric telephone triage is important in improving the quality of services in the health system because researchers can evaluate the effectiveness of treatment, care and diagnostic measures in the form of obstetric telephone triage by developing a guideline. Therefore, this study aimed to design an Obstetric Telephone Triage Guideline (OTTG) using a mixed-method study.

Methods

The present study was carried out using an exploratory sequential mixed method study in two qualitative and quantitative phases. An inductive-deductive approach was also used to determine the concept of obstetric telephone triage. In this respect, a qualitative study and a literature review were used in the inductive and deductive stages, respectively. Moreover, the validity of the developed guideline was confirmed based on experts' opinions and results of the AGREE II tool.

Results

The guideline included the items for evaluating the severity of obstetric symptoms at five levels including "critical", "urgent", "less urgent", "no urgent", and "recommendations". The validity of the guideline was approved at 96%, 95%, 97%, 95%, 93%, and 100% for six dimensions of AGREE II including scope and purpose, stakeholder involvement, the rigor of development, clarity of presentation, applicability, and editorial independence, respectively.

Conclusion

The OTTG is a clinically comprehensive, easy-to-use, practical, and valid tool. This guideline is a standardized tool for evaluating the severity of symptoms and determining the urgency for obstetrics triage services. By using this integrated and uniform guideline, personal biases can be avoided, leading to improved performance and ensuring that patients are not overlooked. Additionally, the use of OTTG promotes independent decision-making and reduces errors in triage decision-making.

LINKS

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FULL TEXT

Introduction

Hospitals receive 20 to 30 phone calls from pregnant women per day. During these calls, healthcare providers use their obstetric knowledge and experiences to determine the severity of the problem and the urgency of a physical consultation with an obstetrician [1,2,3]. Obstetric triage services are usually provided physically

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(face-to-face), however, in many Western societies, women typically make an initial phone call to inquire about the need for counselling or a visit to the emergency room [4,5,6,7,8,9]. Telephone triage is a service delivery system that is currently not performed uniformly due to the lack of specific instructions [1,2,3].

While most existing guidelines for obstetric triage are based on physical triage. However, telephone triage has many positive aspects such as efficacy and uniformity. However, there are some challenges due to the lack of clinical perspective during the telephone call and the lack of specific diagnostic information [10].

Obstetric physical triage is an independent and efficient unit [11, 12] with versatile dimensions such as parturient admission, evaluation of fetal well-being, as well as acute obstetric and gynecological emergencies [13]. The use of triage is important throughout the pregnancy and labor stages. Triage ensures appropriate care based on the clinical priorities of the patient and the effective use of resources [14, 15]. However, some problems of obstetric triage include patient dissatisfaction and prolonged waiting times [16,17,18]. Prolonged waiting time results in leaving patients without examination, delayed delivery of necessary care and treatment, patient dissatisfaction, and increased mortality and morbidity [19, 20]. On the other hand, reducing the waiting time decreases the duration of hospital stay, lowers the treatment cost, and saves hospital resources [21].

Studies show that triage standardization favorably affects its efficiency and safety [17]. The telephone is a 24-hour means of communication between patients and health care providers [22], and the importance of the telephone answering system has been specified [23].

Some of the advantages of telephone triage include increased access to services, reduced waiting time to receive services, avoidance of unnecessary referrals, and long and expensive trips [24, 25].

Understanding the correct telephone triage approach by obstetric triage personnel is extremely important since improper communication leads to untimely acceptance of pregnant women and incorrect decisions [26].

The results of a review study showed that there is no agreement on the existence of a standard system in the field of obstetric triage [17]. Bailey et al. (2018) conducted a review study to investigate obstetric telephone triage. The results showed that more research is needed to examine midwives' perceptions of their role in obstetric telephone triage, reviewing obstetric telephone triage processes and tools [27]. Engeltjes et al. (2020) conducted a Delphi study in the Netherlands to design obstetric telephone triage guidelines. The telephone obstetric triage guidelines were designed based on the physical obstetric triage system ROTS with five prioritization categories, which 91.9% of professional users declared complete, good, and user-friendly [28]. Limited studies have focused on the design and psychometrics of obstetric telephone triage guidelines [27], whereas the design of obstetric telephone triage guidelines can strengthen obstetric performance [29].

Given the importance of clarifying the dimensions and characteristics of obstetric telephone triage in improving the quality of services in the health system, researchers can evaluate the effectiveness of treatment care and diagnostic measures in the form of obstetric telephone triage by using this guideline. In addition, different health service providers and managers can use the results of these assessments to improve the quality of obstetric telephone triage. With this background in mind, the present study aimed to develop an obstetric telephone triage guideline.

Methods

This was an exploratory sequential mixed method study in two qualitative and quantitative phases to develop and validity assessments of the guideline an inductive-deductive approach was performed to explain the concept of obstetric telephone triage. In this respect, a qualitative study and a literature review were carried out

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to extract the codes and convert them to the items of the OTTG. After item generation and developing the first draft of OTTG, its validity was assessed by the experts using Appraisal of Guidelines for Research and Evaluation II (AGREE II). Figure 1 shows the procedure of the study for OTTG development and validation.

The details for the procedure of the study are as follows:

Qualitative phase

This qualitative study with a content analysis approach was performed as the first part of a multi-stage large study [30,31,32].

The participants with maximum diversity and different educational levels, fields, and specialties related to obstetric triage were interviewed. The mean call volume was 400 calls per month.

The obstetric triage personnel were recruited from medical educational hospitals with obstetric and telephone triage services, specifically from Shahid Beheshti University of Medical Sciences in Tehran-Iran.

The inclusion criteria for obstetric triage personnel were: the ability to express experiences, and willingness to participate in the study, having at least 6 months of work experience in the obstetric department, and being familiar with telephone triage. The exclusion criteria included: refusing to continue the interview.

The participants were recruited using the purposive sampling method that continued until data saturation. The semi-structured individual interviews were performed to explain the participants' perceptions and work experiences about telephone triage. The interviews were conducted by the first author of the research, and recorded and immediately transcribed verbatim. Following receiving permission to do the research in the setting, the objectives were explained to the participants of the study before the interviews.

Afterward, informed consent was obtained from all participants and they were ensured of the confidentiality of the information. Moreover, participation in the study was voluntary. The participants were asked to add anything left about the subject at the end of the interviews. Ultimately, the researcher referred to the possibility of future interviews in addition to appreciating the cooperation of the participants. Data analysis was conducted using Granheim and Lundman's method, which was performed simultaneously with data collection [33]. The interviews were transcribed immediately after each interview and completed on the same day. The average, duration of the interviews was 28.52 min (with a duration between 20 and 49 min). Based on the participants' viewpoints, the most significant factors influencing obstetric telephone triage were categorized into two main categories: common complaints (27 codes) and communication (8 codes). The initial guideline framework, number of levels, and criteria for evaluating maternal and fetal health were developed based on the findings of a qualitative study.

In the deductive approach and using a literature review, a comprehensive search was conducted on databases such as Scopus, PubMed, Embase, ProQuest, Web of Science, Cochrane, Science Direct, and Google Scholar, using keywords such as pregnancy, obstetric, triage guideline, system, index, tool, questionnaire, scale, telephone, midwifery, and maternity. A total of 26 articles were included in the study, and items related to obstetric telephone triage not existing in the pool of items obtained from the qualitative stage were added to the main items.

Quantitative phase (validity assessment)

The AGREE II tool was used to assess the internal validity of the guideline. The primary draft of the guideline was sent via email to 10 experts in questionnaire development, emergency medicine, reproductive health,

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obstetrics, and telephone triage (different from the participants in the qualitative phase) for their feedback on the decision-making process for the risk classification based on maternal and fetal criteria and symptoms, the severity of the emergency, patient arrival time at the hospital.

AGREE II encompasses 23 key criteria in six domains scope and purpose (criteria 1–3), stakeholder involvement (criteria 4–7), rigor of development (criteria 8–14), clarity of presentation (criteria 15–17), applicability (criteria 18–21), and editorial independence (criteria 22 and 23) [27].

The score of each domain was calculated by adding the score given to the criteria and after total score calculation, it was standardized by converting to a 0-100 score range based on the following formula: $\text{X-Min Score} / \text{Max-Min Score} \times 100$. The guideline remained in the study in case of earning a score above 60% in each area [34].

To assess the acceptability of the guideline, it was sent again to the same 10 experts via email who rated the final guideline in terms of feasibility and applicability (extremely high = 4, high = 3, low = 2, and very low = 1), being scientific (completely agree = 4 to completely disagree = 1), and importance (completely agree = 4 to completely disagree = 1). Finally, data analysis was performed, and validity was confirmed with 70% consensus about the acceptable utility of the guideline [35].

Finding

The participants were 21 obstetric triage personnel and the key informants, including emergency medicine specialists, clients, gynecologists, and reproductive health specialists. The average work experience of obstetric triage personnel was 13.6 years (work experience of 3 to 28 years).

Based on the results of the qualitative phase, 124 primary codes and 35 integrated codes were extracted through the semi-structured interviews.

According to the participants' opinion, the most significant factors influencing the use of obstetric telephone triage services were in two main categories: common complaints (27 codes) and communication (8 codes).

The common complaints category includes items such as abdominal pain, haemorrhage, hypertension, postpartum concerns, membrane rupture, suspicion of labour onset, illness/other, and decreased foetal movements. The communication category includes items such as last menstrual period, age, gestational age, number of pregnancies and parity, and obstetric and medical history. These items were included in the obstetric telephone triage guidelines. The extracted items from the qualitative interviews are listed in Table 1.

Ten items were also extracted from the review of the searched articles. In the deductive approach, otherwise, the items related to obstetric telephone triage, which were not identified in the qualitative phase, were then added to the main items. These additional items include headache with aura, headache without aura [36], severe and continuous pain after 24 weeks of gestation [28], lack of fetal movements before 20 weeks [28], lack of fetal movements between 20 and 24 weeks, pain and gestational age between 24 and 37 weeks [28], confirmed uterine pregnancy by ultrasound or unconfirmed pregnancy by ultrasound between 5 and 16 weeks [37] and mild vaginal bleeding [38, 39], dyspnea lasting less than 24 h and mild diarrhea before 16 weeks [28, 40].

Finally, the items extracted from the qualitative study (using an inductive approach) were integrated with the items extracted from the literature review (using a deductive approach) results and initial draft of the obstetric telephone triage guideline was created.

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Figure 2 the components of obstetric telephone triage guidelines.

The guideline was then reviewed by experts, who prioritized the recommendations into five levels: critical, urgent, less urgent, no urgent, and recommendation. The critical level included life-saving measures for both the mother and fetus, while the other levels consisted of hospital referral within one hour, four hours, and 24 h, as well as the need for a consultation (Fig. 3).

The obstetric telephone triage guidelines included multiple levels and evaluation criteria for both the mother and fetus and were once again provided to experts for validation.

Table 2 shows the validity and quality of the developed guideline based on the AGREE II tool (Table 2).

According to the experts's opinion, the score obtained in all domains of the AGREE II tool was above 60%, so the designed guideline has a content validity.

The final validation of the guideline was carried out based on the opinions of experts in terms of applicability (93%), scientific (90%), and importance (100%).

Discussion and recommendations

The present study introduces an understandable, applicable, and valid guideline for obstetric telephone triage. This guideline is the first obstetric telephone triage guideline designed in Iran, which is based on the modified Emergency Severity Index (ESI) obstetric triage [41]. This guideline helps to perform obstetric telephone triage based on cause, the severity of symptoms, and treatment for pregnant women in 5 levels including Critical (life-saving measures for mother or fetus), Urgent (visit the hospital within an hour), Less Urgent (Refer to the hospital within four hours), No urgent (refer to the hospital within twenty-four hours) and Recommendations (need to consult) [41]. In a study conducted in the United States of America to develop a telephone triage of candidiasis diagnosis, Hoffstetter et al. (2012) showed that it is difficult to diagnose candidiasis using symptoms and self-report through telephone triage as well as telephone treatment in symptomatic women. However, a telephone symptom guide for the diagnosis of candidiasis increased the accuracy of treatment by telephone triage [42]. While obstetric telephone triage guidelines are intended to guide triage personnel, they should not reduce their decision-making ability or professional responsibility and should be consistent with the patient's professional insights and preferences.

Based on a survey, providing friendly advice in telephone triage leads to mothers' reassurance and prevention of premature delivery for childbirth [43]. In a study, Huibers et al. reported that the majority of calls responded to by triage personnel were non-urgent [44]. In a study, pregnant women often make several calls for pregnancy and childbirth counselling. Triage personnel often provide different responses that are not documented, which leads to safety problems for the caller. Therefore, it is important to develop an evidence-based process for telephone triage [45]. In a study by Wahlberg et al., triage personnel reported callers' anger, loud voice, and disrespectful behaviour. In addition, they barely listened to the triage personnel's guidance and were ultimately dissatisfied with the call. An inaccurate understanding of the situation or exaggeration of the event disrupts triage personnel's judgment and causes loss of information [46]. Obstetric telephone triage is a complex multifaceted process affected by different internal and external factors [27]. Having a unified national guideline on telephone triage can reduce weaknesses in management and planning.

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The results of the present study showed the validity of 93%, 90%, and 100%, respecting the guideline's applicability, scientific, and importance, respectively. In a study by Engeltjes et al., an obstetric telephone triage guideline was designed based on the Rotterdam Obstetric Triage System (ROTS) in the Netherlands. The guideline included the examination of emergency obstetric symptoms at five levels. Their results showed that 91.9% of the experts considered the tool to be complete, accurate, and user-friendly, and 98.4% of them expressed that the tool was ready to be used [28]. The results of the studies showed that the validity of The Maternal Fetal Triage Index (MFTI), the Perinatal Emergency Team Response Assessment (PETRA), and the Swiss Emergency Triage Scale (SETS), all three obstetric triage systems, were 72.9%, 80%, and 78.4%, respectively [6, 8, 47].

The validation was performed using different methods for triage guidelines. The results showed that external validity is one of the most valid methods [15]. In maternal care, developing valid obstetric triage guidelines is critical [48, 49], and that also requires training packages [50]. There is limited evidence on the implementation and evaluation of such a system [51]. A successful triage unit follows a consistent policy. All instructions should be for the management of all clients for various reasons. If providers fail to follow the guidelines or standards, difficulties in fulfilling responsibilities and risks for clients may occur [52]. The guidelines allow all triage personnel to quickly evaluate and provide services to clients. Coordinated use of protocols, guidelines, and team training are effective ways to improve the quality of the services. In all cases, the use of guidelines and timely evaluation enables team action and coordination to ensure appropriate results [53].

One of the major limitations of the present study was the lack of access to obstetric telephone triage guidelines of different countries with various healthcare systems in the world. Another limitation of the present study was the lack of consideration of the patient's voice and cultural factors.

Conclusion

In this study, we examined various dimensions of obstetric telephone triage. Our findings indicate that the obstetric telephone triage guideline is clinically comprehensive, easy to understand, practical, and valid. This guideline serves as a standardized tool for evaluating the severity of symptoms and determining the urgency of obstetric care for triage personnel. By following this integrated and uniform guideline, personal biases can be avoided, leading to improved performance and ensuring that patients are not overlooked. Additionally, the use of an integrated obstetric telephone triage guideline promotes independent decision-making and reduces errors in triage decision-making.

Data availability

The data that support the findings of this study are available from Masoumeh Simbar but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of Shahid Beheshti University of Medical Sciences.

Abbreviations

AGREE: Appraisal of Guidelines Research and Evaluation

ROTS: The Rotterdam Obstetric Triage System

OTTG: Obstetric Telephone Triage Guideline

MFTI: The Maternal Fetal Triage Index

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PETRA: Perinatal Emergency Team Response Assessment and SETS: Swiss Emergency Triage Scale

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DETAILS

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Emergency medical dispatchers’ experiences of using the Medical Priority Dispatch System telephone triage to identify maternity emergencies: a qualitative focus group study

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ABSTRACT (ENGLISH)

Objectives

The ambulance service plays a pivotal role in the provision of care in out-of-hospital maternity emergencies. Telephone triage of this patient group is complex and must be sensitive to an emergency situation to prevent unnecessary delays in treatment. This study aimed to explore emergency medical dispatchers' (EMDs) perceptions of the structured protocol they use.

Design

Voluntary participation in semistructured phenomenological focus groups. The participants were asked to discuss their experiences of using Medical Priority Dispatch System Protocol 24 (pregnancy, childbirth and miscarriage). Thematic analysis was applied to code and group topics. Discussion between the EMDs is presented for each theme and their experiences, including quotes, are presented to offer an overview of the maternity protocol and its use.

Setting

A large urban UK ambulance service.

Participants

23 control room staff.

Results

Perceptions of maternity emergencies, challenges with key questions, the need for sensitivity surrounding miscarriage, using prearrival instructions and postdispatch instructions to help patients and ideas for additional ProQA functionality emerged as the five overarching themes. Protocol 24 was considered to reflect many of the clinical factors EMDs associate with maternity emergencies although further factors, including some non-clinical, were suggested for inclusion. Miscarriage and termination-related calls were thought to be challenging as the language of the protocol is designed for pregnancy. However, instructions were generally considered well written and user-friendly, although some were thought to be unnecessary. EMDs were largely positive regarding the ProQA software, but felt backward navigation was difficult if a situation changed.

Conclusions

Maternity calls were considered rewarding but complex by EMDs. We suggest changes including the use of more sensitive language in response to miscarriage and termination and make recommendations for the omission and inclusion of specific instructions, as well as enhancements to key questions and functionality. Further research is needed to ensure focus group findings are generalisable to other services, particularly in other countries.

LINKS

[Linking Service](#)

FULL TEXT

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STRENGTHS AND LIMITATIONS OF THIS STUDY

- This is the first published study using focus groups to explore emergency medical dispatchers' (EMDs) perceptions of emergency maternity call management.
- Participants worked for one of the busiest ambulance services in the world representing substantial experience in handling maternity calls.
- All participants worked for one ambulance service, therefore, the study may not be representative of the wider EMD community.
- The sample was made up of self-selecting participants which may have resulted in volunteer bias.

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- While focus groups carry a risk of researcher bias, participants in this study were asked to confirm researchers' understanding of their response focus groups to minimise the potential for such bias.

Introduction

Triage systems are routinely used in emergency medicine to generate the most appropriate response to the clinical needs of the patient while taking into account the availability of resources.¹ Obstetric triage is more specialised than general triage and requires assessment of the woman, fetus and labour status.^{2,3} Furthermore, telephone triage of maternity patients has been identified as a complex multifaceted process by midwives.⁴ Maternity emergencies that occur outside of hospital will often result in contact with the ambulance service,⁵ and will initially be triaged over the telephone by emergency medical dispatchers (EMDs).

EMDs undergo 5 weeks of classroom training which includes the definitions of key terms related to maternity emergency and non-emergency calls, and role-play of the instructions for different scenarios.

Worldwide, almost 300 000 women die annually during pregnancy and childbirth.⁶ Compared with other high-income countries, in England too many babies are stillborn (2952 in 2015) and die soon after birth (1745 in 2015) and around 50 women each year die from direct or indirect causes related to pregnancy.⁷ Preventable maternal morbidity and mortality is associated with failure to provide timely and appropriate healthcare.^{6,8-11}

Thaddeus and Maine's landmark paper identified three key phases of delay contributing to detrimental outcomes after the development of an obstetric complication, the second phase of which is delay in the arrival at a healthcare facility.¹¹ Ambulance service triage plays an important role in minimising this delay. Other studies have additionally shown that an unavailable or inadequate emergency medical services response to maternity emergencies has negative impact on maternal outcomes^{9,10} and have highlighted the important role that ambulance personnel have in appropriate triage, care and transport of patients experiencing maternity emergencies.^{9,10}

The Medical Priority Dispatch System (MPDS), started in 1979, is one of the most commonly used dispatch systems worldwide, using codes and scripted questions to generate an emergency response.¹² Historically, EMDs would triage all calls using a set of physical cards containing triage questions. Except in extreme circumstances, nowadays, EMDs use a semiautomated software tool, ProQA, which integrates MPDS with computer technology to reduce human error and speed up the triage process. MPDS Protocol 24 (P24) uses scripted and 'blue for you' questions (answered with information volunteered by the caller rather than being directly asked) to triage pregnancy, childbirth and miscarriage. The answers to these key questions (KQ) are entered into the dispatch software which uses algorithms to generate a recommended ambulance response in terms of both timeframe and resources dispatched. Instructions may also be provided prior to a clinician arriving at scene.¹³

Previous research into maternity telephone triage has focused on midwifery^{4,14,15} with no published research to date on call handlers' perceptions. The aim of this study was to explore the experiences of EMDs in identifying maternity emergencies using MPDS and their reflections on the utilisation of a structured protocol.

Methods

Design

Semistructured phenomenological focus groups were used to allow detailed investigation of participants' views and experiences.

Setting

The London Ambulance Service NHS Trust (LAS) is an urban ambulance service that provides prehospital and emergency care to nearly 10 million people in the 620 square miles of the Greater London area¹⁶ and responds to more than 1.9 million calls a year including 12 000 maternity calls.¹⁷

At the time of this study, the LAS was using MPDS automated software V.13.0 (2015 release, Priority Dispatch, Salt Lake City, Utah, USA).

Participants and recruitment

Staff working in emergency call taking (n=396) were sent an open invitation to participate in focus groups via internal communications including posters, newsletters and email. 23 accepted the invitation, participating in one of four focus groups (table 1). Three of the focus groups (consisting of five to seven participants) included a mix of call handlers who triage calls and allocators/dispatchers who dispatch vehicles and one comprised five EMD managers only (to eliminate hierarchical anxiety and encourage honesty).

Table 1

Characteristics of participants

Characteristic		Number of participants (n=23)
Gender	Male	8 (35%)
	Female	15 (65%)
Role	Call handler	14 (61%)

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Characteristic		Number of participants (n=23)
	Allocator/dispatcher	4 (17%)
	EMD manager	5 (22%)
Number of years' experience	Mean (SD)	6.98 (7.14)

EMD, emergency medical dispatcher.

Data collection

Guide questions were developed by a male research paramedic (AA, MSc Public Health) and a female clinical audit manager with specialist knowledge of the ambulance service (JS, MRes Health and Social Care). Both were qualified by education and experience in qualitative data analysis and were experienced in facilitating focus groups. Neither of the researchers were previously known to the participants. Participants were informed that the developers of MPDS funded the study to explore experiences of using the system and determine the accuracy of triage through comparison of ambulance and hospital records (not reported in this paper). Researchers had an interest in maternity but remained unbiased with no previous experience in the use of MPDS. Formal written consent was gained.

Guide questions were piloted with subject matter experts within the ambulance service. The questions were flexible and informed by interaction with participants in order to gain rich information (table 2). Researchers checked their understanding with participants during the focus groups in order to confirm their interpretation and minimise bias.¹⁸ Fieldnotes were made during and after, documenting behavioural cues and reflections to inform analysis.

Table 2

Focus group guide

Main question	Objective
Tell us about any positive experiences you've had using P24. Tell us about any frustrations you've had with P24.	To provide open-ended warm-up questions exploring general experience with MPDS.
Does P24 more often than not agree or disagree with your intuition/thoughts/feelings?	To explore MPDS outcomes compared with EMD intuition.
Take a moment to jot down 3 factors or cues that you use to help you predict whether the call will be a maternity emergency or not.	To investigate what is understood about maternity emergencies. To generate ideas for improving P24/identification of emergencies.
What about P24 prearrival instructions (PAIs)—what are your experiences using them for giving instructions to maternity calls?	To understand EMD's perspectives on PAIs for P24.
If you had 1 minute to talk with the developers of MPDS on maternity calls...what would you say?	To generate ideas for improving P24/identification of emergencies/instructions.

EMD, emergency medical dispatcher; MPDS, Medical Priority Dispatch System.

The focus groups lasted between 90 and 120 min and were led by AA in a hotel conference room away from the workplace with only the researchers and participants present to encourage honesty and openness.

Data analysis

The audio-recorded focus groups were transcribed verbatim and independently coded by AA and JS using an open line-by-line approach. Axial coding was used to reveal patterns that were later grouped under higher level categories to form a coding tree using MAXQDA software. Common categories were merged by AA and JS and outlying codes discussed to develop overarching themes. No new information was forthcoming during the final session and researchers concluded thematic saturation had been reached, guided by Glaser's definition of data saturation.¹⁹ A final framework describing the overarching themes was generated.

Patient and public involvement

The protocol was reviewed by two patient representatives to ensure the study had been designed in a way that was understandable and reasonable to the public. Patients and/or the public were not involved in the conduct, or reporting, or dissemination plans of this research.

Involvement of the patient representatives was not relevant for the recruitment or conduct of the study as participants were employees rather than patients. Results will be disseminated to participants via internal communications at the time of publication.

Results

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Five major themes emerged regarding the triage of maternity emergencies using MPDS.

Perceptions of maternity emergencies

Although often rewarding, participants perceived maternity calls as more complex than other calls. The nature of a maternity call and the variation in presentation and outcome meant that EMDs often felt underprepared when using P24.

I'm more often likely than any other card set to have to call up for help because there's so much stuff that I don't know. I just think in general that's the card I need the most help on. (P7)

EMDs acknowledged that P24 considers many of the clinical factors that they associate with a maternity emergency including haemorrhage, presenting parts, multiple births, known complications and early gestation. However, participants suggested that the presence of meconium, age of the mother and an exhausted patient could each also indicate an emergency, but were missing from P24. Labour or miscarriage in a public place was cited as a cause for concern due to lack of provisions and failure to provide dignity or comfort. EMDs suggested that maternity calls could be screened for location and a higher priority given to those in public, similar to the MPDS triage of fallers.

You can't get towels, you can't get pins, you can't get comfortable. You can't do anything on those instructions [in a public place]. I just can't imagine the complications that might arise when you're by yourself. (P8)

EMDs recognised the importance of intuition in the recognition of maternity emergencies. The ability to interpret different manifestations of pain or distress was felt to be the result of either an innate understanding or experience.

That certain type of scream, it's not always screaming actually it could be a silence. It is very subjective but generally it's a different type of silence, a mysterious silence as opposed to a 'I'm not really sure what's going on kind of silence' or it's a real scream as opposed to 'oh I'm just screaming because it really hurts but nothing serious is happening right now'. (P15)

However, it was accepted that this would be difficult to incorporate in P24.

Challenges with KQs

One of the most substantial concerns for EMDs was the first 'blue for you' question (KQ1: 'Apparent miscarriage or stillbirth?') due to uncertainty when answering and the perception that this could result in the incorrect triage of the call.

I made a mistake because someone said 'oh the baby is too early' so I went down the miscarriage route and it was a Cat 4 [the lowest category call] and then they've called back in and then the second question came up and they've put that they're in their third trimester. (P1)

EMDs are to answer 'yes' to KQ1 if the caller mentions tissue or a fetus. EMDs recalled responding inaccurately as a result of the information given to them. EMDs also felt ill equipped to make the decision without knowing gestation and this caused anxiety about undertriaging the call.

It says 'tissue or foetus out' but they [the caller] never say that. They'll just say bleeding or 'I think I might be having a miscarriage'. So when they say it, 'I think I might be having a miscarriage', do you still go with miscarriage because how do you know that they're having a miscarriage? (P20)

The second 'blue for you' question (KQ9: 'Caller mention of a multiple birth?') elicited similar responses from participants who felt callers sometimes omit that they are expecting multiples. They were concerned this would result in undertriage and would prefer to ask the question directly.

Maybe there should be some leeway in that if it's blue [for you] and we are uncertain then we could ask. (P8)

Participants reported wide variations in callers' knowledge of their pregnancy, meaning many were not able to answer accurately when asked about complications.

When you ask say... if they have any high risk complications, what they count as high risk complications may not be what we count as high risk complications. (P19)

Listing the complications for callers felt counterproductive and participants often described rewording the question in lay terms. The list was not felt to be exhaustive and EMDs recalled unlisted complications being disclosed, making it difficult to triage appropriately.

They start naming random things and you look down the list and that's not one. (P12)

EMDs also felt that exploration of abdominal pain was incomplete and resulted in inappropriate use of labour instructions. This left EMDs concerned that they were causing unnecessary stress for callers but were unable to use their own judgement as to whether labour instruction was required as MPDS does not allow for deviation. I don't think she was in labour, and then going on it's [P24] then giving me birthing instructions and it's just like this is cringe, I'm panicking this woman for no reason. (P10)

Assessment of bleeding was another area that it was felt could be improved. EMDs acknowledged that they could ask if the bleeding was 'spurting or pouring' but were frustrated that the questions do not take into account expected bleeding such as the 'show' or provide an opportunity to document heavy bleeding that is not spurting or pouring.

But it doesn't actually say 'are you bleeding, are you gushing out with blood, or have you just had your show come out'. (P18)

The need for sensitivity surrounding miscarriage

EMDs reported that the management of miscarriage-related calls was sometimes challenging and that questions were designed for pregnancy, making them inappropriate for both unplanned and planned terminations.

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I feel that miscarriages is the point where the card... it doesn't breakdown but it becomes difficult. I think that's the best way to put it. It's just not as pleasant. There needs to be more scope, more flexibility. (P11)

The consensus was that the instructions and prompts lack empathy. Use of the word 'birth' in particular was thought to be insensitive, evoking feelings of the arrival of a healthy baby.

The language of birth is having a baby. That's what they've been looking forward to. (P1)

Participants worried about having a negative impact on callers and would prefer phrases with less medical terminology. Each focus group paid particular attention to the phrase, 'I'm very sorry there is nothing we can do for your baby'. Although some felt the wording was suitable and prevented false hope, others felt it did not consider the emotional nature of the situation.

It sounds very cold a lot of this doesn't it. (P4)

Similarly, EMDs found some prearrival instructions (PAIs) to be inappropriate as they were designed for labour. EMDs would prefer specific instructions to read when a patient was having a miscarriage. Some admitted omitting instructions that felt insensitive despite worrying that they could be criticised for non-compliance if their call was audited.

When someone is having a miscarriage which is like four weeks and you tell them not to sit on the toilet... I mean if you were the mum you probably don't want anything to do with that. (P7)

An additional issue raised by EMDs concerned identifying a viable pregnancy due to variation in the classification of the term viable between countries. MPDS categorises pregnancies over 24 weeks as viable, whereas some ambulance services, including the study site, have lowered this threshold. EMDs in these services must remember to select 24–36 weeks of gestation for any pregnancy that would result in life support in the case of birth. For example, the centre at which this study is based categorises any pregnancy over 20 weeks as viable and therefore required EMDs to select 24–36 weeks. Managers were aware that this introduced room for error which would result in a lower category response for a baby that could potentially receive life-saving treatment.

They've [EMDs] got to remember in their head that they [the caller] said 20 so I've got to select the 24 to 36 so that's how mistakes and stuff are made. (P13)

Participants stated that emergency calls relating to medical terminations were becoming more prevalent and questioned whether P24 was fit for purpose in these circumstances. Furthermore, EMDs felt that P24 was neither relevant nor sensitive to callers who have knowingly chosen to terminate their pregnancy.

Protocol 24, is that really appropriate to triage these women who have chosen not to have a baby and we are like 'how many weeks pregnant are you?' you know. (P23)

Using PAIs and postdispatch instructions to help patients

Overall, participants viewed PAIs as their opportunity to help patients. Most were impressed with how advanced, well written and user-friendly the P24 PAIs were and gave examples of when the instructions worked well.

My favourite instruction- I had to ask a guy, I think he was feeling his wife's tummy, and the next instruction was: 'it's supposed to feel like a grapefruit' and the next thing he says was –'it feels like a grapefruit!' (P3)

However, EMDs felt that some PAIs were unnecessary and detracted from the core elements of the instructions. The instruction to find a shoelace and a safety pin was questioned by many.

I do think that instruction is a little bit ridiculous... What you are potentially doing in a lot of cases is taking the one person on the phone with you with mum away from mum who's potentially going to have her baby, getting them to hunt around the house for shoelaces and safety pin whilst they are unlacing a shoe. It happens all the time. (P23)

EMDs expressed frustration over the lack of explanation for some PAIs and felt further elucidation could help the caller understand instructions, which may seem unusual or counterintuitive, thereby increasing cooperation. Leave the baby for three minutes, they don't want to do that. They want to wrap the baby up and give it a cuddle and you're saying 'no leave it for three minutes' and again we do not explain why. And as far as they're concerned we're just saying 'and now we are just going to let your baby freeze for three min, lets twiddle our thumbs shall we?' Its a long time. (P21)

Checking for crowning was cited as an instruction that callers often ignored and EMDs expressed frustration with the lack of reassurance or alternatives. Participants described using unscripted support and persistence to encourage callers. It was suggested that a 'refusal button' encompassing maternity-specific alternative phrases could be useful in these cases.

Just something alternative of that, maybe some reassurance that you're not going to break anything or, like, you don't need to touch. (P3)

For callers in progressive labour who are not alone, the level of detail and different pathways available gave participants confidence that the PAIs were capable of managing most issues and yet were simple enough for a young child. For more complex maternity conditions, PAIs were considered more difficult to follow. EMDs viewed the prompts as inflexible if the birth occurred in an unexpected environment. Additionally, water births were perceived as commonplace but not catered for by P24.

So they were in the water in a home birth pool and she was delivering and the head was out and obviously there is no instruction to deliver the baby under the water... The only reason I knew what to do was because my second child was born under water so I had that experience from the midwife. Other than that I had no experience and I was panicking. (P14)

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Giving inappropriate instructions or not having instructions for certain scenarios left EMDs feeling discouraged about the PAIs and safety concerns were raised for the women in these situations.

Ideas for additional ProQA functionality

Most participants thought ProQA was easy to follow. However, EMDs found it difficult to navigate if the situation changed or more information became available. Being able to move backward and forward freely through the protocol was a desired feature.

Particularly with the complex ones, people do like to look ahead and see what is coming up because they are not so familiar with them, because they actually want to be prepared. (P17)

The lack of manoeuvrability meant that some EMDs had experienced difficulty in finding PAIs for imminent births. The introduction of a shortcut to birthing instructions was suggested in the same way that cardio pulmonary resuscitation (CPR) and choking instructions are available at the touch of a button.

And it throws you straight to the birthing instructions- that would be really helpful. In the same way that you've got the black cross and the choking icon, the screen has a screaming dad option. (P11)

Concerns were raised over whether ProQA was capable of thoroughly assessing mother and baby at the same time. P24 triages the mother and relies on the caller to notice and report issues with the baby. EMDs worried that complications could be easily missed and found it difficult to immediately upgrade to the highest priority call in these cases. Additionally, adult CPR instructions are automatically given unless the patient entry is manually changed to the baby. The emotional and stressful nature of the situation was felt to exacerbate this issue.

If the baby is born and it's going blue or is not breathing, the system doesn't automatically make it a Cat 1 [the category demanding the fastest response in England], so the EMD is expected to go back to case entry and change the patient to a baby. In that situation it's too panicked to do that. An EMD is trying to do everything at once. (P14)

Discussion

Main findings

Maternity calls were considered rewarding but complex if the case was not a straightforward labour. Participants were largely positive about ProQA and most agreed it was easier to follow than the physical card sets. While it was recognised that P24 KQs accounted for many factors believed to be integral to the telephone triage process, participants suggested some enhancements. EMDs agreed that some KQs, the handling of miscarriage, PAIs and functionality could all be improved.

The complexity of maternity triage was reflected in reports of requiring help or feeling uncertain when dealing with these calls. This supports other studies that have investigated midwives' perception of telephone triage and acknowledged the challenges faced when using this medium of communication⁴ as well as the anxiety associated with this method of triage.¹⁴ The lack of visual information and the increased difficulty in obtaining a full history over the phone have been cited as two of the main challenges in obstetric telephone triage,²⁰ therefore, detailed questioning is required to produce accurate assessment and responses. Our findings support the consideration of several additional factors in prehospital maternity emergency triage including the presence of meconium, maternal age, exhaustion and location as well as deeper investigation of abdominal pain, bleeding and high-risk complications. Inclusion of additional factors is supported by recent publications in the Netherlands where a new evidence-based, obstetric telephone triage system has been developed including assessment of maternal age, presence of coloured fluid loss and maternal panic.²¹ The guideline exhibits diagnostic validity²² and reliability²³ further supporting the potential inclusion of additional factors in prehospital maternity telephone triage to enhance symptoms recognition and accurate assessment and response. EMDs felt that P24's 'blue for you' questions could lead to incorrect assumptions resulting in inaccurate triage. Particular concern was raised over the gestation of the pregnancy and the identification of viable birth or miscarriage. EMDs would prefer to ask a direct question about gestation in weeks to avoid confusion and eliminate risk of error. The literature suggests undertriage is associated with poor communication and non-normative symptom description^{24 25} which could be confounded by P24's expectation of EMDs to infer critical information from callers who may have difficulty in communicating their presentation effectively. Identifying a viable birth as a miscarriage could result in delays to life-saving treatment.

Triage of the baby was another area of P24 that EMDs felt could be enhanced by additional direct questioning. Effective communication is a key element of telephone triage and asking too few questions has been associated with malpractice cases.²⁶ Failure to seek pertinent information may result in the omission of critical details resulting in inappropriate triage and potentially poorer outcomes for mothers and babies.

Unprompted, each focus group discussed concerns over the emotional sensitivity of the scripted wording in response to miscarriage. Successful telephone triage is dependent on effective communication, interpersonal skills and empathy.¹⁵ Women experience a traumatic and sad life event when a miscarriage occurs and many suffer from feelings of grief, guilt, depression and anxiety.^{27 28} Moreover, the response of healthcare professionals to miscarriage in the emergency department has been shown to result in an experience of marginalisation for women who feel their loss is not acknowledged.²⁹⁻³¹ Sensitive and empathetic care is crucial to the long-term emotional recovery of women who suffer miscarriage.³²

Participants also questioned the appropriateness of P24 for the triage of calls related to medical terminations. Women experiencing a medical termination may suffer from mental health-related consequences prior to and following the procedure. It is the legal and ethical responsibility of healthcare providers to respond to the need for postabortion care, including psychological support.^{33 34} Currently, P24 does not include a specific pathway for

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the triage of planned abortion and therefore the language used in these circumstances was felt to be inadequate.

As the first point of contact, EMDs represent the start of a woman's interaction with the health service and should set the tone with a caring response to avoid emotional repercussions for the woman in future. Therefore, there is an important role for MPDS, not only in providing accurate triage but in the support of callers in stressful and emotive situations.

Strengths and weaknesses of the study

This is the first focus group study exploring EMD's perceptions of emergency maternity call management. The study was conducted in one of the busiest ambulance services in the world with substantial experience in handling maternity calls. However, the participants all worked for one ambulance service and therefore the study may not be representative of the wider EMD community. The self-selected nature of our sample may also have resulted in volunteer bias. While focus groups carry a risk of researcher bias, participants in this study were asked to confirm researchers' understanding of their responses during the focus groups to minimise the potential for such bias.

Implications

To our knowledge, this is the first publication using focus groups to explore EMDs' perceptions of emergency maternity call management. Although all participants for this study were self-selecting and worked for the same ambulance service, their participation has provided novel and meaningful results contributing to the first published reflection of EMDs' experiences of using MPDS to identify maternity emergencies.

While providing support for P24, this study has also identified several potential enhancements that could be made to MPDS P24 to improve triage and aid the management of maternity emergencies. Further research is needed to determine whether the findings from these focus groups can be generalised.

We thank the colleagues who gave up their own time to participate in the focus groups, without whom this study would not have been possible, and Valentina Pendolino for her input on the final draft of this paper.

Data availability statement

Data are available upon reasonable request.

Ethics statements

Patient consent for publication

Not applicable.

Ethics approval

This study involves human participants and was approved by an NHS Research Ethics Committee (London Surrey Borders) (Ref: 18/LO/2027). Participants were advised not to share patient-identifiable details. Data were treated as confidential and anonymised at transcription. Participants gave written informed consent to participate in the study before taking part.

Footnote

Contributors JS and RF designed the study. AA and JS conducted the research, analysed the data and wrote an initial study report. CB wrote the final paper with revisions from JS and RF who act as guarantors. Funding This work was supported by the International Academies for Emergency Dispatch (Ref: L0017726) but remained independent with no input from the sponsors.

Competing interests None declared.

Patient and public involvement Patients and/or the public were involved in the design, or conduct, or reporting, or dissemination plans of this research. Refer to the Methods section for further details.

Provenance and peer review Not commissioned; externally peer reviewed.

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DETAILS

9. Evidence Search on Maternity Triage

Subject:	Emergency medical care; Patients; Software; Pregnancy; Researchers; Data analysis; Multiple births; Focus groups; Obstetrics; Medical research
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Maternity care: Leicester services are downgraded for understaffing and risky triage delays

Adrian O'Dowd

[ProQuest document link](#)

ABSTRACT (ENGLISH)

Both services at Leicester Royal Infirmary and Leicester General Hospital were regularly understaffed, said the

9. Evidence Search on Maternity Triage

CQC, and it found “multiple examples” where people’s care had been delayed in maternity triage owing to a lack of doctors. Safety and openness Carolyn Jenkinson, deputy director of secondary and specialist healthcare at the CQC, said, “Both services were regularly understaffed, which placed people and their babies at risk. Leicester General Hospital: inspection report. 20 Sep 2023.
<https://api.cqc.org.uk/public/v1/reports/6160f075-b448-4f43-982f-5d4882a5a2a3?20230920070046> 3 Care Quality Commission.

LINKS

[Linking Service](#)

FULL TEXT

Understaffing and triage delays that led patients to give up waiting and discharge themselves have been identified as problems at some maternity services run by University Hospitals of Leicester NHS Trust.

The Care Quality Commission (CQC) lowered previous overall ratings of “good” on two of three maternity services run by the trust—Leicester Royal Infirmary and Leicester General Hospital¹²—to “requires improvement” after carrying out inspections in February and March. It issued a warning notice for the trust to focus its attention on rapid improvements in managing these maternity services.

On the rating for safety the CQC lowered both sites’ previous “requires improvement” ratings to “inadequate,” and the ratings for being well led were also deemed “requires improvement.” At the other maternity services site run by the trust, St Mary’s Birth Centre,³ the CQC kept the overall rating as “good,” although the rating for being well led was lowered from “good” to “requires improvement.”

Although the trust maintained its overall rating of “requires improvement,” the CQC said that it had observed a deterioration in the level of care provided to women, people using the service, and their babies during its inspections at the trust. These were carried out as part of the CQC’s national maternity inspection programme, which aims to provide an up-to-date view of the quality of hospital maternity care in England.

Both services at Leicester Royal Infirmary and Leicester General Hospital were regularly understaffed, said the CQC, and it found “multiple examples” where people’s care had been delayed in maternity triage owing to a lack of doctors.

Safety and openness

Carolyn Jenkinson, deputy director of secondary and specialist healthcare at the CQC, said, “Both services were regularly understaffed, which placed people and their babies at risk. It also meant staff weren’t always able to take their breaks, which affected their wellbeing, morale, and ability to do their job.”

She said that inspectors had found multiple examples where people’s care had been delayed in maternity triage because of doctor shortages, sometimes for as long as six hours, which led to some patients self-discharging without being seen and may have placed them at risk.

Jenkinson was more positive about the fact that the trust was working to improve culture across all maternity locations and had reorganised its structure, with many new posts still needing to be embedded.

Julie Hogg, chief nurse at the trust, said, “Improving maternity services is a key priority, and many of the highlighted challenges had already been identified before the inspection with plans in place to tackle them. However, we take the report and its findings incredibly seriously and are using them to drive further improvements.

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“While we know there is more to do, we are committed to providing safe, high quality, and compassionate care and are encouraged that the reports highlight our hardworking staff and the actions being taken to ensure a culture of safety and openness. We have invited the CQC back to see the changes we have made.”

¹ Care Quality Commission. Leicester Royal Infirmary: inspection report. 20 Sep 2023.

<https://api.cqc.org.uk/public/v1/reports/2eabd2d2-3f93-4e28-8caf-1ae577959e95?20230920070046>

² Care Quality Commission. Leicester General Hospital: inspection report. 20 Sep 2023.

<https://api.cqc.org.uk/public/v1/reports/6160f075-b448-4f43-982f-5d4882a5a2a3?20230920070046>

³ Care Quality Commission. St Mary's Birth Centre: inspection report. 20 Sep 2023.

<https://api.cqc.org.uk/public/v1/reports/25fac6f5-351f-454f-8108-6ce864882a26?20230920070046>

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9. Evidence Search on Maternity Triage

Updates:	2023-09-21; 2024-08-27
Database:	Health Research Premium Collection,British Nursing Index

2023 RCM Awards

Anonymous

[ProQuest document link](#)

LINKS

[Linking Service](#)

FULL TEXT

The annual RCM awards are an opportunity to celebrate the very best in midwifery standards, care and innovation. Here is a winner linked to maternity triage.

As part of an initiative to centralise all antenatal concerns and labour calls, the teams at Southampton, Hampshire, Isle of Wight and Portsmouth (SHIP) Local Maternity and Neonatal Systems (LMNS) and University Hospital Southampton (UHS) created the Healthier Together urgent care app.

This is targeted at pregnant women and birthing people, who can use it to report any concerns during pregnancy, which are broken down into red, amber and green symptoms. Any women with amber-level concerns over 20 weeks are linked to a maternity triage line.

As well as escalating any serious cases, the app also serves to reduce anxiety among women and cut the volume of calls to day assessment units.

WHAT THE JUDGES SAID:

"A fantastic initiative, a clear and passionate presentation and significant potential for scale-up and sustainability"

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DETAILS

Subject:	Innovations; Womens health; Collaboration; Learning disabilities; Neurodiversity; Handicapped accessibility; Training; Health care; Pandemics; Midwifery education; Public health; Pregnancy; Listening; Confidence; Mental health; Working groups; Maternal child nursing
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Evaluating the implementation of the Birmingham Symptom-specific Obstetric Triage System (BSOTS) in Australia.

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[ProQuest document link](#)

ABSTRACT

BACKGROUND

Obstetric triage is usually undertaken by a midwife and involves conducting a physical assessment to identify a woman's presenting problem. The Birmingham Symptom-specific Obstetric Triage System (BSOTS) was developed in the United Kingdom (UK) to overcome challenges associated with triaging women by standardising the maternity triage process. The Australian study site is the first hospital outside the UK to implement this approach.

AIM

To evaluate the implementation of the BSOTS in an Australian tertiary maternity service.

METHODS

A multi-method approach including pre-implementation BSOTS education evaluations (n = 26), post-implementation clinical data audit (n = 660), and staff focus groups (n = 9) was undertaken. Participants included midwives who worked in the Maternity Assessment Centre. Data of women who had attended the service during BSOTS implementation was analysed in the audit component.

FINDINGS

Staff valued the BSOTS standardised approach to maternity triage, particularly for midwives new to the role. The retrospective audit showed that time to triage and time to care outcomes for women improved from pre-implementation audits and were mostly adhering to auditable standards. Lack of knowledge amongst staff (especially medical staff) regarding the BSOTS was considered a barrier to the effective flow of care of women through the centre.

DISCUSSION

The BSOTS is a useful approach for prioritising women's care. Ensuring that all staff are aware of the system and its benefits is likely to enhance implementation and improve triage outcomes.

CONCLUSION

The BSOTS is an innovative midwife led practice change that is applicable to the Australian context, and benefits women, midwives, and the maternity service.

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LINKS

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DETAILS

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The obstetric and gynecological service providers' and recipients' perception and experience of the quality of obstetric triage services during the COVID-19 pandemic in Iran

Yazdimoghaddam, Hamideh; Sadrzadeh, Sayyed Majid; Fatemeh Zahra Karimi

[ProQuest document link](https://www.proquest.com/scholarly-journals/evaluating-implementation-birmingham-symptom/docview/2716524430/se-2?accountid=48232)

ABSTRACT (ENGLISH)

Background

Enhancing the quality of obstetric triage services requires a clear perception of the current situations and problems, this issue gained more importance during the COVID-19 pandemic. The purpose of this study was to explore the obstetric and gynecological service providers' and recipients' perception and experience of the quality of obstetric triage services during the COVID-19 pandemic.

Methods

This research was a qualitative study carried out using conventional content analysis. Participants were selected through purposive sampling, and data collection was conducted using in-depth semi-structured interviews. Data were analyzed using MAXQDA software and conventional content analysis. Validity of the data was approved based on four criteria: credibility, dependability, conformability and transferability.

Results

Five themes emerged through analysis: "unpreparedness to deal with the COVID-19 resulting in disorganized triage", "threat to the physical and mental health of personnel during the COVID-19 pandemic", "degradation of the quality of services due to improper triage structure during the COVID-19 pandemic", "communicating with patients which is neglected during the COVID-19 pandemic" and finally "accountability required to improve the provision of services during the COVID-19 pandemic".

Conclusion

Obstetrics and gynecology service providers and recipients faced formidable challenges in the triage department during this pandemic caused by the complex and ambiguous nature of the Coronavirus. Identifying the problems, barriers and challenges in providing services to patients in this situation especially in triage, can lead to an improvement in the outcome of services.

LINKS

[Linking Service](#)

FULL TEXT

Background

The COVID-19 pandemic was recorded as one of the most challenging disasters in the world [1, 2]. The health system needed to adopt a clear policy for dealing with this disease because of its severity. In Iran, according to WHO, from 3 January 2020 to 26 November 2022, there were 7,559,706 confirmed cases of COVID-19 disease with 144,633 deaths (<https://covid19.who.int/region/emro/country/ir>).

The emergency department is one of the main parts of the health system. Nowadays, the emergency department has become the main site for providing emergency medical care [3, 4]. Research results have shown that during the COVID-19 pandemic, the emergency department was the top priority and the emergency workforce were the first human role players who provided health care services to the patients; accordingly, a heavy workload was imposed on them. Currently, a huge crowd in the emergency department is recorded from diverse countries. Large population of patients admitted to the emergency departments during the COVID-19 pandemic led to the crowdedness in the departments which was aggravated by lack of healthcare personnel and resources, which could have affected the quality of healthcare services [3, 5,6,7,8].

A highly sensitive group in the society is the population of pregnant women. Due to their frequent referrals to obstetrics and gynecology ward, it is necessary to provide high quality services in the obstetric triage as it can lead to a higher level of satisfaction and efficiency, as well as the reduction of mortality rate in the emergency departments. Therefore, it is necessary to closely scrutinize the quality of services so that optimally desirable

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services are provided to clients [8, 9].

Finally, as to our best knowledge, few studies have been conducted to examine this issue, as well as due to the importance of the health services quality in reducing mortality rate and increasing quality of life, this study was conducted with the aim of exploring the obstetric and gynecological service providers' and recipients' perception and experience of the services quality in the obstetric triage during the COVID-19 pandemic.

Methods

This qualitative study was conducted during the COVID-19 pandemic in the obstetric triage ward in the hospitals of Mashhad University of Medical Sciences, Mashhad, Iran, from Sep 2021 to Feb 2022.

Obstetric and gynecological service providers' and recipients were provided with the necessary explanations about the objectives and method of the study; subsequently, their (Obstetric and gynecological service providers' and recipients) written consents were obtained.

Since the quality of health care services is a subjective, complex, and multidimensional concept, qualitative research methods were applied in the present study. In addition, the use of these methods was likely to provide deeper insights into the service providers' and recipients' perceptions because improving the service quality regardless of the clients' perceptions, opinions, needs and expectations seems to be less achievable [10,11,12,13,14,15].

Since the aim of this study was exploration of the perceptions and experiences of the obstetric and gynecological service providers and recipients about the quality of services in obstetric triage, and because there was no similar study in Iran, the conventional content analysis method was used.

The conventional content analysis is commonly applied about a topic when the research literature on that topic is scarce. In the present case, the researchers worked on the study data to create a new viewpoint.

Data collection was performed and continued up to the point of data saturation, i.e. the follow-up questions continued until the interviews did not provide further information and only the previous data were repeated.

After the participants completed the informed consent form, data were collected by in-depth semi-structured interviews. At the interview, the interviewer introduced himself and described the objectives of the study. Besides, he created a friendly atmosphere by asking introductory and warm-up questions (to elicit the demographic information) and forming an appropriate relationship to gain the women's trust. At the end of the interview, the participants were asked to add any further comments and were informed about further interviews, if any. Each interview session lasted between 45 and 90 min.

The interviews were recorded and transcribed verbatim with the interviewees' consent. Inclusion criteria for obstetrics and gynecology service providers and recipients in obstetric triage ward included being able to understand and speak Persian in order to express their feelings and experiences, and being interested in participating in the study to talk about the experiences and concerns with the researcher. In addition, an inclusion criterion for obstetrics and gynecology services providers was having at least a 6-month experience of working in an obstetric triage ward during the COVID-19 pandemic. The only exclusion criterion was the participants' unwillingness to continue cooperating at any stage of the interview.

Triage services in Iran are given to all pregnant women regardless of their gestation status. It includes patients who show early pregnancy symptoms such as threatened miscarriage.

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ESI triage system is used in Iran. ESI triage system (Emergency Severity Index) is a five-level system in which, in addition to the severity of the disease and the degree of deterioration of the patient's clinical condition (acuity), the amount of facilities required by the patient (resource) in the emergency room is also determined. The severity of the disease with the presence or Absence of life or limb threat and presence of danger signs as well as determined vital signs and required facilities are determined based on experience and comparison with similar cases.

Some interview questions for the service providers were: What was the effect of Covid-19 on the provision of obstetric services? What challenges and problems did you face on that occasion? How did these challenges affect your workflow?

Some interview questions for the service recipients were: What problems did you face in the obstetric triage?

During the interviews, the participants were asked to talk about their caregiving experiences in detail. In addition, to guide the interview and in response to the participants' answers, other questions were asked; e.g. can you explain more in this regard? Have you had any experience in this field that you can explain to me?

During the study process, the interviews were conducted based on the created questions and the researchers directed the questions based on the important created categories.

The study was analyzed based on the principles of conventional content analysis, which includes the following steps: transcribing the entire interview verbatim immediately after each interview, reading the whole text for a general understanding of its content, identifying the conceptual units and initial codes, classifying similar initial codes into more comprehensive categories, and ultimately determining the theme of the categories.

All interviews were recorded, typed word by word, and edited for correspondence with the participants' verbal protocols. In order to extract the codes, the data were read word by word. With the help of reduction and text compression process, the initial codes were extracted and were then compared based on their similarities and differences and placed in sub-categories. After organizing, the sub-categories were placed in the related categories based on the relationship between them. Finally, after analyzing, interpreting and abstracting the categories, the theme which was more condensed was extracted [16].

The credibility, dependability, conformability and transferability criteria, expressed by Lincoln and Guba, were used to confirm the study findings. Certain measures were taken including spending enough time for data collection and analyses to deeply understand the participants, reviewing the interviews and codes by the research team, building a good rapport with the participants to conduct more in-depth interviews, processing data in the long term, reading the interviews several times to modify the codes, reviewing various stages of analysis in repeated sessions by the research team, and reviewing the codes by other colleagues. Interviews, codes and extracted categories were given to some experts familiar with qualitative research methods; they were asked to review the coding and analysis methods and provide comments on its accuracy. In controversial cases, discussions were made and consensus was achieved. Different stages of analysis were recorded and described to be used for evaluation by external experts [17, 18]. Data were analyzed using MaxQda12 software.

Results

In this qualitative study, 57 in-depth interviews were conducted with service recipients (24 patients) and service providers (33 triage staff) in the obstetric triage of hospitals affiliated to Mashhad University of Medical Sciences, Iran. Service recipients (age range from 18 to 42 years) were either housewives or employed, and had different levels of education (ranging from elementary school to postgraduate) at a gestational age ranging

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from 5 to 42 weeks. Service providers (age range from 24 to 56 years) were midwives, obstetrics and gynecology residents, and triage ancillary workers. They had different levels of education ranging from high school diploma to PhD degrees, with working experience from 1 to 28 years (Tables 1 and 2).

Qualitative analysis of the data led to the emergence of 674 initial codes, 200 sub-sub-categories, 55 sub-categories, 15 main categories and 5 themes (Table 3).

The themes were 1- “unpreparedness to deal with the COVID-19 outcomes in disorganized triage”, 2- “threat to the physical and mental health of the personnel during the COVID-19 pandemic”, 3- “degradation of the quality of service due to the improper triage structure during the COVID-19 pandemic”, 4- “communicating with patients which was neglected during COVID-19 pandemic” and 5- “accountability required to improve the provision of services during the COVID-19 pandemic”.

Unpreparedness to deal with the COVID-19 outcomes in disorganized triage

This concept was extracted from two main categories: “Not knowing how to deal with patient admission at the beginning of the COVID-19 pandemic” and “the challenge of patient admission and care due to lack of a clear structure”.

These categories indicate factors such as the requirement of COVID-19 patient admission that increased the disorganized referral of patients and improper distribution of patients in non- COVID-19 centers. These factors put negative effect on the quality of obstetric service in the triage ward during COVID-19 pandemic.

“We are legally obliged to admit every COVID-19 patient who is referred to the hospital, although this ward is a non-COVID-19 center. Unless we can really admit the patient and the patient has a non-emergency condition, we are allowed to refer that person elsewhere” (health care service provider).

The lack of clarity in the referral process of COVID-19 patients during the early days of this crisis perplexed the healthcare staff about deciding whether to refer or admit the patient, or even refer patients to the triage ward.

“Patients had to be admitted to the COVID-19 emergency room, but they did not know it. Neither did we know whether to refer the patient to the COVID-19 emergency or not, since there was no a specific protocol about this new disease” (health care service provider).

Confusion about referrals in the triage ward wasted a lot of time, subsequently, it put a bad effect on the quality of care and services.

“A patient with COVID-19 disease was referred to our hospital from a doctor’s office. Our hospital is a non-COVID-19 center so the patient had to be referred to a COVID-19 center instead. Finally, the patient was referred to a COVID-19 center. Wrong patient referrals generally took up our valuable time for other patients” (health care service provider).

Threats to the physical and mental health of personnel during the COVID-19 pandemic

This concept is extracted from 5 main categories: 1- “Fear of being infected, the cause of social and family isolation”, 2- “Physical, psychological, and social consequences of the COVID-19 disease”, 3- “Physical and

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mental exhaustion of patients and staff at the peak of the COVID-19 pandemic”, 4- “Fear of being hospitalized in COVID-19 centers is a factor of hiding the truth” and 5- “Quality of care which is neglected during the COVID-19 pandemic”. This concept represents the factors that affect the quality of services provided in the obstetric triage and its consequences.

The crowded triage wards and the heavy workload, especially at the peak of the COVID-19 pandemic, reduced the physical strength of the personnel.

“We do not rest at all at night because we have to take care of 40-50 patients in each shift. Especially at the peak of the COVID-19 pandemic, we become too exhausted after each shift in a way that we cannot even do our daily routines” (health care service provider).

This heavy workload in triage ward has also negatively affected the family and emotional relationships of the staff.

“We have several work shifts in a week. We do not have time to spend with our family and take care of our children at all. We cannot support our children emotionally and pay attention to their nutrition and education” (health care service provider).

Fear of being hospitalized in a COVID-19 center, fear of the COVID-19 stigma and being rejected or fear of being rejected caused the patients to hide the truth of their being infected with the COVID-19 disease, which leads to further transmission of the disease to others, especially to the triage personnel.

“Many patients do not say they are infected but when we check the system, we see that the patient has a positive PCR. Because they are afraid of being hospitalized in a COVID-19 center” (health care service provider).

If the triage personnel are infected with COVID-19, we will face a lot of problems such as absence of the personnel due to sick leave, which imposes heavier workload on other personnel.

“The staff is too exhausted now. Staff who is infected with the COVID-19 disease took a sick leave so it imposes heavier workload on other personnel. We don’t even have a day off” (health care service provider).

Fear of encountering the COVID-19 patients and the possibility of being infected with the virus can have a negative effect on the quality of patient care in the triage ward.

“As soon as a patient says, ‘my PCR is positive’, I subconsciously take the patient away since I do not feel safe although it is our duty to examine the patient” (health care service provider).

Reduction in the quality of service due to improper triage structure during the COVID-19 pandemic

This concept is extracted from 4 themes: 1- “Fast diagnosis due to the presence of a fixed obstetric resident in the triage ward”, 2- “Necessity of personnel cooperation in systematically observing the COVID-19 conditions in the triage section”, 3- “Dissatisfaction with lack of proper triage infrastructure under COVID-19 conditions” and 4- “Deficiency in purposeful and efficient triage management under COVID-19 conditions”. This concept represents the factors that affect the quality of structure criteria in the obstetric triage. Lack of a fixed resident in the triage ward is one of the challenges of obstetric triage especially under COVID-19 conditions which causes problems such as delayed patient care, long patient stay in the emergency ward, patient dissatisfaction and even neglecting the emergency patient.

“Under these conditions, we should have fixed residents in the COVID-19 center. It takes a long time to decide

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about a patient because we have to wait for a resident to return to the center. These factors cause the patient to be dissatisfied with the service provider.

“We must have a fixed emergency resident in the COVID-19 center. The patient may need immediate medical care while I am visiting patients in other wards” (health care service provider).

Lack of an isolation room for COVID-19 patients is another challenge in obstetric triage ward, which increases the risk of transmitting this disease to other patients and staff.”

“There is no isolated room for PCR-positive patients in the triage ward. Several pregnant women are visited at the same time, one of whom may be infected with COVID-19, so the disease transmits to others quickly. It is really important to isolate COVID-19 patients from others in the emergency ward” (health care service provider).

Despite the obligation of admitting COVID-19 patients in all centers and also heavy workload of the healthcare staff, the payment assigned for health care staff did not include the personnel of non- COVID-19 centers. This unfairness put extra negative effect on providers’ motivation in caring for patient.

“We have a heavy workload. There is no substitute for those care providers who left the ward. We have to admit the COVID-19 patients but the officials say the extra payment, which is assigned for health care staff during the COVID-19 pandemic, does not include the staff who work in non- COVID-19 centers” (health care service provider).

Communicating with patients who are neglected during the COVID-19 pandemic

This concept is extracted from two main categories: “Empathetic communication: giving care compassionately in the triage ward”, “Fear of being infected, the cause of poor communication between patients and staff”; it indicates the need for effective communication between the health care providers and the recipients because empathetic communication with the patients helps them calm down. However, in most cases, due to the fear of being infected, the staff are unable to communicate properly with patients and those who accompany them. This negatively affects the quality of services provided in the obstetric triage ward.

“Before this pandemic, we communicated very easily with the patient, we did not wear a mask so the patient could see our smiles and our communication with the patient was much better but now our relationship with the patients is not as friendly” (health care service provider)

The COVID-19 conditions lead to patients’ and their families’ dissatisfaction, and inappropriate behavior of the staff.

“I was in so much pain and in the hallway, there was only one bed on which I was lying. The staff said, do not sleep, and get up. Their behavior was not good. I said why you treat me like this, they said if you wish, you may go to another hospital” (health care service recipient).

“Do not come to the room, do not stand behind the door, and do not talk. I felt bad to be treated like this so I complained about that but they said that you could leave the hospital” (health care service recipient).

Accountability required to improve the provision of services during the COVID-19 pandemic

This concept is extracted from two main categories: “Commitment to work in difficult COVID-19 conditions” and “Effective care requirements”. The commitment and effort of the triage staff under these difficult conditions had led to the recipients’ satisfaction with triage services, and affected quality of structure criteria provided in the obstetric triage ward.

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“They examined me. Everything was fine. I felt good. Their behavior and accountability were good. Despite COVID-19 conditions, when the emergency room was overcrowded, everything was better than I expected” (health care service recipient).

The staff normally endure the difficulty of COVID-19 conditions and establish a proper relationship with the patient and their family.

“All patients are stressed during this pandemic and their tolerance is low. If there is a problem, I will try to avoid conflict with patients and their family” (health care service provider).

Personnel in the triage ward are committed to do their duties despite the challenges such as the lack of personal protective equipment.

“Because we are not provided with personal protective equipment such as the N95 mask, I get stressed about being infected as a result of giving care to COVID-19 patients. But it does not affect my work; I do take my own responsibilities” (health care service provider).

On the other hand, team work among healthcare personnel, especially under COVID-19 conditions, affects the provision of optimal care to patients and effectiveness of services provided in the triage ward.

“When a patient is admitted, I cannot give them all required services. There must be a teamwork to provide better services. It is really a process. A resident must take a complete patient history and then send it to me in order to transfer the patient. Facing a problem in any step of this process causes trouble” (health care service provider).

The experience and skills of the caregiving staff are the most effective factors in the triage ward, because it exerts remarkable effect on providing optimal care and accelerating the patient assignment, especially under emergency situations.

A health care service provider said: “Skilled and experienced midwives can correctly and quickly distinguish between an emergency patient and a non-emergency one just by taking a brief look at patient’s complexion” (health care service provider).

Discussion

The emergence of the COVID-19 disease turned into a major global health challenge, and all health policymakers made efforts to reduce its mortality and morbidity. This qualitative study was conducted to explain the obstetric and gynecological service providers’ and recipients’ perception and experience of the quality of services in the obstetric triage ward during the COVID-19 pandemic to have a better management of patients and possible control of the disease in this ward.

One of the concepts in the present study was “unpreparedness to deal with COVID-19 outcome in disorganized triage”. The emergence of the disease, the varying behaviors of the Coronavirus, different symptoms and course of the disease perplexed the medical staff and caused fear and anxiety among patients [19, 20]. In addition, the ambiguous nature of the Coronavirus and the unknown process of the disease have caused psychological disorders in different population groups [21]. At the beginning of the pandemic, the unknown nature of the virus sometimes made medical staff afraid of being infected with the virus and transmitting the disease to their own family members. As the pandemic continued, the medical staff became more competent in overcoming their fear. Despite their fatigue, the staff attempted more than ever to take care of COVID-19 patients while taking the burden of wearing uncomfortable protective uniforms during long shifts of care giving

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[22].

The long triage process of COVID-19 patients due to lack of a clear structure affected the quality of services. A study by Paul et al. showed that the management of patients care in triage centers positively affected patients' satisfaction and reduced the duration of patient's stay in the triage ward [23].

One of the emerging concepts in the present study was "threat to the physical and mental health of personnel under COVID_19 conditions". This issue is more common in patients referring to medical centers, because of their fear and anxiety of being hospitalized in the COVID_19 center; therefore, they tend to hide the reality of being infected with the COVID-19 disease. Also, psychological factors are among the most dangerous ones when dealing with crises and disasters. For instance, "fear of death" implies an emotional response to the perception of real or imaginary symptoms along with threats to survival [24]; it can also compromise patients' immune system [25]. In a phenomenological study, based on the experience of COVID-19 patients, "fear or anxiety of death" was extracted as one of the main themes [26]. In other studies, "fear of death" has been identified as a serious psychological consequence among patients with COVID_19 disease and their caregivers [27, 28]. Patients with the COVID_19 disease tend to get anxious and worried due to the ambiguity of the nature of the disease. Meanwhile, nurses do not have the required experience and skills to deal with these patients' anxiety [29]; even they are not familiar with the term "Corona phobia" or fear of Corona. These factors contribute to patients' further anxiety. Therefore, it is essential to strengthen midwives' coping strategies by which they become more competent to deal with this psychological disorder [30]. The triage healthcare workers are at risk of physical and mental consequences directly as the result of providing care to patients with COVID-19. Result expressed implementation strategies to reduce the chances of infections, shorter shift lengths, and mechanisms for mental health support could reduce the morbidity and mortality amongst them [31].

Another concept in the present study was "reduction of service quality due to inappropriate triage structure during the COVID-19 pandemic". A study by Cavallaro et al. showed that one of the reasons for providing delayed emergency services was the lack of professionally qualified staff [32]. The results of the present study showed that under the condition of COVID-19 pandemic, many of the personnel in the triage ward were themselves infected with the virus. Another study by Andersson et al. showed that skills, competence as well as presence of the personnel in the triage ward were important factors in terms of correct decision-making about patients admitted to the triage ward [33]. Consequently, when a pregnant mother is properly and successfully examined by an experienced midwife for referral purposes or for discharging from hospital, then the clients' satisfaction will definitely increase due to fast diagnosis [34]. The results of the present study showed that due to the lack of a fixed resident in the COVID-19 center, the process of diagnoses took longer in the obstetric triage; therefore, it led to pregnant mothers' dissatisfaction, especially under the COVID_19 conditions. The findings of a study by Rashidi et al. showed that one of the causes of pregnant mothers' dissatisfaction originated in long waiting time for caregiving and patient assignment [35]. The results of another study by Johnson et al. also showed that long waiting time led to patients' leaving without initial examination, delay in receiving the necessary care and treatment, dissatisfaction, and an increase in mortality rate in some cases [36].

Another concept in the present study is "communication with the patient which is neglected under COVID_19 conditions". Communication is essential for obtaining an accurate history and collecting necessary information to make the right diagnosis [37]. The results of other studies have shown that proper communication between health care service providers and recipients was a significant factor in providing effective and dynamic care [38]. According to these studies, the health care service recipients expect to be appropriately treated by health care providers and receive good quality of care during the triage process [39]. Establishing relationships for triage is

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necessary to assess the clinical situation. The assessment includes subcategories such as general condition, time factor, threats, pain, parameter, physical examination and an overview, the result of which indicates prioritization [33].

In the research Rashidi-Fakari with title “The Quality of the Maternity Triage Process: a Qualitative Study” concluded that most participants identified care as the main factor in the quality of the delivery triage process. Standardization and adaptation of procedures and criteria in care in both examination and history taking are effective in the quality of the process of providing maternity triage services. Incorrect initial assessments, especially during triage, have been reported to increase errors and cause complications and complications [40].

Another concept in the present study is the following: “Accountability is required to improve the provision of service under the condition of COVID-19 pandemic”. Accountability is one of the main goals considered by policy makers and health systems managers. According to the World Health Organization report in 2000, one of the three fundamental goals of health systems is to meet the patients’ needs [41], because any system must attempt to meet the legitimate needs of its service recipients in order to be successful. Accountability has recently gained an increasing significance since it is associated with patient satisfaction. Additionally, improving accountability can increase the sense of comfort and better cooperation between health care service recipients and providers; therefore, it is expected to lead to the ever-increasing health of the society. Health care providers in the obstetric triage would further feel the need to meet pregnant women’s needs as they are considered as a highly susceptible group. Especially during the COVID-19 pandemic, it is more important to provide pregnant women with high quality health care services to achieve greater satisfaction [42,43,44].

During the COVID-19 pandemic, one of the most important factors was the pregnant women’s fear and anxiety when presenting to the obstetric triage. According to previous research, fear and stress cause the secretion of oxytocin that leads to the tendency to communicate with others [45], so the appropriate accountability triage personnel play an important role in the pregnant mothers’ sense of convenience and comfort. Commitment to work and effective interaction between service providers and recipients lead to the development of a more accountable health system [46, 47].

Important infrastructure measures are required to improve the situation during the conditions of this crisis [42].

Since the COVID-19 disease may be considered as the most devastating contemporary global challenge and threat, meeting the needs of the service recipients, especially the pregnant mothers, is essential. The findings indicate that interactions and communication were identified as a main factor in the quality of the delivery triage process, especially in the conditions of Covid-19. Accuracy and speed of operation are very important for triage and critical situations. Because carelessness and errors in triage have a negative effect on clients and the next stages of care. For these purposes, we should plan and take timely and appropriate measures to control and reduce the consequences of this disease.

In order to improve the quality of the caregiving process such as early diagnosis, treatment, hospitalization and recovery of patients, the following may be considered: the formation of a crisis team, preparing and compiling guidelines and protocols, and screening all households through designing an effective health system.

Also, the following measures may be recommended: taking measures to recruit further personnel, using new infrastructure and optimal use of resources, employing a permanent resident in the triage ward on a full-time basis, revising the principles of triage for infected patients, and assigning hospitals as COVID-19 centers in each city for the referral of infected and suspected patients in crisis COVID-19.

Conclusion

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The present study showed that obstetric and gynecological service providers and recipients in medical centers faced increasing challenges and were stressed during the COVID-19 pandemic.

The main concern of the participants in the present study was the fear of contracting Covid-19 and likely threats to their pregnancy. This concern is caused by the complex, ambiguous and unknown nature of the corona virus. Therefore, women with the Covid-19 disease experienced conflicts of fear and anxiety since their symptoms continued to worsen. At the community level, it seems that ignorance of symptoms, delay in the referral, resistance against hospitalization, preference of home quarantine despite the exacerbation of symptoms, and consequently a delay in providing effective care of pregnant patients are among the issues that require immediate attention.

The present study on the experiences of obstetric service providers and recipients ultimately led to the identification of problems, barriers and challenges in providing services to pregnant mothers during this pandemic. Moreover, improving the quality of midwifery triages under crisis conditions turns to a serious goal for policy makers. Therefore, we are now able to contemplate on the existing problems and barriers in the obstetric triage to plan for healthier mother and newborns.

Availability of data and materials

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

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Standardizing OB Triage Acuity Assignments

Buck, Karen Anne

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ABSTRACT (ENGLISH)

Purpose: This DNP quality improvement project aimed to improve the obstetric (OB) triage process by decreasing waiting room times and patient length of stay times and to meet initial nurse assessment benchmark time when compared with pre-implementation data

Procedure: Education on data collection form completion was provided to nursing staff and providers prior to the implementation period. Nursing staff and providers completed forms for 218 OB triage patients over a six-week period in 2022. Post-implementation data was matched with pre-implementation data according to acuity level and type of insurance.

Results: The results of the DNP quality improvement project were determined by comparing the time to nurse assessment, waiting room times, and overall length of stay times during project implementation to pre-implementation data. Non-parametric testing identified a significant reduction in time to nurse assessment and waiting room times when comparing the post-implementation data to the data collection pre-implementation ($p < .001$)

Conclusions: Implementation of the Obstetric Triage Acuity Scale positively impacted the timeliness of care in OB triage.

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Effect of a labor triage checklist and ultrasound on obstetric referral at three primary health centers in Eastern Uganda.

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ABSTRACT

OBJECTIVE

To test whether introduction of a midwife-performed triage checklist and focused ultrasound improves diagnosis and referral for obstetric conditions, including multiple gestation, placenta previa, oligohydramnios, preterm birth, malpresentation, and abnormal fetal heart rate.

METHODS

We implemented an intake log (Phase 1), a checklist (Phase 2), and a checklist plus ultrasound scan (Phase 3) at three primary health centers in Eastern Uganda for women presenting in labor. Intake diagnoses, referral status, and delivery outcomes were assessed, as well as sensitivity and positive predictive value (PPV).

RESULTS

Between February 2018 and July 2019, 1155, 961, and 603 women were enrolled across the three phases (n=2719); 2339 had outcome data. Incidence of any outcome-confirmed condition was 8.8%, 7.9%, and 7.1% (P=0.526) for each phase, respectively. The proportion of referred women with a condition did not change between Phases 1 and 2 (7.8% versus 8.6%, P=0.855), but increased in Phase 3 (48.4%, P<0.001). Sensitivity improved with each intervention; PPV decreased with ultrasound.

CONCLUSION

Use of ultrasound plus checklist increased referrals and sensitivity for high-risk conditions, with decreased PPV. The checklist alone improved correct diagnosis, but not referral. Further evaluation of these triage interventions to maximize diagnostic accuracy, referral decisions, and outcomes are warranted.

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Improving assessment of acute obstetric patients – introducing a Swedish obstetric triage system

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ABSTRACT (ENGLISH)

Background

Failure to identify severely ill obstetric patients seeking acute care, and hence delaying treatment, can lead to maternal morbidity and mortality. Triage is the prioritization of patients seeking emergency care, based on clinical decision-making tools assessing medical urgency. While triage has been applied in general emergency medicine for 30 years, there are only a few obstetric triage systems (OTS) and obstetric triage has hitherto been unknown in Sweden. Obstetric triage is more complex than general triage since both mother and fetus require assessment, and pregnancy-related physiological changes must be taken into account. This paper aims to describe the development and an initial evaluation of the first OTS in Sweden.

Methods

A multidisciplinary team surveyed reasons to seek acute obstetric care and the current patient flow at the largest obstetric unit in Scandinavia, Sahlgrenska University Hospital, Gothenburg, Sweden, with about 10,000 deliveries/year. A semi-structured literature review on obstetric triage was undertaken. Based on the survey and the literature review the first Swedish OTS was developed and implemented. Patient satisfaction was followed by electronic questionnaires. Initial validity evaluation was performed, defined by the system's ability to identify patients with need for hospital admission, stratified by acuity level.

Results

The Gothenburg Obstetrical Triage System (GOTS) addresses the patient to one of five acuity levels based on both vital signs and 14 chief complaint algorithms. It entails recommendations for initial procedures of care as well as an acuity form for documentation. Initial evaluation of the system indicates good correlation between need for admission and acuity level. The implementation has provided the staff with an improved medical overview of the patients and patient flow and enabled the unit to monitor emergency care in a structured way. Implementation came along with increased patient and staff satisfaction.

Conclusion

The GOTS is the first OTS developed in and for Sweden and implementation has improved management of obstetric patients seeking acute care. Patients are now prioritized according to level of acuity and the time to assessment and treatment of severely ill patients can be structurally evaluated. Both patients and staff express improved satisfaction with obstetric triage.

LINKS

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FULL TEXT

Background

For non-obstetric patients seeking acute care at an emergency department (ED), triage is performed at first contact with medical staff in order to determine acuity level and hence prioritize in accordance with clinical urgency. There are myriad triage systems and triage has been the gold standard in general emergency care for more than 50 years [1]. In Sweden, the predominant non-obstetric triage system is the Rapid Emergency Triage and Treatment System (RETTTS) [2, 3]. Triage has been shown to reduce the total length of stay (LOS), enable standardized initial assessment and improve patient satisfaction, compared to not applying triage [4,5,6,7,8,9]. However, triage systems applied in general ED include very few obstetric determinants and are not adapted to the physiological changes and disease spectrum specific to pregnancy and the postpartum period. They are therefore inappropriate for obstetric patients.

Failure to quickly identify and treat critically ill pregnant and recently delivered women seeking acute care has repeatedly led to maternal morbidity and mortality [10,11,12]. In 2011 Paisley et al. concluded that the lack of Obstetric Triage Systems (OTS) leads to initial assessment of patients based on quick visual evaluation and on time of arrival as well as inconsistency in assessments of patients presenting with similar symptoms [13]. They

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presented the first OTS, the Florida Hospital Ob Triage Acuity Tool, and emphasized that a triage level was to be assigned before any other examinations were undertaken [13].

Subsequently, other OTS have been developed. Prior to the development of GOTS the Obstetric Triage Acuity Scale (OTAS) [4, 5] and the Maternal Fetal Triage Index (MFTI) were introduced [14, 15]. “Both systems have sufficient interrater reliability. Validity was established with construct and content validity respectively, for OTAS assessing higher levels of admission rates and resources utilization in higher acuity levels, and for MFTI during the development [5, 6, 16]. However, the OTAS did initially not include vital sign parameters to assess the patient’s acuity, an important factor known to strengthen the assessment [17, 18]. MFTI differs significantly from the predominantly used non-obstetric triage system in Sweden. For both systems, evidence of external validity is yet to be as so presented [19, 20]. As with other triage systems, these OTS are adapted to the circumstances, such as local guidelines and previous non-obstetric triage systems, in which they were developed. Furthermore, the systems lacked recommendations for initial management, which would enable staff with limited or no experience in triaging and managing obstetric patients to use the OTS in the general ED setting. Shortly after the development of GOTS, two additional OTS were presented: the obstetric and gynecological amendments to the Swiss Emergency Triage Scale (SETS) and the Birmingham Symptom-specific Obstetric Triage System (BSOTS) was presented [21, 22].

In 2014 Angelini et al. established a Best Practice for obstetric triage, underlining the need for a validated and reliable obstetric triage tool and the importance of teamwork. The obstetric triage process should consist of a 10–20-min initial assessment of both mother and fetus by a nurse or midwife [7]. A 2017 committee opinion by the American College of Obstetricians and Gynecologists urges hospital-based obstetric units to collaborate with EDs to establish guidelines for triage of pregnant women [23].

Sweden has a standardized, free of charge, prenatal care system with more than 99% of pregnant women attending regular appointments. Healthy women with suspected uncomplicated pregnancies are usually handled by midwives but MDs/obstetricians are consulted and/or responsible for antenatal care in case of intercurrent diseases and pregnancy complications. Proximity to a delivery unit varies greatly related to place of residence. Except for the Stockholm area, there is only one obstetric department in each city/region. Depending on both location of and organization within the different hospitals, pregnant or newly delivered women in need of acute care are assessed in general EDs, in obstetric triage units or in maternity (delivery) units. Staff in these units have varying experience in managing obstetric patients seeking acute care. No department of obstetrics applied obstetric triage prior to this study and no OTS built or adapted to the Scandinavian context was available. The ratio between acute prenatal visits and overall birth volumes ranges from 1.2 to 1.5 [13]. With the Swedish annual birthrate at approximately 115,000, this corresponds to 135,000–170,000 patients being assessed annually with suboptimal routines. There is thus a need for an OTS adapted to the Scandinavian context in both obstetric units as well as general EDs, in order to improve acute care for obstetric patients.

Methods

The aim of this study was to describe the development, implementation and initial evaluation of an OTS.

In 2016 the Department of Obstetrics at Sahlgrenska University Hospital, Gothenburg, Sweden, planned to introduce obstetric triage, due to concerns about patient safety. Sahlgrenska University Hospital is a tertiary referral hospital and the Department of Obstetrics is the largest obstetric unit in Sweden, with approximately 10,000 births per year. Its outpatient unit provides acute care to patients from gestational week 19 until 12 weeks postpartum. There are also scheduled visits for obstetric patients requiring the university hospital’s competence. Routine prenatal care is provided at prenatal clinics under other management and located

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elsewhere. Women requiring acute care during the first half of pregnancy attend Sahlgrenska University Hospital's Department of Gynecology.

Prior to April, 2017, most patients with acute symptoms called a coordinator midwife, accessible 24 h daily, before attending. The coordinator referred the patient either to the general ED, the delivery ward, her ordinary prenatal clinic or the outpatient clinic.

The development of the OTS took place in five different phases, see Fig. 1.

Phase 1. Survey of the demands for a Swedish obstetric triage system

A multidisciplinary team, including obstetricians, midwives, auxiliary nurses and administrative staff, was assembled in order to assess the causes for patients seeking acute care at the obstetric outpatient unit as well as to map the pathway of these patient visits. This multidisciplinary mapping, together with repeated Strengths, Weaknesses, Opportunities and Threats (SWOT) analyses [24], enabled identification of areas with deficiencies in patient safety from a clinical point of view. In addition, a retrospective analysis of 380 consecutive patients' records concerning unplanned visits during two weeks was performed to identify the most common causes for seeking care. Patient identification data was extracted from the administrative registration system Elvis (Insieme Consulting AB, Sweden), for all patients' visits. Medical documentation related to the visit was reviewed, identifying the main cause for seeking care.

Phase 2. Literature review

A literature search on obstetric triage was conducted with the aid of the medical library at Sahlgrenska University Hospital. The search was performed with the keywords "triage" AND ("obstetrics" OR "obstetric" OR "obstetrical" OR "maternal") in PubMed and CINAHL limited to publications in English or Scandinavian languages. The first literature search was conducted in 2016 when the project was started comprising the timespan 1995/01/01 to 2016/12/31, and the search was repeated in 2020 to add any new information for this publication (Fig. 2).

Phase 3. Development of an obstetric triage system

The novel, Swedish OTS was to include both symptoms or chief complaint as well as vital sign parameters adapted to the obstetric patient's physiology. Furthermore, it was to be designed in accordance with national guidelines and preferably resemble the predominant non-obstetric triage system in Swedish EDs, in order to facilitate implementation in both obstetric and non-obstetric EDs. The OTS was also to enhance the structure of care, enabling a better overview of the patients in the waiting area and improvement of patient safety in alignment with the Best Practice [7]. Furthermore, the changes were to facilitate a structured evaluation of clinical management and implementation was to be accomplished with unaltered or improved patient and staff satisfaction.

A first draft of the Gothenburg Obstetric Triage System (GOTS) was produced, based on knowledge attained from previous obstetric and non-obstetric triage systems. The most common reasons to attend were the foundation for the chief complaint algorithms. Levels of acuity and reference levels for vital sign parameters were determined according to local guidelines, which were in turn based on previous research on normal vital signs in pregnancy [6, 25, 26]. The draft was repeatedly evaluated by the multidisciplinary team, allowing for

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structural changes if the chief complaint algorithms or the associated acuity chart were found to be clinically inappropriate.

Phase 4. Implementation

When consensus on the OTS and acuity chart was reached the system was implemented into clinical praxis, with recurring evaluations and discussion in the staff group. To support the implementation, guidelines for the new working method were written. Training and information were provided to both medical and administrative staff at regular workplace meetings, allowing for questions and reflections to be addressed. A flowchart of the implementation process provided up-to-date information and the implementation date was set, after which members of the multidisciplinary team were scheduled to work at the unit daily for the first month.

In addition to the development of GOTS, administrative, organizational and facility changes were made to enable the working method of obstetric triage. These included introduction of a time registration system as well as assigning staff (midwives, auxiliary nurses and obstetricians) to shifts devoted exclusively to triage and subsequent care of acute patients. All midwives at the unit were trained to perform triage, but they also rotated to other work stations and shifts. A triage room was appropriately equipped, e.g. with triage algorithms, equipment for assessing vital parameters, Doppler ultrasound for detecting fetal heartbeat, a stretcher and a computer. Scheduled and unscheduled patients were separated into different waiting areas. Furthermore, posters in the waiting area provided information regarding GOTS.

Phase 5. Initial evaluation

Patient satisfaction was continuously monitored by an electronic questionnaire available in Swedish, English and Arabic. The questionnaire is administered postpartum in clinical routine to all women who delivered at Sahlgrenska University Hospital (supplementary). Women answered on a five-level response scale regarding satisfaction with treatment, participation in decision-making and accessibility of unit. In addition, they were able to write free comments. Results were presented as a composite, weighted outcome. Staffs' satisfaction was continually, verbally evaluated on regular staff meetings. LOS and admission rates according to acuity levels were monitored by an administrative time registration system, Elvis/Power BI Report, with monthly reports.

Results

Phases 1 and 2

The predominant causes for contacting the coordinator or attending the unit were reduced fetal movements, vaginal bleeding, abdominal pain, signs of hypertensive disorder including preeclampsia, signs of prenatal or postpartum infection, premature contractions, contractions at term, suspected rupture of membranes and signs of mastitis. These conditions, together with severe conditions such as trauma towards the pregnant abdomen, headache/neurological symptoms, postpartum hemorrhage, chest pain, dyspnea and signs of venous thromboembolism constituted the foundation for the chief complaint algorithms.

Mapping the care process revealed the following areas requiring improvement:

*

The care process was unstructured and the staff felt uncertain, to some extent, when assessing patients.

*

Patients were registered at the reception by staff with no medical training and then placed in a waiting area

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without medical assessment, although the midwives did keep an eye on them while they waited.

*

Scheduled and acute patients shared the same waiting area. No midwives or auxiliary nurses were designated to assess and care exclusively for the acute patients. The obstetricians handled a mixture of scheduled and acute patients.

*

Patients that looked ill or expressed that they were in pain were seen first, but this prioritization did not always correspond to the actual acuity level.

*

Assessment was dependent on the midwives' experience and could hence differ from day to day.

*

The management structure did not enable adequate evaluation of the organization, due to lack of pre-determined benchmarks and time registration. Planning for adequate staffing was thus difficult.

*

The organization led to near misses, where patients not assessed in time might have suffered severe complications.

Results of the literature review are shown in Fig. 2 and Table 1 (Additional file 1). The literature review and perusal of studies on general emergency care revealed two factors, key to improving care [4, 9, 27] - Triage, including a triage area and an OTS as well as separating patients seeking acute care from scheduled patients. These two key factors corresponded well with the deficiencies identified at the unit. Regrettably, the literature review did not provide guidance in which OTS to use since comparative studies do not exist. Furthermore, there is no consensus in outcome measurement of internal validity and external validity of existing systems is unknown.

Phase 3. Development of the Gothenburg obstetric triage system

The Gothenburg obstetric triage system

The GOTS is a five-tier triage scale, structurally similar to RETTS, that includes structured reevaluation during the waiting time. The GOTS acuity level assessment is based both on vital signs and 14 chief complaint algorithms (Fig. 3). The reference levels for vital signs are adapted to the physiological changes in pregnancy (Fig.4). The algorithms comprise contractions, suspected rupture of membranes, vaginal bleeding, reduced fetal movements, suspected hypertensive disorder, neurological symptoms, abdominal/back pain, trauma, postpartum hemorrhage, signs of prenatal or postpartum infection, chest pain/breathing problems, suspected thromboembolism, hyperemesis and suspected mastitis. The algorithms include information on both obstetric and non-obstetric possible causes for the symptoms and on initial treatment and investigations, such as laboratory tests. The system also entails an acuity form for documentation.

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Workflow based on the Gothenburg obstetric triage system

The patient is seen by a midwife in triage and the chief complaint and vital sign parameters as well as fetal heartbeat are assessed and registered on the acuity form (Fig. 4). One of five acuity levels, ranging from red (immediate evaluation) through orange (urgent, evaluation within 20 min) to yellow-green-blue (non-urgent), is selected. The thresholds for wait time in the different acuity levels were modelled after RETTS [18], the predominately used non-obstetric triage system in Sweden at the time when GOTS was developed. If two divergent acuity levels are indicated by the chief complaint and the vital signs, the higher level is chosen. Yellow to blue levels entail low risk of critical illness and the patient can wait, with the goal of evaluation set to 60, 120 and 240 min respectively. After triage, further examinations are conducted in accordance with the level of acuity. In all patients, the primary evaluation and treatment is conducted by a midwife and about 30–40% of the patients are managed without involvement of an obstetrician. If the patient shows signs of circulatory and/or respiratory failure or presents with symptoms of stroke she is directly referred to the general ED. Treatment for stabilization of the patient is preformed to ensure safe transfer.

Phase 4. Implementation

Organizational effects

The change in working method has enabled the staff to better evaluate its effectiveness, for instance changes in total LOS (Fig. 5), waiting times (Fig. 6) and total obstetric triage volumes per hour in real time. Approximately 80% of all patients have a total LOS <4 h, maintaining this level even though number of visits have increased by almost 40% since the registration started. This facilitates more effective staff allocation and process planning. Outcome variables have been set in accordance with those in general emergency care at Sahlgrenska University Hospital [28].

Phase 5. Initial evaluation

Initial evaluation of the system indicates success in identifying patients requiring admission into appropriate acuity levels (Fig. 6). The most critically ill (red) patients are seen within 10 min. However, orange-level patients are not always assessed within the target of 20 min. Time to assessment at this level is equivalent to that of the non-urgent acuity levels (Fig. 6). Time to assessment by an obstetrician is proportional to the acuity level. We were not able to compare LOS before and after GOTS was introduced as LOS was not measured in a structured way prior to the implementation of an OTS. However, since 2018, the percentage of patients with LOS under 4 h has remained at a constant level, i.e. around 80% despite the fact that the number of patients seeking acute care has increased by approximately 40% during the study period (Fig. 5).

Patient satisfaction

Questionnaire response rate was approximately 70%, with little variation over several years. Patient satisfaction increased from around 80% before introduction of GOTS to 86% (Table 1).

Patient satisfaction as assessed by questionnaire before and after introduction of GOTS in April 2017. Results are presented as a composite, weighted outcome consisting of satisfaction with treatment, participation in

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decision-making and accessibility of unit according to a five-level response scale.

Staff satisfaction

Staff members report a valid sensation of increased security, manifested by the knowledge of “who is waiting in the waiting area” and structure, manifested by a simplification in knowing in which order to assess the patients and directions in initial management, after implementation. The staff also experience less perceived stress and communication between professions is perceived as objective, clearer and more direct, aligning with previous research [29]. The unit has developed an emergency care profile and is now classified as one of Sahlgrenska University Hospital’s EDs. Staff is much better prepared for severely ill patients and all professions have a better understanding of initial management and treatment.

Discussion

We present the first Swedish obstetric triage system, the GOTS, its development, implementation and initial evaluation. GOTS enables prioritization of obstetric patients seeking acute care based on clinical urgency and can be used in both obstetric and non-obstetric EDs. Obstetric triage based on the GOTS, has been successfully implemented at the largest Department of Obstetrics in Scandinavia, the Sahlgrenska University Hospital. The implementation has provided the staff with an improved medical overview of the patients and patient flow and enabled the unit to monitor emergency care in a structured way. GOTS successfully identifies patients requiring admission. Implementation came along with increased patient and staff satisfaction.

Previous studies have used the effect on LOS – length of stay – as a primary outcome to measure the effectiveness of triage, showing varying results [4, 30]. This outcome measurement is relevant from an organizational point of view and for patient satisfaction [30, 31] and has traditionally been used since it is easy to register and evaluate. Nevertheless, evaluating LOS is not without difficulty. Since 2018, the percentage of patients with LOS under 4 h has remained at a constant level, i.e. around 80% despite the fact that the number of patients seeking acute care has increased during the study period. We firmly believe that without GOTS, the obstetric ED would not have been able to uphold this performance. It must, however, also be emphasized that LOS is dependent on other factors within the department, such as the discharge rate which enables admission of new patients from the ED [30]. All department units are interrelated and the workload at any unit affects the others.

The challenge in evaluating LOS is also evident in the evaluation of waiting time and admission rate in the blue GOTS category, that includes patients with suspected rupture of membranes and patients presenting for scheduled visits. The latter occur, despite the explicit goal of separating emergency and planned visits, since the number of available semi-acute appointments is as yet insufficient at Sahlgrenska University Hospital. Primiparous patients with confirmed rupture of membranes are, according to local guidelines, followed for three days by the obstetric ED before induction and are triaged to be seen before acute patients classified as green. The same applies for patients that should have had a scheduled semi-acute appointment. This is the reason for blue patients having higher admission rates and a lower LOS than green patients (Fig. 6). Hence, it is important to find complementing outcome variables in order to assess effectiveness and functionality, with focus on aspects such as patient safety and workplace environment [7, 31,32,33].

The unit has failed to achieve an overall time to triage of <10 min, mainly due to limited facilities. With only one room allocated for triage and an approximately 10-min long assessments, more rapid turnover is impossible. Interestingly, time to triage, i.e. before any type of medical assessment, correlates with acuity level. This is partly due to some of the severely ill patients arriving by ambulance, resulting in immediate triage. Even the administrative staff has obtained a sense of emergency care and will now notify midwives more quickly if they

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suspect that the patient is severely ill. While time to initial midwife assessment, after triage, is almost equal for all other patients than red (Fig. 6), longer waiting time to obstetrician assessment was associated with lower acuity. This waiting time includes 10–60 min of CTG in the majority of cases.

This study shows that GOTS enables rapid identification and assessment of patients with the highest level of acuity and that acuity level correlates well with admission rates, suggesting good validity. More comprehensive studies on GOTS validity are currently performed. The system presents as a good foundation for improved and adapted triage of obstetric patients even in general EDs. Even though obstetric patients will best be taken care of in a designated obstetric unit, some conditions such as severe trauma or acute chest pain in the pregnant and newly delivered woman may be better treated in a general ED. As many geographical areas lack designated obstetric units, the obstetric patient might seek care at any unit providing emergency and urgent care. Hence, coordination and communication regarding these patients as well as introducing reliable triage systems including obstetric determinants is of great importance [23].

It can be discussed whether to develop another OTS when there are already existing OTS. At the time of GOTS development (2016) only three OTS were available— Florida Hospital Ob Triage Acuity Tool, MFTI and OTAS. To the best of our knowledge, the Florida Hospital Ob Triage Acuity Tool has not been evaluated on reliability nor validity. Studies on OTAS and MFTI have shown sufficient inter-rater reliability. However, OTAS, with some similarities to the predominantly used non-obstetric triage system in Sweden, did not include vital sign parameters for assessment and the MFTI, developed in accordance to the non-obstetric triage system ESI, differs significantly from the predominantly used non-obstetric triage system in Sweden, which might impair the implementation as well as complicate the collaboration with non-obstetric EDs. Alongside the fact that there is no consensus on which system to apply, lacking of scientific support for their external validity [34], the internal validity of the triage systems being questioned [19, 20] and the systems not offering sufficient support to staff with scares or no experience in triaging and managing obstetric patients, it was decided to develop an OTS suitable for the Swedish context.

Strengths and limitations

GOTS is the first OTS in Sweden. Development by a multidisciplinary team working clinically with acute obstetric patients is a strength as it ensures that the OTS is adapted to the local needs and prerequisites. Basing assessments on both chief complaint algorithms and vital signs with pregnancy-adapted reference levels is another strength. However, this study also has limitations. Due to inadequate time registration prior to implementation of GOTS, comparisons regarding patient flow through the obstetric ED are not possible. This is currently addressed in implementation studies of GOTS at other Swedish obstetric departments. As previously mentioned, it can be questioned whether LOS is an adequate measurement of acute care quality because of the risk of disturbing factors. However, time to triage and time to further examination is of great importance for patient safety and is more directly related to the urgency of the patient's presenting symptom. In this study, more in-depth evaluation of staff satisfaction with the working method was difficult since the staff has been involved in the continuous development and implementation and hence, might be biased. This subject is now under evaluation in a mixed-method study, implementing GOTS in other obstetric departments.

Both reliability and validity studies, addressing patient safety, are currently performed and studies on patient flow and the staff's experience of working with obstetric triage have been initiated. With the rising need for structured and cost-effective care, and the aim to decrease maternal morbidity and mortality rates, obstetric triage will become increasingly important.

Conclusions

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The GOTS is the first OTS developed in and for Sweden and implementation has led to improved management of obstetric patients seeking acute care. Patients are now prioritized according to level of acuity and the time to assessment and treatment of severely ill patients can be followed in a structured way. Both patients and staff express improved satisfaction with obstetric triage. Further research to improve both the triage system and working method has been initiated.

Availability of data and materials

The datasets analyzed for LOS, time to triage and admission rates, during the current study are not publicly available due to the risk of identifying patients seeking emergency care at the unit but are available from the author on reasonable request.

Abbreviations

ED: emergency department

GOTS: Gothenburg Obstetric Triage System

LOS: length of stay

OTS: obstetric triage system

SU: Sahlgrenska University Hospital

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Exploring the concept and structure of obstetric triage: a qualitative content analysis

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ABSTRACT (ENGLISH)

Background

Obstetric triage is a new idea, so the design and implementation of it requires identification of its concept and structure. The aim of this qualitative study was to explore the concept and structure of the obstetric triage in Iran.

Methods

The purposive sampling was done and it continued until reaching the theoretical saturation. Thirty-seven semi-structured interviews were conducted individually and face-to-face. Interviews were audio recorded, transcribed, and analyzed using conventional content analysis.

Results

Two themes, 8 main categories, and 16 subcategories emerged from the content analysis of the interviews and observations. The themes were the concept and structure of obstetric triage. The concept of obstetric triage

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consisted of three categories of nature, process, and philosophy of obstetric triage. The structure of obstetric triage included five categories of assessment criteria, emergency grading, determining the appropriate location for patient guidance, initiation of diagnostic and therapeutic measures, and timeframe for initial assessment and reassessment.

Conclusion

Findings highlighted that obstetric triage is a process with a dual and dynamic nature. This process involves clinical decision making to prioritize the pregnant mother and her fetus based on the severity and acuity of the disease in order to allocate medical resources and care for providing appropriate treatment at the right time and place to the right patient. The results of this study could be used for the design and implementation of the obstetric triage system.

LINKS

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FULL TEXT

Background

The triage concept has a historical root in military medicine and primarily focuses on mass disaster situations [1, 2]. The first triage was applied by two French military surgeons for sorting wounded soldiers in war during the years 1801–1979 [3]. In the 1950s–1960s, however, to respond to the problem of population congestion in the emergency department of hospitals, triage evolved from military to civil practice in the United States [4, 5].

Triage is widely used to refer to any decision about the allocation of limited medical resources, but Iserson et al. explained three conditions to use the term triage in emergency practice: “1- There is at least a moderate lack of health care resources. 2- A health care professional assesses the medical needs of each patient, based on a precise examination. 3- A triage officer uses a system or schedule, usually based on an algorithm or set of criteria, to determine the specific treatment or priority of treatment for each patient [1]”. Accordingly, triage involves a concise and focused evaluation and allocation of patient to a level of acuity so that the patient can safely wait for medical screening examination and treatment [6].

Triage is a risk stratification system whose extension to the obstetric service would increase the quality of patient care [7]. In 1986, obstetric triage was proposed as one of the most critical prenatal care and as a gatekeeper of the initial assessment of labor and other obstetric and non-obstetric complaints in pregnant women [6]. Since then, various studies have provided different definitions of triage. The Association of Women’s Health, Obstetric and Neonatal Nurses (AWHONN) defined obstetric triage as a concise, complete and systematic method for determining (priority for full evaluation) the disposition of the woman and her fetus [8]. This definition emphasizes that triage is the action or the methods used to assess and to prioritize patients, while some consider it as a tool of prioritization or even taking care of the place [8, 9]. On the other hand, there is no universal agreement on how patients should be triaged, nor is there a uniform law as a dynamic process [5]. Some pundits consider the concept of triage as an initial assessment by midwife or nurse with no involvement of any doctor, while others consider it as an initial assessment and evaluation [8, 10].

Obstetric triage promotes faster response to urgent situations, improves maternal and fetal care and bed utilization, avoids unnecessary admissions, reduces the waiting time and patient’s stay, increases patient satisfaction and the efficiency of departments while reducing their costs, and reduces maternal mortality [5, 9, 11, 12].

In Iran, the provision of emergency obstetric services to pregnant women is carried out at the obstetrics &gynecology emergency department of specialist hospitals or labor &delivery department of general hospitals

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[13]. By early 2018, emergency severity index (ESI) was used for the triage of pregnant women in general emergency wards, but obstetrics & gynecology emergency units or labor & delivery wards had no structured obstetric triage. Studies on the root causes of maternal mortality or obstetric risk management have shown that poor triage for pregnant women and defects in risk assessment are infrastructural problems of maternal mortality and obstetric adverse events [14, 15]. Therefore, in early 2018, the Ministry of Health and Medical Education prepared a draft for the obstetric triage tool and asked all its affiliated universities to submit their comments and suggestions for improvement [13]. Obstetric triage is a new idea in Iran, and it is evident that the design and implementation of an obstetric triage system requires identification of its concept and structure. Hence, this study was conducted to explore the perception of health care providers involved in obstetric triage about their concept and structure of obstetric triage. The results of this study can help improve the design and implementation of the obstetric triage system in Iran.

Methods

Study design and setting

This study is part of multistage mixed method research that was performed with the aim of the design, clinical validation, implementation, and determination of the feasibility of an obstetric triage system in Iran. This qualitative study involving conventional content analysis was conducted to explore the maternity care providers and policymakers' experiences on obstetric triage during November 2018–April 2019.

The study environment was Imam Khomeini Hospital, the Deputy of Treatment, and the School of Nursing and Midwifery of Ahvaz University of Medical Sciences and the departments of midwifery, maternal health, and national triage of the Ministry of Health of Iran. The Ahvaz Imam Khomeini Hospital is a teaching tertiary referral hospital in Khuzestan province of Iran, with approximately 6700 births and 15,000 obstetric triage visits annually.

Ethical considerations

Participants received written and oral information about the study, and written informed consent was obtained for the interview. They were free to decline participation or to withdraw at any time. The Ethics Committee of Ahvaz University of Medical Sciences approved this study (Approval ID: IR.AJUMS.REC.1397.537).

Data collection and participants

Data were collected from in-depth, semi-structured interviews using open questions, observation, and field notes. All interviews were conducted individually and face-to-face, at a time and place that was convenient for the participant. All interviews were recorded with permission from the participants. A semi-structured preset guide was provided for the interview. The participants were asked to describe how to perform obstetric triage in the setting, and then to explain their own experiences and perceptions about obstetric triage. The focuses of interview questions were "what is your experience concerning obstetric triage?" and "what are the meaning and structure of obstetric triage in your experience?" (Additional file 1). Then, based on the participants' responses, more open questions were asked to clarify the details of their response. Interviews were conducted between November 2018 and April 2019. Each interview lasted between 45 and 60 min and continued until reaching information saturation. The research population included 37 professional midwives, nurses, gynecologists, and specialists of emergency medicine. Participants in this study were from various occupational categories, including clinicians, hospital executive managers, faculty members, as well as provincial and national policymakers involved in the triage program. The maximum diversity in the participants was considered in terms of occupation, work experience, and education level. At first, the sampling of volunteers began with a

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target-based method and gradually continued through theoretical sampling. Inclusion criteria were having at least 1 year of work experience in the emergency department, and exclusion criteria were participants' reluctance to continue collaborating.

Data analysis

Analysis was guided by conventional (inductive) content analysis as described by Graneheim and Lundman [16]. The analysis was carried out simultaneously with the collection of information. In this method, codes and categories were derived directly from the raw data. In this way, immediately after each interview, the entire text of it was transcribed verbatim. Each interview was read several times to identify meaning units, and then the meaning units were labeled and coded. Then meaning units and codes were classified according to conceptual and semantic similarities. Categories and sub-categories were compared together and, finally, themes were extracted from the analysis and interpretation of data.

The first author (AM) coded data initially. To obtain credibility, participants with maximum diversity were selected, sampling was done to data saturation, appropriate meaning units were selected, and data were reviewed by participants [16, 17]. The integration of data collected in the interview and field notes and checking data by foreign observers were used for dependability [18]. The research steps were fully described and were confirmed by co-authors to enhance data confirmability [18, 19]. Characteristics of the participants, methods of sampling, and data collection were described accurately to facilitate transferability [16, 18].

Results

The findings are based on 37 interviews. Table 1 presents the participants' characteristics. Two themes, 8 main categories, and 16 subcategories emerged from the content analysis of the interviews and observations (Table 2). The themes were the concept and structure of obstetric triage. The concept of obstetric triage consisted of three categories of nature, process, and philosophy of obstetric triage. The structure of obstetric triage also included five categories of assessment criteria, emergency grading determine the appropriate location for patient guidance, initiation of diagnostic and therapeutic measures, and timeframe for initial assessment and reassessment.

Concept of obstetric triage

Based on the participants' experiences and statements, obstetric triage is the dynamic and dual clinical decision-making process to prioritize patients based on the severity and acuity of the maternal and fetal condition to allocate resources and medical care to provide appropriate treatment at the right time and place to the right patient.

Obstetric triage nature

This category describes participant's experiences of the dual and dynamic nature of obstetric triage.

Duality of obstetric triage

Regarding the subcategory of duality of obstetric triage, the participants believed that in obstetric triage, it is necessary to consider both maternal and fetal conditions.

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“According to the condition of the pregnant woman as a human and the fetus in her uterus as another human, we have two assessments, both the mother and the fetus. Any life-threatening in any of these two creates an emergency status, and we have to make decisions based on that.”(Midwife 7)

“There are two people-there is a fetus inside the uterus- we cannot just prioritize the mother, there is a fetus as well.”(Midwife 1)

“Both the mother and the fetus are important. For example, umbilical cord prolapse has no danger to the mother, but her fetus is at risk of dying, and the cesarean section should be performed immediately.”(Midwife 15)

Dynamicity of obstetric triage

From the participants' point of view, triage has a dynamic nature, as at any given moment the level of illness of a person may rise from one class to another or descend to a lower class and change priorities.

“The patient is currently in good general condition but may be in poor health in a quarter.”(Midwife 2)

“Triage is not only specific to the patient's arrival but must be considered throughout the patient's treatment process, as it is a dynamic process, and the patient's condition may change at any time.”(Emergency medicine specialist 1)

“The level of disease in some patients may rapidly change. For example, a person with severe preeclampsia may develop seizures and become a Level 1 patient.”(Midwife 1)

Obstetric triage process

Participants said the triage process is a set of actions taken to achieve the primary goal of triage. These measures include clinical assessment and decision-making; prioritization of patients, and resource and medical care allocation.

Clinical assessment and decision-making

From the perspective of the participants, obstetric triage decision-making is a complex clinical decision based on the assessment of maternal and fetal signs and symptoms using knowledge and experience, critical thinking, and clinical judgment.

Decision-making in triage is not equivalent to a medical diagnosis, but a triage midwife should diagnose life- or organ-threatening conditions of the mother and fetus. She should be able to quickly assess the available information, identify useful clues out of them, and be able to make the right decision based on these clues, about prioritization of the patients and their place of assessment.

“After the assessment of the patient and gathering information, I decide based on my experiences, my sixth sense, and my knowledge, that how much urgent the patient's condition is and what I should do for her.”(Nurse 3)

“We assess the patient based on appearance, type of pain, chief complaint, etc., until the main symptom is identified and then start classifying based on it.”(Midwife 2)

“I understand the severity of the illness from the patient's symptoms, such as when a mother comes with ectopic pregnancy. Because I have seen many ectopic pregnancies, I compare her symptoms with previous cases, and I judge about her illness severity.”(Midwife 15)

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“Diagnosis of preeclampsia is not the duty of the triage midwife; she must determine whether the patient needs to undergo resuscitation, the delivery, or the examination room at the same time or if she can wait for 10 minutes or half an hour.”(Policy maker 1)

Prioritization of patients

Participants said they arrange patients to receive faster or later services and care by a physician or other health care providers.

“When four patients come together for example, I sort them and first introduce to the physician the one who has the most urgent conditions.”(Nurse 1)

“When the life of a mother or fetus is at risk, we visit her earlier than those who need partial treatment or outpatient care.”(Midwife 7)

Resource and medical care allocation

Participants believe that due to limited resources and health care, allocation of resources and health care based on prioritization is essential.

“The reality is that we cannot serve multiple people at the same time, so we prioritize people based on their level of urgency and give priority to those who are in more urgency.”(Midwife 7)

“Because we have staff and resource constraints one way or another, we have to manage them. Emergency resources and the energy of emergency personnel should, therefore, be spent first on critically ill patients and then on better patients.”(Policy maker 5)

Obstetric triage philosophy

This category justifies the existence of obstetric triage. From the participants' point of view, the goal of creating an obstetric triage system is to ensure that the right and timely treatment is delivered to the right mother or fetus at the right time and place.

Providing the right treatment to the right patient at the right time and place

The obstetric triage is a way to help reduce maternal mortality by accelerating the provision of appropriate care at the right time and place to the high-risk pregnant mother. The ideal obstetric triage system should be able to accurately identify mothers or fetuses in need of emergency care, and provide conditions for quick access to medical diagnostic procedures by guiding them in the right direction and at the right time.

“The purpose of hospital triage is to send the patient to the right place at the right time to get the right service.”(Emergency medicine resident 1)

“Delay in receiving appropriate care is one of the causes of maternal mortality. Thus, the triage should be able to distinguish a mother who only needs primary treatment such as serum therapy from those with emergency conditions and to direct the patient to fast track unit or waiting room and, cases that are critically ill should be transferred to the emergency room to receive faster and more appropriate treatment.”(Policy maker 5)

“They must have a purpose; the right decision for the right patient at the right time.”(Midwife 5)

Structure of obstetric triage

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Participants believe that the obstetric triage structure is based on a comprehensive triage model and includes assessment criteria, emergency grading, determining the route of treatment for the patient, initiating diagnostic and therapeutic measures, and determining the timeframe for initial assessment and reassessment.

Assessment criteria

Participants described assessment criteria in three subcategories of maternal, fetal, and placenta/ amniotic fluid/cord.

Maternal criteria

Maternal criteria including gestational age, obstetric emergencies, history (obstetric, medical and pharmaceutical), chief complaints, clinical (subjective and objective) signs and symptoms, vital signs, physical examination, Para-clinic, patient inclusion, general condition, and level of consciousness.

“The bottom line is that we give a comprehensive service to the patient. We should not ignore anything in the assessment; we should consider the mother and the fetus promptly.”(Policy maker 4)

“First, we need to determine whether the pregnancy is the first half of pregnancy or the second half of pregnancy. I think in the second half of pregnancy the issues, which threaten the life of the mother and a viable baby, are even more important. Emergency issues such as bleeding after an abortion or abdominal pain due to a ruptured ectopic pregnancy are important in the first half of pregnancy.”(Gynecologist 1)

“In obstetric triage, we assess vital signs, gestational age, co- morbidities, signs and symptoms (such as bleeding, amniotic fluid leakage, and decreased fetal movement), physical examination (such as pelvic examination), and Para-clinic tests (such as NST and ultrasound).”(Gynecologist resident 2)

“First, it is important to look at the appearance of the patient, for example, how the patient arrives (with his foot, wheelchair, or stretcher), or how her general condition is (ill, toxic), and her level of consciousness (alert, oriented, and unconscious)? Then the chief complaint and symptoms of the patient should be considered? Next, we need to conduct a series of physical examinations, such as checking vital signs.”(Midwife 8)

“We need to take a history from the patient about obstetric and gynecological conditions, medical and surgical history, and the reason of referral.”(Midwife 5)

Fetal criteria

Fetal criteria included fetal heart rate, fetal movement, and diagnostic tests (NST, CST, or BPP).

“Fetal heart rate and fetal movement in patients with higher gestational age should be controlled and decision should be made based on the fetal condition (live or dead / reduced or no fetal movement).”(Midwife 1)

“In our opinion, a mother with a smooth NST (without a beat to beat), is an obstetric urgency and her triage level is one, because the fetus may die in any minute.”(Policy maker 4)

Placenta/ amniotic fluid/ cord criteria

The placenta, amniotic fluid, and cord were considered as assessment criteria within the structure of obstetric triage. Problems like placenta previa, placental abruption, and placenta retention or adhesion (accreta, increta, percreta) were introduced as placenta criteria. Amniotic fluid was examined in terms of volume, outflow or leakage of amniotic fluid, and color and transparency. Cord prolapse was another criterion for judging pregnant women in triage.

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"One of the cases that we consider when evaluating a patient is the placental condition. For example, pregnant women who come with placenta accreta and bleeding are placed in level one and very urgently must be transferred to the operating room or admitted to the ward".(Midwife 9).

"You do not see placenta retention anywhere except obstetric emergency, general emergency scales cannot be used for this patient, so you must include placenta among assessment criteria."(Policy maker 3)

"We examine the clear or meconium of the amniotic fluid because thick meconium may cause fetal death, and quickly the cesarean section or vaginal birth should be done." (Midwife 12)

"In patients with cord prolapse, if pulse is felt in vaginal examination, the fetus is alive and the patient is in emergency and should be immediately transferred to the operating room, but if the cord does not have a pulse, the patient is not in an emergency and must be hospitalized to give vaginal birth."(Midwife 11)

Emergency grading

This category consists of two subcategories, namely the number and name of levels, and the grading criteria.

Number and name of levels

Some participants said it is better for mothers/ fetuses to be categorized into 5 levels of (1) resuscitative, (2) emergent, (3) urgent, (4) less urgent, and (5) non-urgent. They believe this grading allows for more accurate evaluation and treatment that is more appropriate.

"Dividing patients into 5 levels allows patients who need temporary admission or short-term care, such as levels 3 and 4, also receive appropriate treatment."(Gynecologist 1)

However, some also were of the opinion that the grading of mothers/ fetuses at three levels (resuscitative, urgent, and non-urgent) is sufficient because too many levels confuse staff and make no difference in the treatment process.

"Classification of patients in 5 levels does not have a positive effect on the treatment, and care process, and only confuses the staff."(Gynecologist 2)

Grading criteria

Regarding the grading criteria, the gynecologists' and midwives' opinions differed from those of nurses. The first group grade all levels only based on the severity and acuity of the disease and the presence or absence of life or organ-threatening symptoms in the mother or fetus, because they believed that grading by the facilities needed is subjective, and various individuals may provide a different rating for a single patient. The second group reported that grading of levels 1 and 2 was conducted using the severity and acuity of illness and at other levels by the facilities required.

"In my opinion, if levels 3 to 5 are based on the severity of the disease (as opposed to the ESI triage), assessment and prioritization will be more accurate. Because in obstetric patients, grading by facilities needed is not very precise and anyone can make different interpretation."(Midwifery Supervisor)

"At levels 3, 4, and 5, where disease severity criteria are not clear, we classify mothers at these levels based on our own experience, so each of us may have different opinions about the mother."(Midwifery 16)

"It is better to evaluate all levels based on the severity of the disease." (Gynecologist 1)

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"We first evaluate the patient based on the severity and acuity of the disease, then on the number of facilities. For example, if the patient has abdominal pain, we assess how ill she is and then estimate how many facilities (such as ultrasound and examination) she needs."(Nurse 2)

Determining the appropriate location for patient guidance

Participants stated that the triage midwives introduced a suitable place to provide proper care to the mother/fetus after assessment and categorization. Midwives entered Level 1 and Level 2 mothers to the treatment room immediately, Level 3 mothers to the fast track units or waiting room, and Level 4 and Level 5 mothers to specialized or general clinics. Sometimes mothers/fetuses may need to be referred to more equipped centers.

"Sometimes, in-hospital visits, we see a triage nurse referring all patients to an emergency medicine specialist, but in some hospitals, the triage nurse sends some patients to the emergency medicine specialist and some to a general physician; this is the right triage. Emergency patients should be addressed to the emergency department and less urgent patients to the fast track unit and outpatient patients to the general physician."(Policy maker 5)

"We send Level 1 and Level 2 mothers immediately to the delivery room or in the emergency room. For Level 3 and Level 4, it is better to have space where they can wait, Level 5 mothers are referred to either a general or specialist clinic and do not enter the emergency room."(Midwife 6)

"In order to determine the mechanism and responsibilities of obstetric triage, a flowchart must be designed, and the midwife must know exactly where to send the mother."(Policy maker 3)

Initiation of diagnostic and therapeutic measures

Participants pointed out that triage midwives can manage low-risk mothers/fetuses and, in high-risk cases, they can take some diagnostic and therapeutic measures, including vaginal examination, glucometry, or pulse oximetry, and do fetal health assessment tests such as NST or request ultrasound and laboratory tests.

"High-risk mothers should be sent to the emergency room to be examined by gynecology residents. Low-risk mothers, such as labor pain, can be managed by the midwives."(Gynecology resident 1)

"For example, when a mother comes with abdominal pain and abnormal symptoms and is suspected of having an ectopic pregnancy, we do not wait for a resident to come. Initial measures such as insertion intravenous line, serum therapy, taking a sampling of the necessary tests are taken until the resident is present at the mother's bedside."(Midwife 3)

"In obstetric triage, when the mother presents with a complaint of rupture of the membrane to check its severity, I do a vaginal examination, or when she complains of decreased fetal movement, I perform a none stress test."(Midwife 10)

Timeframe for initial assessment, reassessment, and evaluation

Participants stated that at any moment, the mother's disease level might rise from one level to another or drop to a lower level, so reassessment of the mother waiting for a physician visit is necessary. They pointed out that to manage mothers faster should be specified the time threshold for midwife assessment, reassessment, and physician evaluation.

"When triaging other mothers, we do not neglect Level 3 or 4 mothers who are waiting for a physician's visit

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because they may become worse (level 1 or 2) while waiting. We reassess them every 15 minutes.”(Midwife 13)

“Sometimes mothers who need medical counseling with other doctors (meaning doctors other than gynecologists) wait several hours. I wish that the schedule for the physician visit was defined and the physician colleagues were required to visit the mother within that schedule.”(Midwife 4)

“The ESI general triage has not assigned a schedule for initial and reassessment by a nurse and evaluation by a physician. In Iran, we have set a time threshold for it due to problems such as overcrowding, small numbers of personnel and resources, etc. It is also advisable to include this schedule for assessment in obstetric triage.”(Policy maker 2)

Discussion

This study explored Iranian maternity care providers' and policymakers' perceptions of obstetric triage. To the best of our knowledge, this was the first study on this subject conducted in Iran. Participants had maximum diversity in terms of occupation, work experience, and education level, which made them the best sample for answering the research question.

Although no qualitative study was found on the concept and structure of obstetric triage in the literature review, a review of existing tools showed that they are almost identical in nature, process, and philosophy. However they differ in structure (such as assessment criteria, emergency grading, etc), which may be due to variations in available resources (such as staff, place, and equipment) in various countries. (The details of the development and validation of this tool are presented in another article [20].)

A common point across the two themes was the difference between obstetric triage and general triage. This difference is due to the differences in the nature and assessment criteria of the two systems. Evidence from quantitative studies also supports the differentiation of the triage of pregnant mothers [21, 22]. All participants acknowledged the dual nature of obstetric triage. Participants explained that in obstetric triage, both fetal and pregnant mothers' conditions should be considered in the assessment, clinical decision-making, prioritization, and allocation of resources and care. Angelini and Mahlmeister emphasized the assessment process should be done for both the mother and the fetus [23]. However, the type of general triage systems is performed only based on the conditions and symptoms of the mother's condition, and the fetus is ignored in them. Therefore, the development of an obstetric triage system that reflects the variety of pregnant women and fetuses is essential [24].

Participants recognized that obstetric triage has a dynamic nature. Because as the patient's condition progresses, her triage level, priority, and the intervention required could alter consequently. In agreement with our findings, Robertson-Steel [2], Gausche-Hill et al. [25], and Angelini and Mahlmeister [23] understood the change in patient status as a cause of triage dynamic, while Foley and Reisner [26] consider the shift in patient's condition, resources, and information available during the patient response period as its reasons. Therefore, the dynamic nature is one of the characteristics of all types of triage including obstetric triage.

Participants understood the obstetric triage process as a clinical assessment and decision making to sort patients to receive care and treatment. They identified the main problem of the mother or fetus by assessing clinical signs and symptoms and then decided on her/his high-risk and life-threatening conditions using knowledge, experience, critical thinking, and clinical judgment. This decision is not equivalent to a medical diagnosis, but rather it is a rapid diagnosis of life or organ-threatening conditions of the mother and fetus and a prompt action to resolve these conditions. In accordance with our findings, Gerdzt et al. also explained triage as a decision-making process to prioritize people according to their need for medical care [27], and for this purpose

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identifying the chief complaint among the available symptoms and signs is crucial [28]. Numerous studies have shown the use of knowledge, experience, and intuition in triage decision-making [29,30,31,32]. Hence, like other types of triage, decision-making is an essential component of obstetric triage. Proper decision-making requires thinking and intuition gained through knowledge and experience.

Participants regarded obstetric triage as sorting or prioritizing pregnant mothers to receive care and services that allow the mothers or fetuses at high risk to receive care earlier than those with low risk. The triage is derived from the root of the French word *trier* meaning to sort. Now it is used almost exclusively in the health care context. It prioritizes high and low-risk patients to receive faster or delayed treatment [1, 33]. This definition also applies to the obstetric and general triage.

Contributors would allocate available resources and care according to the priority of pregnant mothers or fetuses because it is not possible to provide simultaneous care to all patients due to the restriction of available resources like staff, space, equipment, and the large number of patients. When the health system is not able to meet all the needs of patients with available resources, it uses a triage plan to adapt to this problem [34]. Similarly, Iserson et al. described lack of medical resources as one of the main conditions to use triage practice in this setting [1].

Participants believed philosophy of obstetric triage to ensure that the right mother/fetus goes to the right place and gets the right treatment in the shortest possible time. The participants' understanding of the obstetric triage philosophy is similar to that of the general triage [35, 36]. Participants performed obstetric triage assessments based on maternal, fetal, and placental/amniotic fluid/cord criteria. Nevertheless, in general triage, it is based on maternal criteria only [35, 36]. This difference is due to the dual nature of obstetric triage, where maternal and fetal conditions are assessed simultaneously. On the other hand, they considered pregnancy-specific criteria such as gestational age, specific symptoms of pregnancy and childbirth, and physiological changes during pregnancy that were different from the assessment criteria of patients in general triage. Studies have also shown that the use of specific pregnancy and childbirth criteria for maternal and fetal assessment in obstetric triage is essential [21, 22].

Regarding the number of levels of obstetric triage, the participants' opinions varied between Level 3 and Level 5. Some agreed with the five levels because they believed that this grading would result in more accurate evaluation and faster treatment of the mother or fetus. However, others disagreed with the five levels because they thought it would confuse the staff without had a positive effect on the treatment process. Various studies showed that grading patients in five levels is more effective than three levels [37, 38]. The American College of Emergency Physicians (ACEP) also supports grading patients in five levels [39]. Similarly, most of the obstetric triage systems such as OTAS and MFI also classify pregnant mothers into five levels [8, 24].

Regarding the grading criteria, participants had a different understanding. For gynecologists and midwives, the grading criterion at all levels was severity and acuity of illness, while nurses graded mother into levels 1 and 2 based on severity and acuity and into 3–5 levels based on the facilities required. The gynecologists and midwives thought that grading by the facilities needed is subjective, and various individuals may provide a different rating for a single patient. Mistry reported a similar perception among nurses in the United Arab Emirates [40]. Grading criteria in all existing obstetric triage is severity and acuity of disease [8, 24, 41].

Contributors mentioned that following initial assessment and prioritization, the mother/ fetus should be guided to the correct place of treatment. This location is determined by the level of priority of the mother/fetus. This topic is also emphasized in comprehensive models of general triage [37, 42].

Participants explained that triage midwives could manage low-risk patients and, in high-risk cases, could start

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some diagnostic and therapeutic measures. Paul et al. recommended the use of an obstetric triage inter-professional collaboration model between midwives and physicians. They showed that this model causes to use peoples' professional experiences more effectively, and frees up physicians for more severe patients [43]. Similarly, Angelini et al. reported that midwives manage more than 70% of pregnant women in obstetric triage and only when a variety of obstetric complaints occur outside labor-management of physicians involved in care [44].

Due to the dynamic nature of triage, participants conducted initial assessment and reassessment for the mother/fetus. However, they pointed out that a defined schedule for them should be determined. The determination of these schedules varies in types of general triage. For example, the time to do initial assessment is only defined in the Australian triage scale (ATS) and reassessment time is considered only in Canadian triage and acuity scale (CTAS). Time to visit doctors is set almost in all types of general triage (ATS, CTAS, MTS, and ESI) [36, 45,46,47]. In this regard, different obstetric triages also follow the principles of general triage based on which they are designed [21, 41, 48]. Since triage aims to provide the right treatment at the right time, it seems necessary to determine the appropriate schedule for assessment and evaluation.

A limitation of this study is failure in gathering data from clinicians in non-teaching hospitals, where the process of triage of pregnant mothers differs from teaching hospitals.

Conclusion

Findings highlighted that obstetric triage is a process with a dual and dynamic nature. This process involves clinical decision making to prioritize the pregnant mother and her fetus based on the severity and acuity of the disease to allocate medical resources and care to provide appropriate treatment at the right time and place to the right patient. The implementation of this process depends on a systematic and dependent interaction of a set of elements defined in the obstetric triage structure.

Availability of data and materials

All relevant data are given within the manuscript and the supplementary files.

Abbreviations

AWHONN: Association of Women's Health, Obstetric and Neonatal Nurses ESI: Emergency Severity Index
ACEP: American College of Emergency Physicians ATS: Australian Triage Scale CTAS: Canadian Triage and Acuity Scale MTS: Manchester Triage System

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Contributions

Conceived and designed the experiments: AM, MI, MN, MM; Performed the experiments: AM, MI, AZ; Analyzed and data: AM, MI, AF, AZ, MM; Wrote the paper: AM, MI. The authors read and approved the final manuscript.

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Ethics declarations

Ethics approval and consent to participate

This paper is reported the findings of research study that adhered to the Declaration of Helsinki, and has been approved by the Ahvaz Jundishapur University of Medical Sciences in Iran (Approval ID: IR.AJUMS.REC.1397.537). The written informed consent was obtained from the participants.

Consent for publication

Not applicable.

Competing interests

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Supplementary information

Additional file 1.

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Interview Guide

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Scholar

DETAILS

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A protocol for evaluating a multi-level implementation theory to scale-up obstetric triage in referral hospitals in Ghana

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ABSTRACT (ENGLISH)

Background

Ghana significantly reduced maternal and newborn mortality between 1990 and 2015, largely through efforts focused on improving access to care. Yet achieving further progress requires improving the quality and

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timeliness of care. Beginning in 2013, Ghana Health Service and Kybele, a US-based non-governmental organization, developed an innovative obstetric triage system to help midwives assess, diagnosis, and determine appropriate care plans more quickly and accurately. In 2019, efforts began to scale this successful intervention into six additional hospitals. This protocol describes the theory-based implementation approach guiding scale-up and presents the proposed mixed-methods evaluation plan.

Methods

An implementation theory was developed to describe how complementary implementation strategies would be bundled into a multi-level implementation approach. Drawing on the Interactive Systems Framework and Evidenced Based System for Implementation Support, the proposed implementation approach is designed to help individual facilities develop implementation capacity and also build a learning network across facilities to support the implementation of evidence-based interventions.

A convergent design mixed methods approach will be used to evaluate implementation with relevant data drawn from tailored assessments, routinely collected process and quality monitoring data, textual analysis of relevant documents and WhatsApp group messages, and key informant interviews. Implementation outcomes of interest are acceptability, adoption, and sustainability.

Discussion

The past decade has seen a rapid growth in the development of frameworks, models, and theories of implementation, yet there remains little guidance on how to use these to operationalize implementation practice. This study proposes one method for using implementation theory, paired with other kinds of mid-level and program theory, to guide the replication and evaluation of a clinical intervention in a complex, real-world setting. The results of this study should help to provide evidence of how implementation theory can be used to help close the “know-do” gap.

Plain language summary

Every woman and every newborn deserves a safe and positive birth experience. Yet in many parts of the world, this goal is often more aspiration than reality. In 2006, Kybele, a US-based non-governmental organization, began working with the Ghanaian government to improve the quality of obstetric and newborn care in a large hospital in Greater Accra. One successful program was the development of a triage system that would help midwives rapidly assess pregnant women to determine who needed what kind of care and develop risk-based care plans. The program was then replicated in another large hospital in the Greater Accra region, where a systematic theory to inform triage implementation was developed.

This paper describes the extension of this approach to scale-up the triage program implementation in six additional hospitals. The scale-up is guided by a multi-level theory that extends the facility level theory to include cross-facility learning networks and oversight by the health system. We explain the process of theory development to implement interventions and demonstrate how these require the combination of local contextual knowledge with evidence from the implementation science literature. We also describe our approach for evaluating the theory to assess its effectiveness in achieving key implementation outcomes. This paper provides an example of how to use implementation theories to guide the development and evaluation of complex programs in real-world settings.

LINKS

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FULL TEXT

Contribution to the field

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There has been a rapid growth in the development of frameworks, models, and theories of implementation. Yet, much is unknown about how these theoretical developments can inform implementation practice.

*

By proposing a method for integrating implementation, mid-level, and program theory to guide the development and evaluation of a complex scale-up project, this study protocol responds directly to recent calls to

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operationalize theory and develop pragmatic, yet rigorous, methods for assessing theory and informing practice.

*

The results should provide empiric evidence of how implementation theory can be used to accelerate progress on getting potentially life-saving interventions into the field.

Background

The Millennium Development Goals (MDGs) sought to decrease global maternal mortality by 75% and under-five mortality by two-thirds between 1990 and 2015 [1, 2]. During this time period, the global maternal mortality ratio decreased by nearly 44% [3]. However, progress was uneven and by 2015, an estimated 66% of maternal deaths occurred in Sub-Saharan Africa [3]. Under-five mortality followed similar trends, showing heterogeneity across regions and countries, despite an overall 53% reduction in the global under-five mortality rate [4]. Progress on reducing newborn mortality and stillbirth was particularly slow [5]. Reducing maternal and newborn mortality, as well as stillbirth, represents a key unfinished part of the MDG agenda that is carrying into the Sustainable Development Goals (SDG) era.

Ghana significantly reduced maternal and newborn mortality during the MDG period (from 634 maternal deaths per 100,000 live births in 1990 to 319 in 2015; from 42 newborn deaths per 1000 live births in 1990 to 28 in 2015) [3, 6]. Efforts focused primarily on increasing facility births with a skilled attendant and referring high-risk cases to higher-level hospitals. Yet data on maternal and newborn outcomes within facilities suggest that the quality and timeliness of care needs to improve in district and regional facilities who serve large volumes of mothers needing specialized care [7, 8]. Reducing the “third delay”—the delay in receiving adequate and appropriate treatment once care is sought [9]—is of particular priority.

The third delay begins when a pregnant woman arrives at the hospital, with an important component being delay in first assessment upon arrival [10]. The potential consequences of this delay can be severe for women with high-risk or otherwise complicated pregnancies and their infants. Therefore, quickly and accurately assessing women upon their arrival to the facility and developing tailored, risk-based care plans constitute an important first step in assuring positive outcomes [11].

Beginning in 2013, the Ghana Health Service (GHS) and Kybele, a US-based non-governmental organization, developed an obstetric triage system for quick and accurate assessment of obstetric patients in low-income settings [11] as part of a long-term partnership to improve maternal and neonatal outcomes [11,12,13].

The core elements of the system were developed and tested at Greater Accra Regional Hospital (GARH) (formerly Ridge Regional Hospital), a tertiary facility, between 2012 and 2015. The primary focus of the GARH project was to test and refine the clinical aspects of the obstetric triage protocol intervention, with timeliness of assessment as the clinical intervention outcome of interest. Implementation resulted in a reduction in median waiting time from arrival to assessment from 40 to 5 min [11].

In 2018, the obstetric triage system was introduced at Tema General Hospital (Tema), another high-volume facility in the Greater Accra region. The objective of this pilot was to gain knowledge about other clinical and implementation outcomes relevant to triage. In addition to timeliness of assessment, the Tema implementation also measured the accuracy of triage assessment (i.e., were women assigned the correct risk category) as a clinical outcome. Recognizing that neither outcome could be achieved without a systematic implementation process, a theory was developed to guide implementation. Fidelity, adoption, and sustainability were measured as implementation outcomes. The median arrival to assessment time decreased from 1 h and 8 min to 9 min

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within 4 months, and the overall time needed to achieve full implementation decreased from 3 years in GARH to 5 months in Tema. Data on the other clinical and implementation outcomes have been collected and are being analyzed.

Based on the Tema results in improving timeliness of assessment, in 2019, Kybele and GHS began the Obstetric Triage Implementation Package (OTIP) project to scale the triage system to six additional Ghanaian hospitals. Implementing evidence-based practices at scale requires simultaneous attention to systems change across multiple levels [14]. Thus, the “within-facility” theory of change developed at Tema was augmented to include components across facilities and across the health system. The resulting multi-level theory posits how multiple facilities might share learnings and build “across-facility” synergy, thus producing higher-fidelity implementation and clinical quality more quickly than a single facility attempting to embed the practice on its own. This augmented multi-level implementation theory (described in detail and diagrammed in Fig. 2 below) will be used as a process model to guide implementation and will also serve as the evaluation framework for the implementation process. The objective of this evaluation is twofold: to assess the effect of this theory on implementation fidelity and triage quality, and to use this assessment to generate evidence for a generalizable mid-level theory for implementing evidence-based interventions in low-resource maternity settings.

Methods

Design

The OTIP evaluation uses a type II hybrid effectiveness-implementation pre-post design [15] focusing on both clinical and implementation outcomes. Implementation is staggered across facilities, starting two at a time every 6 months. This staggered approach allows for before-after comparisons of facilities with their own results, as well as cross-facility comparisons of the implementation process. The first two facilities began triage implementation in late August 2019. In the initial 6 months of implementation, facilities receive intensive implementation support, with facilities then transitioning into full self-management of the program.

The evaluation questions of interest are as follows:

1. 1.

To what extent were the components of the implementation theory used in guiding the implementation process?

2. 2.

How effective was this theory in accelerating and sustaining the implementation of obstetric triage? What were the mechanisms by which this occurred?

3. 3.

To what extent did the theory result in changes beyond the level of individual facilities (e.g., changing norms or policy across multiple facilities)?

4. 4.

What insights garnered from this specific implementation theory can be generalized to other settings, helping to define a mid-range theory about the implementation of evidence-based interventions in new settings?

Setting

As described above, the obstetric triage system was developed at GARH, and replicated at Tema, both high

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volume obstetric referral hospitals in the Greater Accra region. The six scale-up facilities included in this implementation study are public hospitals that similarly receive large numbers of obstetrics patients (each hospital conducts 4000–7000 births per year). Participating facilities were selected by a national Technical Advisory Group (TAG) consisting of leaders from the GHS responsible for maternal health and institutional care (the structure and role of the TAG is discussed below). Priority was given to high-volume facilities with Comprehensive Emergency Obstetric Care capability.

Intervention

The obstetric triage system is a midwife-led clinical assessment and prioritization intervention. When an obstetric patient arrives at the facility, she is directed to a triage area for assessment by a midwife. The midwife records the patient's obstetric and medical history, vital signs, and labor progress onto a standardized triage assessment sheet, leading to categorization of high (red), intermediate (yellow), or low (green) risk, and the application of a corresponding color-coded patient wristband. Based on the diagnosis and risk status, a care plan is developed and documented. High-risk pregnancies require immediate intervention, intermediate-risk cases require careful and frequent monitoring, and low-risk cases proceed with normal childbirth, with the assistance of a midwife. Figure 1 shows the risk categorization for common conditions.

Despite the simplicity of this intervention, it is not commonly used in Ghanaian hospitals, and there are no dedicated triage areas. Assessment typically occurs once a bed becomes available on a first-come, first-serve basis, resulting in delays that can endanger mothers' and newborns' lives. Thus, the triage system was developed to facilitate rapid and accurate patient assessment and care planning as a routine part of midwifery practice. Similarly, the implementation theory was developed to facilitate accurate and consistent implementation of the triage system, to help embed triage and care-plan development as a normal and integral part of midwives' way of work.

Implementation

The focus on theory in implementation science has grown rapidly over the past decade but has primarily remained in the domain of research [16]. The systematic use of mid-level and program theories has been proposed as one way to bridge implementation theory and practice, but practical guidance to practitioners on how to create or select theories has been limited [17]. In a recent commentary, Kislov and colleagues encourage theory building in implementation science to shift from a top-down, static process, to an empirical, iterative process refined by learning from the local environment [17]. Our approach to theory building has adopted this concept, by using a program theory of change as the starting point for a more general implementation theory.

Comprehensive implementation theory

As mentioned previously, the implementation theory for OTIP was developed using a theory of change process [18]. Developing a theory of change to guide program design is a key first step in public health planning and evaluation, but this language is not common in the implementation science literature [19]. A key benefit of theory of change methodology is that it requires program designers to specify each step of the change process, and why proposed actions should be expected to produce desired results. Mapping a theory of change helps illuminate important assumptions and hypotheses.

Historically, theory of change methodology has described why an intervention should be expected to produce a

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desired programmatic outcome [18]. We applied this methodology in partnership with frontline staff in Tema to explore implementation strategies that could be expected to produce the desired implementation outcomes of adoption and fidelity. This resulted in the development of a within-facility implementation theory. In developing the OTIP scale-up theory, the original Tema within-facility theory was validated and supplemented with additional cross-facility and system components based on references to the implementation science literature. We followed this inductive/deductive approach because we needed to develop a facility level implementation process that would generate the engagement and support of staff, and would allow us to incorporate local contextual factors hypothesized to affect implementation.

The multi-level implementation theory developed to guide OTIP is depicted in Fig. 2. The Interactive Systems Framework (ISF) provides useful language for thinking through how each set of actors contributes to the implementation of OTIP and, ultimately, embedding the new way of work within hospitals [20]. The ISF defines three types of systems in any implementation effort (the synthesis and translation system, the support system, and the delivery system) that work in concert to promote the adoption and embedding of a new intervention or practice. Within OTIP, synthesis and translation system activities include the codification and standardization of the intervention package and its adaptation to local facility contexts (with subsequent modifications to the core intervention package made, as needed, based on implementation experience in each additional facility). Support system activities include selecting participating facilities, strengthening organizational readiness, and building implementation capacity. Delivery system activities include fidelity monitoring, coaching and mentoring of staff, and the adoption of strategies to improve fidelity and quality of implementation.

“Within-facility” theory

The within-facility implementation theory has its roots in the Evidence Based System for Implementation Support (EBSIS) described by Wandersman and colleagues, which emphasizes the need for training, technical assistance (TA) tools, and quality improvement (QI) to support the implementation of an evidence-based intervention [21]. In addition, it relies on the findings of Aarons et al. that leaders within organizations and systems play a large role in defining implementation climate and readiness [22, 23].

Application of the theory begins with the selection of triage champions. These are midwives and physicians selected by the leadership in each facility to act as facilitators, change agents, and implementation coaches. The expectation is for them to take on what Aarons et al. describe as a transformational leadership role [23]. As OTIP is a midwife-led intervention, the midwife champions become experts on the obstetric triage system and provide formal training for their peers. Midwife champions also provide crucial peer leadership to ensure acceptance and adoption of the intervention in each facility through fidelity monitoring. The physician champions are responsible for garnering the buy-in of other physicians in their hospitals. Each participating facility differs in staff composition and daily operations. Thus, the OTIP implementation theory proposes that while all facilities should receive identical training and tools, equipping champions to develop their own approach to TA and QI is more likely to be successful than mandating a one-size-fits-all implementation approach.

Once selected, triage champions undergo intervention-specific training for 2 days, delivered initially by Kybele and subsequently by national champions, whose role is described below. Training on the first day focuses on the clinical aspects of triage, delivered through a combination of didactic and hands-on formats. Training on the second day covers performance targets, fidelity monitoring, and adaptation. Champions are trained on a phased monitoring approach (Fig. 3) to measure compliance against three intervention quality standards related to clinical outcomes: banding compliance (was every mother banded?), banding accuracy (was the correct band

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assigned based on the assessment?), and the creation of the care plan (was the mother's care plan aligned with the band and diagnosis?). The standards are shown in Table 1. Training is also provided during day two on the use of Plan-Do-Study-Act (PDSA) cycles [24] to hypothesize causes for gaps in intervention quality, and to develop and test locally appropriate strategies to address them. A PDSA Cycle worksheet is provided for documentation of each cycle, learning, and subsequent adaptations of implementation strategies to improve quality adoption of triage.

After training, the champions determine the best method for delivering the training content to their colleagues in each hospital, as well as where and how to prepare the triage area. As described by Hawe and colleagues, these adaptations target the form of the intervention, while retaining its function [25]. In other words, the core intervention activities (assessment, completion of triage form, wrist-banding, care plan development) are identical, but the manner in which the triage space is designed and situated is determined locally. Similarly, the function of the implementation strategies is standardized across all participating facilities (e.g., training on triage system, coaching to enforce proper practice), but the form is permitted to vary according to champions' understanding of what will work best in their facilities (e.g., classroom sessions vs. on-the-job training, individual coaching at the bedside vs. role play sessions in team meetings).

Following the kick-off Kybele-led training, facility champions are provided access to the implementation monitoring system (developed using a Google application) through their smart phones. Each week, a sample of OTIP triage assessment forms is randomly selected from the previous 7-day period. Depending on the monitoring phase, champions enter data on banding compliance, triage assessment form completion, and banding accuracy into the system. For each facility, the system aggregates the data to assess weekly compliance against the standard, creating run charts of performance over time. These charts are visible to all facilities and to the evaluation team. Each week, the facility champions review the data and use PDSA cycles to design new implementation strategies, or to reinforce previous ones to improve implementation performance against the standards. These strategies primarily fall within the categories described by Leeman et al. as dissemination strategies (messages, communication, posters, recognition, enforcement) to improve the knowledge and attitude of frontline staff and capacity building strategies (additional training, job aids, coaching) to improve their capability to perform triage [20]. One standard is addressed in each monitoring phase, and the monitoring proceeds to the next phase when compliance to the standard is achieved for three continuous weeks. Once phase 3 standards have been met for three continuous weeks, the facility is categorized as having achieved full implementation. When the implementation in the facility is considered complete, a close out event is conducted in each facility, in which each facility develops an ongoing monitoring plan. No additional support is provided for the implementation of this plan.

“Across-facility” theory

In their 2004 systematic review of the diffusion literature, Greenhalgh and colleagues highlighted the importance of social networks, opinion leaders, and champions to facilitate the spread of innovations [26]. The across-facility theory operationalizes these ideas around social networks and dissemination through the use of a champion-led learning network. The network is housed on a WhatsApp platform and provides triage champions the opportunity to share learning and insights, ask for guidance, collectively problem-solve, and create healthy peer competition to sustain implementation. In addition, the clinical champions convene in-person when each new set of facilities comes on board to share successful practice. The primary objective of these learning

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sessions is to document successful implementation strategies, to create a formal implementation guide that will inform future scale-up, and to discuss adaptations to enhance implementation outcomes such as adoption, penetration, and sustainability.

System-level theory

Implementation theory at the system level involves dissemination and communication of implementation progress to national-level stakeholders to encourage adoption of the innovation nationwide. For OTIP, this process involves the establishment of a Technical Advisory Group (TAG), consisting of leaders from GHS's Institutional Care Division as well as others responsible for developing policies, practices, and programs to improve clinical care delivery nationwide. To promote collaboration across levels, one midwife champion and one physician champion are designated as "national champions" and TAG members. The TAG also includes selected facility leaders (e.g., head of obstetrics) to further reinforce the relationship between the national and facility levels. The TAG provides transactional leadership [23] through monitoring and supervision of overall implementation. The TAG meets regularly throughout the project period to discuss implementation challenges, share lessons learned, and build a collective understanding of how to successfully integrate the obstetric triage system into national policy.

As described by Raghavan and colleagues [14], policies need to be deployed across multiple levels of the policy ecology. As insights about requirements for successful implementation are shared with the TAG, policy advocacy may need to encompass, for example, hiring or reassigning staff across maternity units for triage, issuing standards for equipping dedicated triage areas, encouraging facility leaders to promote triage within their institutions, and establishing national standards for selecting triage champions. We use the word "policy" broadly to include both formal policy change as well as changes in rules, customs, or traditions that arise due to informal influence exerted by the TAG, even if formal institutional policies are not developed or rewritten.

Evaluation approach

A convergent design mixed methods approach will be used [27], as is common in the evaluation of complex multi-level program implementation. Relevant data will be drawn from tailored assessments, routinely collected process and quality monitoring data, textual analysis of relevant documents and WhatsApp group messages, and key informant interviews. Evaluation at the facility level will include process evaluation during the first 6 months of implementation in each facility, and outcome and sustainability evaluation after external support for implementation has ended. Cross-facility comparisons and assessment of the TAG support will be undertaken at the end of the project period, after external support for implementation has concluded in all facilities

Within-facility assessments

The primary clinical outcome is the waiting time from patient arrival to triage assessment. At each facility, waiting times are collected before, after, and 6 months following the end of receiving intensive triage implementation support from Kybele, to assess sustainment following the cessation of external implementation support. If there is no triage program in the facility at baseline, data from arrival to when the patient is first seen by a midwife is used to calculate waiting time. Median waiting times are compared in each facility. A priori sample size calculations were conducted using G*Power. Assuming an effect size similar to the pilot study ($d \approx 0.776$), a minimum of 60 women will need to be included in each round of data collection in each facility, in order to detect a change with 95% power. Given the potential for a smaller effect size than observed in the pilot, 75 women will be recruited in each round of data collection. The secondary clinical outcomes are assessment accuracy and appropriateness of the care plan developed given the diagnosis. As data collection on these secondary outcomes cannot occur until the triage program is implemented, changes cannot be compared to baseline, but

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data on these outcomes will be collected at endline and 6 months following the end of receiving implementation support.

The primary implementation outcomes are acceptability, adoption, and sustainability. Acceptability and adoption of the obstetric triage system by frontline staff at each facility will be measured through semi-structured interviews based on the Consolidated Framework for Implementation Research (CFIR) constructs, and by measures of banding compliance at endline. Interviews will be conducted by a senior member of the research team, and their notes will be coded by a team of graduate-trained coders using a codebook generated inductively based on interview data from the first two implementing facilities. These codes will be used to categorize the interview data from the remaining facilities, and additional inductive codes will be added. Changes in banding compliance over time will be assessed using run charts. Sustainability will be assessed using Normalization Process Theory (NPT), which seeks to explain how new technologies and practices become embedded into health provider routines [28, 29], as well as by the post-implementation measurements of waiting time, compliance, and accuracy. A recent systematic review found that NPT assessment can provide critical information to determine the extent to which an implementation project will be successful from a sustainability perspective [30]. While NPT assessments have primarily been conducted through qualitative data collection, NPT developers assert that the theory holds a degree of flexibility, and data collection can be adapted to best meet contextual needs [30]. Additionally, NPT developers have introduced the NoMad quantitative instrument intended assess intervention integration [31]. The NoMad tool has been used in global health to assess the degree to which a program has been embedded within a given context during implementation [32]. The NoMad will be adapted, per the developers' instructions, to ensure it is relevant to the project and context-specific. Approximately 6 months after the end of receiving implementation support from Kybele, all frontline staff will complete an NPT assessment to measure the four key components of NPT, which include coherence, cognitive participation, collective action, and reflexive monitoring [33].

Implementation determinants posited to affect the outcomes will also be measured. The CFIR-based interviews will also be used to measure staff perceptions of barriers to implementation. In addition, following training of the triage champions, but prior to implementation, a facility readiness assessment will be conducted using a modified version of the R = MC2 readiness heuristic [34, 35]. This version is the result of a Delphi process with content experts to validate and simplify the items within R = MC2 [35] and make it more pragmatic [36]. This assessment has been further collaboratively adapted with the triage champions for use in Ghana. As readiness is posited to affect both the ability of organizations to implement new practices and the degree to which those new practices can be embedded within ways of work, we will explore whether baseline readiness as measured by R = MC2 is correlated with adoption and sustainability. Given the lack of guidelines around how to interpret R = MC2 scoring, this part of the study will be exploratory in nature and presented via narrative description rather than statistical analysis. Specifically, we will identify any barriers to readiness captured through the assessment and explore whether these barriers affected the implementation outcomes in any discernable way.

Local implementation strategies developed and adapted through the PDSA cycles will be coded using the FRAME framework [37]. This coding will allow us to assess the nature and types of adaptations undertaken by each facility team. Finally, in-depth interviews will be conducted with the national and facility champions to learn more about their growth as leaders. These qualitative data will be analyzed thematically to evaluate how champions perceive the OTIP as strengthening their leadership capacity, an important factor in implementation readiness and program sustainability.

Assessment of the role of the TAG will be based on a review of meeting minutes and correspondence to describe TAG activities and focus areas. In-depth interviews will be conducted with TAG members at project

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conclusion to gain insight into their perceptions of the role of the TAG, its success in achieving its aims, and the lessons learned throughout the obstetric triage scale-up project. TAG members will also be asked to reflect on the feasibility, acceptability, and perceived utility of the TAG for further scale-up of the obstetric triage system, as well as other public health projects that GHS might seek to implement. These interviews will be coded inductively and analyzed using thematic analysis.

Table 2 summarizes the data that will be collected at each stage of implementation mapped to the theory shown in Fig. 2. Figure 3 provides an overview of the intervention and assessment activities and illustrates how the data presented in Table 2 will be used for evaluation across the course of the project period.

A rich blend of qualitative and quantitative data will be used to answer the research questions. To assess the extent to which the theory was used to guide implementation, an assessment rubric will provide a detailed synthesis of the data in Table 2. This synthesis will seek to determine how strongly the implementation data reflects the strength and utility of each component of the theory for each facility.

One aspect of the implementation theory is the EBSIS approach of providing training, support and tools to develop local implementation strategies. To assess this, we will analyze the adaptations from the PDSA worksheets in each facility (#10 in Table 2) to assess whether there is evidence of use of a systematic iterative approach to create strategies to improve implementation quality (based on data related to the success of previous implementation efforts), whether strategies were developed on an ad hoc basis, or whether diverse strategies were employed at all. Finally, we will analyze the qualitative interview data with frontline staff (#11 in Table 2) as well as the NPT data (#12 in Table 2) to gain insight into how implementation capability gets embedded into everyday workflow in each facility.

Across-facility assessments

At the across-facility level, we will assess both outcomes and the implementation process. To evaluate whether the time to triage a patient post-intervention differs by facility, we will pool data on post-implementation clinical outcomes (i.e., wait time to assessment, assessment accuracy, appropriateness of care plan given diagnosis) and estimate a fixed-effects model with facility-specific indicator variables and facility-specific covariates as independent variables. If differences in triage time are seen across facilities, we will triangulate the results with the facility-specific process evaluation data to explore hypotheses about facility effects, and conduct additional explanatory interviews with facility staff as needed.

One hypothesis we will test is whether the use of the theory to guide implementation results in progressive maturity of the implementation process. If this is true, we would expect progress towards outcomes to occur faster in facilities where implementation takes place later in the course of the project, moderated by factors such as readiness. To assess this, we will compare the slopes of median wait time for triage collected at baseline, endline, and 6 months after the conclusion of external support for implementation, controlling for initial readiness (#4 in Table 2). We will use a piecewise linear random effects growth curve model for this analysis, with the independent variable being the timing of implementation start in each facility [38]. We will also evaluate strategies that were common across facilities and investigate whether these were the result of sharing in the WhatsApp platform or at the learning network session (#6 in Table 2), or whether different facilities developed similar strategies independently. This will provide insights into how implementation strategy development can be accelerated by sharing across facilities, and help guide the design of future support systems.

These insights are useful for evaluating the generalizability of this theory to the implementation of other

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evidence-based interventions, and system effects beyond the facility level. The facility level interviews will be augmented by observations of the TAG process (#8), TAG member interviews (#7), and national champion interviews (#9) to assess the influence of the implementation theory on leadership and higher-level system change.

Discussion

This protocol describes a complex multi-level implementation theory to derive testable hypotheses around how a focused implementation approach can accelerate adoption and embedding of a new evidence-based intervention. In this way, it offers a model for using program theory to develop testable hypotheses and empiric evidence that can then be used to refine mid-level theory, driving both implementation research and practice forward.

This study faces some limitations with respect to research rigor—the most important being the lack of control groups. This limits our ability to assess the effectiveness of the implementation approach employed on clinical outcomes. However, by developing a theory-based approach for how a complex intervention should be scaled in the field rather than proceeding with an ad hoc approach, this evaluation will contribute useful and novel information about how theory-driven implementation can support actors working to install and embed evidence-based practices in low- and middle-income country settings. Looking beyond the research community, empiric data on the merging of implementation theory and practice can be of great use to policymakers, practitioners, and evaluators, who must contend with the vagaries of real-world implementation contexts.

In short, the results of this study should help to provide empiric evidence of how implementation theory can be used to help close the “know-do” gap, and accelerate progress on getting potentially life-saving interventions into the field.

Availability of data and materials

The datasets collected and analyzed during the current study will be available from the corresponding author on reasonable request.

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DETAILS

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The Quality of the Maternity Triage Process: a Qualitative Study.

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ABSTRACT

INTRODUCTION

There is no consensus on what the bases and criteria are for the dynamic process of maternity triage. Properly performing the maternity triage process requires reliable data to ensure the correct implementation of this process and the identification of existing deficiencies, and find strategies to modify, improve and enhance the quality of this process.

OBJECTIVE

The present study was conducted to explain the quality of the maternity triage process.

METHODS

The present qualitative study performed a directed content analysis on 19 maternity triage service providers and key informants selected through purposive sampling. The data were collected through semi-structured interviews in 2018 and analyzed using directed content analysis based on the Donabedian's model. The accuracy and rigor of the qualitative data were then investigated and confirmed.

RESULTS

The participants identified the most important factors affecting the quality of the services provided in maternity triage as two categories of measures and care, and interactions and communication. The category of measures and care included two subcategories of examinations and obtaining a medical history.

CONCLUSION

The present study comprehensively identified different dimensions of the quality of maternity triage services at different levels. The participants identified the quality of the maternity triage process as a multi-dimensional and important concept. Different dimensions of the maternity triage process are recommended that be addressed when designing and implementing maternity triage guidelines and instructions so as to maintain the quality of this process and satisfy their needs.

LINKS

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DETAILS

Supplemental data:	Cited By;; Int Emerg Nurs. 2014 Jan; 22(1):40-6 [23685041]; BMJ. 2000 Mar 18; 320(7237):768-70 [10720363]; J Adv Nurs. 2015 Oct; 71(10):2279-92 [26179813]; Acad Emerg Med. 2001 Feb; 8(2):170-6 [11157294]; Nurse Educ Today. 2004 Feb; 24(2):105-12 [14769454]; J Adv Nurs. 2001 Aug; 35(4):550-61 [11529955]; Arch Acad Emerg Med. 2019 Jan 13; 7(1):e13 [30847448]; Rev Lat Am Enfermagem. 2010 Jan-Feb; 18(1):54-60 [20428697]; CJEM. 2005 Jan; 7(1):12-6 [17355648]; Nurs Crit Care. 2006 May-Jun; 11(3):136-45 [16719019]; J Adv Nurs. 2008 Apr; 62(1):107-15 [18352969]; Int J Health Care Qual Assur. 2018 Jul 9; 31(6):575-586 [29954270]; Arch Surg. 2009 Sep; 144(9):853-8 [19797111]; BJOG. 2017 Nov; 124(12):1867-1873 [28294509]
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Clinicians' perspectives on admission of pregnant women: A triad

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ABSTRACT (ENGLISH)

Purpose: Reducing primary cesarean births is a national priority in the United States. Recommendations include delaying admission of low-risk pregnant women to the hospital until they are in active labor, considered to be 6 cm cervical dilatation. How this recommendation affects decision-making during triage requires further exploration. The purpose of this study was to explore the clinician's perspective on the triage process and deferral of hospital admission for low-risk pregnant women who were not yet in active labor. Methods: A qualitative descriptive approach was used via semistructured interviews with physicians, midwives, and nurses. Data analysis used an inductive approach and identified codes, a theme and subthemes. Results: Twenty-five clinicians participated. A triad of decision-making occurred between three main stakeholders: the low-risk pregnant woman, the triage nurse, and the physician or midwife. One theme and four subthemes related to this triad were identified. The theme Admission of Low-Risk Pregnant Women Depends on Many Factors provides context to the maternity care triage process. There are many factors clinicians consider prior to admitting women, including situational and clinical factors. Subthemes related to the woman are her expectation and knowledge about birth and her ability to cope with labor. Subthemes associated with the provider and triage nurse are care variation and concern for maternal and fetal safety. Clinical Implications: From the clinician's perspective, triage is a complex, dynamic process, even for low-risk pregnant women. There is an interplay of different factors affecting clinical decision-making, thus the decision-making triad provides a possible framework for shared decision-making. (PsycInfo Database Record (c) 2020 APA, all rights reserved) (Source: journal abstract)

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MeSH subject:	Attitude of Health Personnel; Decision Making; Female; Humans; Midwifery; Obstetric Nursing; Obstetrics; Patient Admission; Pregnancy; Prenatal Care; Triage
Classification:	3430: Professional Personnel Attitudes &Characteristics
Age:	Adulthood (18 yrs &older)
Population:	Human; Male; Female
Identifier (keyword):	birth; maternity care; spontaneous labor; triage
Test and measure:	Test name: Interview Guide; Test DOI: https://doi.org/10.1037/t25467-000
Methodology:	Empirical Study, Interview, Qualitative Study
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Maternity triage: did negligent assessment lead to cerebral palsy?

Symon, Andrew

[ProQuest document link](#)

ABSTRACT (ENGLISH)

Andrew Symon reports on the recent case of PXW v Kingston Hospital, which examined a midwife's conduct in relation to assessing a woman in the latent phase of labour

LINKS

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DETAILS

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Obstetric Triage Scales; a Narrative Review.

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ABSTRACT

INTRODUCTION

The growing demand for high-quality obstetric care and treatment has led to the advent and development of a field known as obstetric triage. The present review study aimed to examine the development of tools and criteria for obstetric triage services.

METHODS

In this narrative review, two authors searched for related articles using the keywords of "obstetric triage, gynecology triage, perinatal Triage, maternity triage, midwifery triage" AND "tool, index, scale, questionnaire, system". With Persian and English language limitation, searches were performed in Scopus, Google Scholar,

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Scientific Information Database, ProQuest, Medline, Embase and Web of Science databases for articles published from 2000 to 2018.

RESULTS

Out of the 289 articles reviewed in this study, 8 articles met the eligibility criteria. Out of these 8 articles, 6 were dedicated to introducing a tool designed and only 2 introduced an obstetric triage system. The obstetric triage tools and systems covered included Emergency Severity Index (ESI), Obstetric Triage Acuity Scale (OTAS), Birmingham symptom specific obstetric triage system (BSOTS), Maternal Fetal Triage Index (MFTI), Florida Hospital Obstetric Triage Acuity Tool, self-assessment questionnaire for gynecologic emergencies (SAQ-GE) and Perinatal Emergency Team Response Assessment (PETRA). Overall, the validity and reliability of the studied method were investigated and found to be acceptable in only 5 of the reviewed studies.

CONCLUSION

The review showed the lack of consensus on how to devise a single standardized tool or system for obstetric triage. The comparison of different obstetric triage tools and systems demonstrated the need for a standardized and widely-approved system with high validity and reliability and standard definitions for obstetric triage to determine the right priority and waiting times of obstetric care services.

LINKS

[Linking Service](#)

DETAILS

9. Evidence Search on Maternity Triage

Supplemental data:

Conflict of Interest:; The authors declare that there is no conflict of interest regarding the publication of this paper.; Cited By:; CJEM. 2008 Mar; 10(2):136-51 [18371252]; BMC Pregnancy Childbirth. 2017 Sep 18; 17(1):309 [28923021]; MCN Am J Matern Child Nurs. 2011 Sep-Oct; 36(5):290-6 [21857199]; J Womens Health (Larchmt). 2008 Mar; 17(2):269-77 [18321178]; BJOG. 2017 Nov; 124(12):1867-1873 [28294509]; BMC Pregnancy Childbirth. 2017 Jul 11; 17(1):216 [28693518]; CJEM. 2004 Nov; 6(6):421-7 [17378961]; J Emerg Nurs. 2009 Apr; 35(2):105-8 [19285171]; Am J Obstet Gynecol. 2013 Oct; 209(4):287-93 [23535239]; J Obstet Gynecol Neonatal Nurs. 2014 Nov-Dec; 43(6):771-9 [25203897]; J Obstet Gynaecol Can. 2017 Jul; 39(7):523-533.e12 [28625281]; J Clin Epidemiol. 2006 Jun; 59(6):615-21 [16713524]; World J Emerg Surg. 2014 Aug 13; 9:46 [25180047]; J Perinat Neonatal Nurs. 2000 Mar; 13(4):1-12 [11075082]; Scand J Trauma Resusc Emerg Med. 2011 Jun 30; 19:42 [21718476]; J Perinat Neonatal Nurs. 2007 Oct-Dec; 21(4):315-22 [18004169]; J Obstet Gynaecol Can. 2016 Feb; 38(2):125-33 [27032736]; J Clin Nurs. 2005 Oct; 14(9):1067-74 [16164524]; Int J Obstet Anesth. 2009 Jul; 18(3):253-7 [19457651]; J Obstet Gynecol Neonatal Nurs. 2015 Nov-Dec; 44(6):710-6 [26469540]; CJEM. 2005 Mar; 7(2):107-13 [17355660]; Can Nurse. 1993 Aug; 89(7):17-20 [8348515]; Nurs Womens Health. 2011 Feb-Mar; 15(1):81-4 [21332964]; Res Nurs Health. 2007 Aug; 30(4):459-67 [17654487]; J Obstet Gynecol Neonatal Nurs. 2015 Nov-Dec; 44(6):701-9 [26469714]; Int J Qual Health Care. 1997 Apr; 9(2):143-7 [9154501]; MCN Am J Matern Child Nurs. 2014 Sep-Oct; 39(5):284-97; quiz 298-9 [24905040]

Correspondence author:

Rashidi Fakari, Farzaneh

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Database:

Health Research Premium Collection, MEDLINE®

Telephone triage and midwifery: A scoping review.

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9. Evidence Search on Maternity Triage

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[ProQuest document link](#)

ABSTRACT

BACKGROUND

Midwives use telephone triage to provide advice and support to childbearing women, and to manage access to maternity services. Telephone triage practises are important in the provision of accurate, timely and appropriate health care. Despite this, there has been very little research investigating this area of midwifery practice.

AIM

To explore midwives and telephone triage practises; and to discuss the relevant findings for midwives managing telephone calls from women.

METHODS

A five-stage process for conducting scoping reviews was employed. Searches of relevant databases as well as grey literature, and reference lists from included studies were carried out.

FINDINGS

A total of 11 publications were included. Thematic analysis was used to identify key concepts. We grouped these key concepts into four emergent themes: purpose of telephone triage, expectations of the midwife, challenges of telephone triage, and achieving quality in telephone triage.

DISCUSSION

Telephone triage from a midwifery perspective is a complex multi-faceted process influenced by many internal and external factors. Midwives face many challenges when balancing the needs of the woman, the health service, and their own workloads. Primary research in this area of practice is limited.

CONCLUSION

Further research to explore midwives' perceptions of their role, investigate processes and tools midwives use, evaluate training programs, and examine outcomes of women triaged is needed.

LINKS

[Linking Service](#)

DETAILS

9. Evidence Search on Maternity Triage

MeSH subject:

Adult; Female; Humans; Midwifery -- education; Perception; Pregnancy; Workload; Health Services Accessibility (major); Nurse Midwives -- psychology (major); Telephone (major); Triage (major)

Correspondence author:

Bailey, Carolyn M

Publication title:

Women and birth : journal of the Australian College of Midwives

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Last updated:

2024-02-09

Database:

Health Research Premium Collection, MEDLINE®

Transforming triage

Horton, Kate; Johns, Nina; Goodwin, Laura; Kenyon, Sara

[ProQuest document link](#)

ABSTRACT (ENGLISH)

Triage based on clinical priority is standard procedure in A&E departments, and should be rolled out to maternity units too.

LINKS

[Linking Service](#)

FULL TEXT

Headnote

Triage based on clinical priority is standard procedure in A&E departments, and should be rolled out to

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maternity units too, argue Kate Horton, Nina Johns, Laura Goodwin, and Sara Kenyon.

TRIAGE SYSTEMS ARE DESIGNED TO PRIORITISE the provision of care according to clinical need. Prioritisation follows a standardised initial consultation and physiological assessment, and depends on the presenting condition, the severity of physical symptoms and measurement of vital signs. Triage is well established in emergency medicine, but no standardised triage system currently exists within maternity care.

The physiological changes in pregnancy - increased heart rate, lower blood pressure and increased respiratory rate - mean that general parameters of standard triage tools may not be applicable. The underlying good health of the maternity population may also mask the severity of maternal illness if a specific assessment is not undertaken. Existing triage tools also do not allow the assessment of the condition of the unborn baby.

Previously, all women attending maternity units, other than for scheduled antenatal clinic visits, were reviewed on labour wards. Confidential enquires (CMACE, 2011; CEMACH, 2007) have identified high numbers of women attending with problems that were pregnancy-related, but not labour, whose attendance at the delivery suite diverted midwifery staff and clinical care from women in active labour. National recommendations that women attending with unscheduled visits should be seen in areas away from the delivery suite are now accepted throughout the UK. However, maternity units were not designed for this and 'triage' departments have evolved in other physical spaces, such as day assessment units and labour induction bays.

These maternity triage departments have expanded without standardised pathways, and their workloads continue to grow without appropriate organisational and clinical systems.

Standardising the system

The need for a standardised maternity triage system has been recognised in recent UK confidential enquiries (CMACE, 2011; CEMACH, 2007) as well as many local reported clinical incidents. The need to develop guidelines for the triage of pregnant women has also been highlighted by the American College of Obstetricians and Gynecologists (2016), which advocates the use of tools such as the Birmingham system described below to improve quality and efficiency. The demand for such a system has been further emphasised by the NICE guideline for safe midwifery staffing (NICE, 2015), which defines a delay of 30 minutes or more between presentation and triage as a 'red flag event'.

The Birmingham symptom-specific obstetric triage system (BSOTS) was co-produced in 2013 by midwives and obstetricians from Birmingham Women's and Children's NHS Foundation Trust and researchers at the University of Birmingham. The system is based on established triage systems in emergency medicine and uses a uniform assessment with clinical prioritisation of the common conditions that women present within maternity triage.

Initial assessment

An initial standardised assessment of each woman identifies her presenting condition, key clinical symptoms and physiological indicators. Symptomspecific prioritisation algorithms use this information to define the level of clinical urgency using a four-category scale. The guidelines for levels of clinical urgency and immediate subsequent care were developed using current available evidence, and consensus statements with the agreement of the local maternity team.

The initial triage assessment, lasting around five minutes, is completed within 15 minutes of the woman's attendance, and includes the taking of a brief maternal history, completion of baseline maternal observations (temperature, pulse, respirations, blood pressure), assessment of pain levels, abdominal palpation and

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auscultation of fetal heart rate (if the woman is antenatal). This assessment is used to define a category of clinical urgency, which guides timing of subsequent assessment and immediate care using algorithms.

These standardised symptom-specific algorithms are specific to the primary reason for attendance - abdominal pain, antenatal bleeding, hypertension, suspected labour, ruptured membranes, reduced fetal movements, feeling unwell and postnatal concerns. The clinical priority allocated is colour-coded depending on urgency: red, amber, yellow and green. The algorithms also guide immediate care of the woman and direct further investigations.

The initial triage assessment is carried out in the 'triage room' - ideally a single identified room - although that room may change/rotate if women cannot be moved after assessment. Following their initial triage assessment, women will be seen in the order of their clinical need and are informed when this is likely to be. If designated as being 'amber' priority, they will stay in the triage unit for urgent assessment; if 'yellow' or 'green', they can return to the waiting area until further assessment. Women prioritised as 'red' are usually transferred immediately to the labour ward for emergency care or imminent birth.

Local midwifery and medical staffing will depend on how busy the triage department is, with the priority to undertake the initial triage within 15 minutes of arrival.

In large and busy departments, it is recommended that one midwife is responsible for initial triage, while another midwife undertakes subsequent care and investigations. In smaller departments, one midwife can undertake both roles but needs to remain responsive to new arrivals and interrupt the ongoing care of women to triage others.

Using a standardised triage system such as BSOTS improves the overall management of the department - in addition to the care of individual women - by maximising the effective use of available resources and allowing midwives and medical staff to easily view the clinical workload. BSOTS enables midwives to have an overview of the number of women in the department; those who have not yet had their initial triage assessment and, following initial assessment and triage, the level of clinical urgency for each woman. BSOTS also creates a shared language between clinicians, enabling medical staff to prioritise which woman should be reviewed next, facilitating effective handover between staff, and prompting rapid escalation of clinical and staffing concerns.

The BSOTS triage system has been used by Birmingham Women's Hospital since 2013 and is well established as the standard of care for women presenting with unscheduled pregnancy-related concerns. Following initial review of the system, three other West Midlands maternity units have implemented BSOTS in their triage departments and worked with the University of Birmingham to further evaluate its safety and effectiveness.

A mixed-methods design was selected for evaluating the impact of the introduction of BSOTS, the objective of which was to evaluate the recognised features of a robust triage system according to the following criteria:

1. Utility: System must be easy to understand and simple to apply by clinicians.
2. Validity: System should measure what it is designed to measure; it should measure clinical urgency as opposed to severity or complexity of illness.
3. Reliability: The application of the scale should be independent of the clinician performing the role and be consistent. 'Inter-rater reliability' is the term used for the statistical measure of agreement that is achieved by two or more raters using the same scale.
4. Safety: Triage decisions must correspond with objective clinical criteria and must optimise time to medical

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intervention.

Improving safety

An initial evaluation at Birmingham Women's Hospital showed that BSOTS increased the number of women seen within 15 minutes of attendance to maternity triage from 38% (159/421) to 53% (209/391) - relative risk 1.4 (1.2, 1.7 (95% confidence interval (CI))) (Kenyon et al, 2017). The system also appeared to reduce the time spent waiting for assessment and the interval between attendance to medical review for those who required it.

Numbers of women who reattended, when they were next seen by maternity services and the investigation of predefined maternal and neonatal morbidities suggested validity and improved safety.

To evaluate the reliability of the BSOTS triage algorithms, 30 midwives who had undergone the training agreed to complete eight scenario cases. Excellent inter-rater reliability (intraclass correlation 0.961 and 95% CI 0.91-0.99) was demonstrated using the cases with the BSOTS algorithms. Scenarios with the highest and lowest clinical importance were most consistently assessed accurately, and all maternity units using BSOTS showed the excellent inter-rater reliability.

These results show that BSOTS is relatively easy to use - achieving the utility criterion - and the triage decisions appear to correspond with the clinical situation and improve safety. This was confirmed by findings from focus group interviews, which demonstrated that midwives felt the introduction of BSOTS helped them manage and organise the department. They reported that they felt the safety of women and their babies had improved and that the system, although standardised, afforded them opportunities to use their clinical judgement when appropriate.

To enable further review and planning, a national consensus meeting was held in May 2017, chaired by the director of the Birmingham Clinical Trials Unit and comprising representatives of the RCOG, the National Maternal and Neonatal Health Safety Collaborative (NMNHSC), service users, the PROMPT faculty and West Midlands clinical networks. At the meeting, it was agreed that no further evaluation was required as the system appeared to increase safety for mothers and babies, as well as clinicians.

To that end, BSOTS has been included as a safety option by the NMNHSC, and local maternity clinical networks and the West Midlands Academic Health Science Network are supporting implementation. The RCM and the RCOG also support its implementation and the system is being rolled out nationally. ©

Sidebar

BSOTS enables midwives to have an overview of the number of women in the department; those who have not yet had their initial triage assessment and, following initial assessment and triage, the level of clinical urgency for each woman

Kate Horton is delivery suite matron at Birmingham Women's Hospital; Nina Johns is an obstetrician at Birmingham Women's Hospital; Laura Goodwin is a research fellow at the University of Birmingham; and Sara Kenyon is professor of evidencebased maternity care at the University of Birmingham

15% rise in the number of women seen within 15 minutes at Birmingham Women's Hospital after introduction of BSOTS

90.8% accuracy in triage prioritisation

19% of women attending were experiencing reduced fetal movements (Kenyon et al, 2017)

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INTERESTED IN USING BSOTS?

If you are interested in more information or implementing the system in your triage department, contact the BSOTS team via kate.horton@bwnft.nhs.uk

DETAILS

Subject:	Physiology; Emergency medical care; Womens health; Triage; Pregnancy; Workforce planning; Midwifery; Maternal child nursing; Heart rate
Publication title:	Midwives; London
Volume:	21
Pages:	50-53
Publication year:	2018
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Language:	English
Document type:	Journal Article
ProQuest document ID:	2045245150
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First available:	2018-05-28
Updates:	2018-05-28; 2018-05-30; 2019-11-07; 2023-11-29
Database:	Health Research Premium Collection,British Nursing Index

The design and implementation of an obstetric triage system for unscheduled pregnancy related attendances: a mixed methods evaluation.

Kenyon, Sara¹; Hewison, Alistair²; Dann, Sophie-Anna³; Easterbrook, Jolene⁴; Hamilton-Giachritsis, Catherine⁵; Beckmann, April⁶; Johns, Nina⁷ ¹Institute of Applied Health Research, College of Medical and Dental Sciences, University of Birmingham, Edgbaston, Birmingham, B15 2TT, UK. s.kenyon@bham.ac.uk. ²Institute of Clinical Sciences, College of Medical and Dental Sciences, University of Birmingham, Edgbaston, Birmingham, B15 2TT, UK. ³Institute of Applied Health Research, College of Medical and Dental Sciences, University of Birmingham, Edgbaston, Birmingham, B15 2TT, UK. ⁴Day Assessment Unit, Birmingham Women's and Children's NHS Foundation Trust, Mindelsohn Way, Birmingham, B15 2TT, UK. ⁵University of Bath, Claverton Down, Bath, BA2 7AY, UK. ⁶Pacific Institution, 33344 King Road, Abbotsford, BC, V2S 4P4, Canada. ⁷Birmingham Women's and Children's NHS Foundation Trust, Mindelsohn Way, Birmingham, B15 2TG, UK.

[ProQuest document link](#)

ABSTRACT

BACKGROUND

No standardised system of triage exists in Maternity Care and local audit identified this to be problematic. We designed, implemented and evaluated an Obstetric Triage System in a large UK maternity unit. This includes a standard clinical triage assessment by a midwife, within 15 min of attendance, leading to assignment to a category of clinical urgency (on a 4-category scale). This guides timing of subsequent standardised immediate care for the eight most common reasons for attendance. A training programme was integral to the introduction.

METHODS

A mixed methods evaluation was conducted. A structured audit of 994 sets of maternity notes before and after implementation identified the number of women seen within 15 min of attendance. Secondary measures reviewed included time to subsequent care and attendance. An inter-operator reliability study using scenarios was completed by midwives. A focus group and two questionnaire studies were undertaken to explore midwives' views of the system and to evaluate the training. In addition a national postal survey of practice in UK maternity units was undertaken in 2015.

RESULTS

The structured audit of 974/992 (98%) of notes demonstrated an increase in the number of women seen within 15 min of attendance from 39% before implementation to 54% afterwards (RR (95% CI) 1.4 (1.2, 1.7) $p = <0.0001$). Excellent inter-operator reliability (ICC 0.961 (95% CI 0.91-0.99)) was demonstrated with breakdown showing consistently good rates. Thematic analysis of focus group data ($n = 12$) informed the development of the questionnaire which was sent to all appropriate midwives. The response rate was 53/79 (67%) and the midwives reported that the new system helped them manage the department and improved safety. The National Survey (response rate 85/135 [63%]) demonstrated wide variation in where women are seen and staffing models in place. The majority of units 69/85 (81%) did not use a triage system based on clinical assessment to prioritise care.

CONCLUSIONS

This obstetric triage system has excellent inter- operator reliability and appears to be a reliable way of

9. Evidence Search on Maternity Triage

assessing the clinical priority of women as well as improving organisation of the department. Our survey has demonstrated the widespread need for implementation of such a system.

LINKS

[Linking Service](#)

DETAILS

Journal classification:

Index Medicus

MeSH subject:

Female; Focus Groups; Humans; Maternal Health Services; Pregnancy; Qualitative Research; Surveys and Questionnaires; Time Factors; United Kingdom; Attitude of Health Personnel (major); Midwifery -- education; Midwifery -- methods (major); Obstetrics -- methods (major); Practice Patterns, Physicians' (major); Triage -- methods (major)

Supplemental data:

Cited By:: Health Serv Manage Res. 2012 Nov; 25(4):190-9 [23554445]; Emerg Med Australas. 2009 Aug; 21(4):277-85 [19682012]; J Accid Emerg Med. 1999 May; 16(3):179-81 [10353042]; Obstet Gynecol. 2016 Jul; 128(1):e16-e19 [27333358]; J Adv Nurs. 2015 Jul; 71(7):1484-98 [25708256]; Int J Nurs Stud. 2008 Apr; 45(4):645-7 [17959177]; Accid Emerg Nurs. 2002 Oct; 10(4):221-34 [12568450]; Psychol Bull. 1968 Oct; 70(4):213-20 [19673146]; Int Emerg Nurs. 2009 Jul; 17(3):143-8 [19577200]; Emerg Med Australas. 2008 Jun; 20(3):250-9 [18462405]; Scand J Caring Sci. 2005 Dec; 19(4):432-8 [16324070]; BMC Med Res Methodol. 2013 Sep 18; 13:117 [24047204]; BMJ. 1995 Jul 29; 311(7000):299-302 [7633241]; BJOG. 2011 Mar; 118 Suppl 1:1-203 [21356004]; Emerg Nurse. 2003 Sep; 11(5):19-21 [14533295]

Correspondence author:

Kenyon, Sara

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Last updated:	2024-02-09

Maternity triage: a guide for trainees

Agass, Ria¹; Patel, DrSamiksha¹ ST6 in Obstetrics and Gynaecology, Department of Obstetrics and Gynaecology, St Mary's Hospital, Manchester

[ProQuest document link](#)

ABSTRACT (ENGLISH)

Maternity triage typically sees women between 16-20 weeks of gestation onwards. A telephone triage system normally operates as a screening tool to help select those women who need further detailed assessment. Maternity triage has developed since the 1980s to become an emerging specialty within obstetric and midwifery care (Angelini, 2014). This article covers pain, reduced movements, vaginal bleeding and sepsis, and also discusses women in vulnerable situations and how they may be recognized. It looks at how to triage these complaints and considers potential differential diagnoses. References

LINKS

[Linking Service](#)

DETAILS

Subject:	Pregnancy : Complications; Pain and Pain Management; Bacterial Infections; Blood and Blood Disorders; Diagnosis; Maternity Services; Accident and Emergency Services; Emergency medical care; Hematology; Medical diagnosis; Health services; Pregnancy; Pain; Pain management; Pregnancy complications
Publication title:	British Journal of Hospital Medicine
Volume:	77
Issue:	12
Pages:	C186-C189
Publication year:	2016
ISSN:	0007-1064

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Publisher location:	United Kingdom
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Language:	English
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Document URL:	https://www.proquest.com/scholarly-journals/maternity-triage-guide-trainees/docview/1856871194/se-2?accountid=48232
First available:	2017-01-10
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Database:	British Nursing Index

Improving Quality of Services in Maternity Care Triage System

Santos, Manuel¹; Portela, Filipe²; Abelha, António³; Machado, José³; Pereira, Eliana⁴; Brandão, Andreia⁴; Braga, Jorge⁵ ¹Departamento de Sistemas de Informação, University of Minho, Guimarães, Portugal ²Algoritmi Centre, University of Minho, Guimarães, Portugal ³CCT, University of Minho, Braga, Portugal ⁴University of Minho, Braga, Portugal ⁵Centro Hospitalar do Porto, Porto, Portugal

[ProQuest document link](https://www.proquest.com/scholarly-journals/maternity-triage-guide-trainees/docview/1856871194/se-2?accountid=48232)

ABSTRACT (ENGLISH)

The main objectives in triage are to improve the quality of care and reduce the risks associated to the waiting time in emergency care. Thus, an efficient triage is a good way to avoid some future problems and how much quicker it is, more the patient can benefit. The most common triage system is the Manchester Triage System that is a reliable system focused in the emergency department of a hospital. However, its use is more suitable for more widespread medical emergencies and not for specialized cases, like Gynecological and Obstetrics emergencies. To overcome these limitations, an alternative pre-triage system, integrated into an intelligent decision support system, was developed in order to better characterize the patient and correctly defined her as

9. Evidence Search on Maternity Triage

urgent or not. This system allows the increase of patient's safety, especially women who need immediate care. This paper includes the workflow that describes the decision process in real time in the emergency department, when women are submitted to triage and identify points of evolution.

LINKS

[Linking Service](#)

DETAILS

Subject:	Emergency medical care; Decision support systems; Emergency medical services; Workflow
Identifier / keyword:	Intelligent decision support system; Decision support system; Midwifery; Mother; Triage
Publication title:	International Journal of E-Health and Medical Communications; Hershey
Volume:	6
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Publisher:	IGI Global
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2024-08-27

Database:

Health Research Premium Collection

PA.47 A Novel System of Maternity Triage in the Obstetric Assessment Unit

Perry, H; Lindley, CM; Northover, E; Connor, JI; Parasuraman, R

[ProQuest document link](#)

ABSTRACT

Background

The number of women attending the obstetric assessment unit (OAU) for unscheduled antenatal care is unpredictable often with long delays in initiating treatment in these high risk women.

Aims

To design and pilot a triage system to prioritise patient care and aid patient flow through a busy OAU thereby creating a system by which the most urgent cases receive timely care aiming to reduce poor outcomes due to delays in treatment. The aim is to perform a basic assessment within 15 min 15 minutes of arrival,

Methods

A robust clinical assessment was carried out for each woman on arrival by a senior midwife using a triage assessment sheet. The women were then triaged according to clinical need based on a 'Traffic light system'

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devised locally based on Emergency Department protocols.

Results

There were 38 women seen in the period of the pilot. The majority of women (58%) were in the 'amber' category with 5% in the 'red'. 55% of women were triaged within 15 and 79% within 30 min. Women were classified correctly in 90% of cases. 66% of women were self-referrals, 18% from community midwives and 5.3% from GPs.

Discussion

The triage system will ensure that women are given advice, care or transferred to the clinical area that is most suitable to their individual needs. The pilot study has identified delays still occurring in the initial assessment and on-going work will aim to identify and address the cause of these delays.

LINKS

[Linking Service](#)

FULL TEXT

TVM:UNDEFINED

DETAILS

Subject:	Social
Identifier / keyword:	Prenatal care; Delay; Mother; Triage
Publication title:	Archives of Disease in Childhood. Fetal and Neonatal Edition; London
Volume:	99
Supplement:	1
Source details:	Perinatal Medicine 2014 9-11 June 2014 Harrogate
First page:	A31
Publication year:	2014
Publication date:	Jun 2014
Publisher:	BMJ Publishing Group LTD
Place of publication:	London

9. Evidence Search on Maternity Triage

Country of publication:

United Kingdom, London

Publication subject:

Medical Sciences--Pediatrics

ISSN:

13592998

e-ISSN:

14682052

Source type:

Scholarly Journal

Language of publication:

English

Document type:

Journal Article

DOI:

<https://doi.org/10.1136/archdischild-2014-306576.89>

ProQuest document ID:

1780451111

Document URL:

<https://www.proquest.com/scholarly-journals/pa-47-novel-system-maternity-triage-obstetric/docview/178045111/se-2?accountid=48232>

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Last updated:

2024-10-05

Database:

Health Research Premium Collection

Call the midwife: an audit of a telephone triage service

Clarke, Paula¹; Bowcock, Malcolm; Walsh, Michelle; Johnson, Vanessa¹ Consultant midwife, Birmingham Women's NHS Foundation Trust

[ProQuest document link](#)

ABSTRACT (ENGLISH)

Audit of the maternity telephone triage service at Birmingham Women's NHS Foundation Trust. Audit results and findings in respect of the number and reasons for calls, call documentation, and the clinical content and presentation quality of telephone conversations, are summarised. The action being taken to resolve the

9. Evidence Search on Maternity Triage

problems highlighted, including the strengthening of guidelines and improved staff training, is discussed. 19 references

LINKS

[Linking Service](#)

DETAILS

Subject:	Telephone Use; Maternity Services; Staff : Attitudes; Professional Development; Midwifery; Health services; Pregnancy; Employee attitude; Telemedicine
Location:	United Kingdom--UK
Publication title:	Essentially MIDIRS
Volume:	3
Issue:	10
Pages:	17-23
Publication year:	2012
ISSN:	2044-0308
Publisher:	MIDIRS
Publisher location:	United Kingdom
Source type:	Scholarly Journal
Language:	English
Document type:	Article
Accession number:	1152092
ProQuest document ID:	1399047583
Document URL:	https://www.proquest.com/scholarly-journals/call-midwife-audit-telephone-triage-service/docview/1399047583/se-2?accountid=48232

9. Evidence Search on Maternity Triage

First available:

2013-07-10

Updates:

2013-07-10; 2016-03-10; 2017-10-26

Database:

British Nursing Index

An audit of the maternity triage service at Birmingham Women's NHS Foundation Trust

Clarke, P; Bowcock, M; Walsh, M; Jeffrey, J

[ProQuest document link](#)

ABSTRACT

Birmingham Women's NHS Foundation Trust established a triage service in 2004 in response to the large numbers of women who presented for an assessment. These assessments were not always labour related and interrupted the 1:1 care being provided by midwives. Although Triage was later perceived as successful because interruptions in labour were reduced, the separate department had a number of problems which emerged. The problems include: telephone triage, clinical decision-making, the woman's experience, staff experience and documentation.

The authors applied the clinical audit process to the Triage function. This gave us the opportunity to develop a rich vision of what good practice would constitute, including evidence based clinical practice, women's and staff views, structured telephone calls and targets from Accident & Emergency triage. In order to pave the way for improvement, the authors also considered what service the authors thought the authors were currently providing. The authors observed and measured actual practice, including quantitative measures of activity and qualitative exploration of the experience of the women and staff. This exploration also included listening to 100 clinical conversations between staff and women in order to assess the clinical content of the advice given as well as the quality of the call.

From this wide range of information, the authors derived a set of recommendations which are intended to answer the crucial audit question: 'How can the authors consistently do what the authors should be doing?' The authors tabulated the recommendations in a form which makes clear the relationship between good practice to which the authors aspire and what the authors do now.

LINKS

[Linking Service](#)

FULL TEXT

TVM:UNDEFINED

DETAILS

9. Evidence Search on Maternity Triage

Subject:	Social
Identifier / keyword:	Quality management; Women's health; Workforce; Midwife; Audit; Mother
Publication title:	Archives of Disease in Childhood. Fetal and Neonatal Edition; London
Volume:	95
Supplement:	1
Source details:	British Maternal and Fetal Medicine Society 14th Annual
First page:	Fa64
Publication year:	2010
Publication date:	Jun 2010
Publisher:	BMJ Publishing Group LTD
Place of publication:	London
Country of publication:	United Kingdom, London
Publication subject:	Medical Sciences--Pediatrics
ISSN:	13592998
e-ISSN:	14682052
Source type:	Scholarly Journal
Language of publication:	English
Document type:	Journal Article
DOI:	https://doi.org/10.1136/adc.2010.189605.7
ProQuest document ID:	1780441501

9. Evidence Search on Maternity Triage

Document URL:

<https://www.proquest.com/scholarly-journals/audit-maternity-triage-service-at-birmingham/docview/1780441501/se-2?accountid=48232>

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Last updated:

2024-10-05

Database:

Health Research Premium Collection

Improving practice: women's views of a maternity triage service.

Molloy, C; Mitchell, T

[ProQuest document link](#)

ABSTRACT (ENGLISH)

Research evaluating a maternity service from the perspective of service users in order to identify areas of good practice and those requiring improvement. Findings related to access and waiting times, staff-patient relationships, care environment and quality, information, communication and choice are reported. [(BNI unique abstract)] 41 references

LINKS

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DETAILS

Subject:

Maternity Services; Patients : Attitudes and Perceptions; Midwife Patient Relations; Patients : Education; Pregnancy; Childbirth & labor; Health services; Midwife patient relationships; Patient satisfaction; Patient education

Publication title:

British Journal of Midwifery

Volume:

18

9. Evidence Search on Maternity Triage

Issue:	3
Pages:	185-191
Publication year:	2010
ISSN:	0969-4900
Publisher:	Mark Allen Publishing Ltd.
Publisher location:	United Kingdom
Source type:	Scholarly Journal
Peer reviewed:	Yes
Language:	English
Document type:	Article
Publication note:	BNI, Vol. 14 No. 2, February 2010
Accession number:	167118
ProQuest document ID:	764405545
Document URL:	https://www.proquest.com/scholarly-journals/improving-practice-womens-views-maternity-triage/docview/764405545/se-2?accountid=48232
First available:	2010-11-15
Updates:	2017-10-26
Database:	British Nursing Index

Clinical review: Considerations for the triage of maternity care during an influenza pandemic--one institution's approach.

Beigi, Richard H; Hodges, Jeff; Baldisseri, Marie; English, Dennis

[ProQuest document link](https://www.proquest.com/scholarly-journals/improving-practice-womens-views-maternity-triage/docview/764405545/se-2?accountid=48232)

9. Evidence Search on Maternity Triage

ABSTRACT

The ongoing pandemic of 2009 H1N1 swine-origin influenza A has heightened the world's attention to the reality of influenza pandemics and their unpredictable nature. Currently, the 2009 H1N1 influenza strain appears to cause mild clinical disease for the majority of those infected. However, the risk of severe disease from this strain or other future strains remains an ongoing concern and is noted in specific patient populations. Pregnant women represent a unique patient population that historically has been disproportionately affected by both seasonal and pandemic influenza outbreaks. Data thus far suggest that the current 2009 H1N1 outbreak is following this same epidemiologic tendency among pregnant women. The increased predilection to worse clinical outcomes among pregnant women has potential to produce an acute demand for critical care resources that may overwhelm supply in facilities providing maternity care. The ability of healthcare systems to optimize maternal-child health outcomes during an influenza pandemic or other biologic disaster may therefore depend on the equitable allocation of these limited resources. Triage algorithms for resource allocation have been delineated in the general medical population. However, no current guidance considers the unique aspects of pregnant women and their unborn fetuses. An approach is suggested that may help guide facilities faced with these challenges.

LINKS

[Linking Service](#)

DETAILS

Identifier / keyword:	Influenza pandemic; Pandemic; Midwifery; Influenza; Pregnancy; Mother; Triage
Corporate/institutional author:	Magee-Womens Hospital Ethics Committee
Publication title:	Critical Care [NLM - MEDLINE]
Volume:	14
Issue:	3
Pages:	225
Number of pages:	0
Publication year:	2010
Publication date:	2010
Publisher:	National Library of Medicine - MEDLINE Abstracts

9. Evidence Search on Maternity Triage

Publication subject:	Medical Sciences
ISSN:	13648535
e-ISSN:	1466609X
Source type:	Scholarly Journal
Language of publication:	English
Document type:	PERIODICAL
Accession number:	20587086
ProQuest document ID:	740219946
Document URL:	https://www.proquest.com/scholarly-journals/clinical-review-considerations-triage-maternity/docview/740219946/se-2?accountid=48232
Copyright:	Copyright National Library of Medicine - MEDLINE Abstracts 2010
Last updated:	2023-11-22
Database:	Health Research Premium Collection

Managing demand: telephone triage in acute maternity services.

Cherry, A; Friel, R; Dowden, B

[ProQuest document link](https://www.proquest.com/scholarly-journals/clinical-review-considerations-triage-maternity/docview/740219946/se-2?accountid=48232)

ABSTRACT (ENGLISH)

Overview of the development of a telephone triage service within an acute maternity setting at the Royal Glamorgan Hospital. Evidence for change, strategies for implementing change, the initiation of the practice development midwife role and outcomes for patients are outlined. [(BNI unique abstract)] 22 references

LINKS

[Linking Service](#)

9. Evidence Search on Maternity Triage

DETAILS

Subject:	Maternity Services; Telephone Use; Patient Assessment; Midwifery : Role; Pregnancy; Childbirth &labor; Health services; Midwifery; Telemedicine
Publication title:	British Journal of Midwifery
Volume:	17
Issue:	8
Pages:	496-500
Publication year:	2009
ISSN:	0969-4900
Publisher:	Mark Allen Publishing Ltd.
Publisher location:	United Kingdom
Source type:	Scholarly Journal
Peer reviewed:	Yes
Language:	English
Document type:	Article
Publicationnote:	BNI, Vol. 13 No. 8, August 2009
Accession number:	160749
ProQuest document ID:	764391838
Document URL:	https://www.proquest.com/scholarly-journals/managing-demand-telephone-triage-acute-maternity/docview/764391838/se-2?accountid=48232
First available:	2010-11-15
Updates:	2017-10-26

Telephone triage in maternity care.

Kennedy, S

[ProQuest document link](#)

ABSTRACT (ENGLISH)

Implementation and audit of a new telephone triage in maternity care policy at Forth Valley, Scotland. The reasons for implementing telephone-based triage are explained, together with results of the audit concerning the reasons for the calls received and their outcomes. [(BNI unique abstract)] 14 references

LINKS

[Linking Service](#)

DETAILS

Subject:	Midwifery; Maternity Services; Patient Assessment; Pregnancy; Childbirth &labor; Health services
Location:	Scotland, United Kingdom--UK
Publication title:	Midwives
Volume:	10
Issue:	10
Pages:	478-480
Publication date:	Nov-Dec 2007
Publication year:	2007
ISSN:	1479-2915
Publisher:	Ten Alps Publishing

9. Evidence Search on Maternity Triage

Publisher location:	United Kingdom
Source type:	Scholarly Journal
Language:	English
Document type:	Article
Publication note:	BNI, Vol. 12 No. 3, March 2008
Accession number:	143601
ProQuest document ID:	764353263
Document URL:	https://www.proquest.com/scholarly-journals/telephone-triage-maternity-care/docview/764353263/se-2?accountid=48232
First available:	2010-11-15
Updates:	2012-08-10; 2012-09-10; 2017-10-26
Database:	British Nursing Index

Delivery suite assessment unit: auditioning innovation in maternity triage.

Nolan, S; Morga, J; Pickles, J

[ProQuest document link](https://www.proquest.com/scholarly-journals/telephone-triage-maternity-care/docview/764353263/se-2?accountid=48232)

ABSTRACT (ENGLISH)

Research evaluating the delivery suite assessment unit (DSAU) established at Bradford Royal Infirmary, which aims to reduce antenatal admissions to delivery suite and provide a better environment for women attending for antenatal or labour assessment. The unit's 1st 12-month audit results were presented, and increases in discharges to clients' homes and client satisfaction and confidence were discussed. [(BNI unique abstract)] 23 references

LINKS

[Linking Service](#)

9. Evidence Search on Maternity Triage

DETAILS

Subject:	Consumer Satisfaction; Maternity Services; Patient Assessment; Labour; Patient satisfaction; Childbirth & labor; Pregnancy; Health services
Publication title:	British Journal of Midwifery
Volume:	15
Issue:	8
Pages:	506-510
Publication year:	2007
ISSN:	0969-4900
Publisher:	Mark Allen Publishing Ltd.
Publisher location:	United Kingdom
Source type:	Scholarly Journal
Peer reviewed:	Yes
Language:	English
Document type:	Article
Publication note:	BNI, Vol. 11 No. 8, August 2007
Accession number:	135822
ProQuest document ID:	764327999
Document URL:	https://www.proquest.com/scholarly-journals/delivery-suite-assessment-unit-auditioning/docview/764327999/se-2?accountid=48232
First available:	2010-11-15
Updates:	2017-10-26

9. Evidence Search on Maternity Triage

Database:

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