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Review Article

Efficacy of Ultrasound for Sonologists, Sonographers and Nurses to assess high-risk conditions at Labor Triage in Pakistan

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ABSTRACT

Healthcare problems that impede the effective delivery of health services, resulting in unequal access to care and suboptimal health outcomes, plague many countries. The absence of an expert medical personnel and diagnostic facilities are main causes of these problems. The worldwide ultrasound industry is still mainly unregulated, and national training policies and regulations that guarantee a minimal level of proficiency for safe practice differ. Requirements for reform and control of ultrasound usage have arisen since health professionals in many countries may perform ultrasounds with little to no training and without official certification. For this literature review, data from numerous search engines were obtained. The data for this study came from PubMed, Science Direct, NCBI, Medline, Medscape, and Google Scholar. It is a highly plausible alternative to teach nurses to do routine targeted obstetric scanning for the detection of high-risk pregnancies in order to make up for the lack of sonographers and sonologists in low-income countries. Therefore, sonologists are more effective than nurses in using ultrasonography to evaluate high-risk problems during labor triage.

INTRODUCTION

Healthcare problems that impede the effective delivery of health services, resulting in unequal access to care and suboptimal health outcomes, plague many countries. The absence of an expert medical personnel and diagnostic facilities are main causes of these problems [1]. According to the WHO, worldwide offering ultrasound training should implement a uniform curriculum and competency evaluation. The worldwide ultrasound industry is still mainly unregulated, and national training policies and regulations that guarantee a minimal level of proficiency for safe practice differ. Requirements for reform and control of ultrasound usage have arisen since health professionals in many countries may perform ultrasounds with little to no training and without official certification. One potential risk factor for misdiagnosis in ultrasound is the use of unskilled clinicians [2]. A further issue facing developing countries is the severe lack of sonographers and physicians with ultrasound training. Ironically, there is a severe lack of educated nurses and midwives even in metropolitan areas due to the magnitude of this shortfall. Teaching nurses to use point-of-care ultrasonography to identify pregnant women at high risk so they may be sent to regional hospitals for additional treatment is a creative idea. This setup would resemble Pakistan's triage service, which determines which patients need additional medical attention [3]. This research assessed a new training

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program that teaches basic obstetric ultrasonography to healthcare professionals who are not familiar with ultrasound technology. The program uses the length of the fetal femur to estimate gestational age. We investigated nurses' proficiency in conducting and interpreting ultrasonography exams. We investigated post-course improvements in their knowledge and confidence as well as the accuracy of their fetal measures in comparison to more seasoned practitioners [4]. In order to enhance patient care and reduce mistake rates, nurse handoffs must be standardized [5]. The Maternal-Fetal Triage Index primarily uses labor and delivery triage instruments; however, it is uncertain if this makes it easier to promptly assess pregnant women with high levels of acuity [6]. Without going against health regulations, we must give the patient's final destination and a timeline for doing so [7]. Trainees showed considerable improvements on all metrics. This comparatively low completion rate illustrates how difficult it is to build ultrasonic capability in such an environment. To find out how well trainees retain ultrasonography skills over time and how the curriculum affects clinical practice and patient outcomes, more research is required [8].

METHODS

For this literature review, data from numerous search engines were obtained. The data for this study came from PubMed, Science Direct, NCBI, Medline, Medscape, and Google Scholar. The phrases ultrasound and triage labor were used as publication search criteria. Following unbiased database searches, only studies demonstrating the usefulness of ultrasonography for sonologists and nurses in assessing high-risk situations during labor triage in Pakistan were included. The quality and usefulness of the research were both assessed. Data were extracted from all journal papers. Ethical approval was obtained from The University of Lahore, IRB No. REC-UoI-/132-12/202 and date of Issue was 07-12-2023.

RESULTS

Only 20 papers were utilized to collect data on the usefulness of ultrasonography for sonologists and nurses to assess high-risk situations at labor triage in Pakistan. The current study looked at the effectiveness of ultrasonography in sinologists and nurses (Table 1 and Figure 1).

Table 1: Summary Of included studies

Study Name	Country	Objective	Findings
[1]. Abrokwa *et al.*, 2022	Germany	To determining the advantages and difficulties of task shifting for primary healthcare in nations with low and intermediate incomes.	Task shifting for point-of-care ultrasonography in primary healthcare shows that it has an influence and leads to significant health outcomes when diagnoses are delegated to doctors at lower-level institutions.
[2]. Bidner *et al.*, 2022	Australia	To assess training in prenatal point-of-care ultrasound.	It brought to light the lack of similar high-quality studies that are required to strengthen the evidence foundation for training in prenatal point-of-care ultrasound and the necessity of standardizing competence evaluation procedures.
[3]. Vinayak et al., 2017	Kenya	To evaluate several procedures, such as the precision of the pictures and reports produced by nurses, the operation of an ultrasound scanner the size of a tablet, and the education of nurses in doing ultrasounds.	It is quite possible to address the lack of sonologists and sonographers in low-income nations by teaching nurses to perform routine targeted obstetric scanning for the purpose of identifying high-risk pregnancies.
[4]. Viner *et al.*, 2022	United Kingdom	To assess a new, context-specific education program designed to educate nurses the fundamentals of obstetric ultrasonography, including measuring the length of the fetal femur to determine gestational age.	It shows that following ten days of training, ultrasound-naive practitioners can be trained to confidently and professionally execute basic obstetric ultrasound dating scans. It also shows that local teams can be successfully trained to administer the program online.
[5]. O'Rourke et al., 2018	Pennsylvania	To raise staff satisfaction with the uniformity of the patient admission procedure from obstetric triage to the labor and delivery unit.	Staff perceptions of the quality of women's admission from obstetric triage to the labor and delivery unit were enhanced by the revised patient admission procedure, which included a safety time-out board and huddle.
[6]. Kodama *et al.*, 2021	Washington DC	To compare the length of a labor and delivery triage assessment conducted before to and during the Maternal-Fetal Triage Index's introduction.	The Maternal-Fetal Triage Index women who were deemed higher priority underwent a shortened triage review during labor and delivery.

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[7]. Caliendo *et al.*, 2004	Pittsburgh	To evaluate whether patients get active labor or emergency treatment in accordance with EMTALA requirements.	Being aware of EMTALA concerns pertaining to obstetric care is a crucial aspect of a nurse's professional duty. Adherence to EMTALA laws confers an extra degree of excellence to the emergency nursing of the pregnant family.
[8]. Hall *et al.*, 2021	USA	To evaluate a program that trains medical professionals in obstetrics point-of-care ultrasonography.	Following the training program, trainees showed considerable improvements on all metrics. This comparatively low completion rate illustrates how difficult it is to build ultrasonic capability in such an environment.
[9].Sepulveda *et al.*, 2013	Chile	To evaluate fetal anomalies in the second trimester of pregnancy by a sonologist and skilled nurse.	When typical ultrasound findings are confirmed, expectant parents can feel reassured, but if any anomalies are found, more research should be conducted.
[10]. Ansari *et al.*, 2020	Pakistan	To assess the improvement in obstetric patient care using a triage acuity instrument designed specifically for obstetrics.	MFTI's obstetric triage method considers the urgency and symptoms at the time of presentation. The application of a methodical and well-designed triage strategy results in better patient care.
[11]. Elmashad *et al.*, 2020	Egypt	To look into how simulation obstetric triage training affects nurses' skills and understanding.	Following the deployment of the simulated obstetric triage training, the nurses' knowledge and practice ratings showed a significant improvement over previously. Demonstrating that obstetric simulation training was a useful method for enhancing the skills and knowledge of obstetric nurses in relation to obstetric triage.
[12]. Bijani *et al.*, 2018	Irán	To determine the perception of professional capacity among Iranian triage nurses.	There are many different aspects of triage nurses' professional capacity that have been discovered. As per the findings, a nurse has to have clinical competence together with psychological abilities and professional dedication to be eligible for employment in triage.
[13]. Angelini *et al.*, 2014	Providence	To review the literature during a 15-year period on the application of triage ideas in obstetrics.	From this systematic research, we discovered and defined best practices for obstetric triage units. Both can be utilized to direct obstetric triage research and practice in the future.
[14]. Delnavaz *et al.*, 2018	Iran	To assess how nursing students' knowledge and skills are affected when emergency severity index triage is taught through role-playing and lectures.	For the purpose of teaching skills relevant to the practice of nursing, such as triage education, interactive teaching techniques like role-playing might be beneficial.
[15].Mohammed Mostafa *et al.*, 2023	Egypt	To evaluate the impact of triage training on the performance of obstetric nurses.	Nurses must participate in ongoing education programs to be up to date on the latest developments in obstetric triage knowledge and practice.
[16]. Butler *et al.*, 2023	New Zealand	To find out if continuing education in triage improves knowledge, accuracy, or behavior.	Interventions in triage education can increase knowledge, accuracy, and behavior; however, it is unclear if these gains will last.
[17]. McGregor *et al.*, 2009	Australia	To ascertain what sonographers believe to be the most crucial concerns related to role extension and whether they wish to expand their professional function.	Sonographers who answered the poll in the majority said they supported the growth of sonographer practitioners.
[18]. Qazi *et al.*, 2023	Pakistan	To evaluate the accuracy and predictive validity of ultrasound measurements in monitoring the growth and development of the fetus during pregnancy.	Precisely estimating the fetal weight is important in obstetrics since it impacts the course and outcome of labor and delivery.
[19]. Thomas *et al.*, 2020	Australia	To investigate how sonographers feel about sharing unfavorable results with patients, as well as how much autonomy they have in doing so and how it affects their sense of self as professionals.	Within a collaborative model of care, the sonography profession requires autonomy and a strong sense of professional identity free from hierarchical obstacles.

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[20]. Ramsay *et al.*, 1999	Australia	To investigates the function of the sonologist in three sonographer-driven gynecological and obstetric ultrasonography practices.	The sonologist in a practice where sonographers are the primary providers is frequently expected to do more than just write reports. Consequently, having a sonologist on site would be necessary for the best patient care.

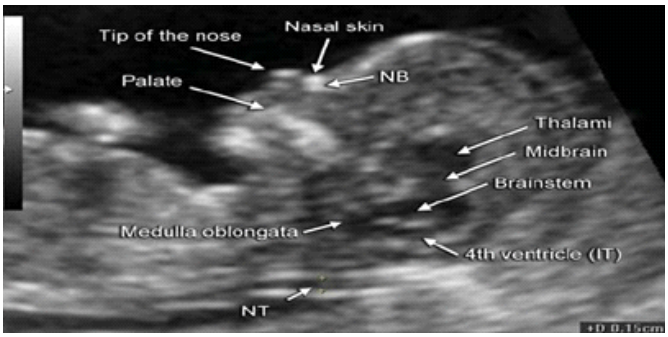

Figure 1: The fetal brain, face, and neck as shown by a two-dimensional ultrasound during the first trimester [9]

DISCUSSION

The validity of the maternal fetal triage index has been demonstrated, making it a high-quality acuity tool for improving patient care. Hospital emergency departments use triage as a risk management strategy because it is a clinical evaluation that separates patients for prompt diagnosis and treatment [10]. Obstetric triage is the process of taking a pregnant patient who is seeking medical attention and systematically assessing mother and unborn child to identify which medical needs should be attended to first in order to maintain the mother's and the unborn child's stable physical condition. Given that a pregnant woman's requirements may be pregnancy-related or not, obstetric triage can be handled by an obstetric nurse in a labor and delivery room or in a different emergency department. Obstetric triage has several demonstrated benefits, including bettering treatment given, lowering the possibility of mistake, performing standardized assessment, and obtaining appropriate management in accordance with a comprehensive process of planning and evaluation [11]. The importance of triage nurses in helping patients in urgent situations who require immediate treatment to be prioritized makes it imperative to research and find strategies for improving these nurses' professional competence. Triage errors, which can result from inadequately skilled triage nurses, can lead to a number of issues, including prolonged patient stays, postponed patient transfers to other hospital departments, overcrowding in the emergency room, lower-than-expected care quality, and additional complications that worsen patients' conditions and occasionally result in permanent harm or even death [12]. In the past 15 years, obstetric triage has undoubtedly emerged as one of the most important advancements in perinatal care [13]. Numerous research have looked at nurses' triage knowledge, and some of the findings indicate that nurses' triage knowledge is lacking. Another concern made was that emergency department nurses are not given enough training in the triage section. According to another study conducted in Iran, nurses were not well trained and lacked the necessary expertise on triage [14]. In Pakistan, the Obstetric Triage Education course is a crucial part of the orientation program for triage unit nurses and is the first course that covers the nursing care of pregnant patients [15]. Triage accuracy is the percentage of patients who are accurately assigned based on the severity of their illness, as agreed upon by a triage expert and a triage clinician. The degree of factual information needed by nurses to carry out their triage duties is referred to as triage knowledge, and the actions a triage nurse does to support the triaging process are known as triage behavior [16]. The duty of the sonographer is expanded to include reporting on ultrasound exams as part of the development of ultrasound practitioners. Professional recognition in the context of sonographer practitioner growth include both the profession's acknowledgement and the person. Thus, in this context, "professional recognition" refers to sonographers' desire for acknowledgment as independent health professionals who are particularly engaged in the creation and interpretation of ultrasound tests, as well as recognition of the profession in its entirety [17]. Because ultrasonography can provide precise images of the fetus, it is widely used in obstetrics. Ultrasonography screening during pregnancy primarily attempts to lower the risk of obstetric issues by early detection of abnormalities such as intrauterine growth limitations and macrosomia [18]. Because their communication is restricted during the ultrasound examination, sonographers have an elevated emotional workload as they attempt to offer patient-centered care [19]. It goes without saying that sonographers may be forced to diagnose patients or divulge information to them in ways that are outside the scope of their training and licensure if sonologists are unavailable. This is why some authors advocate for sonographers to have more responsibilities, but they also recommend that "the medical supervision of some obstetric units should be improved [20].

CONCLUSIONS

It is a highly plausible alternative to teach nurses to do routine targeted obstetric scanning for the detection of high-risk pregnancies in order to make up for the lack of sonographers and sonologists in low-income countries. It is possible to train seasoned midwives to do obstetric ultrasound examinations with confidence and reassure

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patients with healthy newborns by using ultrasonography. In distant healthcare facilities in middle- to low-income countries, nurses can benefit greatly from collaborating with radiologists as a team. However, a sinologist's diagnostic conclusions are far more accurate than a sono-nurse's. Therefore, sonologists are more effective than nurses in using ultrasonography to evaluate high-risk problems during labor triage.

Authors Contribution

Conceptualization: MS
Writing-review and editing: MS, RA, RR. MAR, MAA, AA
All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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