

## Effects of Educational Program on Maternity Nurses' Knowledge and Practice Regarding Obstetric Triage

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### Abstract

**Background:** The triage nurse is typically the first person a patient encounters when seeking care in the obstetric department. Nurses' knowledge about triage is a key in triage decision-making. **Aim:** identify the effect of educational program on maternity nurses' knowledge and practice regarding Maternal Fetal Triage Index (MFTI) as an obstetric triage scale. **Methods:** This study employed a quasi-experimental research design. The Minia University Hospital for Obstetrics and Pediatrics (MUHOP) hosted the experiment. About 70 maternity nurses were part of the convenient sample. Two tools were used: a structured interview questionnaire with two components (personal data and knowledge evaluation sheet) and an observational checklist for practices sheet. An educational program was implemented for maternity nurses about obstetric triage. **Results:** About 54.3% of studied nurses have age group from 25-35 years, 32.9% work at labor ward, and 64.3% of them obtain their knowledge from nurses' work. There is a highly statistically significant difference between pre & post-test regarding total knowledge and practices of studied maternity nurses regarding obstetric triage p-value 0.001 for both. **Conclusion:** The knowledge of maternity nurses about obstetric triage improved between the pretest and post-test as evidenced by the pretest and posttest knowledge scores. **Recommendations:** provide a continuous education and training program to maternity nurses' on obstetric triage.

**Keywords:** Educational program, maternity nurse, knowledge, practices, obstetric triage

### Introduction:

The triage approach is a straightforward yet well-planned process in which patients are divided into subgroups based on the seriousness of their presenting condition. By giving patients with urgent cases priority over those with less urgent illnesses, this strategy seeks to maximize benefits. The purpose and function of triage are to first identify the patients with life-threatening and emergency conditions who cannot wait to be seen and initiate appropriate interventions (Moirangthem, 2019).

Obstetric triage is "the quick, complete, and systematic maternal and fetal assessment performed when a pregnant woman presents to

care to establish priority for a full evaluation," according to the Association of Women's Health, Obstetric, and Neonatal Nurses (AWHONN) (Long, 2021).

Numerous advantages of obstetric triage include bettering the treatment given, lowering the risk of error, performing standardized assessment, and obtaining appropriate management in accordance with a comprehensive planning and evaluation procedure (Goodman et al., 2018). Additionally, when correctly executed, obstetric triage can shorten hospital stays and lower the cost of unneeded procedures. Also, it enhances care plan documentation from 51% to 96% (Elmashad et al., 2020).

**Smithson et al. (2013)** created the obstetric triage scale, which **Gratton et al.** later improved (2016). The Canadian Triage Acuity Scale (CTAS) has five levels: critical, emergency, urgent, semi-urgent, and non-urgent. The Obstetric Triage Acuity Scale (OTAS) is based on the CTAS. The OTAS system also makes it easier to evaluate how acuity and flow are distributed and how care is provided. The acuity is color coded on this scale. This scale takes into account the beginning of labor, fetal membrane rupture, hemorrhage, hypertension, and fetal assessment. This tool addresses serious complaints of pain, stomach problems, infection symptoms, drug usage, and psychological issues. In its ultimate form, the tool will also cover cervical dilation, critical pregnancy-specific parameters, respiratory distress, fetal welfare, hemodynamic stability (screening for shock symptoms, compromise, and aberrant vital signs), and respiratory distress (**Fakari et al., 2019**)

For pregnant women who seek emergency or unscheduled care, the Association of Women's Health, Obstetric, and Neonatal Nurses has created a tool for an enhanced, standardized approach to triage. Designed for best practices, the Maternal Fetal Triage Index (MFTI) provides detailed descriptions of the signs and symptoms that women may experience during their pregnancy. The mother and/or fetus are given one of five acuity ratings based on these symptoms by the nurses. Obstetric triage needs to be standardized across all clinical settings in the country. The Maternal Fetal Triage Index represents a significant advancement in American nurses' triage practices (**Abd-El-Razik & Gamal, 2018**).

Obstetric triage should be used at obstetric units for pregnant women using the MFTI, according to recommendations made by (**ACOG, 2018**). A powerful instrument that offers a standardized method for obstetric triage is MFTI. The MFTI is a five-level obstetric acuity instrument that nurses can use to rank the urgency of a woman's need for provider evaluation when she presents for care at a delivery unit. There are five tiers: For example, in the event of an antepartum hemorrhage, "1 stat" calls for immediate life-saving assistance

for the mother or her fetus; "2 urgent" refers to extreme pain that is unrelated to labor or the presence of a high-risk clinical condition; "3 prompt" includes pregnant women at or over 34 weeks of gestation in active phase labor; "4 non-urgent" includes pregnant women at term gestation in early labor; and "5 scheduled" or requested includes pregnant women presenting for scheduled procedures or routine prenatal care (**Elmashad et al., 2020**)

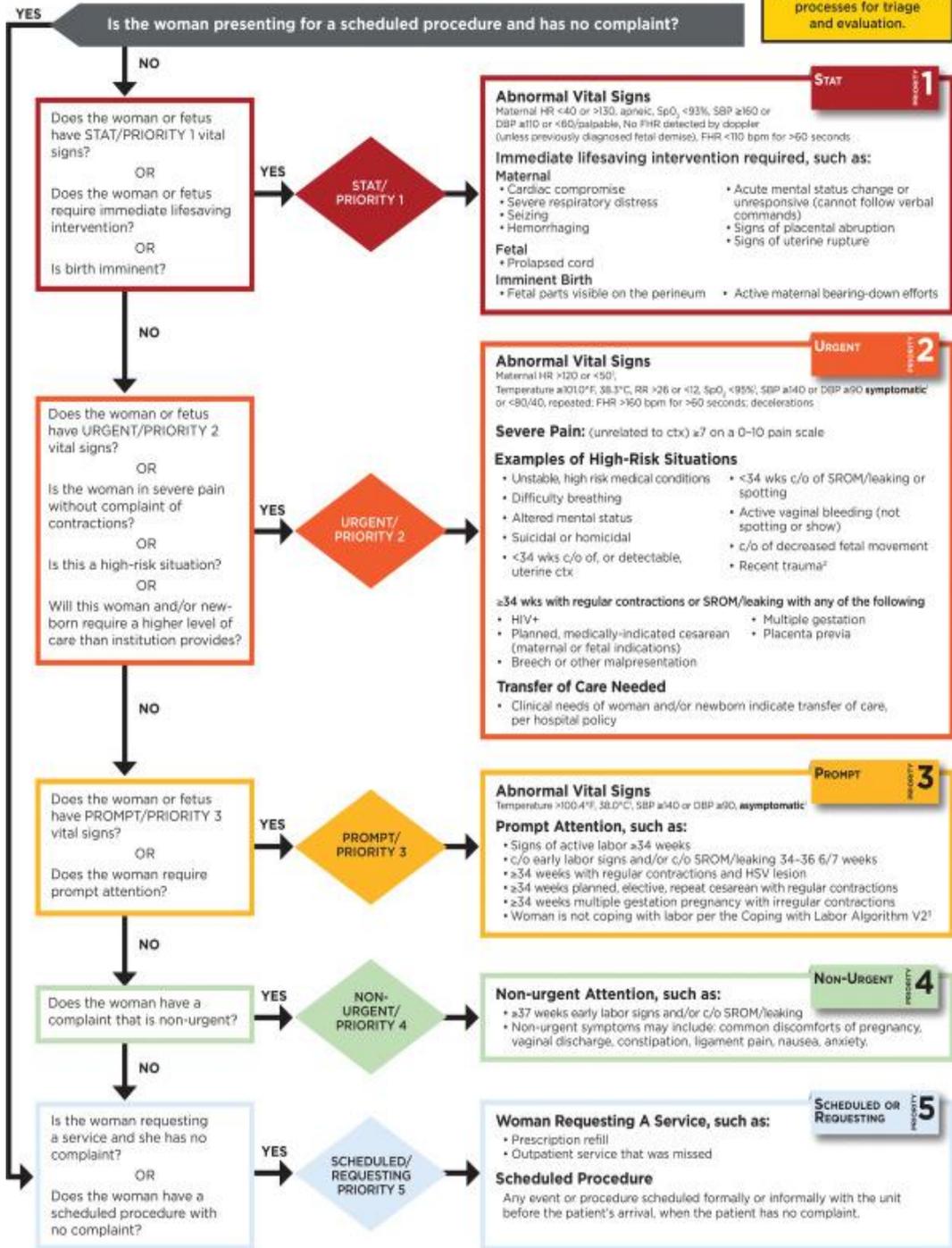
The role of the health care providers (HCPs) especially nurses have an important role in applying the triage system and providing care for patients with mild colds to extreme complaints. This role requires the triage nurse to make quick decisions about the priority admittance as a means of deciding the order in which patients will receive treatment (**Hesham et al., 2022**).

Triage training becomes mandatory for all nurses working in the emergency department. As a result, educating emergency nurses appropriately about triage and keeping knowledgeable and experienced nurses for triage will save many lives, prevent disabilities, and reduce complications in addition to lowering healthcare expenses. Therefore, proper triage training can increase triage nurses' effectiveness and confidence, enabling them to act more competently (**Faheim et al., 2019**).



# Maternal Fetal Triage Index (MFTI)

Implement appropriate infectious disease control processes for triage and evaluation.



<sup>1</sup>High Risk and Critical Care Obstetrics, 2013

<sup>2</sup>Trauma may or may not include a direct assault on the abdomen. Examples are trauma from motor vehicle accidents, falls, and intimate partner violence.

<sup>3</sup>Coping with Labor Algorithm V2 used with permission

The MFTI is exemplary and does not include all possible patient complaints or conditions. The MFTI is designed to guide clinical decision-making but does not replace clinical judgement. Vital signs in the MFTI are suggested values. Values appropriate for the population and geographic region should be determined by each clinical team, taking into account variables such as altitude.  
©2015 Association of Women's Health, Obstetric and Neonatal Nurses. For permission to use MFTI or integrate the MFTI into the Electronic Medical Record contact permissions@awhonn.org.

**index.** Adopted from Ruhl C, Scheich B, Onokpise B, Bingham D. (2015) Content validity testing of the maternal fetal triage index. *J Obstet Gynecol Neonatal Nurs*; 44:701–9

### **Significant of the study:**

Maternal morbidity and mortality are major public health problems, especially in West Africa. Hemorrhage, hypertension, obstructed labor, and sepsis are the major direct emergency obstetric causes; the treatments for those obstetrical complications are well known, and appropriate emergency obstetric care should prevent most of these deaths (**Hesham et al.,2022**).

In developing countries such as Egypt, until now there is no standardized tool for prioritization and assessment of pregnant women. Triage is structured for emergency hospitals, but not well structured in the obstetric department; although the obstetric emergency unit is existing. Many obstetrical practices can lead to poor obstetric outcomes due to a lack of standardization of knowledge and practices regarding obstetric triage. The most frequent poor obstetrical outcomes include incorrectly diagnosing urgent and emergent obstetric conditions, errors in triage evaluation, failure to administer appropriate drug therapy, failure to recognize the labor phase, failure to recognize ruptured membranes or failure to rule out antepartum hemorrhage (**Elmashad et al., 2020**).

The obstetric nurses' knowledge and practices can improve obstetric triage efficacy and efficiency if properly conducted. Training is one of the important educational methods, especially for the health-related professional team (**Naz et al., 2022**). So, the researchers are interested in identifying the effect of educational program on maternity nurses' knowledge and practices regarding obstetric triage.

### **Aim of the study:**

To identify the effect of educational program on maternity nurses' knowledge and practice regarding MFTI as an obstetric triage scale.

### **Research hypothesis**

Educational Program has positive effect on Maternity Nurses' Knowledge and Practice regarding Obstetric Triage

### **Operational definitions:**

**Triage** is the process of ranking patients in order of their severity so they can receive the greatest care in the shortest possible time.

**Obstetric triage** is a succinct, thorough, and systematic strategy for ranking the condition of the pregnant woman and her fetus in order of priority for a full evaluation.

**The Maternal Fetal Triage Index (MFTI)** is a five-level acuity index that nurses can use to classify a woman's level of acuity and prioritize the urgency of the woman for provider evaluation depending on acuity when she arrives at an obstetric unit for care.

### **Subjects and methods:**

The subjects and methods of this study are displayed into four designs technical, operational, administrative, and statistical design.

#### **I. Technical Design:**

Which involved research design, setting, study sample, and tools of data collection.

#### **Research Design:**

A quasi-experimental (pre-posttest) design was used in this study. This study was used as it replicates findings before and after the intervention.

**Setting:**

The research was carried out at the Minia University Hospital for Obstetrics and Pediatrics (MUHOP), Egypt. Minia University Hospital for Obstetric and Pediatric serves all areas of Upper Egypt. It is a building that has five-floors, four for governmental admission and the first one for private service.

**Sample:**

A total of 70 convenient maternity nurses included in the study, who worked at MUHOP and were involved (15 nurses from the admission ward, 23 nurses from the labor ward, 16 nurses from the inpatient ward, and 16 postpartum unit). The sample included all maternity nurses at the head of the work in all previous places.

**Tools of the study:**

The data was collected using two tools

**Tool (1):** Self-administered structured interview questionnaire was developed by the researchers. It involved two parts.

**Part one:** included sociodemographic characteristics of maternity nurses as (age, marital status, qualification, place of work, and years of experience).

**Part two (Knowledge assessment sheet):** involved 13 open questions to assess maternity nurses' general knowledge about obstetric triage as the definition, goals, principles, obstetric triage scale, obstetric triage color meaning, elements of triage obstacles, levels of severity, and actions for levels of severity. Knowledge specified to MFTI scale as definition of MFIT, the value of assigning, categories based on scale MFTI, time limit based on categories, and integration in medical electronic record (Fakari et al., 2019) and (Moudi et al., 2020). In addition to the source of knowledge about obstetric triage.

**Knowledge and practice scoring system:**

Each question was scored as (3) for a complete answer, (2) for the incomplete answer, and (1) for wrong or no answer. The total knowledge score was 39. Knowledge was considered inefficient if the percent score was <75% (29) and considered efficient if the percentage was 75% (29) and more (Ibrahim et al., 2021).

**Tool (2): Observational checklist for practices sheet:** involved 5 main items involved effective obstetric triage communication, obstetric triage assessment, prioritization of care based on obstetric triage assessment, obstetric triage categories of pregnant women regarding MFTI, and documentation of obstetric triage assessment findings.

**Practice scoring system:**

Each question was scored as (3) for doing each step correctly and complete, while (2) score was given for done correctly and incomplete (1) score for done incorrectly or not done. The scores of total practice were considered as  $\geq 80\%$  (12) for competent practice and  $< 80\%$  (12) for incompetent practice (Ibrahim et al., 2021).

**Tools Validity:**

The tools were reviewed by a team of three specialists 2 staff in obstetrics and gynecological nursing, as well as one staff in obstetrics and gynecological medicine, for clarity and comprehensiveness.

**Tools Reliability:**

Reliability analysis was measured using the Cronbach Alpha coefficient and was found to be 0.812 for a structured interview questionnaire. The reliability of the observational checklist was 0.740.

**Procedure:**

Before carrying out the study, an official letter was directed to the manager of MUHOP,

Minia University to obtain permission to collect data after specifying the purpose of the study.

## II. Operational design:

It was displayed in two phases; pilot study and fieldwork.

### Pilot study:

The pilot study included 10% (7 nurses) according to the inclusion of the sample size to evaluate the clarity and efficiency of the tool used in the study.

### Assessment phase:

Upon obtaining official permission to conduct the study. The researcher met each maternity nurse individually, explained the purpose of the study and method of implementation of the educational program, and took their oral consent to participate in the study. After that personal data was obtained and asked to fill data regarding knowledge about obstetric triage as a form of the pretest. Also, an overt observational checklist was applied at the lab before the educational program to assess nurses' practice regarding obstetric triage. The questionnaire took 25-35 minutes.

### Fieldwork:

Data collection for this study was taken eight months starting from the beginning of July 2021 and completed by March 2022. Follow-up ended in April 2022. This was achieved in three phases, assessment, implementation, and evaluation:

### Supportive materials:

It was designed by the researcher based on a literature review. It was prepared in the form of booklet using a simple and clear Arabic language supported by a poster to MFTI to be a guide to the maternity nurses in determining the priority of receiving care.

### Implementation phase:

Carrying out of the educational program took about 32 weeks or nearly 8 months. The researcher visited MUHOP two days per week. Conducting two sessions a day for a group of maternity nurses, each group contained numbers of 4-5 nurses. The duration of each session last from 30-40 minutes. **The First session:** At the beginning of the first session, an orientation to the training and its aim occurred. It covered the theoretical background including the definition of obstetric triage and MFTI, time limit based on categories, awareness of triage scales, its mean goal, understanding, and application of triage colors, levels of severity, and actions for levels of severity, elements of triage obstacles and integration in the medical electronic record. Different teaching methods were used to reach the intended objective as lecture, group discussion, problem-solving and critical thinking.

The first training scenario was performed by the researchers as role-playing. The obstetric triage was carried out in accordance with MFTI by one researcher acting as the pregnant woman and the other as the obstetric nurse interviewing the pregnant woman. At the end of the session, a copy of the booklet and the printed colored MFTI posters were distributed to the maternity nurses to be a guide for solving the training exercise which was given as homework training. After 30 minutes **the second session** was begun: To check the right response for the maternity nurses undergoing training, the researchers solved the training exercise at the beginning of the second session while working with the obstetric nurses to review the previous theoretical material, then the second training scenario was acted by the researchers as the same way as the first scenario, and solved at the end of the session.

**Schedule of nurses' follow up:** the nurses was followed weekly for any explanation until time of evaluation

### Evaluation phase:

After 6 weeks of the educational program, the researcher interviewed nurses again involved in the session to take the post-test that includes the same questions as the pretest questions to assess their knowledge. And an overt observational checklist was applied at the lab to assess nurses' practice regarding obstetric triage as a form of the post-test. That took from 25-30 minutes.

### III- Administrative design:

This study was carried out with the approval of Mini University's faculty of nursing's ethical committee, as well as official permission from the manager of MUHOP. Each nurse who participated in the study gave informed consent, and confidentiality was ensured. The nurse has the option to leave the study at any time.

### IV-Statistical design:

Statistical Package for Social Sciences (SPSS) V.26 was used to organize, categorize, code, tabulate, and analyze the acquired data. Numbers, percentages, averages, and standard deviations were used to portray data in tables and charts. The Wilcoxon and chi-square test was performed to determine statistical significance. A T-test was used to compare the mean. A P-value of <0.05 was declared statistically significant.

### Limitations of the study:

Exposure to educational program (such as lectures and training) to some difficulties related to nurses' work, so the researcher was met with a small group to accomplish the study.

### Results:

**Table (1):** shows sociodemographic characteristics of studied maternity nurses, and clarifies that 54.3% of them have age group from 25-35 years with a mean  $\pm$  SD of 28.27 $\pm$ 5.26, about 80.0% and 48.6% are married and have an institute of nursing, 32.9% work at labor ward, about 45.7% have an experience in their work from 5-10 years, and about 11.4% attend training courses regarding obstetric triage.

**Figure (1)** demonstrates the source of nurses' knowledge before the educational program and shows that 64.3% of studied nurses obtain their knowledge from nurses' work and 35.7% from studying.

**Table (2):** illustrates maternity nurses' general knowledge about obstetric triage in pre and post-test, and reports that there is a highly statistically significant difference between pre & post-test regarding definition, goals, principles, scale, color meaning, elements of triage obstacles, levels of severity, and actions for levels of severity p-value 0.001 for all previous items.

**Table (3)** illustrates maternity nurses' knowledge about MFTI scale in pre and post-test and clarifies that there is a highly statistically significant difference between pre & post-test regarding MFTI definition, the value of assigning, categories based on scale MFTI, time limit based on categories, and integration in medical electronic record p-value 0.001 for all previous items.

**Figure (2):** clarifies that 8.6% of studied maternity nurses have efficient knowledge regarding obstetric triage in the pre-test was improved to 97.1% in post-test, with a highly statistically significant difference between pre & post-test p-value 0.001.

**Table (4):** illustrated maternity nurses' practices regarding obstetric triage in pre and post-test, and finds that there is a highly statistically significant difference between pre & post-test regarding effective obstetric triage communication, assessment, prioritization of care based on assessment, obstetric triage categories of pregnant women regarding MFTI, and documentation of obstetric triage assessment findings p-value (0.001) for all.

**Figure (3):** demonstrates that 5.7% of studied maternity nurses have competent practices regarding obstetric triage in the pre-test which was improved to 78.6% in post-test, with a highly statistically significant difference between pre & post-test p-value 0.001.

**Table (5):** demonstrates that there is a relationship between pre-test total knowledge and educational background, years of experience, and training course attendance (p-value <0.05).

Additionally, there is no association between pretest total knowledge and age, marital status, or place of employment (p-value >0.05).

**Table (6):** shows that there is a relationship between total practices regarding obstetric triage in pretest and educational qualification, years of experience, and attending training courses p-value <0.05. And there is no relationship between total knowledge in pretest

and age, marital status, and place of work p-value >0.05.

**Table (7):** shows that there is a relationship between total knowledge and total practices regarding obstetric triage in a pretest p-value 0.002.

**Table (1): Distribution of studied maternity nurses according to socio demographic characteristics (N=70)**

| Socio demographic characteristics                             | No.                              | %    |
|---|----------------------------------|------|
| <b>Age: (years)</b>   |                                  |      |
| • Less than 25 year   | 21                               | 30.0 |
| • 25- 35 year   | 38                               | 54.3 |
| • More than 35 year   | 11                               | 15.7 |
| <b>Age mean <math>\pm</math> SD</b>                           | <b>28.27<math>\pm</math>5.26</b> |      |
| <b>Marital status</b>   |                                  |      |
| Single  | 14                               | 20.0 |
| Married   | 56                               | 80.0 |
| <b>Educational level:</b>                                     |                                  |      |
| • Nursing diploma school                                      | 29                               | 41.4 |
| • Institute of nursing  | 34                               | 48.6 |
| • University  | 7                                | 10.0 |
| <b>Place of work:</b>   |                                  |      |
| Admission ward  | 15                               | 21.3 |
| • Labor ward  | 23                               | 32.9 |
| • inpatient department  | 16                               | 22.9 |
| • Postpartum ward   | 16                               | 22.9 |
| <b>Years of experience in obstetrics and gynecology ward:</b> |                                  |      |
| • Less than 5 years   | 21                               | 30.0 |
| • 5-10 years  | 32                               | 45.7 |
| • More than 10 years  | 17                               | 24.3 |
| <b>Years of experience mean <math>\pm</math> SD</b>           | <b>7.71<math>\pm</math>2.11</b>  |      |
| <b>Attending training courses regarding obstetric triage:</b> |                                  |      |
| • Yes   | 8                                | 11.4 |
| • No  | 62                               | 88.6 |

**Figure (1) Source of nurses' knowledge before educational program (N= 70):**

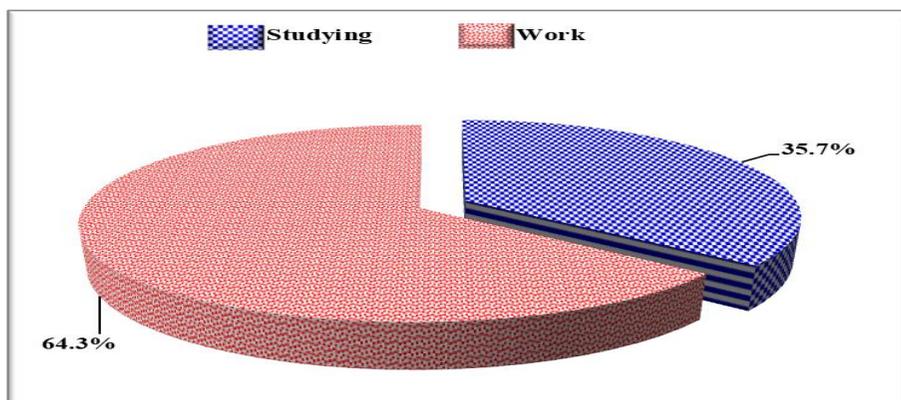


Table (2): Maternity nurses' general knowledge regarding to obstetric triage in pre and posttest (N= 70):

| Items                                   | Pre-test                |    | Post-test |    | P-value |                |
|---|-------------------------|----|-----------|----|---------|----------------|
|   | No.                     | %  | No.       | %  |         |                |
| <b>Obstetric triage's definition</b>    | Correct and complete    | 6  | 8.6       | 49 | 70.0    | <b>0.001**</b> |
|   | Correct and incomplete  | 27 | 38.5      | 15 | 21.4    |                |
|   | Incorrect or don't know | 37 | 52.9      | 6  | 8.6     |                |
| <b>Obstetric triage's goals</b>         | Correct and complete    | 4  | 5.7       | 51 | 72.9    | <b>0.001**</b> |
|   | Correct and incomplete  | 31 | 44.3      | 17 | 24.2    |                |
|   | Incorrect or don't know | 35 | 50.0      | 2  | 2.9     |                |
| <b>Obstetric triage's principles</b>    | Correct and complete    | 2  | 2.9       | 42 | 60.0    | <b>0.001**</b> |
|   | Correct and incomplete  | 24 | 34.2      | 23 | 32.9    |                |
|   | Incorrect or don't know | 44 | 62.9      | 5  | 7.1     |                |
| <b>Obstetric triage's scale</b>         | Correct and complete    | 5  | 7.1       | 53 | 75.7    | <b>0.001**</b> |
|   | Correct and incomplete  | 32 | 45.7      | 14 | 20.0    |                |
|   | Incorrect or don't know | 33 | 47.2      | 3  | 4.3     |                |
| <b>Obstetric triage's color meaning</b> | Correct and complete    | 7  | 10.0      | 59 | 84.3    | <b>0.001**</b> |
|   | Correct and incomplete  | 39 | 55.7      | 10 | 14.3    |                |
|   | Incorrect or don't know | 24 | 34.3      | 1  | 1.4     |                |
| <b>Elements of triage obstacles</b>     | Correct and complete    | 2  | 2.9       | 56 | 80.0    | <b>0.001**</b> |
|   | Correct and incomplete  | 22 | 31.4      | 12 | 17.1    |                |
|   | Incorrect or don't know | 46 | 65.7      | 2  | 2.9     |                |
| <b>Levels of severity</b>               | Correct and complete    | 3  | 4.3       | 58 | 82.9    | <b>0.001**</b> |
|   | Correct and incomplete  | 29 | 41.4      | 8  | 11.4    |                |
|   | Incorrect or don't know | 38 | 54.3      | 4  | 5.7     |                |
| <b>Actions for levels of severity</b>   | Correct and complete    | 2  | 2.9       | 57 | 81.4    | <b>0.001**</b> |
|   | Correct and incomplete  | 30 | 42.8      | 9  | 12.9    |                |
|   | Incorrect or don't know | 38 | 54.3      | 4  | 5.7     |                |

Wilcoxin test used for pair qualitative variables (\*\*) highly statistically significant  $p < 0.01$

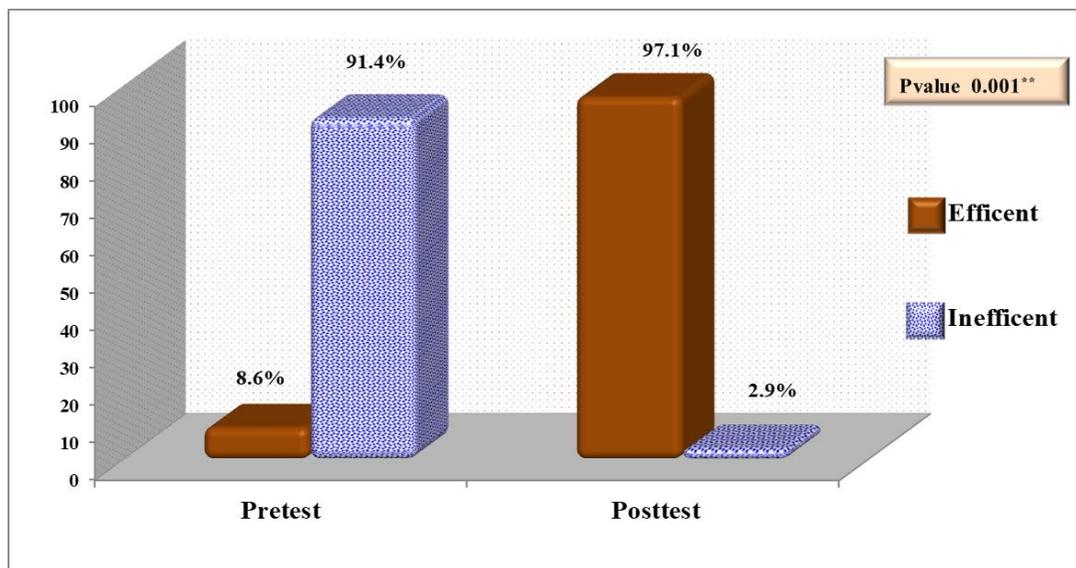
**Table (3): Maternity nurses' knowledge regarding MFTI scale in pre and posttest (N= 70):**

| Items                                    |                         | Pre-test |      | Post-test |      | P-value |
|--|-------------------------|----------|------|-----------|------|---------|
|  |                         | No.      | %    | No.       | %    |         |
| MFTI definition                          | Correct and complete    | 5        | 7.1  | 52        | 74.3 | 0.001** |
|  | Correct and incomplete  | 19       | 27.1 | 15        | 21.4 |         |
|  | Incorrect or don't know | 46       | 65.8 | 3         | 4.3  |         |
| Value of assigning                       | Correct and complete    | 3        | 4.3  | 49        | 70.0 | 0.001** |
|  | Correct and incomplete  | 23       | 32.9 | 19        | 27.1 |         |
|  | Incorrect or don't know | 44       | 62.8 | 2         | 2.9  |         |
| Categories based on scale MFTI           | Correct and complete    | 6        | 8.6  | 56        | 80.0 | 0.001** |
|  | Correct and incomplete  | 30       | 42.8 | 12        | 17.1 |         |
|  | Incorrect or don't know | 34       | 48.6 | 2         | 2.9  |         |
| Time limit based on categories           | Correct and complete    | 3        | 4.3  | 57        | 81.4 | 0.001** |
|  | Correct and incomplete  | 29       | 41.4 | 10        | 14.3 |         |
|  | Incorrect or don't know | 38       | 54.3 | 3         | 4.3  |         |
| Integration in medical electronic record | Correct and complete    | 2        | 2.9  | 62        | 88.5 | 0.001** |
|  | Correct and incomplete  | 28       | 40.0 | 2         | 2.9  |         |
|  | Incorrect or don't know | 40       | 57.1 | 6         | 8.6  |         |

Wilcoxon test used for pair qualitative variables

(\*\*) highly statistically significant  $p < 0.01$

**Figure (2): maternity n nurses' total knowledge score regarding obstetric triage in pre and posttest (N= 70):**

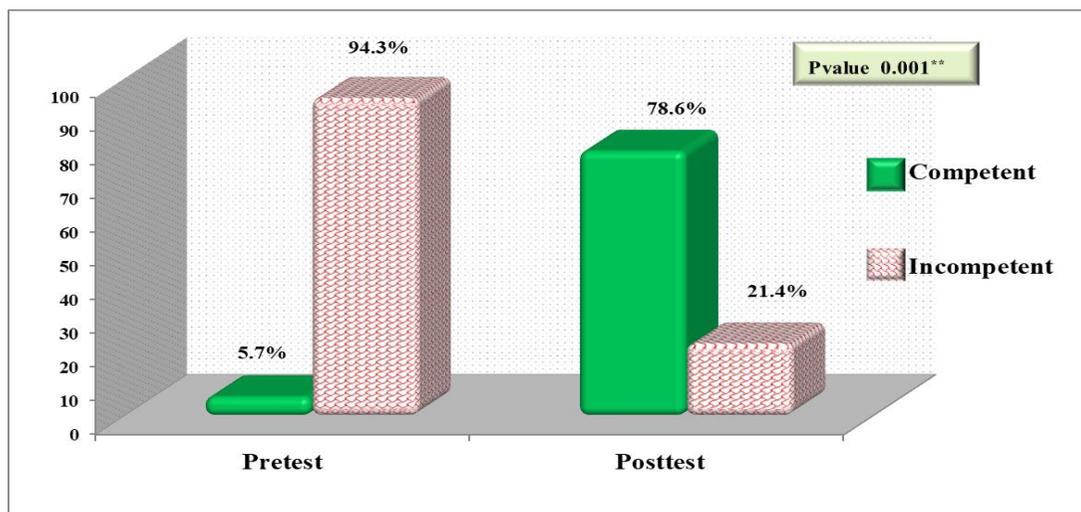


**Table (4): Maternity nurses' practices regarding obstetric triage in pre and posttest (N= 70):**

| Items   | Pre-test                     |    | Post-test |    | P-value |                |
|---|------------------------------|----|-----------|----|---------|----------------|
|   | No.                          | %  | No.       | %  |         |                |
| <b>Effective obstetric triage communication</b>                     | Done completely correct      | 4  | 5.7       | 54 | 77.1    | <b>0.001**</b> |
|   | Done incompletely correct    | 23 | 32.9      | 14 | 20.0    |                |
|   | Done incorrectly or not done | 43 | 61.4      | 2  | 2.9     |                |
| <b>Obstetric triage assessment</b>                                  | Done completely correct      | 6  | 8.6       | 56 | 80.0    | <b>0.001**</b> |
|   | Done incompletely correct    | 31 | 44.3      | 11 | 15.7    |                |
|   | Done incorrectly or not done | 33 | 47.1      | 3  | 4.3     |                |
| <b>Prioritization of care based on obstetric triage assessment</b>  | Done completely correct      | 7  | 10.0      | 55 | 78.6    | <b>0.001**</b> |
|   | Done incompletely correct    | 27 | 38.6      | 8  | 11.4    |                |
|   | Done incorrectly or not done | 36 | 51.4      | 7  | 10.0    |                |
| <b>Obstetric triage categories of pregnant women regarding MFTI</b> | Done completely correct      | 9  | 12.9      | 57 | 81.5    | <b>0.001**</b> |
|   | Done incompletely correct    | 16 | 24.3      | 8  | 11.4    |                |
|   | Done incorrectly or not done | 45 | 62.8      | 5  | 7.1     |                |
| <b>Documentation of obstetric triage assessment findings.</b>       | Done completely correct      | 11 | 15.7      | 58 | 82.9    | <b>0.001**</b> |
|   | Done incompletely correct    | 32 | 45.7      | 8  | 11.4    |                |
|   | Done incorrectly or not done | 27 | 38.6      | 4  | 5.7     |                |

Wilcoxon test used for pair qualitative variables

**Figure (3): maternity nurses' total practices score regarding obstetric triage in pre and posttest (N= 70):**



(\*\*) highly statistically significant  $p < 0.01$

**Table (5): Relation between maternity nurses' total knowledge about obstetric triage in pretest and socio demographic characteristics (N= 70):**

| Socio demographic characteristics  | Total Knowledge     |      |                        |      | P-value        |
|--|---------------------|------|------------------------|------|----------------|
|  | Efficient<br>(n= 6) |      | Inefficient<br>(n= 64) |      |                |
|  | No.                 | %    | No.                    | %    |                |
| <b>Age: (years)</b>  |                     |      |                        |      |                |
| • Less than 25 year  | 0                   | 0.0  | 21                     | 32.8 | 0.178          |
| • 25- 35 year  | 4                   | 66.7 | 34                     | 53.1 |                |
| • More than 35 year  | 2                   | 33.3 | 9                      | 14.1 |                |
| <b>Marital status</b>  |                     |      |                        |      |                |
| Single   | 1                   | 16.7 | 13                     | 20.3 | 0.831          |
| Married  | 5                   | 83.3 | 51                     | 79.7 |                |
| <b>Educational level:</b>  |                     |      |                        |      |                |
| • Nursing diploma school   | 0                   | 0.0  | 29                     | 45.3 | <b>0.001**</b> |
| • Institute of nursing   | 1                   | 16.7 | 33                     | 51.6 |                |
| • University   | 5                   | 83.3 | 2                      | 3.1  |                |
| <b>Place of work:</b>  |                     |      |                        |      |                |
| Admission ward   | 1                   | 16.7 | 14                     | 21.9 | 0.421          |
| • Labor ward   | 1                   | 16.7 | 22                     | 34.4 |                |
| • inpatient department   | 1                   | 16.6 | 15                     | 23.4 |                |
| • Postpartum ward  | 3                   | 50.0 | 13                     | 20.3 |                |
| <b>Years of experience in obstetrics and gynecology ward:</b>  |                     |      |                        |      |                |
| • Less than 5 years  | 0                   | 0.0  | 21                     | 32.8 | <b>0.030*</b>  |
| • 5-10 years   | 2                   | 33.3 | 30                     | 46.9 |                |
| • More than 10 years   | 4                   | 66.7 | 13                     | 20.3 |                |
| <b>Attending training courses regarding obstetric triage:</b>  |                     |      |                        |      |                |
| • Yes  | 3                   | 50.0 | 5                      | 7.8  | <b>0.002**</b> |
| • No   | 3                   | 50.0 | 59                     | 92.2 |                |
| Chi-square test    (*)Statistically significant p < 0.05                      (**) highly statistically significant p < 0.01 |                     |      |                        |      |                |

**Table (6): Relation between maternity nurses' total practices about obstetric triage in pretest and socio demographic characteristics (N= 70):**

| Socio demographic characteristics                             | Total practices     |       |                        |      | P-value        |
|---|---------------------|-------|------------------------|------|----------------|
|   | Competent<br>(n= 4) |       | Incompetent<br>(n= 66) |      |                |
|   | No.                 | %     | No.                    | %    |                |
| <b>Age: (years)</b>   |                     |       |                        |      |                |
| • Less than 25 year   | 0                   | 0.0   | 21                     | 31.8 | 0.168          |
| • 25- 35 year   | 4                   | 100.0 | 34                     | 51.5 |                |
| • More than 35 year   | 0                   | 0.0   | 11                     | 16.7 |                |
| <b>Marital status</b>   |                     |       |                        |      |                |
| Single  | 0                   | 0.0   | 14                     | 21.2 | 0.303          |
| Married   | 4                   | 100.0 | 52                     | 78.8 |                |
| <b>Educational level:</b>                                     |                     |       |                        |      |                |
| • Nursing diploma school                                      | 0                   | 0.0   | 29                     | 43.9 | <b>0.001**</b> |
| • Institute of nursing  | 1                   | 25.0  | 33                     | 50.0 |                |
| • University  | 3                   | 75.0  | 4                      | 6.1  |                |
| <b>Place of work:</b>   |                     |       |                        |      |                |
| Admission ward  | 1                   | 25.0  | 14                     | 21.2 | 0.424          |
| • Labor ward  | 0                   | 0.0   | 23                     | 34.9 |                |
| • inpatient department  | 2                   | 50.0  | 14                     | 21.2 |                |
| • Postpartum ward   | 1                   | 25.0  | 15                     | 22.7 |                |
| <b>Years of experience in obstetrics and gynecology ward:</b> |                     |       |                        |      |                |
| • Less than 5 years   | 0                   | 0.0   | 21                     | 31.8 | <b>0.046*</b>  |
| • 5-10 years  | 1                   | 25.0  | 31                     | 47.0 |                |
| • More than 10 years  | 3                   | 75.0  | 14                     | 21.2 |                |
| <b>Attending training courses regarding obstetric triage:</b> |                     |       |                        |      |                |
| • Yes   | 2                   | 50.0  | 6                      | 9.1  | <b>0.013*</b>  |
| • No  | 2                   | 50.0  | 60                     | 90.9 |                |

Chi-square test (\*)Statistically significant  $p < 0.05$  (\*\*) highly statistically significant  $p < 0.01$

**Table (7): Relation between maternity nurses' total knowledge and practices regarding obstetric triage in pretest (N= 70):**

| Total practices | Total Knowledge     |      |                        |      | P-value        |
|-----------------|---------------------|------|------------------------|------|----------------|
|                 | Efficient<br>(n= 6) |      | Inefficient<br>(n= 64) |      |                |
|                 | No.                 | %    | No.                    | %    |                |
| • Competent     | 2                   | 33.3 | 2                      | 3.1  | <b>0.002**</b> |
| • Incompetent   | 4                   | 66.7 | 62                     | 96.9 |                |

Chi-square test (\*\*) highly statistically significant  $p < 0.01$

### Discussion:

It is crucial to research and find various strategies to improve the professional qualities of triage nurses since they are crucial in prioritizing the needs of patients who are in urgent need of care and are in critical conditions (Bijani et al., 2018).

Regarding maternity nurses' knowledge in pre and post-test, current findings report that there is a significant improvement in their knowledge score after implementation of the educational program with a statistically significant difference between pre and post-test ( $p < 0.01$ ). This was in the same line as

**Rebecca & Jariatu, 2020**, who applied their study to increase the efficiency and accuracy of obstetric triage, with no published tools existing for low-income settings, and reported a statistically significant difference between pre and post-test regarding obstetric triage nurses' knowledge ( $p < 0.01$ ).

The same opinion was reported by **Shehab et al., 2017**, who carried out their study in Egypt to evaluate the effect of an educational program regarding patients' triage on nurses' knowledge and skills in the emergency department. And **Mohammed et al., 2022**, who implemented their study to evaluate the effect of the obstetric triage training program on nurses' knowledge in the obstetric emergency unit. This similarity shows the effect of educational program on improving maternity nurses' knowledge regarding obstetric triage.

This was proven by a significant difference between pre and post-test concerning the detailed general knowledge about obstetric triage and MFIT knowledge that was found in the present study. And this was in agreement with **Shehab et al., 2017** and **Mohammed et al., 2022**.

Based on the present study, it was illustrated that more than three-fifths of studied nurses obtain their knowledge before implementation of the educational program about obstetric triage from nurses' work and more than one-third from studying. Near to these findings, **Mohammed et al., 2022**. Reported that more than one-quarter of maternity nurses obtain their knowledge before intervention from studying.

As regards maternity nurses' total practices about obstetric triage, the actual study demonstrates that there is a significant improvement in nurses' practices that were observed after the training program. This was shown by a significant difference between pre and post-test regarding effective obstetric triage communication, assessment, prioritization of care based on assessment, obstetric triage categories of pregnant women regarding MFTI,

and documentation of obstetric triage assessment findings ( $p < 0.01$ ) for all.

The same findings were reported by **Elmashad et al., 2020**, who implemented their study in Egypt to investigate the effect of implementing simulation obstetric triage training on nurses' knowledge and practices, and **Hesham et al., 2022**, who carried out their study to apply the triage protocol to improve quality of care in emergency unit at Maternity Hospital, and both of them clarified a significant difference between pre and posttest ( $p < 0.01$ ) regarding nurses' practices about obstetric triage, and this may be due to supporting the vital effect of regular training of maternity nurses on practices that promote women and fetal health as obstetric triage.

Based on the current study, it was found that there was a relationship between total knowledge and total practices regarding obstetric triage in pretest ( $p < 0.01$ ). That was consistent with **Elmashad et al., 2020**, who demonstrated a relationship between total knowledge and total practices regarding obstetric triage in pretest ( $p < 0.01$ ). This support that maternity nurse who had good practice regarding obstetric triage, this practice should first back to a good theoretical basis.

Concerning the relationship between pre-test total knowledge about obstetric triage and socio-demographic characteristics, the present study reported that there was a relationship between pre-test total knowledge and educational background, years of experience, and training course attendance ( $p$ -value  $< 0.05$ ). Additionally, there is no association between pretest total knowledge and age, marital status, or place of employment ( $p$ -value  $> 0.05$ ).

The same findings were reported by **Moirangthem, 2019**, who carried out their study to maximize benefits by prioritizing patients from urgent cases to non-urgent cases, and **Abd-El-Razik & Gamal, 2018**, who implemented their study in Egypt to assess the effect of using the obstetrics triage guideline by the nurse and its impact on pregnant women's outcomes, both of them reported that there was

a relationship between total nurses' knowledge about obstetric triage and educational level and years of experience ( $p < 0.05$ ). This support that high education and advanced work experience years act a vital role in improving their information background.

On the other hand, **Faheim et al., 2019**, who applied their study to evaluate the effect of triage education on emergency nurses' performance in diverse emergency departments, and showed no relationship between total nurses' knowledge about patient triage and educational level and years of experience  $p$ -value  $> 0.05$ . This difference back to applying a study on general medical problem triage and not specified to obstetric triage.

Regarding the relationship between total nurses' practices and socio-demographic characteristics, the current study illustrated that there was a relationship between pre-test total practices and educational level, years of experience, and training course attendance ( $p$ -value  $< 0.05$ ). Additionally, there is no association between pretest total knowledge and age, marital status, or place of employment ( $p$ -value  $> 0.05$ ).

The same finding was reported by **Ibrahim et al., 2021**, who implemented their study to evaluate the effect of emergency obstetric protocol on the practices of intern nursing students, and reported that there was a relationship between pre-test total practices and educational level, years of experience, and training course attendance ( $p$ -value  $< 0.05$ ).

### **Conclusion:**

Nurses' knowledge and practice about obstetric triage was improved after implementing the educational and training program. There is a relationship between total knowledge and total practices regarding obstetric triage in a pretest  $p$ -value 0.002.

### **Recommendations:**

- Theoretical and practical training of triage for maternity nurses in hospitals as well

as undergraduate curriculum and continuous educational training programs about obstetric triage should be provided.

- Every obstetric unit should have an accessible simple manual instructional booklet about obstetric triage and MFTI to assist nurses in prioritizing newly admitted cases in accordance with the severity of obstetric symptoms.

- Establish emergency scenarios with staff from multiple areas to help everyone involved to be better prepared when an actual emergency occurred.

- Apply the study to a wide range of hospitals for the generalization of the findings.

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### **References:**

- Abd-El-Razik A. & Gamal A. (2018)**. Effect of Nurses Application of Structured Obstetrics Triage Guideline on Pregnant Women Outcomes. *Int J of Novel Research in Healthcare and Nursing*, 5(2), 251–265.
- American College of Obstetricians and Gynecologists (ACOG) (2018)**. Committee Opinion No. 667: Hospital-Based Triage of Obstetric Patients. *Obstetrics and gynecology*, 128(1), e16
- Bijani, M., Torabizadeh, C., Rakhshan, M., & Fararouei, M. (2018)**. Professional capability in triage nurses in emergency department: A qualitative study. *Revista Latinoamericana de Hipertension*, 13(6), 554–560.
- Elmashad, H. A. M., Mohamed, A., Gouda, I., & Fadel, E. A. (2020)**. Effect of implementing simulation obstetric triage training on nurses' knowledge and practices. *International Journal of Nursing Didactics*, 10(02), 27–37. <https://doi.org/10.15520/ijnd.v10i02.2805>
- Faheim, S. S., Ahmed, S. S., Aly, E. F. A. M., & Hegazy, S. M. A. (2019)**. Effect of Triage Education on Nurses' Performance in

- Diverse Emergency Departments. Evidence-Based Nursing Research, 1(2), 11. <https://doi.org/10.47104/ebnrojs3.v1i2.45>
- Fakari, F. R., Simbar, M., Modares, S. Z., & Majd, H. A. (2019).** Obstetric Triage Scales; a Narrative Review. Archives of Academic Emergency Medicine, 7(1), e13. <https://doi.org/10.22037/aaem.v7i1.310>
- Goodman, D. M., Srofenyoh, E. K., Ramaswamy, R., Bryce, F., Floyd, L., Olufolabi, A., Tetteh, C., & Owen, M. D. (2018).** Addressing the third delay: Implementing a novel obstetric triage system in Ghana. BMJ Global Health, 3(2), 1–8. <https://doi.org/10.1136/bmjgh-2017-000623>
- Gratton, R. J., Bazaracai, N., Cameron, I., Watts, N., Brayman, C., Hancock, G., Twohey, R., AlShanteer, S., Ryder, J. E., Wodrich, K., Williams, E., Guay, A., Basso, M., & Smithson, D. S. (2016).** Acuity Assessment in Obstetrical Triage. Journal of obstetrics and gynaecology Canada : JOGC = Journal d'obstetrique et gynecologie du Canada : JOGC, 38(2), 125–133. <https://doi.org/10.1016/j.jogc.2015.12.010>
- Hesham M. Ali, Elsheikh A., & Abed-Elhamid, N. (2022).** Application of Triage Protocol to Improve Quality of Care in Emergency Unit at Maternity Hospital. Egyptian Journal of Health Care, 13(1), 84–98. <https://doi.org/10.21608/ejhc.2022.214079>
- Ibrahim, E., Hamido, S., Metualy, S., & Moustafa, E. (2021).** Emergency Obstetric Protocol on the Performance of Interns Nursing Students. Egyptian Journal of Health Care, 12(3), 999–1011. <https://doi.org/10.21608/ejhc.2021.193551>
- Long, Emilie (2021).** Implementation of Maternal Fetal Triage Index to Improve Nurse Knowledge and Timeliness in Obstetric Triage: A Pilot Project. Thesis in University of Nebraska Medical Center.
- Mohammed, E. A., Fahmy, N. M., Abd-moneim, E. F., & Mohamady, S. H. (2022).** Effect of Obstetric Triage ' s Training Program on Nurses ' Knowledge and Satisfaction at Obstetrics E mergency ' s Unit. International Journal of Novel Research in Healthcare and Nursing, 9(2), 105–120.
- Moirangthem, T. Devi (2019).** Knowledge Regarding Triage System among Nursing Staff Working In Selected Hospital Of Sikkim. Journal of Nursing and Health Science (IOSR-JNHS), 8(2), 27–32. <https://doi.org/10.9790/1959-0802102732>
- Moudi, A., Iravani, M., Najafian, M., Zareiyan, A., Forouzan, A., & Mirghafourvand, M. (2020).** Obstetric triage systems: A systematic review of measurement properties (Clinimetric). BMC Pregnancy and Childbirth, 20(1), 1–11. <https://doi.org/10.1186/s12884-020-02974-0>
- Naz, S., Saleem, S., Shamsul Islam, Z., Bhamani, S., & Sheikh, L. (2022).** Obstetric triage improvement process using the Donabedian model of quality care: a quality improvement initiative. BMJ Open Quality, 11(2), e001483. <https://doi.org/10.1136/bmjopen-2021-001483>
- Rebecca, B., & Jariatu, T. N. S. (2020).** Implementation of a novel obstetric triage tool in the tertiary maternity hospital of Sierra Leone: A quality improvement project. International Journal of Nursing and Midwifery, 12(3), 90–96. <https://doi.org/10.5897/ijnm2020.0418>
- Shehab, M. S., Ali, M. R., Mahmoud, O. H. M., & Abd-el-kader, H. (2017).** Effect of an Educational Program Regarding Patients ' Triage on Nurses ' Knowledge and Skills at Emergency Department. 3(3), 163–169. <https://doi.org/10.5829/idosi.wjns.2017.163.169>
- Smithson, D. S., Twohey, R., Rice, T., Watts, N., Fernandes, C. M., & Gratton, R. J. (2013).** Implementing an obstetric triage acuity scale: interrater reliability and patient flow analysis. American journal of obstetrics and gynecology, 209(4), 287–293. <https://doi.org/10.1016/j.ajog.2013.03.031>