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Effect of Nurses Application of Structured Obstetrics Triage Guideline on Pregnant Women Outcomes

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Abstract: **Triage in hospitals typically aim to categorize and prioritize pregnant women who present for emergent or urgent care before detailed evaluation and management. However, obstetric patients are best served if local emergency services develop protocols whereby they were taken to the most appropriate facility.**

Aim of the study: this study aimed to assess the effect of nurse's application of structure obstetrics triage guideline on pregnant women outcomes.

Design: A prospective quasi-experimental design (pre and post intervention) was utilized.

Setting: at obstetrics department in Prince Hussein Bin Abdullah (Amman, Jordan).

Sample: a convenience sample consists of all nurses (50) working in obstetric department at the time of data collection.

Instruments: included a structured interview questionnaire consisting of two parts; "personal characteristics, and knowledge about obstetric Triage" and the performance assessment checklist through Maternal Fetal Triage Index (MFTI) adopted from AWHONN's, (2016).

Results: nurses were gain knowledge and practices for obstetric women triage as well as "Maternal Fetal Triage Index" after intervention than in before intervention with statistical significance difference p<0001 for all knowledge item about triage. In addition nurses after intervention increase their level of outcomes evaluation above the upper confidence level. An increases in nurses' practicing in relation to improve maternal outcomes after intervention increase their level of outcomes evaluation "above the upper confidence levels", than before intervention "below the confidence level".

Conclusion: Nurses application improved in their proficiency after conducting Structured Obstetrics Triage Guideline for pregnant women outcomes on post intervention than on pre intervention.

Recommendations: 1- theoretical and practical training of obstetric triage for nurses in hospitals as well as undergraduate curriculum.2-Continous educational training programs about obstetric triage for health team should be provided to increase their knowledge and skills 3-Simple manual guidelines for Triage and MFTI should be available at every obstetric unit to guide nurses to priories newly admitted cases according to severity of obstetric symptoms 4-Establish an emergency simulation scenarios with staff from multiple areas to help everyone involved to be better prepared when an actual emergency occurred.

Keywords: **Structured Obstetrics Triage, Guideline, pregnant Women Outcomes.**

1. INTRODUCTION

Although labor and delivery units frequently serve as emergency units for pregnant women, the appropriate structure, location, timing, and timeliness for hospital-based triage evaluations for obstetric patients are not always clear. So, to establish guidelines for triage of pregnant women structured tools may improve quality and efficiency of care, as well as it

could serve as a template for use with individual hospital at obstetric units. In many hospitals no standardized system of triage exists in Maternity Care identified so, this to be a problematic (**American College of Obstetricians and Gynecologists, 2016)** [(1).]

Increased problems associated with pregnancy lead to established standard for triage tools which in many obstetric units may not be applicable, many pregnant women suffer from increased resting heart rate, lower blood pressure and increased respiratory rate. This together with the underlying poor health of the maternity population and associated labor problems may mask the severity of maternal illness unless a specific assessment is undertaken by appropriately trained health care professionals. There is also no means for assessing the condition of the unborn baby (**Lewis, 2007)**[(2).]

Obstetric triage volume typically exceeds the overall birth volume of a hospital by 20–50%. In a large center, up to one third of evaluated women did not give birth at that time and were sent home or to another unit at the completion of their evaluation and management **(Aiken, Sloane, Cimiotti, Clarke, Flynn, and Seago, (2010)** [(3).] Pregnant women most commonly present for evaluation for labor at term.

The percentage of women admitted to the antenatal or birthing unit with complications decreased from 80% to 12% in areas who's provided with a reliable assessment of acuity care and its implementation has allowed for triaging of obstetric symptoms based on severity, and a more in-depth assessment of the patient flow based on standardizing assessment, allows for opportunities to improve performance and make comparisons of patient care and flow across available organizations **(David et al., 2013)**[(4).]

Emergency departments typically have structured triage guidelines for health care providers encountering the diverse cases that may present to their units. Such guidelines aid in determining which patients must be evaluated promptly and which may wait safely, and aid in determining anticipated use of resources **(American College of Obstetricians and Gynecologists, 2016)** [(1).]

The symptom specific conditions include abdominal pain, antenatal bleeding, hypertension, ruptured membranes, reduced fetal movements, suspected labor and unwell baby or other symptoms in needs for urgent nursing intervention. Following the initial assessment, a traffic light system is used to categorize women into time frames within which they need to be seen, depending on the clinical urgency of their condition. Women categorized as Red go immediately into delivery suite, Orange category women have a full assessment and plan of care within 15 minutes, and women categorized as Yellow need care within an hour and those categorized as Green in need for care within 4 hours. However, the lack of true prioritization guidelines in obstetric triage is becoming increasingly dangerous and inefficient. Standard workflows and acuity indexes benefit the nursing profession by creating standards and expectations **(Jolene, 2013).** [(5).]

High-risk perinatal centers are seeing higher risk patients, as the prevalence of pregnancy-related co-morbidities (obesity, diabetes, hypertension, etc.) increases. Obstetric triage is the entry into labor and delivery as well as the obstetric operating rooms, and patients should be evaluated for life-threatening risk factors and dangers immediately upon arrival, rather than waiting to be seen on a first-come-first-served basis. The implementation of obstetric triage standards and the utilization of an obstetric triage index have the potential to dramatically increase through put, patient outcomes, patient safety, and patient satisfaction **(Whitney, 2016)** [(6).]

The global community's approach to improvement in maternal mortality may be applied to other high-impact public health issues, including the delivery of all emergency services. Compared with maternal illness, medical and surgical emergencies account for far more morbidity and mortality. However, efforts to improve comprehensive emergency systems globally have not achieved as much attention as the improvement of maternal health **Emilie et al., (*2015)*** [(7).]

In maternity care, triage of pregnant women is less reliable and the need to develop specific guidelines and education packages has been identified, with limited evidence of such a system being implemented and evaluated to identify and treat women with unscheduled pregnancy-related attendances has resulted in adverse outcomes, Centre for Maternal and Child Enquiries **(CMACE, 2007)** [(8).] Clear communication between physicians and obstetric triage personnel is recommended to rely on well-defined clinical criteria and to decrease the likelihood of these errors. Consistent communication between emergency department (ED) and obstetric personnel is essential when transferring obstetric patients from the (ED) to the (OB) triage unit, as these patients may initially present to the ED **(George & Evridiki, 2015)** [(9).]

Different definitions of triage were found, a common definition noted throughout the literature is that of a process which "places the patient in the right place at the right time to receive the right level of care" **(Qureshi & Veenema, 2003)** [(10)]**.** The Association of Women's Health, Obstetric and Neonatal Nurses has developed a tool for an improved, standardized approach to triage for pregnant women who seeks emergency or non-scheduled care. The Maternal Fetal Triage Index is formulated for best practices; it includes specific descriptions of the signs and symptoms with which women may present during all trimesters of pregnancy. Based on these symptoms, nurses assign one of five acuity levels to the woman and/or fetus. "There is a clear need for standardizing obstetric triage in clinical settings nationwide". "The Maternal Fetal Triage Index is a strong step forward in improving how nurses perform triage in the United States" **(Jimenez, 2015)** [(11)] **.**

Researchers explore obstetrics triage and describe the content validity and interrater reliability testing of the MFTI tool. They describe the process by which the MFTI tool was validated by a multidisciplinary group of clinicians **(Ruhl, Scheich, Onokpise, Bingham (2015)** [(12)]**.** These tools typically classify patients based on the urgency of the patient's condition, often using a five-level system, and can increase the proportion of high-acuity patients seen in an urgent fashion. This tool may be used to improve quality and efficiency of care and guide allocation of resources. Hospital obstetric units are encouraged to develop triage protocols based on local conditions but informed by evidence-based decision making **(Paisley, Wallace, DuRant, (2012)** [(13)]**.** Association of Women's Health, Obstetric and Neonatal Nurses' Maternal–Fetal Triage Index **(Fig. 2)** could serve as templates for use in individual hospital units.

For pregnant patient, assessment may be conducted by a registered nurse, certified nurse– midwife or certified midwife, nurse practitioner, physician assistant, as designated by hospital policy. Triage is followed by the complete evaluation of the woman and the fetus by a health care provider with skills and training appropriate to evaluate the issues identified during triage. The American College of Obstetricians and Gynecologists' *Guidelines for Perinatal Care* provides further information on what is necessary in this evaluation (**American Academy of Pediatrics, (2012)** [(14)] **.** Although a separate triage area and standing orders may facilitate care for obstetric triage patients, having an available health care provider appears to best optimize patient flow and reduce length of stay **(Zocco, Williams, Longobucco, Bernstein (2007)** [(15)] . The use of certified nurse–midwives, who provide obstetric emergency care triage services, may improve efficiency, reduce length of stay, and improve screening and evaluation.

Patient care is elevated through the practice of nursing staff measuring, monitoring, and disseminating patient care quality indicators and metrics, as well as working to continuously improve patient outcomes. The perinatal triage nurse is at the forefront of initial decision-making about patient entry into the system. Standardization of the process and appropriate designation of patient prioritization is the cornerstone of safety, as timely responsiveness is critical. Failure to recognize and respond to change of patient condition, failure-to-rescue incidents, and lack of timely triage are all increasingly litigated areas of obstetrics. In addition MFTI addresses key patient safety issues in a systematic approach, working to prevent untimely maternal-fetal death and improve fetal outcomes. So, this is important key role of nursing responsibilities **(Bailey, 2009)** [(16)].

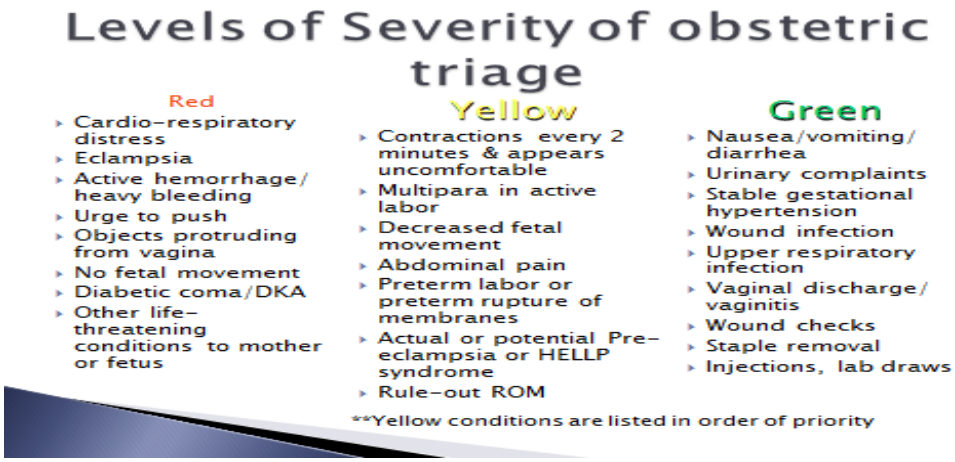

Figure (1) Levels of Severity of Obstetric Triage , Maternal Fetal Triage Index Adopted From AWHONN.(2016) [(17)]**….**

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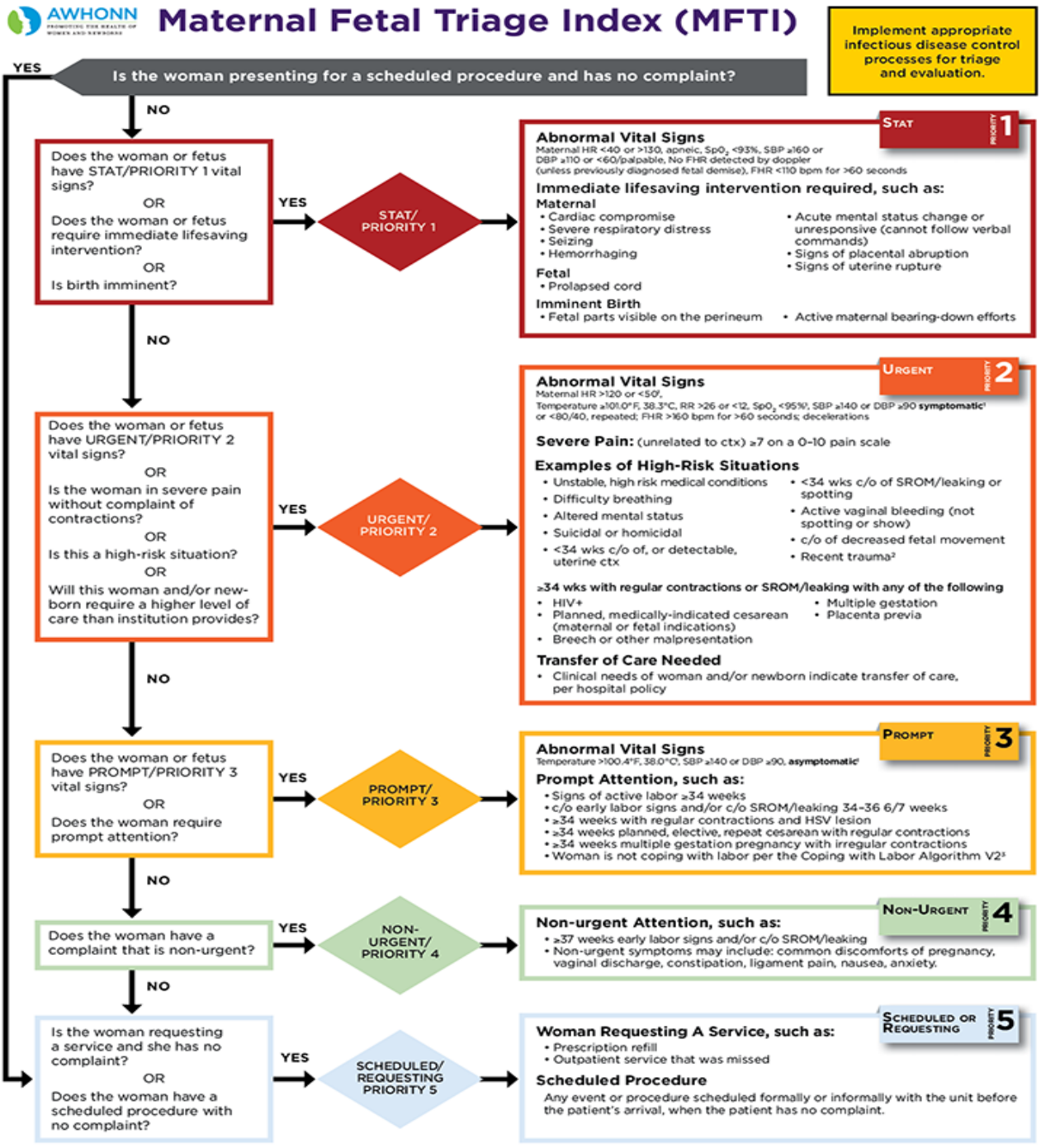

[1]High Risk and Critical Care Obstetrics, 2013

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

[3]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 judgment. 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.

Figure (2). Maternal–fetal triage index. Adopted from Ruhl C, Scheich B, Onokpise B, Bingham D. (2015) [18] . Content validity testing of the maternal fetal triage index. J Obstet Gynecol Neonatal Nurs;44:701–9.)

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2. AIM OF THE STUDY

To assess the effect of nurse's application of structure obstetrics triage guideline on pregnant women outcomes.

Hypothesis:

1. Nurse's application will be improved in knowledge after conducting Structured Obstetrics Triage Guideline for pregnant women Outcomes on post intervention than on pre intervention.
2. Nurse's application will be improved in practice after conducting Structured Obstetrics Triage Guideline for pregnant women Outcomes on post intervention than on pre intervention.
3. Nurse's application will be improved in evaluating maternal outcomes after conducting Structured Obstetrics Triage Guideline for pregnant women Outcomes on post intervention than on pre intervention.

3. SUBJECTS AND METHOD

Design: A prospective quasi-experimental design (pre and post intervention) was utilized.

Setting: The study was conducted at obstetrics department at Prince Hussein Bin Abdullah (Amman, Jordan)

Sample: A convenience sample consists of all nurses working in obstetric department at the time of data Collections were included in the study. Total number was **50** staff nurses & midwives as well as registered nurses and physicians employed on the maternity unit.

Tools of data collection:

I-Structured interviewing questionnaire: It was designed by the researchers after reviewing related literature. It was written in an Arabic language in the form of close and open-ended questions. It encompassed of two major parts: First part included personal and socio demographic data such as (age, qualifications, and years of experience in delivery room and attendance of training courses about obstetric triage. Second part included nurses' knowledge about **obstetric triage. It consisted of two sections;**

• First section (1) knowledge about obstetric triage, it consisted of (10) items

1. Definition, 2. Purpose, 3. Function of obstetric triage, 4. Factors that impact upon the communication process at triage, 5.Nursing role and responsibility, 6. Standardized approach to obstetric triage to improve processes and outcomes 7. Elements of assessment of obstetric triage 8. Levels of severity, 9. Actions for levels of severity,10. Elements of maternal and neonates outcomes.

• Second section (2) knowledge about Maternal Fetal Triage Index (MFTI) adopted from **AWHONN's, (2016)[19].** To educates perinatal nurses about obstetric triage basics—what triage means in obstetrics, the nurses' role, and how a systematic approach can be beneficial to improve the process of triage and outcomes. A five-level acuity classification index describes how it was used to prioritize a woman's urgency for provider evaluation. Clinical cases throughout the course and in the posttest assist the nurse to apply the concepts presented to prioritize the cases. It consisted of (6) items.

1 .Definition of MFIT index, 2- How does the nurse use the MFTI? 3- What is the value of assigning an MFTI? 4. Priority level indicating a woman's urgency for evaluation if there is only one woman presenting for triage? 5-Can we integrate the MFTI into our electronic medical record (EMR) at this time? 6-What about education on the MFTI and evaluation for maternal and neonatal outcomes?

Scoring system: Each item was assigned

A score of (2) given when the answer was correct,

A score (1) was given, when the answer was partially correct and

A score (0) was given when the answer was incorrect or don't know.

The total score for the knowledge of nurse was calculated by the addition of the total score of all sections. In addition, nurses' total knowledge score was converted into total percent and graded as the following; poor when total score was (<60), average when total score was (6 0%- 75%) and good when total score was (<75%).

Procedure for Data collection:

- **Study period:** The process of data collection was carried out from Jan 2016 to May 2017.

- **Approval to conduct the study:** Before conducting the study the researcher obtained approval from Ministry of Health, Jordan. Also the researcher obtained written consent from the directors of Prince Hussein Bin Abdullah hospital.

- **Tools Development:**

- Validity: Content Validity of the tools was ascertained by review of literature about obstetric triage. Then, the content of the questionnaires were submitted to a panel of 3 of nursing and medical experts who reviewed the instruments for content validity two from Nursing obstetric, and one from obstetric medicine.

- Reliability: Reliability analysis was used to determine the extent to which the items in the questionnaire are stable, and related to each other. A test –re-test reliability was done to assess the consistency of the tool, to measure items reliability. The questionnaire was given to a group of 5 subjects and the answers were analyzed. The same questionnaire was given to the same group after 2 weeks and the answers were analyzed and computed to the results of the first test. The reliability was computed. It was (r = .86).

- The pilot study was carried out on 10 of the sample. They were excluded from the study sample, to test the clarity of data collection tools. Also, to detect any obstacle or problem that might arise in data collection, and estimate the time needed to fill the tools. Modification of the tools was done to clarity of the sentences, the appropriateness of its content, the sequence of its items, and the accuracy of scoring and recording of the items in accordance.

- **Ethical considerations:** Participants gave their consent after explaining the aim of the study. Emphasis was placed on each participant's right to withdraw from the research at any time with no negative repercussions. The nurses were also assured that any information obtained during the study would remain confidential and be used for research purposes only.

- Assessment: Initially the nurses were interviewed to get baseline data. At the beginning, explained the aim, duration, and activities of the study. Pre-tests were done to assess nurses' knowledge about obstetric triage and MFTI, then the researcher started planning by incorporating baseline information obtained from pre-test assessments and relevant literature.

- The structured obstetric triage guidelines was developed in the form of a written Poster to compensate for the obstetric nurses' information deficit relating to obstetric triage as well other methods used for education as simulation and role play were used. Then final objective of the instructional intervention was to enhance nurses' information and improve care during pregnancy and labor as well as evaluate outcome prospectively relevant to application for guidelines and according to women triage classifications. So, typical triage protocols involve an initial assessment and decision about the priority level for evaluation.

- The nurses performing triage should assign the patient's acuity during the first encounter. Triage is followed by the complete evaluation of the woman and the fetus by a health care provider with skills and training appropriate to evaluate women and their fetus classified as adequately done, partially done and not done.

- The researcher was available 3 days/week to practice Triage with health care staff and divided all nursing staff into small groups (5 nurses). The total sessions were 10 sessions, the researcher stayed with each session around 45 minutes to explain MFTI and methods of evaluation for outcomes.

Statistical analysis:

Upon completion of the data collection, each answer sheet was coded and scored. Data were statistically analyzed using (SPSS) statistical package version 16 on IBM compatible computer. Test of significance was used and level of significance is $p < 0.05$. Statistical presentation and analysis correlations r and relationship in a form of cross tabulation was done. Qualitative data were expressed as number and percentage and analyzed by applying: Chi – square test for qualitative variable analysis.

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4. RESULTS

Table (1): represented that more than one third of studied nurses 34% were ranged between age of 26-30 years old, their levels of education varies between secondary education, midwiferies' and nurse specialization, less than half of them (42%) were have only two years of experience. Also, majority of them attended and triage courses (84%).

Table (2) represented increases knowledge of nurses about Triage after intervention than before intervention with statistical significance difference p<0001 for all knowledge items.

Table (3) showed Knowledge of nurses about Maternal Fetal Triage Index in which the most of them were become more knowledgeable, and their knowledge become completely corrected for in all knowledge items of MFTI. So, there were a statistical significance difference P<0.001 between their knowledge after intervention than pre intervention.

Table (4) showed significantly increased in nurses total knowledge regarding triage and MFIT after intervention than before the intervention P<0.0001

Figure (3) represented significantly decreased nurse's total knowledge regarding Triage and MFTI below the confidence level at pre intervention and not reached to the confidence level.

Figure (4) represented increases nurses knowledge about triage and MFTI after intervention above upper confidence level.

Table (5) showed a highly statistical significance difference P<0,01 for nursing practicing Maternal Fetal Triage Index after intervention regarding to the number of urgent or emergent elicited cases and maternal fetal outcomes evaluation.

Table (6): There were a positive correlation between maternal total knowledge, fetal outcomes and numbers of urgent and emergent elicited case after triage intervention at 0,001 levels of statistical significance.

Figure (5): represented nurse's evaluation for fetal outcomes before intervention below the confidence level, while after intervention increase their level in outcomes evaluation to reach the upper confidence levels

Figure (6): represented nurse's evaluation to improve maternal outcomes before intervention below the confidence level, while after intervention increase their level of outcomes evaluation above the upper confidence level

Table (7): Relationship between total knowledge score, total knowledge MFTI, with nurses characteristics and fetal outcomes. represented that there were a significant relationship P<0.001 between nurses total knowledge after than before intervention as well as total knwledge for MFTI in relation to nurses levels of education, jobs, years of experience and evaluating fetal outcomes

Table (1): Biosocial characteristics of studied nurses

Nurses characteristics	No	%
Age of nurses		
>20 yrs.	11	22.0
20-25 yrs.	10	20.0
26-30 yrs.	17	34.0
31-35yrs.	7	14.0
<35 yrs.	5	10.0
Nurses type		
Nurses specialized	35	70.0
Midwifery	15	30.0
Levels of education		
Secondary education	13	26.0
Midwiferies	10	20.0
Specialized nurse	14	28.0
Supervisors	5	10.0
Physicians	8	16.0
Years of experience		

Less than 2 yrs.	21	42.0
3-5 yrs.	19	38.0
6-8 yrs.	6	12.0
10 yrs. or more	4	8.0
Attending courses about triage		
Yes	8	16.0
No	42	84.0

Answer Research Hypothesis Number One

Nurse's application will be improved in their knowledge after conducting Structured Obstetrics Triage Guideline for pregnant women Outcomes on post intervention than on pre intervention.

Table (2): Knowledge of nurses about Triage before and after intervention

Knowledge items	**Knowledge before intervention**		**Knowledge after intervention**		**X^2 P. Value**
	No.	**%**	**No.**	**%**	
Know definition of triage					1.64
Correct	11	22.0	47	94.0	
Partially correct	32	64.0	3	6.0	0.000
I don't know	7	14.0	0	0	
Know purpose of triage					
Correct	6	12.0	46	92.0	10.72
Partially correct	23	46.0	4	8.0	0.000
I don't know	21	42.0			
Know function of triage					
Correct	0	0.00	44	88.0	38.72
Partially correct	32	64.0	6	12.0	0.000
I don't know	18	36.0	0	0.0	
Know affecting triage communication					
Correct	2	4.0	46	92.0	
Partially correct	40	80.0	2	4.0	50.08
I don't know	8	16.0	2	4.0	0.000
Know nurses role during triage					
Correct	3	6	46	92.0	23.56
Partially correct	31	62.0	4	8.0	0.000
I don't know	16	32.0	0	0.0	
Know if triage improve maternal and fetal outcomes					
Correct	32	64.0	46	92.0	3.92
Partially correct	18	36.0	4	8.0	0.000
I don't know	0	0.0	0	0.0	
Know elements of triage obstacles					
Correct	8	16.0	46	92.0	35.28
Partially correct	34	68.0	4	8.0	0.000
I don't know	8	16.0	0	0.0	
Know levels of severity					
Correct	3	6.0	47	94.0	12.40
Partially correct	38	76.0	3	6.0	0..000
I don't know	9	18.0	0	0.0	
Know actions for levels of severity					
Correct	19	38.0	45	90	
Partially correct	38	56.0	5	10.0	2.32
I don't know	3	6.0	0	0	0.000

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Table (3): Knowledge of nurses about Maternal Fetal Index Triage (MFIT)

Knowledge items	Knowledge before intervention		Knowledge after intervention		X^2 P. Value
	No.	%	No.	%	
Know definition of MFIT					12.32
Completely correct	7	14.0	48	96.0	
Incompletely correct	30	60.0	2	4.0	0.000
Incorrect	13	26.0	0	0	
How does nurse use it?					
Completely correct	7	14.0	46	92.0	11.08
Incompletely correct	28	46.0	4	8.0	0.000
Incorrect	15	30.0			
Know value of assigning					
Completely correct	5	10.00	47	94.0	15.28
Incompletely correct	10	20.0	3	6.0	0.000
Incorrect	35	70.0	0	0.0	
Know primary level urgency for evaluation					
Completely correct	12	24.0	48	96.0	22.24
Incompletely correct	32	64.0	2	4.0	0.000
Incorrect	6	12.0	0	0.0	
Know integration in medical electronic record					
Completely correct	2	4	46	92.0	33.88
Incompletely correct	13	26.0	1	2.0	0.000
Incorrect	35	70.0	3	6.0	

Table (4): Nurses total knowledge score for triage and Maternal Fetal Index Triage (MFIT)

Knowledge items	Knowledge before intervention		Knowledge after intervention		X^2 P. Value
	No.	%	No.	%	
Total knowledge score					
>60% poor knowledge	31	62.0	0	0	19.96
60-75% Fair knowledge	13	26.0	4	8	0.000
<75% Good knowledge	6	12.0	46	92	
Total knowledge score MFIT					
>60% poor knowledge	38	76.0	1	2.00	35,28
60-75% Fair knowledge	7	14.0	4	8.00	0.000
<75% Good knowledge	5	10.0	45	90.00	

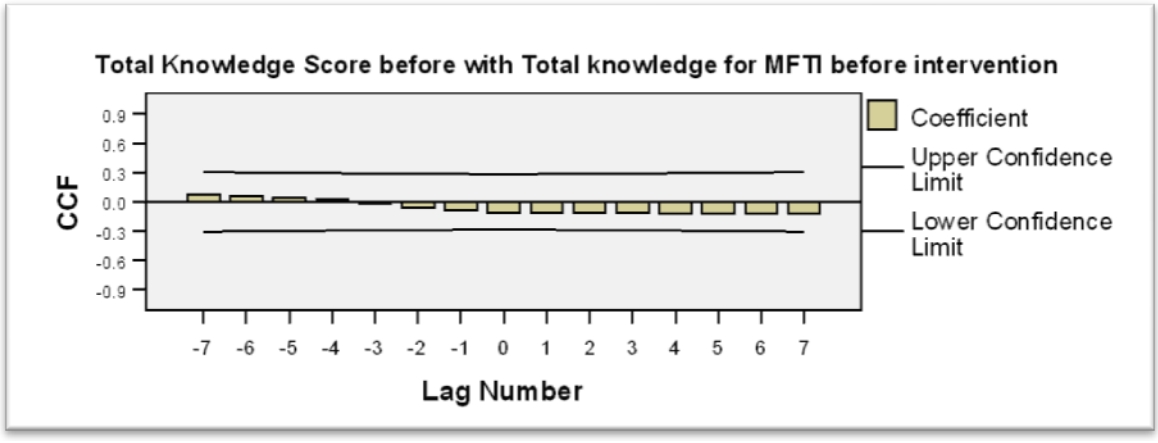

Figure (3): Total Nurses knowledge score and total knowledge score for MFTI before intervention

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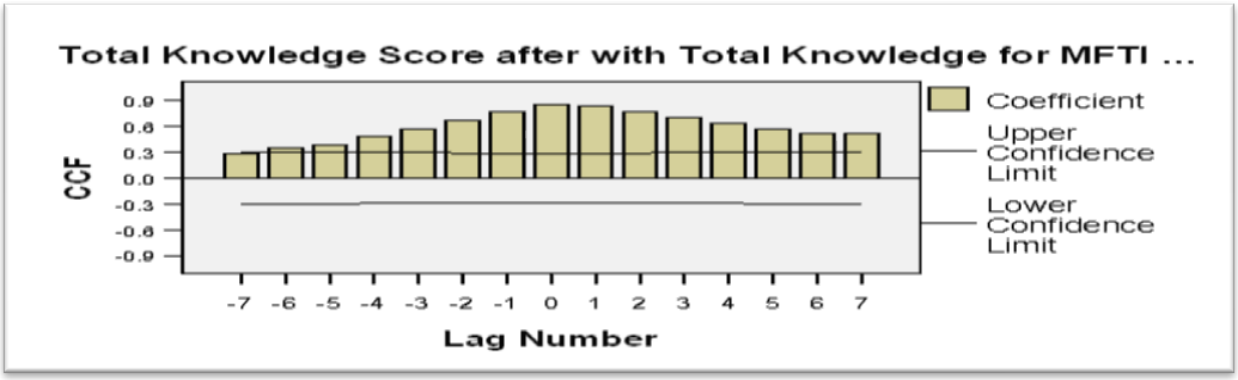

Figure (4) represented nurse's knowledge about triage and MFTI after intervention

Answer Research Hypothesis Number Two:-

Nurse's application will be improved in practice after conducting Structured Obstetrics Triage Guideline for pregnant women Outcomes on post intervention than on pre intervention.

Table (5): Nurses practice for Maternal Fetal Triage Index (MFIT)

Practice items	Practice before intervention		Practice after intervention		X^2 P. Value
	No.	%	No.	%	
Giving health education about MFIT					
Completely done	0	0.0.0	47	94.0	38.72
Incompletely done	6	12.0	3	6.0	0.000
Not done	44	88.0	0	0	
Numbers of urgent elicited cases (Obstetric and non obstetric symptoms)					
Completely done	9	18.00	46	92.0	28.88
Incompletely done	35	70.0	4	8.0	0.000
Not done	6	12.00	0	0.00	
Number of emergent cases (Obstetric and non-obstetric symptoms)					
Completely done	0	0.00	44	88.0	35.28
Incompletely done	46	82.0	6	12.0	0.000
Not done	4	8.0	0	0.0	
Maternal and fetal outcomes evaluation					
Completely done	12	24.0	45	90.0	25.48
Incompletely done	33	66.0	5	10.0	0.000
Not done	5	10.0	0	0.0	

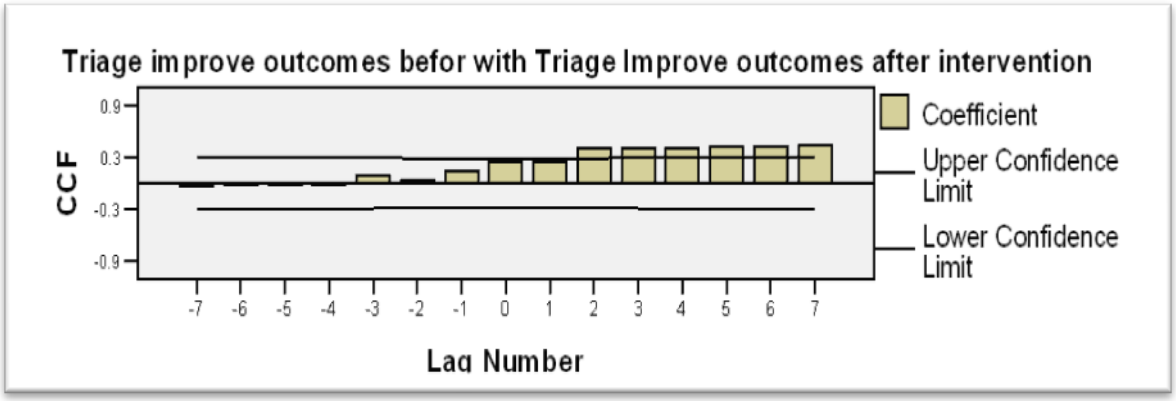

Figure (5): Nurses practice to improve feto-maternal outcome before and after interventio

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Answer Research Hypothesis Number Three:-

Nurse's application will be improved in evaluating maternal outcomes after conducting Structured Obstetrics Triage Guideline for pregnant women Outcomes on post intervention than on pre intervention.

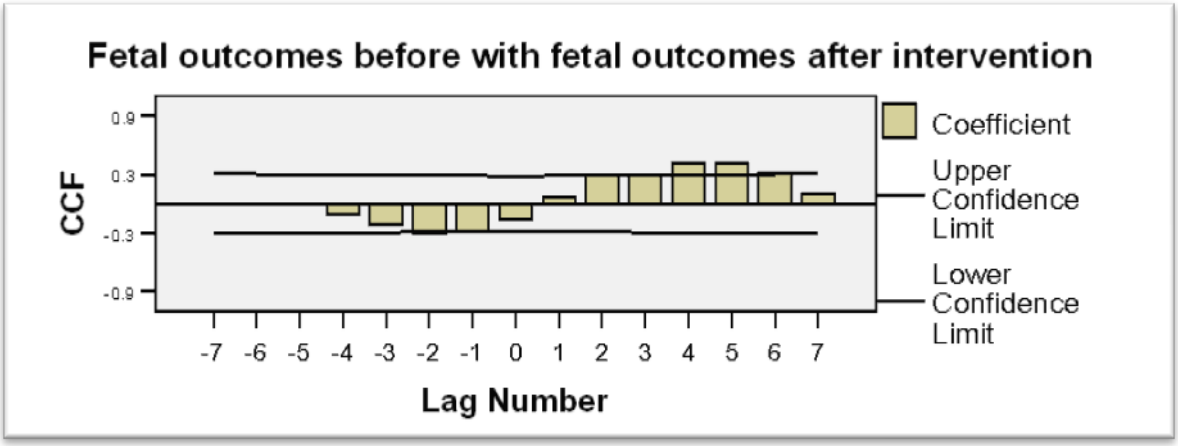

Figure (6): represented nurse's evaluation for fetal outcomes before and after intervention

Table (6): Correlation between maternal total knowledge, fetal outcomes and numbers of urgent and emergent elicited case after triage intervention

Knowledge items	Total triage knowledge	Total FMIT knowledge	Evaluation of maternal and fetal outcomes
Number of urgent case	.875** 0.000	..644** 0.000	.903** 0.000
Number of emergent cases	.799** 0.000	.751** 0.000	.758** 0.000

Correlation is significant at 0.001 levels of statistical significance

Table (7): Relationship between total knowledge score, total knowledge MFTI, with nurses characteristics and fetal outcomes

Levels of education and nurses specialty features	Total knowledge before			Total knowledge after		X^2 P. Value	Total knowledge MFTI before			Total knowledge MFTI after		X^2 P. Value
	>60% poor	60-75% Fair	<75% Good	60-75% Fair	<75% Good		>60% poor	60-75% Fair	<75% Good	60-75% Fair	<75% Good	
Levels of education												
Secondary ed.	9	0	0	6	3	316	9	0	4	0	13	
Midwiferies	16	0	0	0	16	.000	16	0	1	0	16	31.88
Specialized nurse	0	0	0	0	6		0	2	1	4	4	
Supervisors	0	9	6	0	9		3	6	0	0	5	
Physicians	6	4	0	0	10		0	0	8	0	8	.00
Nurses jobs												
Nurses specialized	13	0	0	0	13	13.13	10	3	0	0	13	
Supervisor	5	1	2	0	5	.001	3	2	0	2	5	15.90.
Midwifery	10	7	4	10	14		12	4	0	4	14	.000
Physician	1	1	6	0	8		6	5	5	4	8	
Years of experience												
Less than 2 yrs.	12	9	0	0	21	55.68	19	2	0	0	21	50.00
3-5 yrs.	19	0	0	6	13	.000	19	0	0	0	19	0.000
6-8 yrs.	0	4	2	0	6		0	5	1	0	6	
10 yrs. or more	0	0	4	0	4		0	0	4	2	2	
Fetal outcomes												
Adequately done	5	2	8	4	45	39.13	38	7	4	6	39	22.20
Partially done	2	4	1	0	1	.000	0	0	1	0	5	
Not done	20	8	0	0	0		0	0	0	0	0	.000

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5. DISCUSSION

Obstetric triage is a multidisciplinary, multivariable, and a complex specialty within the prenatal, labor and delivery unit. It is comparable to an emergency department, with unpredictable census, chief complaints, and unexpected challenges. Obstetric triage is a hastily growing vicinity of obstetric care where in maximum being pregnant risk are evaluated beginning at 20-24 weeks' gestation. This renewed interest in establishing obstetric triage devices and using advanced practice nurses as care carriers has heightened the visibility of obstetric triage for administrators and practitioners alike. Obstetric triage is one of the key elements of supervision in delivery unit, if it is not achieved at general degree; the effects of outcomes of women during pregnancy, labor and efficiency of obstetric unit get compromised **Julie (2012)[20].** The aim of this study was to assess the effect of nurse's application of structure obstetrics triage guideline on pregnant women outcomes.

Regarding answer Research hypothesis number one:

Nurse's application will be improved in their knowledge after conducting Structured Obstetrics Triage Guideline for pregnant women Outcomes on post intervention than on pre intervention.

The present study revealed increases in nurses' knowledge about Triage after intervention than before intervention with statistical significance difference for all knowledge items about triage. This result was congruent with **Saissakos, et al., (2009) [21]** who studied "The active components of effective training in obstetric emergencies". They reported that "most enjoyment from their training, found obstetric units that used simulation used as a teaching methods had better clinical outcomes and the staff that received this triage training sustained improvements in their knowledge and confidence levels where obstetric emergencies were concerned".

Regarding nurses Knowledge about Maternal Fetal Triage Index (MFTI) in which most of them were become more knowledgeable, and their knowledge become completely corrected for in all knowledge items of MFTI. So, there were a statistical significance difference $P<0.001$ between their knowledge after intervention than pre intervention. The current study was in line with **Jolene (2013)[22]** who studied "Increasing labor and delivery nursing knowledge of triaging nursing non obstetric medical emergency in pregnant women through the use of simulation" Also, this get in accordance in study about "The introduction of the new symptoms specific obstetric triage system in an acute care: An examination of the view and experience of midwives. Their results represented that Triage was useful for some of managing the department and the workload as well as still allowed the use of clinical judgment for most midwives. Also, clinicians are excellent at problem solving and their views as well as experiences are valuable in service improvement initiatives. This discrepancy may attributed to the successful theoretical and practical sessions which given by the researcher and abilities to enhance their knowledge. The MFTI specifically address both maternal and fetal evaluation immediately at the time of patient presentation and improves efficiency of workflow. The tool is easy to use, and provides the necessary education for implementation. Quality of care then improved by the fact that patient prioritization for provider evaluation is enhanced, escalation of care level occurs in a timely manner, and outcome is ultimately improved for both mother and baby.

Regarding answer Research hypothesis number two:

Nurse's application will be improved in practice after conducting Structured Obstetrics Triage Guideline for pregnant women Outcomes on post intervention than on pre intervention.

The present study revealed increases in nurses' practicing for Maternal Fetal Triage Index (MFTI) after intervention, with high statistical significance difference between nurse's practices after intervention then pre intervention. This result was consistent with **Birch et al., (2007). [23]** Who Studied "Obstetric skills drills: Evaluation of teaching methods. Nurse Education Today". They reported that obstetric units and clinicians who had regular training as part of their education were eligible for lower malpractice rates, and discussed how simulation of obstetrical emergencies improved the knowledge about MFIT this is reflected that the provided practical sessions were effective. These results prove the effectiveness of conducting Structured Obstetrics Triage Guideline for pregnant women.

Regarding answer Research hypothesis number three:

Nurse's application will be improved in evaluating maternal outcomes after conducting Structured Obstetrics Triage Guideline for pregnant women Outcomes on post intervention than on pre intervention.

The present study revealed increases in nurses' practicing in relation to improve maternal outcomes after intervention increase their level of outcomes evaluation "above the upper confidence levels", than before intervention "below the confidence level", while This results was in accordance with **Schull et al., (2015). [24],** whose study "association between patient wait times and patient confidence in the care provider and perceived quality of care". A correlation between employee perception of a professional practice environment and employee job satisfaction has been shown in studies and serves as the motivating force hospitals patient care for quality, excellence in nursing, and new techniques in nursing practice. From the researcher perspective, the nurse should focused their structured education on their adherence to guidelines to increase complains rate, decrease associated cost and increase outcome survival.

Regarding to relationship between total knowledge score, nurses characteristics and fetal outcomes results represented increased total knowledge score after intervention then pre intervention with positive correlation. This is contrasted with results of **Hashem et al., (2013) [25],** whose study about "Effects of Triage Education on Knowledge, Practice and Qualitative Index of Emergency Room Staff". They pointed out that, there was no significant correlation between nurses characteristics and personal knowledge of triage score 6-week after training (*r=0.018, p=0.126*). However, significant positive correlation was found between nursing work experience in emergency ward and type of employment as well as performance scores 6 weeks after training (*r=0.258, p=0.032*). Also, Performance scores of personnel with experience of less than three years were equal with those with less than two years in pre intervention then the difference between them was statistically significant. These results are consistent with those of **Taheri *et al.*, (2005) [26]**. They reported that triage performance scores six weeks after training was higher in personnel with experience of more than two years and the difference between them was statistically significant. They concluded that there was a relationship between work experience and performance in emergency department triage score this is represented that triage training of the nurses in the emergency department qualitative indices were impressively upgraded for their knowledge and practices.

Also, results showed that nurses knowledge reflected on their performance related to the use of MFTI practices which increased and upgrading the maternal and fetal outcome evaluation represented on their prognosis for eliciting obstetric and non-obstetric manifestations (problems unrelated to pregnancy) such as Antenatal – Vaginal bleeding, Miscarriages, Abdominal pain, Ectopic pregnancy, urinary tract infection (UTI), Hyperemesis, Itch / Rash in pregnancy, Hypertension, Absent or Reduced Fetal movements, Episiotomy infections, Caesarean scar infection, Retained placenta, mastitis, pyrexia, UTI, Dysfunctional uterine bleeding, Infection, Pelvic pain, UTI, infections, Ovarian cyst, and Post-operative complications. In addition to the knowledge and performance of emergency nurses, other important factors affecting women's condition include the emergency services, the number of hospital admissions, presence of special and formal processes, and in service education at hospitals. These preliminary data suggest that some features of clinical assessment which can identify women at increased risk of poor perinatal outcome then after intervention such women may be prioritized for detailed assessment of fetal growth and wellbeing such as reported by **O'sullivan, et al., (2009) [27].** So, these results can be considered a perspective view for future and further evaluation.

6. CONCLUSION

The use of structured obstetrics Triage Guideline for Pregnant Women Outcomes in improving the practice and knowledge of nurses and improve their abilities to elicited emergent cases and evaluate the outcomes.

7. RECOMMENDATIONS

1- Theoretical and practical training of triage for nurses in hospitals as well as undergraduate curriculum and continuous educational training programs about obstetric triage for health team should be provided to increase their knowledge and skills

2- Simple manual guidelines for Triage and MFTI should be available at every obstetric unit to guide nurses to pritorize newly admitted cases according to severity of obstetric symptoms

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

4- Comparison of the quality of patient triage by nurses, physicians and emergency medical technicians in the emergency department are the subjects for further studies.

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