

## Implication of Applying Evidence-Based Nursing Practice Guideline during Second Stage of Labor on Maternal and Neonatal outcomes.

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**Background:** utilization of evidence-based nursing practice guidelines during second stage of labor has become a basic women's health needs, in order to decrease risks for both women and neonates. **Aim of the study:** to evaluate the implication of applying evidence-based nursing practice guidelines during second stage of labor on maternal and neonatal outcomes. A **Quasi-experimental design** was used to conduct the current study at delivery room affiliated to obstetric and gynecologic department, Benha University Hospital during the period from January 2015 to April 2015. **Subjects:** A simple random sample of 279 Primipara women who selected according to the study formula based on the total number of women who admitted to the above setting during 2014. These were randomly allocated into two groups. study group who, had nursing care according to the utilized evidence based guideline, control group had ordinary nursing care. **Tools:** Four tools were utilized for data collection, structured interviewing questionnaire sheet, maternal outcomes measurements tool, fatigue assessment scale and neonatal outcomes measurements tool. **Results:** a highly statistically significant difference between two groups regarding the duration of the second stage, rate of perineal laceration and fatigue and energy subscales scores. Moreover there was a statistically significant difference regarding the incidence of perineal laceration and Apgar score of the neonate during both first and fifth minute. **Conclusion;** utilization of evidence based nursing practice guideline for management of the second stage of labor decrease the duration of second stage, perineal laceration, decreases postpartum fatigue, maintain postpartum energy and improve neonatal outcomes. **Recommendation;** nursing management during the second stage of labor should be provided based on evidence based practice guidelines.

**Key words:** Evidence-Based, Nursing, Guidelines, Practice, Second stage of labor, Maternal, Neonatal, Outcomes.

### I. Introduction

The Emergence of High-Tech Birthing," suggests that nurses can balance technology in birth by using evidenced-based practice, evaluating their personal birth philosophy, promoting family-centered maternity care and increasing skills in labor support<sup>(1)</sup>. Evidence-based practice provides a systematic, participative approach to the design, implementation, and evaluation of evidence-based practice guidelines for the use of practitioners in clinical settings. The first step in the evidence based process is to identify a problem in current practice which would represent a trigger for change in practice. The second step is to review and critique of relevant literature. The third step is to identify research evidence that supports the change in clinical practice. The final step is to implement the change in practice and monitor the outcomes<sup>(2)</sup>. According to the Association of Women's Health, Obstetric and Neonatal, Nurses develop of guideline for the management of the second stage of labor. The goals were (a) to assist in promoting the birth of the non compromised fetus by minimizing negative maternal hemodynamic changes caused by inappropriate positions and pushing techniques and (b) to minimize maternal fatigue.<sup>(3)</sup>

The second stage of labor has traditionally been defined by a very clinical description :from full dilatation of the cervix to birth of the baby .It is now recognized that this stage of labor has both a passive and an active phases<sup>(4)</sup>.The passive phase is the time from when cervix is fully dilated but there is no urge to push<sup>(5)</sup>.This phase follows the transition phase which occurs at the end of the first stage of labor, and that it is the time when the woman may feel drowsy and relaxed ;the presenting part may still be high<sup>(6)</sup>. The active phase is recognized when the woman experiences expulsive contractions and had a strong urge to push ,the cervix is fully dilated and the baby is visible<sup>(7)</sup>.

The second stage of labor is a period of increased risk for the fetus and mother, so the primary goal of nursing care during the second stage of labor is to ensure the best possible outcome for the women and

neonates<sup>(8)</sup>. Nursing care focuses on establishing a meaningful, open relationship; determining the fetal status; encouraging the woman's self direction; and supporting the woman and her family throughout the labor and birth process.<sup>(9)</sup>

As with all aspects of maternity care in accordance with a rights-based approach, the individual needs of the mother during the second stage of labor should be taken into consideration, tailoring care to an individual's needs while offering care. A particularly important aspect is information and communication that prepares the woman for what to expect during labor and delivery.<sup>(10)</sup>

In addition this is the stage in labor where the contribution of a qualified and skilled attendant is the most critical in ensuring a safe outcome. While attending a delivery, the timing and process of active pushing should be guided so that this is encouraged only when the cervix is fully dilated and when the presenting part has engaged in the pelvis and the woman feels the urge to push.<sup>(11)</sup> The maternity nurse has the role of encouraging the women to adopt positions of their choice in which they are most comfortable, while remembering the advantages of upright position; as squatting or sitting.

## **II. Significance of the Study.**

The second stage is the stage of increase risks to women and the neonate. However, the provision of skilled care and avoidance of complications during the second stage of labor have been relatively neglected. In spite of the importance of the second stage of labor, there are very few comprehensive evidence-based clinical practice guidelines for second stage management<sup>(12, 13)</sup>. These guidelines are intended to strengthen policy and frameworks for care provision to enable providers to attend to women in the second stage of labor in line with current evidence-based recommendations for practice to optimize outcomes for mother and neonate<sup>(3)</sup>. So the researcher of the present study intended to evaluate the implication of applying evidence- based nursing practice guidelines during second stage of labor on maternal and neonatal outcomes.

## **III. Aim Of The Study**

The aim of the present study was to evaluate the effect of applying evidence- based nursing practice guidelines during second stage of labor on maternal and neonatal outcomes.

## **IV. Research Hypothesis.**

Primipara normal vaginal delivery woman who had care according to the utilized evidence- based nursing practice guidelines will have better maternal and neonatal outcomes than those who had ordinary nursing care.

## **V. Material and Methods**

### **5.1. Design:**

A quasi experimental study design was utilized to conduct the current study.

### **5.2. Setting:**

The present study conducted at delivery room affiliated to obstetric and gynecologic department, Benha University Hospital.

### **5.3 Sampling:**

**A-Type:** A simple random sample ..

### **B-Size:**

Sample size was calculated based on the previous year normal vaginal census report of the obstetrics and gynecology department at Benha University Hospital. The total number of primipara with normal vaginal delivery was 920. (*Benha University Hospital Census, 2014*)<sup>(14)</sup>. Sample size was calculated utilizing the following formula<sup>(15)</sup>.

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n= sample size

N= total population (920)

e= margin error (0.05)

A total 279 of normal vaginal delivery Primipara women were recruited in the current study. They were randomly allocated into two groups: group (1) control group included 131 Primipara women they had ordinary nursing care. Group (2) study group included 148 Primipara women they had nursing care according to the utilized evidence based practice guidelines.

### **C-Technique:**

Control group related intervention and assessment were firstly applied at the first half of time of data collection (1st 2 months).this was applied to avoid and reduce bias during sample collection.

Study group related intervention and assessment were applied at the second half of time of data collection (2<sup>nd</sup> 2 months).

### **D-Inclusion Criteria**

All normal vaginal delivery Primipara women were included after fulfillment of the following criteria.

Women aged 18-35 years.

Spontaneous vaginal delivery

Primigravida women

Free from medical disorders.

Women at the gestational period between 38-42 weeks.

No obstetric complication during first stage of labor.

### **Exclusion Criteria**

Morbid obese women with body mass index more than 30kg/m<sup>2</sup>.

Women with prolonged first stage of labor.

Women who had ante partum hemorrhage .

Women who had premature rupture of membrane.

## **5.4 Tools of Data Collection**

Four tools were utilized for data collection.

### **Tool (1): Structured Interviewing Questionnaire Sheet:**

It was developed by the researchers based on scientific literatures <sup>(16,17)</sup>, it was divided into two parts:-

**Part 1:** demographic data sheet concerning with data such as; age, educational level, residence height, weight and body mass index etc.

**Part 2:** concerning with current obstetric data including; gestational age, time of the first stage of labor, time of membrane rupture, methods of membrane rupture.

### **Tool (2): Maternal outcomes measurements tool.**

It was developed by the researchers after reviewing related literatures <sup>(17, 18)</sup>, to evaluate maternal outcomes. It included (duration of the second and third stage of labor, rate of episiotomy and Perineal tear, and third stage complication).

### **Tool (3): Fatigue Assessment and Analysis scale.**

Visual analogue scale–fatigue (VAS-F) adapted by **Troy and Dalgas-Pelish** <sup>(19)</sup> to evaluate postpartum woman fatigue. It was used in the present study to evaluate women s' fatigue and energy after delivery. The (VAS-F) tool consists of an 18-item scale.(13) Items concerning fatigue and 5 items on energy).Items 1-5 and 11-18 belong to the fatigue subscale. Items 6-10 belong to the energy subscale. With actual use, the horizontal lines should be exactly 10 cm. Each analogue scale has bipolar end anchors related to descriptors of fatigue, with a high score indicating more of the attribute (fatigue or energy). Woman was asked to put (X) mark on the horizontal line. And finally the researcher measure the fatigue score through measuring the point at which the (x) mark was found.

### **Tool (4): Neonatal outcomes measurements tool.**

It was adopted from **Casey, McIntire, and Leveno** <sup>(20)</sup> and modified by the researchers to evaluate neonatal outcomes. It included (neonatal characteristics sex, weight, Apgar score (at 1<sup>st</sup> and 5<sup>th</sup> minutes) and incidence of neonatal admission to the neonatal intensive care unit (NICU). Apgar score scoring system was identified as good (8-10 score), Moderate asphyxia (5-7), and finally sever asphyxia (0-4).

**Tool validity.**

The content validity was done through five panels of expertise in the field of maternity and pediatric nursing to test the content validity. Modification was carried out according to the panel's judgment on the clarity of sentences and appropriateness of content. The percentage of consensus among experts regarding the structured interviewing questionnaire was 97.0%, maternal outcomes measurements tool was 98.0% , fatigue Assessment and Analysis scale and neonatal outcomes measurements tool 98.0%.

**Pilot Study**

The pilot study was conducted on 10.0% of the total sample to test the feasibility and the reliability of the tools. It revealed that, test-retest reliability and internal consistency for the interviewing questionnaire was ( $r = 0.89$  and  $\alpha = 0.91$  respectively ). Maternal outcomes measurements tool related Cronbach's alpha were ( $\alpha = 0.89$  ) . In addition Cronbach's alpha for fatigue assessment and analysis scale were (0.876, & 0.943) for both fatigue and energy scale respectively, and Cronbach's alpha of neonatal outcomes measurements tool was ( $\alpha = 0.93$  ) . The samples of the women included in the pilot study were excluded from the main study sample.

**5.5 Ethical considerations:**

This study was conducted under the approval of the Faculty of Nursing Ethics Committee, Benha University. Participants were given explanations about the purpose of the study, and they were also informed that they could withdraw from the study at any time before the completion of the study. Participants who agreed to complete in this study were asked to sign a consent form. Confidentiality of participants' information was assured and the data were accessed only by the investigators involved in the study.

**5.6 Field of work**

Data were collected from the beginning of January, 2015 till the end of April 2015. Each woman firstly was enrolled in the study when cervical dilation reached 10 cm (second stage of labor). For study group: care was providing to the woman according to the evidence based practice guidelines. The utilized guideline in the present study was evidence-based clinical practice guideline, which was designed by Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN)<sup>(11)</sup>. The interventions and practices considered in the guideline included:

1. Educational preparation of the woman for the second stage of labor, including  
Providing information on the following:  
Realistic estimation of the phases and duration of second stage of labor  
Variety of sensations to be experienced  
Directed and non directed pushing techniques  
Positions woman might assume (e.g., potential benefits of upright position and avoidance of supine position) .  
Benefits of having support persons present
2. Supportive care: physical, emotional, instructional and advocacy
3. Positioning: a wide variety of position options available
4. Facilitating delayed and non directed pushing techniques
5. Evaluation of physiologic processes

For the control group: ordinary care was provided. For both groups women were followed from the beginning of the second stage of labor to the immediate 4 hour of postpartum period. Maternal and neonatal outcomes measurements were assessed by the study researchers. Postpartum fatigue and energy was assessed for each woman utilizing visual analogue scale-fatigue (VAS-F) tool at the immediate 15 minutes and 4 hours after delivery.

**VI. Data Analysis**

Data analysis was performed using IBM SPSS statistical software version 15. The data were explored. Descriptive statistics with mean and standard deviation (SD) for continuous variables and frequency for categorical variables were analyzed. Qualitative variables were compared using chi square test ( $\chi^2$ ) as the test of significance and independent (t) test was used to compare mean score between two groups .the p-value is the degree of significant. A significant level value was considered when  $p\text{-value} \leq 0.05$  and a highly significant level value was considered when  $p\text{-value} \leq 0.001$ , while  $p\text{-value} > 0.05$  indicates non-significant results.

**VII. Results**

**Table (1):** presents the general characteristics women under the study. It was observed that, the mean age of participants under study was (25.25±2.88), in study and control groups were (25.37±2.81, & 25.19±2.96 years) respectively. In addition, the same table manifest that, more than half of women had a secondary educational level. Concerning residence, it was found that, 65.5% and 64.9 % of study and control groups were residing in urban areas. Furthermore, this tables illustrates that the majority of study and control groups women were housewife (86.0%, 85.8%) respectively.

**Table (2):** displays the characteristics of the current process of labor, it was observed that there was no statistical significant difference between study and control groups in relation to the duration of the first stage of labor and the rate of episiotomy . On the other hand it was observed that there was a highly statistical significant difference between two groups regarding the duration of the second stage of labor (p<0.001\*\*). Moreover this table also clarifies that there was a significant difference between two groups in relation to the rate of perineal laceration (p<0.05\*).

**Table (3):** presents distribution of mean score of visual analogue fatigue and energy scale– of both study and control group at the immediate 15 minutes, and 4 hours after delivery , it was observed that there was a highly statistical significant difference regarding fatigue and energy subscales scores between two groups (p<0.001),as the fatigue score was too high among control group as compared with the study group. On the other hand energy score was high among study group as compared with control group. That revealed that guideline decrease postpartum fatigue and maintains women energy.

**Table (4):** exemplifies neonatal characteristics and outcomes among study and control group, it was observed that there was no statistical significance difference between study and control groups regarding neonatal gestational age, birth weight and neonatal sex. On the other hand there was a statistical significance difference between two groups in relation to Apgar score of the neonate during both first and fifth minute. In addition there was a statistical significance difference regarding admission of the neonate to intensive neonatal care unit (p<0.001\*\*).

**Table (1): percentage distribution of presents the general characteristics women under the study.**

Variable	Study group N = 148		control group N= 131		Analytic test		P value
	No	%	No	%	Chi square test	independent t test	
<b>Age (Mean ±SD)</b>	25.37±2.812		25.19±2.96			<b>0.760*</b>	<b>&gt;0.05</b>
<b>Educational qualification</b>					1.46		<b>&gt;0.05</b>
Illiterate	18	12.2	15	11.5			
Read and write	39	26.4	27	20.6			
Secondary educational	75	50.6	74	56.4			
University education	16	10.8	15	11.5			
<b>Residence</b>					<b>.013</b>		<b>&gt;0.05</b>
Urban	97	65.5	85	64.9			
Rural	51	34.5	46	35.1			
<b>Occupational condition</b>					<b>.012</b>		<b>&gt;0.05</b>
Working	21	14.2	18	13.7%			
House wife	127	85.8	113	86.3%			
<b>Body weight (Mean ±SD)</b>	70.99±8.78		71.22±8.692			<b>.219*</b>	<b>&gt;0.05</b>
<b>Length (Mean ±SD)</b>	163.29±5.63		164.00±5.474			<b>1.06*</b>	<b>&gt;0.05</b>
<b>Body mass index (Mean ±SD)</b>	26.51±2.488		26.30±2.477			<b>.714*</b>	<b>&gt;0.05</b>

**Note:** \* P-Value indicated by independent t test Chi-square test was used for other.

**Table (2): percentage distribution of the characteristics of the current process of labor.**

Variable	Study group N = 148		control group N= 131		Chi square test	P value
	No	%	No	%		
<b>Duration of the first stage of labor in hours.</b>					<b>.794</b>	<b>&gt;0.05</b>
8-	45	30.4	34	26.0		
10-	64	43.2	58	44.2		
12-14	39	26.4	39	29.8		
<b>Duration of the second stage of labor in minute.</b>					<b>19.85</b>	<b>&lt;0.001**</b>
20-	58	39.2	22	16.8		
30-	75	50.7	80	61.1		
40-50	15	10.1	29	22.1		
<b>Perineal laceration</b>					<b>11.64</b>	<b>&lt;0.001**</b>
Yes	47	31.8	68	51.9		
No	101	68.2	63	48.1		
<b>Episiotomy</b>					<b>2.49</b>	<b>&gt;0.05</b>
Yes	128	86.5	109	83.2		
No	20	13.5	22	16.8		

**Table (3): Distribution of mean score of visual analogue fatigue and energy scale– of both study and control group at the immediate 15 minutes, and 4 hours after delivery.**

Variable	Mean ± standard deviation		independent t test	p-value
	Study group N = 148	control group N= 131		
Fatigue subscale at immediate 15 minutes after delivery.	48.89±8.30	88.58±10.24	<b>35.25</b>	<b>&lt;0.001**</b>
Fatigue subscale at 4 hours after delivery.	36.56±6.78	76.939±14.25	<b>29.58</b>	<b>&lt;0.001**</b>
Energy subscales at immediate 15 minutes after delivery.	37.52±7.14	22.56±3.69	<b>22.31</b>	<b>&lt;0.001**</b>
Energy subscales at 4 hours after delivery.	39.18±10.6	26.92±3.58	<b>13.17</b>	<b>&lt;0.001**</b>

**Table (4): Distribution of neonatal characteristics and outcomes among study and control group.**

Variable	Study group N = 148		control group N= 131		Analytic test		P value
	No	%	No	%	Chi square test	independent t test	
<b>Gestational age</b>	39.67±1.34		39.64±1.33			<b>.089</b>	<b>&gt;0.05</b>
<b>Neonatal birth weight in (grams).</b>	2608.78±358.22		2604.19±367.21			<b>.398</b>	<b>&gt;0.05</b>
<b>Neonatal sex</b>					<b>.000</b>		<b>&gt;0.05</b>
Male	77	52.0	68	51.9			
Female	71	48.0	63	48.1			
<b>Apgar score at 1 minute</b>					<b>8.71</b>		<b>&lt;0.05*</b>
Good (8-10)	102	68.9	68	51.9			
Moderate asphyxia (5-7)	41	27.7	54	41.2			
Sever asphyxia (≤4)	5	3.4	9	6.9			
<b>Apgar score at 5 minute</b>					<b>8.45</b>		<b>&lt;0.05*</b>
Good (8-10)	136	91.9	107	81.7			
Moderate asphyxia (5-7)	12	8.1	20	15.2			
Sever asphyxia (≤4)	0	0.0	4	3.1			
<b>Admission to intensive care</b>					<b>4.93</b>		<b>&lt;0.05*</b>
No	143	96.6	118	90.1			
Yes	5	3.4	13	9.9			

\*statistical significance (p value<0.05).

### VIII. Discussion

This study aimed to evaluate the implication of applying evidence-based nursing practice guidelines during second stage of labor on maternal and neonatal outcomes among primipara women. As regarding general characteristics of participants including age, educational qualification, occupational condition, bodyweight, height, and body mass index, the present study revealed that there was no statistical significant difference between both study and control groups, these finding was in the same line with **Mohamed and Abdelati(2015)**,<sup>(16)</sup>in the study to evaluate the effect of spontaneous versus valsalva pushing techniques at the second stage of labor among Primipara women on labor outcomes. They reported that there was no statistically significant difference was found between study and control groups regarding their age, body weight, height and body mass index or education level.

At the present study the effect of applying evidence based practice guideline on maternal outcomes were evaluated by different measurements including duration of the second stage of labor, rate of perineal laceration and episiotomy, postpartum fatigue and energy at the immediate 15 minutes and 4 hours after delivery among women under the study .The present study revealed that there was a highly statistically significant difference between both study and control groups ( $p < 0.001^{**}$ ) regarding duration of the second stage of labor . These findings may be due to that the intervention of the utilized practice guideline which allow women to adopt a wide variety of upright positions including squatting or sitting options and spontaneous pushing technique was utilized by the studied women, that is associated with harmony and coordination among different muscles including abdomen, diaphragmatic and pelvic floor muscles that subsequently improve fetal descent and short duration of the second stage of labor.

These findings were agreed with **Thilagavathy (2012)**,<sup>(17)</sup>who added that There was a significant decrease in the duration of second stage of labor among women in supported sitting posture as compared to supine-lithotomy group. In addition **Gupta et al.,(2006)**<sup>(18)</sup> in the study to evaluated the benefits and risks of use of any upright [sitting, squatting) versus supine-lithotomy position during the second stage of labor among 5164 pregnant women. The result of the trials revealed that the use of any upright [sitting, squatting) versus supine lithotomy position during the second stage of labor is associated with reduced duration of second stage of labor (10 trials-mean 4.29 mts, 95% CI 2.95- 5.64 mts).

Regarding the effect of utilizing the guidelines intervention on the duration of the third stage of labor the present study findings showed that there was a highly statistically significant difference between both study and control groups. These findings are in the same line with **Bomfim Hyppolito et al.(1998)**,<sup>(21)</sup> who conducted a randomized clinical trial among 248 low risk term primigravida, with 127 in sitting and 121 in supine position during the second stage of labor to evaluate the possible advantages and disadvantages of upright (sitting) versus supine position. The results of the trials reported that the upright (sitting )position resulted in decrease the duration of the third stage of labor than the supine position.

The present study reported that there was a significant reduction among study group mothers regarding the rate of Perineal laceration as compared with the control group, which may be due to that ordinary care utilize coaching pushing technique, that requires repeated, prolonged breath holding and bearing down which have an adverse effect on subsequent pelvic floor function that affect pelvic floor and Perineal muscles that subsequently increases risk of Perineal laceration.

Regarding the mean fatigue scores around first 15 minutes and 4 hours of postpartum, the present study represented that the mean fatigue score were decreased among study group mothers ,these findings may be related to that utilized evidence based practice guidelines' intervention involved both physical and psychological preparation for women that subsequently reduce their anxiety and stress through the second stage of labor and reduce their fatigue and stress during postpartum period .These findings came in the line with **Haseebetal.(2014)**<sup>(22)</sup>in the study to find out the effects of two different pushing techniques in the second stage of labor on postpartum maternal fatigue and Apgar score of neonates in Saudi females, they added that physiological pushing technique has a better outcome with regard to postpartum maternal fatigue and neonatal Apgar score when compared to directed pushing during the second stage of labor.

As regarding the effect of evidence based practice guideline on neonatal outcome, the present study pointed out that the Apgar score of neonates among study group showed a higher score when compared with control group. These findings may be due to that evidence based guideline related interventions are associated with comfort, less fatigue ,reduce stress and anxiety of the mother .in addition during spontaneous pushing that mothers were encouraged to practice , bearing down is associated with exhalation and open glottis, air escapes and the thoracic pressure is not maintained. That subsequently increases venous return to the heart, cardiac output, maternal arterial pressure, and blood perfusion of the placenta, which affects in oxygen supply to the fetus and illustrated in normal pH and  $P_{O_2}$  of the umbilical arterial blood. These findings partly agreed with **Tuuli et al,(2012)**<sup>(11)</sup> who suggested a reduction in fetal brain oxygenation associated with maternal pushing efforts and fatigue, in addition it was recommended that mothers should encouraged for spontaneous pushing .

## **IX. Conclusion**

Utilization of evidence based nursing practice guideline for management of the second stage of labor decrease the duration of second stage, Perineal laceration ,decreases postpartum fatigue, maintain postpartum energy and improve neonatal outcomes.

## **X. Recommendation**

Nursing management during the second stage of labor should be provided based on evidence based practice guidelines.

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