

## Implementing Different Maternal Positions during First Stage of Labor & Its Effect on Labor Outcomes

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**Abstract:** The aim of this study was to evaluate the effect of implementing different maternal positions during the first stage of labor and its effect on labor outcomes. Design: intervention study design. The study setting was conducted at the labor unit of obstetrics & gynecological department at Benha University Hospital. A purposive sampling technique was used that consisted of 100 parturient women (group I (n=50) assumed upright positions (walking, standing, sitting, kneeling & squatting) & group II (n=50) assumed recumbent positions (supine, semi recumbent & left lateral)) during the first stage of labor. Tools were used for data collection; a structured interviewing questionnaire, observational checklist (Partograph & Apgar score), Visual Analogue Scale & maternal satisfaction with assumed position. Results: Parturient women assumed upright positions had progression of cervical dilatation rate and fetal descent, lower labor pain, lower duration of the active and second stages of labor & higher satisfaction compared to those assumed recumbent positions ( $p < 0.001^{**}$ ). Conclusion: Upright positions were an effective method in preceding the progress of cervical dilatation and fetal descent, increasing the intensity of uterine contraction, reducing the labor pain and the duration of active phase of first and second stages of labor, & improving parturient women's satisfaction. Recommendation: Encourage normal parturient women to assume upright positions during the first stage of labor after providing a brief benefits' explanation & developing an educational program for pregnant women regarding the benefits of upright positions for both mothers and newborns through posters, videos, brochures or pamphlets at antenatal clinics to improve the parturient women's awareness.

**Keywords:** maternal positions, first stage, labor outcomes.

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### I. Introduction

Historically, childbirth was done very differently in some cultures. The first stage of labor is longer and painful for all parturient women. Once a parturient woman becomes hospitalized, nurses let the parturient woman assume a recumbent position. Not all care providers will allow free ambulation in labor, and limit positions to labor on the bed alone. Maternal position influences parturient woman's anatomic and physiologic accommodation to labor (Thies-Lagergren, et al., 2013). Actively promoting and encouraging women to mobilize during labor is a safe, effective way of providing optimum care to healthy women, it is a cost-effective way of reducing complications (Kumud, et al., 2013).

Evidence suggests that changing position and assuming upright position in the first stage of labor improve characteristics of contractions, a reduction in the use of oxytocin to augment labor with an average, improves oxygen supply to the fetus, and increases maternal satisfaction. Mobilization improves alignment of pelvic bones and the shape and capacity of the pelvis, and optimizes a chance for the good fit between fetus and pelvis (Edmonds, 2011).

As well as, Lawrence, et al., (2013), who conducted a systematic review on maternal positions and mobility during the first stage of labor. There is clear evidence that upright positions in the first stage of labor reduce the duration of labor, the risk of caesarean birth, the need for epidural, and do not seem to be associated with increased intervention or negative effects on mothers' and newborns' wellbeing.

On the other hand, a woman lying down on the side or back during the first stage of labor may be more convenient for staff and can make it easier to monitor progression and check the fetus. Fetal monitoring, epidurals for pain relief, and use of intravenous infusions also limit movement. Lying on the back puts the weight of the pregnant uterus on abdominal blood vessels and contractions may be less strong than when upright. Effective contractions help cervical dilatation and the descent of the baby (Berghella, 2017).

Nurses are primary caregivers during the birth process, have the potential to reduce some use of medical interventions by providing effective comfort measures that support and promote physiologic labor.

Although effective at relieving pain, parental pain medication and epidural interventions cause known side effects in the mother and fetus, consequently lengthening the labor duration. Nurses providing care in first stage of labor also need to provide clear, consistent, and evidence based explanation, so that parturient women will understand both the risks and benefits of the used positions (Adams, et al., 2016).

### **Significance of the study**

Prolonged labor may lead to increased maternal and neonatal mortality and morbidity due to increased risks of maternal exhaustion, postpartum hemorrhage, sepsis, fetal distress and asphyxia and requires early detection and appropriate clinical response (Martin, 2015). Also, the rate of elective cesarean section accounts increase for over half of all CS done each year. Cesarean birth is associated with more risk to the parturient woman than vaginal birth. These risks include higher rates of maternal death, overall severe morbidity, adhesions, placental abnormalities (placenta previa, and placenta accreta), postpartum hemorrhage, blood transfusions, surgical injuries, unplanned hysterectomy, uterine rupture, and admission to the intensive care unit (Curtin, 2015).

New labor guidelines may be helpful in promoting vaginal birth by allowing labor to progress based on more recent evidence about normal labor parameters of parturient women (Simpson, 2016). Therefore this study conducted to evaluate the effect of implementing different maternal positions during the first stage of labor & its effect on labor outcomes.

### **Aim of the Study**

Aim of this study was to evaluate the effect of implementing different maternal positions during the first stage of labor & its effect on labor outcomes.

### **Study hypothesis**

-Parturient women who implement different positions will have good maternal progress of labor, fetal & neonatal outcomes.

### **Subject & Method**

#### **D) Subject**

##### **A) Research design:**

Quasi-Experimental design was used to fulfill the aim of this study (pre & posttest).

##### **B) Setting of the study:**

The study was conducted at labor unit of obstetrics and gynecological department at Benha University Hospital.

##### **C) Sampling:-**

###### **Type of sample:**

Purposive sampling technique was used in collecting the data.

###### **Sample size:**

About one hundred (100) parturient women was calculated depending on annual flow rate of primipara with normal vaginal delivery admitted in the hospital in 2016 by utilizing the following formula:  $n = \frac{N}{1+n(e)^2}$  with the stated criteria.

Where n= sample size (100)

N= Total population (132)

e= margin error (0.05)

###### **Sample criteria:**

Parturient women were recruited in the current study according to the following inclusion criteria: primipara, full term & at early active phase of first stage of labor ( $\geq 3$ cm), age (20-35 yrs), Body Mass Index (BMI) ranged (18 - 30 Kg/m), intact membranes on admission, normal course of pregnancy (single fetus, mature, and expected normal fetal weight with cephalic position) & free from medical and obstetric problems in the current labor. The exclusion criteria: parturient women conceived by artificial reproductive technique, or labor induction.

###### **Sampling technique:**

The subjects were assigned after fulfilled the previous criteria into two equal groups according to women's preferring selected positions: -**Group I** (n=50): assumed different upright positions as (walking, standing, sitting, kneeling and squatting) during first stage of labor & **Group II** (n=50): assumed different recumbent positions as (supine, semi recumbent, left lateral) during first stage of labor.

**D) Tools for data collection:-**

**Five tools were used in this study as follows:-**

**1) Interviewing questionnaire schedule:** It was constructed by the researcher after reviewing a related literature that covered socio-demographic data and current obstetric data, for measuring the individual differences.

**2) Partograph** As appointed by (The World Health Organization (**WHO**), **1994**) is a graphic recording used to continuous assessment and monitoring the progress of labor, maternal and fetal condition.

**3) Visual Analogue Scale (VAS)** As appointed by (**McCaffery&Pasero 1999**) which consisted of 10 cm horizontal line, the right end was marked 0 which indicated "no pain", the left end was marked 10 which indicated "worst pain possible ". Parturient women were asked to make a mark on the line that represented their pain intensity, and pain intensity level was scored by measuring the distance from the "no pain" end to the patient's mark. **Scoring:-**

Score 0	indicated no pain
1-2	indicated mild pain
3-6	indicated moderate pain
7-8	indicated severe pain
9-10	indicated worst pain possible

**4)Apgar score** As appointed by (**Apgar & James, 1962**) is a measure of the physical condition of the newborn. It is obtained by adding points (2, 1, or 0) for heart rate, respiratory effort, muscle tone, response to stimulation, and skin coloration; a score of ten represents the best possible condition. **Scoring:-**

Score <4	indicated sever asphyxia
4-6	indicated moderate asphyxia
7-10	indicated good condition

**5) Maternal satisfaction with assumed position:** It is self-reported assessment and developed by the researcher. Each parturient woman was asked to respond to the question: 1) Are you satisfied and preferred your assumed positions? Their responses were recorded as either yes or no.

**Ethical considerations:**

Approval of parturient women will be obtained orally before history taken and after explanation the purpose and benefits of the study. Parturient women were assured that data collected will be confidential and will be used only for research will get rid of them. Each study subject is free to withdraw at any throughout the time of data collection.

## **II. Method:-**

**Pilot study:**

The pilot study was carried out 10% of the total sample (10 parturient women) who met the criteria of selection to test the study process clarity, validity, reliability and applicability of the study tools as well as the estimating timing needed for data collection. Piloting indicated that the tools of data collection were feasible, objective and clear for women after modifications were done in the form of adding or omission of some questions to find the possible obstacles and problem that might be faced during data collection. Parturient women involved in the pilot were excluded from the study.

**Field work:-**

Data collection through a period of 1year; starting from the beginning of January 2017 to the end of December 2017. The researcher visited the sitting of the study two days weekly from 9 am to 5 pm to collect the required sample and introduced herself with explaining the purpose of the study to the parturient women during the early active stage of labor who met the criteria for inclusion in the sample.

Parturient women were informed that participation was voluntary and had the right to refuse or withdraw at any time with no consequences. Each parturient woman implemented the preferred maternal positions. The researcher recruited parturient women assuming upright positions to (Group I) for first six months from beginning of data collection and the parturient women assuming recumbent positions in (Group II) for second six months from beginning of data collection. Field of work was carried out through preparatory, implementation, and evaluation phases.

**Limitation of the Study:**

Many parturient rejected the idea of changing the traditional positions due to the rural society culture, believes and the fear of harming the fetus.

**Preparatory phase**

At first, the researcher interviewed and informed each parturient woman about the aim of the study in simple terms after taken written consent to participate in the study. The researcher asked each parturient woman the questions in simple Arabic language and filled the checklist. The researcher collected bio-socio-demographic, past medical history and current obstetric data. The initial assessment was done on admission when woman is in early active phase of first stage of labor to collect data through physical, abdominal and vaginal examination to meet the sample criteria.

**Implementation phase**

Each parturient in the studied group I was individually met in early active phase of 1<sup>st</sup> stage of labor and the researcher explain the benefits of changing their positions from walking, standing, sitting, kneeling and squatting during the 1<sup>st</sup> stage of labor. The parturient women walked out of bed and were told to return to bed when medical or nursing intervention needed, sitting position was assumed on chair or in the bed with support the back, standing position with support on wall. Each parturient were encouraged to assume one of upright positions alternatively for the 15-20 min every hour according to her comfort and in between parturient were permitted to lie down on bed for 10-15 min every hour and advise her to repeat these positions up to 10 cm cervical dilatation. While, parturient women in the studied group II assumed different recumbent positions as supine, semi recumbent and left lateral lasting more than 50% of the active stage of labor duration.

**The evaluation phase**

Both groups were continuous monitoring during early active stage of labor and then outcomes was assessed and recorded for further statistical analysis. The researcher evaluated and compared the effect of implementing the upright and recumbent positions during the early active stage of labor and assessed its labor outcomes through: -

- Assessing the progress of labor /hr in terms of duration, interval, intensity and frequency of uterine contraction, cervical dilatation, the duration of the active, 2<sup>nd</sup> , and 3<sup>rd</sup> stages of labor, mode of delivery, maternal condition, and fetal condition by using Partograph.
- Measuring of the neonatal physical condition by using Apgar score twice at the 1<sup>st</sup> & 5<sup>th</sup> minutes.
- Measuring the intensity of labor pain and the maternal satisfaction with positioning and with the childbirth experience by using VAS pain rating scale at cervical dilatation ( $\geq 3$ ,  $\geq 6$  &  $\geq 8$ cm) three times across the 1<sup>st</sup> stage of labor.

**Statistical design:**

The collected data were coded, organized, analyzed and tabulated using computer. Presentation of data into tablets and graphs were carried out according to types of variables by using the Statistical Package for the Social Science (SPSS) Version 15 .Descriptive statistics was used to calculate percentages, frequencies & mean standard deviation for the two groups. Inferential statistics (Parametric and non-Parametric) were used to draw conclusions from the study. Chi square test ( $\chi^2$  and Independent T- test) was used to estimate the statistical significant differences between the groups. A significant P-value was considered when P was less than (0.05) and it was considered highly significant when P- value was less than or equal (0.01).

**III. Result**

**Table (1): Distribution of the studied parturient women according their socio-demographic characteristics (n=100).**

Variable	Upright positions group (n=50)		Recumbent positions group (n=50)	
	No	%	No	%
<b>Age (in years)</b>				
20-	32	64	38	76
25-28	18	36	12	24
<b>Mean <math>\pm</math>SD</b>	23.74 $\pm$ 2.76		22.80 $\pm$ 2.18	
<b>Educational level</b>				
Illiterate	4	8	1	2
Middle education	36	72	36	72
High education	10	20	13	26
<b>Occupation</b>				
Employee	0	0.0	0	0.0
House wives	50	100	50	100
<b>Anthropometric measurement (Mean <math>\pm</math>SD)</b>				
<b>Weight (KGs)</b>	78.14 $\pm$ 2.97		78.26 $\pm$ 3.03	

Height (cm)	165.38±24.49	164.92±37.57
BMI (Kg/m <sup>2</sup> )	28.585±0.899	28.4±1.11

**Table(1):** Clarifies that near two third 64.0% of upright positions group were in age of (20-24 yrs) with a mean age of (23.74±2.76 yrs). And three quarter 76.0% of recumbent positions group were in age (20-24 yrs) with a mean age of (22.80±2.18) yrs. According to level of education; more than two third of upright & recumbent positions groups nearly three quarter 72.0% had middle education. According to occupation of the studied parturient, all both upright & recumbent positions group were house wives.

**Table (2): Distribution of the studied parturient women according to progress of labor (n=100).**

Variable	Upright positions group (n=50)		Recumbent positions group (n=50)		X <sup>2</sup>	P value
	No	%	No	%		
<b>Time of rupture of membranes in relate to cervical dilatation</b>						
7cm	9	18	16	32	10.64	<0.001**
8cm	39	74	25	50		
9cm	2	4	9	18		
<b>Mean ±SD</b>	8.82±0.48		7.98±0.79			
<b>Rate of cervical dilatation /hrs</b>						
1cm	8	16	43	86	22.23	<0.001**
2cm	42	84	7	14		
<b>Mean ±SD</b>	1.76±0.43		1.16±0.37			

\*\*A Highly Statistical significant < 0.001

**Table (2):** Illustrates that there was a highly statistical significant difference in progress of labor (p<0.001\*\*). Regarding the time of rupture of membranes in relate to cervical dilatation, nearly three quarter (74%) of upright group have (at 8 cm) cervical dilatation with mean of (8.82±0.48), compared to (46%) of recumbent group with mean of (7.98±0.79). Regarding the rate of cervical dilatation /hr, compared to more than three quarters (84%) of the upright group dilated (2cm/hr) with mean of (1.76±0.43), more than three quarters (86%) of the recumbent group dilated with (1cm/hr) with mean of (1.16±0.37).

**Table (3): Distribution of the studied parturient women according to the mean of the cervical dilatation across the time (n=100).**

Cervical dilatation(cm/hr)	n=50	Upright positions group	n=50	Recumbent positions group	Independent t test	P value
		Mean ±SD		Mean ±SD		
Before assuming positions	50	3.26 ± 0.69	50	3.22 ± 0.35	0.53	>0.05
After one hour	50	3.78±0.47	50	3.86±0.44	4.59	<0.001**
After two hours	50	5.48±0.33	50	5.00±0.50	4.00	<0.001**
After three hours	50	6.88±0.33	50	6.24±0.50	4.10	<0.001**
After four hours	50	8.72±0.39	50	7.09±0.79	7.85	<0.001**
After five hours	8	10.00±0.0	43	9.42±0.49	5.38	<0.001**

Non significant>0.05

\*\*A Highly Statistical significant < 0.001

**Table (3):** Reveals that, the mean of cervical dilatation in cm was (3.26 ± 0.69) before assuming positions with no statistically significant difference for upright group and (3.22 ± 0.35) for recumbent group, but after five hours assuming upright positions was (10.00±0.0) compared to (9.42±0.49) for the recumbent positions. There was a progression in cervical dilatation times among both groups, and there was a high statistical significant difference (<0.001\*\*) between both groups.

**Table (4): Distribution of the studied parturient women according to mean of duration and frequency of uterine contractions across the time (n=100).**

Variable	n=50	Upright positions group	n=50	Recumbent positions group	Independent t test	P value
		Mean ±SD		Mean ±SD		
<b>Duration of uterine contractions (seconds)</b>						
Before assuming positions	50	16.38 ± 0.40	50	16.40 ± 0.29	0.17	>0.05
After one hour	50	19.38 ± 0.60	50	17.40 ± 0.49	0.15	>0.05
After two hours	50	26.10 ± 0.24	50	21.50 ± 0.50	4.49	<0.01**
After three hours	50	44.94 ± 1.73	50	27.00 ± 1.26	9.45	<0.001**
After four hours	50	66.00 ± 1.51	50	35.62 ± 0.63	13.54	<0.001**
After five hours	8	70.80 ± 1.98	43	44.160 ± 1.50	5.66	<0.001**
<b>Frequency of uterine contractions (10 min)</b>						
Before assuming positions	50	1.12 ± 0.06	50	1.56 ± 0.65	1.70	>0.05
After one hour	50	2.46 ± 0.50	50	2.30 ± 0.46	1.65	>0.05
After two hours	50	2.62 ± 0.49	50	2.42 ± 0.50	2.02	<0.05*
After three hours	50	2.98 ± 0.55	50	2.62 ± 0.49	3.44	<0.001**
After four hours	50	3.46 ± 0.61	50	3.00 ± 0.50	4.12	<0.001**
After five hours	8	3.96 ± 0.53	43	3.44 ± 0.64	4.39	<0.001**

Non significant >0.05 \*A Statistical significant p < 0.05 \*\*A Highly Statistical significant < 0.001

**Table (4):** Illustrates that there was a highly statistical significant difference (p<0.001\*\*) in the mean of duration and frequency of uterine contractions between both groups.

**Table (5): Distribution of the studied parturient women according to mean of interval and intensity of uterine contractions across the time (n=100).**

Variable	n=50	Upright positions group	n=50	Recumbent positions group	Independent t test	P value
		Mean ±SD		Mean ±SD		
<b>Interval of uterine contractions (min)</b>						
Before assuming positions	50	4.12 ± 0.77	50	4.24 ± 0.75	.749 0	>0.05
After one hours	50	5.26 ± 0.83	50	5.38 ± 0.81	0.734	>0.05
After two hours	50	3.46 ± 0.504	50	4.00 ± 0.70	4.42	<0.001**
After three hours	50	2.72 ± 0.76	50	3.56 ± 0.61	6.10	<0.001**
After four hours	50	2.50 ± 0.51	50	3.24 ± 0.48	7.53	<0.001**
After five hours	8	2.32 ± 0.47	43	2.96 ± 0.61	7.90	<0.001**
<b>Intensity of uterine contractions (mmhg) ≥1=mild ≥2=moderate ≥3=sever</b>						
Before assuming positions	50	1.04 ± 0.30	50	1.12 ± 0.31	0.995	>0.05
After one hour	50	1.44 ± 0.50	50	1.52 ± 0.51	0.795	>0.05
After two hours	50	1.92 ± 0.27	50	1.70 ± 0.46	2.89	<0.001**
After three hours	50	2.44 ± 0.54	50	2.16 ± 0.58	2.48	<0.001**
After four hours	50	2.68 ± 0.47	50	2.38 ± 0.49	3.11	<0.001**
After five hours	8	2.98 ± 0.14	43	2.68 ± 0.47	4.31	<0.001**

Non significant >0.05 \*A Statistical significant p < 0.05 \*\*A Highly Statistical significant < 0.001

**Table (5):** Illustrates that there was a highly statistical significant difference (p<0.001\*\*) in the mean of interval, and intensity of uterine contractions between both groups.

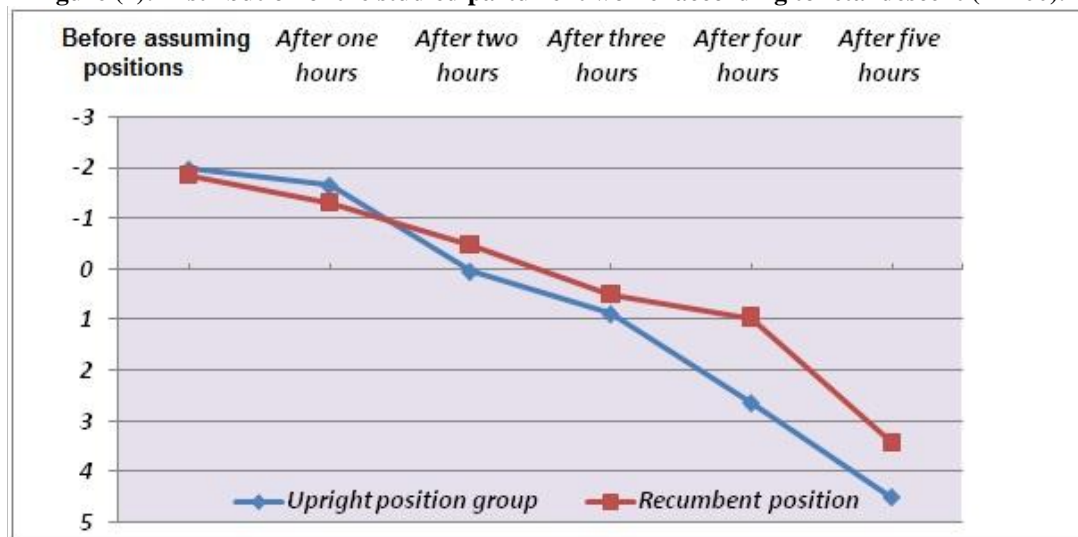
**Table (6):** Distribution of the studied parturient women according to mean duration of different stages of labor (n=100).

Variable	Upright positions group (n=50)	Recumbent positions group (n=50)	Independent t test	P value
	Mean ±SD	Mean ±SD		
Duration of active phase of labor (hr)	3.97±0.52	4.73±0.85	5.38	<0.001**
Duration of the 2 <sup>nd</sup> stage of labor (min)	30.00±8.08	34±7.63	2.54	<0.001**
Duration of the 3 <sup>rd</sup> stage of labor (min)	10.55±1.82	11.20±2.58	1.56	0.12

\*\*A Highly Statistical significant p < 0.001

**Table (6):** Indicates that, there was a highly statistical significant difference (p<0.001\*\*) regarding the duration of the active and 2<sup>nd</sup> stages of labor between both the studied groups and there was no statistical difference during the 3<sup>rd</sup> stage of labor.

**Figure (1):** Distribution of the studied parturient women according to fetal descent (n=100).



**Table (7):** Distribution of the studied parturient women according to the mean of fetal heart rate monitoring (n=100).

Variable	n=50	Upright positions group	n=50	Recumbent positions group
		Mean ±SD		Mean ±SD
Before assuming positions	50	124.50±10.85	50	126.30±13.08
After one hour	50	134.60±11.95	50	136.40±14.18
After two hours	50	142.80±9.65	50	138.80±12.80
After three hours	50	148.40±6.42	50	146.40±9.80
After four hours	50	152.10±11.39	50	149.10±11.55
After five hours	8	154.50±11.92	43	150.20±12.53

**Table (7):** reveals that, both the studied sample groups had normal fetal heart rate during assuming different maternal positions.

**Table (8): Distribution pain mean scores of the studied parturient women according to pain degree at active phase of the first stage of labor (n=100).**

Variable	Upright positions group(n=50)	Recumbent positions group(n=50)	Independent t test	P value
	Mean ±SD	Mean ±SD		
<b>Degree of pain at cervical dilatation</b>				
First time at (≥3cm)	4.32±.47	4.52±0.50	2.04	<0.001**
Second time at(≥6cm)	7.78±.79	8.54±0.65	5.26	<0.001**
Third time at (≥ 8 cm)	9.60±0.49	10.00±0.0	5.71	<0.001**

\*\*A Highly Statistical significant p < 0.0013-6 indicated moderate pain  
 7-8 indicated severe pain9-10 indicated worst pain possible

**Table (8):** Shows that, there was a highly statistical significant difference in pain scores at active phase of the first stage of labor (p<0.001\*\*) between both groups.

**Table (9): Distribution of the studied parturient women according to neonatal outcomes (n=100).**

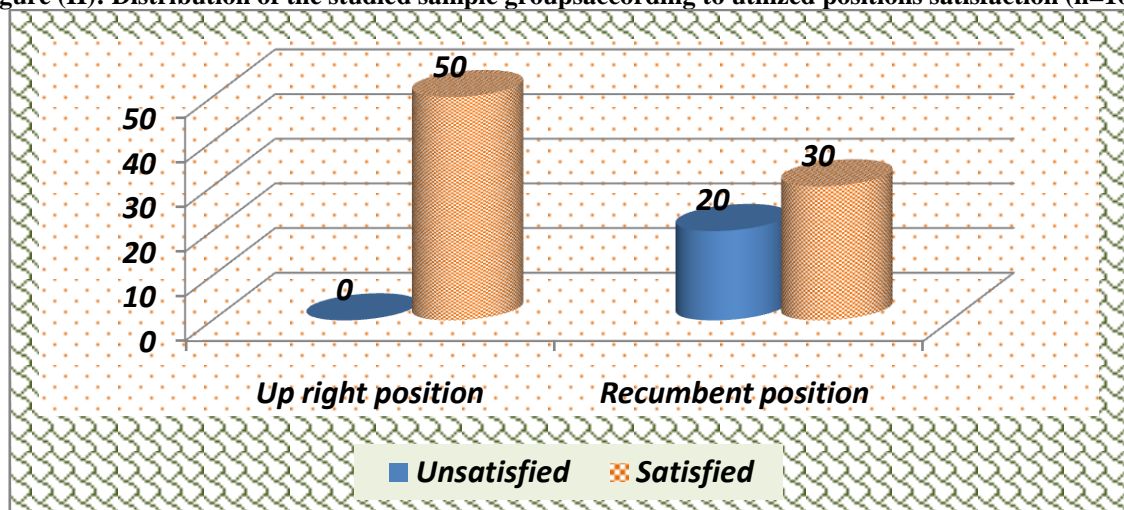
Variable	Upright positions group (n=50)		Recumbent positions group (n=50)		X <sup>2</sup>	P value
	No	%	No	%		
<b>Newborn weight (Kg)</b>						
Mean ±SD	2.80 ±0.13		2.91±0.10		0.396	>0.05
<b>Apgar score at one minute</b>						
Good (8-10)	22	44	11	22	5.47	<0.05*
Moderate asphyxia (5-7)	28	56	39	78		
Sever asphyxia ≤ 4	0	0.0	0	0.0		
Mean ±SD	6.96±0.35		7.22±1.09			
<b>Apgar score at five minute</b>						
Good (8-10)	48	96	44	88	2.17	>0.05
Moderate asphyxia (5-7)	2	4	6	12		
Sever asphyxia ≤ 4	0	0.0	0	0.0		
Mean ±SD	9.88±0.33		9.32±1.19			
<b>Admission to the neonatal intensive care unit</b>						
No	48	96	44	88	2.17	>0.05
Yes	2	4	6	12		

\*Non significant >0.05A Statistical significant p < 0.05\*

**Table (9):** Demonstrates that, there was a statistical significant difference (<0.05\*) regarding the neonatal Apgar score at one minute. Both the upright and the recumbent groups had moderate asphyxia with mean of (6.96±0.35 & 7.22±1.09) respectively. There was no statistical significant difference regarding the weight, neonatal Apgar score at five minutes and the admission to the neonatal intensive care unit (P > 0.05). The mean of neonatal weight for both groups were (2.80 ±0.13 & 2.91±0.10 Kg) respectively. Both groups had good neonatal Apgar score at five minutes with mean of (9.88±0.33 & 9.32±1.19) respectively. The majority of both groups (96.0% & 88.0%) did not need admission to the neonatal intensive care unit respectively.



Figure (II): Distribution of the studied sample groups according to utilized positions satisfaction (n=100).



#### IV. Discussion

The current study is an intervention study which aimed of to evaluate the effect of implementing different maternal positions during the first stage of labor& its effect on labor outcomes. It was conducted in labor unit of obstetrics and gynecological department at Benha University Hospital. Results of this study supported the following investigated hypothesis.

Regarding personnel characteristics of study sample, the present study revealed that parturient women's age of both upright and recumbent groups were twenties. There was homogeneity between the two groups regarding the age. This may be due to that the studied sample were primipara and selected with purposive sample at the range of (20-35 yrs) which is the common marriage age in the studied society culture.

These findings are in accordance with **Al-Seady, et al.,(2017)**, who conducted population based study of labor pain and satisfaction of primipara assume upright versus recumbent positions during first stage of labor, Mansoura University, Egypt, and showed that mean age of both groups were almost identical twenties. Similarly,**Kumud, et al., (2013)**, who studied the effect of upright positions on the duration of first stage of labor among nulliparous mothers, in Chandigarh, and showed that mean age of both groups were almost identical twenties.

Regarding the level of education the findings of the present study revealed that more than two third of upright & recumbent positions groups had middle education, and this explains women's cooperation, understanding the benefits of the assumed different positions which may contribute in maternal progress of labor, fetal and neonatal outcomes. These findings are in agreement with **Al-Seady, et al., (2017)**, who showed that more than half in both the studied groups had middle education.

According to occupation of the studied sample, all of both upright & recumbent positions groups were house wives. The current study revealed that there was homogeneity between the two groups. This may be due to women who delivered in governmental hospitals are mainly with in low entire income with no job. These findings are in the same line with **Al-Seady, et al.,(2017)**, who showed that more than two third were housewives in upright and recumbent groups. Also,**Kumud, et al., (2013)**, concluded that more than three quarters of both the studied sample were housewives.

The present study revealed that parturient women's BMI of upright group and recumbent were with a normal range. This may be due to the selected parturient women were primipara with normal BMI with no body gain weight from previous pregnancy. These findings are in agreement with **Gizzo, et al., (2014)**, who conducted a cohort study on women's choice of positions during labor, in Italy, and showed that women's BMI of recumbent & upright positions groups were with a normal mean of BMI.

Regarding the rate of cervical dilatation per hour, There is a progression in cervical dilatation times among both upright and recumbent groups, and there was a high statistical significant difference (<0.001) between both groups. The mean of cervical dilatation after five hrs assuming upright positions was better than assuming recumbent positions. This may be due to upright group have more gravity action pressure against membranes. This result was supported with, **Martin & Martin, (2013)**, who established a narrative review of maternal physical activity during labor and its effects upon length of first stage, which identified the impact of maternal movement upon length of first stage; seven studies reporting shortening of length of first stage.

Also, **Hafez, (2017)** established a quasi experimental study to assess the effectiveness of walking during the first stage of labor on the progress of labor among primipara, and revealed that there was a statistical

significance difference in the progressive cervical dilatation among both groups. The mean of cervical dilatation in the fifth hr for the study group was better than the recumbent group.

The findings of this study revealed that, there was a highly statistical significant difference ( $p < 0.001$ ) in the mean scores of frequency, duration, interval and intensity of uterine contractions between the upright and the recumbent groups (the recumbent group was less than the upright group). This may be due to both groups have the same supportive nursing care & also women recruited in each group acquiring different maternal positions not only implementing one position. These results agree with, **Hafez, (2017)**, who reported that the gravity increase the duration, intensity, and frequency of uterine contractions.

These findings are in accordance with **Martin & Martin (2013)**, who suggested that changing position and assuming upright position in first stage of labor increases effectiveness of contractions and help feeling more comfortable, reduces the pain, reduce the length of labor and increase maternal satisfaction.

Regarding the duration of the different stages of labor, Indicated that, there was a highly statistical significant difference ( $p < 0.001$ ) regarding the duration of the active and 2<sup>nd</sup> stages of labor. The mean value of duration in the upright group was less than the recumbent group. This may be due to the efficient effect of upright positions. This result was in consistent with **Gizzo, et al., (2014)**, who pointed that there was a significant statistical differences ( $p < 0.001$ ) in the mean length of both active and second labor stages. The mean value of duration in the upright group was less than the recumbent group.

These findings were in agreement with **Meena, (2017)**, who assessed the effect of ambulation in reduction of labor pain among pregnant women in the regional hospital, Kullu, which proved that ambulation therapy is effective in reducing labor pain and there was a highly statistical significant difference ( $p < 0.001$ ) regarding the duration of the different stages of labor between the studied groups.

These results are also matched with **Kripke, (2010)**, who found that women who maintained upright positions include (walking, standing, sitting, kneeling and squatting) was about one hour less than women who were recumbent. Therefore, ambulation provides comfort from long period of recumbent position.

In addition, **Chopra et al., (2013)**, carried out the study in labor room of post graduate institute of medical where progress of labor was assessed through Partograph, and revealed that the mean duration of active phase of first stage of labor in upright group was shorter two hrs than recumbent group. The study concluded that maintenance of upright positions during the 1<sup>st</sup> stage of labor reduces the duration of 1<sup>st</sup> stage of labor. Also, **Searle, (2010)**, who showed that upright positions helps in reducing the duration of second stage of labor, reduction in assisted deliveries, reduction in episiotomies, decreased pain, increased feeling of maternal comfort and partner involvement.

These findings are in accordance with **Kumud, et al., (2013)**, who concluded that maintenance of upright positions during the first stage of labor reduces the duration of first stage of labor. The duration of active phase of first stage of labor in upright group was shorter two hrs than recumbent group. Also, this result was in consistence with **Letshko, (2011)**, who established a Cochrane review and compared the upright versus recumbent position; the upright group includes sitting, standing, walking, and kneeling had less duration of labor about one hr than who were recumbent group.

In the present study, there was a progression in fetal descent times among both groups; the mean of fetal descent at the fifth hr in the recumbent group was less than the upright group. This result was in congruent with **Simkin & Ancheta, (2011)**, who described that changing positions not only helps the women to cope with the labor pain; upright positions use gravity to bring the fetus down, while changing position frequently moves the bones of the pelvis, helping the best fetus fit.

These results are also matched with **Kripke, (2010)**, who conducted a comparison of upright versus recumbent maternal position during the first stage of labor and its effect on labor outcomes in the United States, and found that upright positions help in the early descent of fetus, by gravity, influences in uteroplacental and fetal/maternal blood circulation. In addition, **Searle, (2010)**, who did a randomized controlled trials to assess the effects of different maternal positions during labor on maternal, fetal & neonatal outcomes, and showed that upright positions helps in increased diameters of pelvic inlet and outlet, improved uterine contractility, and improved fetal well being.

Regarding the fetal heart rate, after three hrs of assuming positions both the upright and the recumbent groups had normal range of the fetal heart rate with no fetal distress. This may be due to change among positions prevent vena cava compression; increase fetal blood circulation. This result in the same line with **Judie, et al., (2015)**, who conducted a comparative study to assess the effectiveness of recumbent positions versus upright positions on fetal heart rate and labor pain among mothers in first stage of labor with a purposive sample of sixty Indian women, at government hospital, Vellore, in Oman, and revealed that women who adopted recumbent and upright position had normal range of fetal heart rate with no fetal distress.

In the present study, There was a highly statistical significant difference between both studied groups in pain score at active phase of the first stage of labor ( $p < 0.001$ ). Both the upright and the recumbent groups had severe pain at cervical dilatation (7-8 cm) with mean pain score of the upright group was less than the

recumbent group. This may be due to women who were allowed to ambulate and move as desired during labor lead to cope with the pain more effectively and had an increase sense of control. These findings are in accordance with **Judie, et al., (2015)**, who reported that both the upright and the recumbent groups had severe pain at cervical dilatation (7-8 cm). Also, **Gizzo, et al., (2014)**, who pointed that there was a significant differences ( $p < 0.001$ ) in the mean pain score of the upright group was less than the recumbent group.

As well as, these findings were in agreement with **Savitha, et al., (2013)**, who evaluated the effect of ambulation during first stage of labor on labor pain and outcome of labor among the primigravida mothers in a selected hospital, Mangalore, and revealed that both studied groups experienced severe pain and the mean pain score of the upright group was less than the recumbent group.

Also, **Kavitha, (2010)** conducted a descriptive study to assess the degree of pain, comfort and positions assumed by the primigravida women during the first stage of labor and explored that the degree of pain was at mild to moderate level at 3 cm of cervical dilatation and very severe to worst at 7 cm of cervical dilatation, the left lateral position was the most and frequently assumed position during and in between uterine contractions from (3-7) cm of cervical dilatation, sitting position was more comfortable during early stage of labor and left lateral position most comfortable during late stage of labor.

Regarding the neonatal Apgar score at one minute; upright and recumbent groups had moderate asphyxia. This may be due to that assuming recumbent positions prevent vena cava compression and increase fetal blood circulation. However, assuming upright positions speed up the labor with "gravity effect" that decreases the fetus exhaustion. Similarly, **Lawrence, et al., (2011)**, conducted a study on maternal positions and mobility during first stage labor and pointed out that walking and upright positions in the first stage of labor reduce the length of labor and do not seem to be associated with increased intervention or negative effects on mothers' and newborns' wellbeing.

There was no statistical significant difference regarding the weight, neonatal Apgar score at five minutes and the admission to the NICU. Both groups had good neonatal Apgar score at five minutes. The majority of both groups did not need admission to the NICU respectively. This may be due to have the same early standard newborn care provided by the health care team. On the other hand, the findings of the study contradicted **Judie, et al., (2015)**, who reported that participants had less pain with assuming recumbent positions compared to upright positions. This result may be related to the difference of the studied sample either for the size or for the parity number.

As regards maternal utilized positions satisfaction, the results of the present study revealed that, there was a highly statistical significant difference ( $p < 0.001$ ) regarding satisfaction. The majority of the upright group preferred these positions in the next labor respectively. This may be due to the effect of gravity acting on the descending fetus effectively and increased pelvic dimensions, which speed up the labor. This result was in consistent with **Martin & Martin (2013)**, who suggested that changing position and assuming upright positions in first stage of labor increases effectiveness of contractions and help feeling more comfortable, reduces the pain, and increase mother satisfaction.

Also, these findings were in consistent with **Al-Seady, et al., (2017)**, who reported that parturient women who were assumed upright positions had lower labor pain and higher satisfaction scores compared to parturient women who were assumed recumbent positions ( $p = < 0.001$ ). In addition to, more than three quarters in upright group were more anticipated to assume same position in future deliveries compared to slightly less than one third in recumbent group who preferred to assume same position in the future. In addition, **Ondeck, (2014)**, who established a study in the name of Walk, Move Around, and Change Positions throughout Labor, and found that parturient women who used upright positions and were mobile during labor had shorter labors, less intervention, reported less severe pain, and described more satisfaction with their childbirth experience than parturient women in recumbent positions.

## V. Conclusion

In the light of the study finding, some important facts could be concluded: Upright positions were an effective method in preceding the progress of cervical dilatation rate & fetal descent, increasing the duration, frequency, interval & intensity of uterine contraction, reducing the labor pain, reducing the duration of first, second and third stage of labor, enhancing normal vaginal delivery, and improving parturient women's satisfaction with upright positions. Results of the present study supported the hypothesis.

## VI. Recommendations

In the light of the present study findings, the following recommendations are suggested:

1. Encourage normal parturient women to assume upright positions during first stage of labor after providing a brief benefits' explanation.

2. Developing an educational program for pregnant women regarding the benefits of upright positions for both mothers and newborns through posters, videos, brochures or pamphlets at antenatal clinics to improve the parturient women's awareness.

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