Assess The Effectiveness of Ambulation During First Stage of Labour on Outcome of Labour Among the Primigravida Mothers in Selected Hospital

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DOI: http://doi.org/10.5281/zenodo.2586484

Abstract
Background: Every year 150 million women become pregnant, but some of them do not have easy labors and have pain or even may die. Prolonged labour is one of the reasons for undergoing cesarean sections. Morbidity of cesarean section is more than normal vaginal delivery. Prolonged labour will be preventable through special care in the maternity hospital so as to encourage mothers to walk during the first stage of labour, because this action shortens the course of labour.

As per the census of India in 2016, birth rate is 19.3 births/1000 populations and death rate is 7.3 deaths/1000 populations, it indicates that there is rapid increase in India's population. The fertility rate in India is 2.2 children born/woman. Out of 1000 mothers, 130 mothers undergo prolonged labour. With this there are many complications expected for both mother and baby, associated with prolonged labour. Hence it is necessary to prevent the prolonged labour and shorten the duration of labour by means of medical and natural techniques.

Objectives of the study
1. To assess the effectiveness of ambulation in first stage of labour on outcome of labor among the study group
2. To assess the routine care in first stage of labour on outcome of labour among the control group.
3. To compare the outcome of labour among Study and control group.

Research Methodology
a) Research Approach: Quantitative
b) Research Design: Quasi experimental post test only control group
c) Setting: Selected maternity hospital
d) Population: primigravida mothers
e) Sample: Primigravida mothers with 36 weeks of gestation
f) Sampling technique: Simple random sampling
g) Sample Size: 60
h) Data collection tool: Structured observational checklist
The tool consists of 3 sections: Demographic data, Labour progress, Labour outcome.

Results
Majority of primigravida mothers among study and control group were having age between 21 -25 yrs i.e. 56.67 % and 66.67 % respectively.
56.67 % of primigravida mothers in study group are having secondary school education while 63.33 % of mothers in control group.
93.3% of mothers among study group delivered vaginally which is higher than that of control group i.e. 83%. Only 6.6 % of mothers had undergone instrumental delivery in study group which is lower than that of control group i.e. 16.6%. 13.3% of mothers among study group

are augmented with oxytocin drip which is significantly lower than that of control group i.e. 56.6% as P<0.0001.

Only 6.6 % of primigravida mothers among study group were >14 hrs of 1ˢᵗ stage of labor while 80 % of mothers among control group, which is significantly higher than that of study group as P<0.0001.

Only 13.3 % of primigravida mothers were duration of 2ⁿᵈ stage of labor is more than 2 hrs in study group which is significantly lower than that of control group i.e. 66.6 % as P<0.0001.

Only 6.6 % of mothers delivered with complications in study group, while 20% of mothers delivered with complications in control group, which is not statistical significant as P>0.05.

Only 3.3 % of fetus delivered with complication among study group and 16.6 % of fetus delivered with complication among control group, which is not statistical significant as P>0.05.

Conclusion: *Only 6.6 % of primigravida mothers among study group were >14 hrs of 1ˢᵗ stage of labor while 80 % of mothers among control group, which is significantly higher than that of study group as P<0.0001. So ambulation can be used to improve the outcome of labor in terms of duration of labor, maternal outcome and fetal outcome. Also it is a cost effective intervention which the nurse can implement independently.*

Keywords: *Assess, Effectiveness, Ambulation, First stage of labour, Outcome of labour*

INTRODUCTION

Pregnancy is a unique, exciting and often joyous time in a woman's life, as it highlights the amazing creative and nurturing powers while providing a bridge to the future. Pregnancy and birth are tremendously powerful stages of development that bring a woman to motherhood, a Couple, to family and a beautiful child into the world. Labor process may be viewed as a test of womanhood, a test of personal competence, a peak of experience, and the first act of motherhood [1].

Well! The wait is over, the labor has begun and it is time for the child to be born! Undoubtedly, labor is one of the major events in every woman's life. Parturition is a unique, exciting and wonders some, yet sometimes worrisome experience for the women [2]. It is also one of the most important transitional phase during which the mother has mixed feeling of joy as well as anxiety. Every woman is a unique individual, and every pregnancy has a unique set of comfort as well as discomfort [3].

The child bearing women experience many demanding sensation and discomfort. Ambulation during labor is becoming more popular. Walking during labor reduces patients' discomfort and improves outcome. Although it provides the birthing woman with the freedom to walk, move about, and assume the positions of her choice during labor and birth (unless restriction is specifically required to correct a complication) [4].

Freedom of movement in labor appears to facilitate the progress of labor and enhance childbirth satisfaction through restricting women's movement may have adverse effects. No evidence of harm found for freedom to ambulate, move about, or change position during labor and birth when restriction is not required to correct a complication [5].

Ambulation, movement, and changes of position during the first stage of labor may shorten labor. Women who ambulated during the first stage of labor were less likely to have a surgical delivery, defined as caesarean section. When allowed the freedom to ambulate, move, and change

position during labor, most women choose to do so and find this to be an effective form of pain relief. Women who choose to ambulate during first stage of labour had shorter first and second stages of labor, required less pain relief medication, and had fewer abnormal fetal heart rate patterns [6].

Being upright will make contractions stronger and more efficient. It will allow gravity to keep the baby's head pressed down, which will help the cervix to dilate faster so that labour is speeded up. Changing positions during labour can change the shape and size of the pelvis, which can help the baby's head move to the optimal position during first stage labour, and helps the baby with rotation and descent during the second stage. Swaying motions such as walking, climbing stairs, and swaying back and forth are especially helpful with this.

In the first stage of labour, the cervix will dilate to 10 cm in diameter. In mothers having their first child, this stage usually lasts 12 to 16 hours. Discomfort can often be helped by body positions that allow gravity to speed dilation, such as walking, squatting, kneeling forward on a chair, or sitting. This will help the baby move down in the pelvis faster and less painfully [1]

Problem statement
A study to assess the effectiveness of ambulation during first stage of labour on outcome of labour among the Primigravida mothers in selected hospital.

OBJECTIVES OF THE STUDY
1. To assess the effectiveness of ambulation in first stage of labour on outcome of labor among the study group.
2. To assess the routine care in first stage of labour on outcome of labour among the control group.
3. To compare the outcome of labour among Study and control group.

Materials and Methods
a) Research Approach: Quantitative.
b) Research Design: Quasi experimental post test only control group.
c) Setting: Selected maternity hospital.
d) Population: primigravida mothers.
e) Sample: Primigravida mothers with 36 weeks of gestation.
f) Sampling technique: Simple random sampling.
g) Inclusion criteria:-
- Normal Primigravida mothers in true labour pain
- Mothers who are willing to participate and expecting normal labour.
- Primi mothers admitted in the hospital without rupture of membrane.
- Primi mothers between 36-40weeks of gestational age with live fetus.
- Mothers who are registered in selected hospital.
h) Exclusion criteria:
- High risk Intranatal mothers.
- Multigravida mothers.
- Mothers who augmented during labour.
- Mothers with elective & emergency caesarean section.
- Mothers with premature rupture of membrane.
- Mothers with Malpresentation.
- Mothers who attended antenatal classes.
i) Sample Size: 60.
j) Data collection tool: Structured observational checklist
The tool consists of 3 sections:
1. Demographic data.
2. Labour progress.
3. Labour outcome.

VALIDITY
To ensure the content validity of the prepared tool, it was given to 20 experts. These experts included nursing experts - 18, Statistician-01, obstetrician-01.

RELIABILITY

The reliability of the tool is 1 because all parameters of the tool are standard, which confirms that the tool was reliable.

PROCEDURE FOR DATA COLLECTION

Formal permission was obtained from the respective hospital authority to conduct the study. Written informed consent was obtained from subjects before completing the tool and confidentiality was maintained.

It was planned to select the subjects for study who admitted in labor room. Sixty primigravida mothers in the labour will be selected based on the inclusion criteria by simple random sampling technique using lottery method. Among them thirty mothers will be distributed under study group and thirty under control group. Mothers under study group will be encouraged to walk when there is no uterine contraction and will allow them to rest when tired. Calculate the time of ambulation of each mother in the study group using observational checklist. Reassessing the progress of labour of mothers in the study group. The control group will be observed under natural setting without encouraging for walking. Reassessing the progress of labor of the mothers under control group.

DATA ANALYSIS PLAN

The data analysis was planned to include descriptive and inferential statistics and present them in form of tables, graphs and figures. The data was planned to be set in excel file, entered and to use statistical package of social sciences for entering the data in the computer.

RESULT

ORGANISATION OF THE FINDINGS

The data was analyzed and presented in the following sections:

Section 1: Description of samples according to demographic data of primigravida mothers.

Section 2: Description of analysis on data to assess the effectiveness of ambulation on progress of labor among study group and assess the routine care on progress of labor among control group.

a. Analysis of data according to rate of cervical dilatation among primigravida mothers.

b. Analysis of data according to rate of cervical effacement among primigravida mothers.

c. Analysis of data according to rupture of membranes among primigravida mothers.

Section3: Description of analysis on data to compare the maternal and fetal outcome.

a) Analysis of data according to mode of delivery among primigravida mothers.

b) Analysis of data according to augmentation of labor among primigravida mothers.

c) Analysis of data according to duration of labor among primigravida mothers.

d) Analysis of data related to maternal and fetal complications.

Section 1

Table 1: Demographic data

Parameter		Study (n=30)		Control (n=30)	
		(f)	**(%)**	**(f)**	**(%)**
Age (Yrs)	≤20	7	23.33	9	30
	21 – 25	17	56.67	20	66.67
	26 – 30	6	20	1	3.33
Educational status	Secondary	17	56.67	19	63.33
	Higher secondary	10	33.33	9	30
	Graduate	3	10	2	6.67

The above (table1) shows that majority of primigravida mothers among study and control group having age between 21 -25 yrs i.e. 56.67 % and 66.67 % respectively. 20 % of mothers having age between 26-30 yrs in study group while only 3.33 % of mothers in control group. 23.33 % of mothers having age less than 20 yrs in study group while 30 % of mothers among control group having age less than 20 yrs. 56.67 % of primigravida mothers in study group are having secondary school education while 63.33 % of mothers in control group. 33.33 % of mothers having higher secondary school education in study group and 30 % of mothers among control group. 10 % of mothers are graduate in study group and only 6.67 % of mothers among control group.

Section 2

Table 2: Rate of cervical dilatation among primigravida mothers

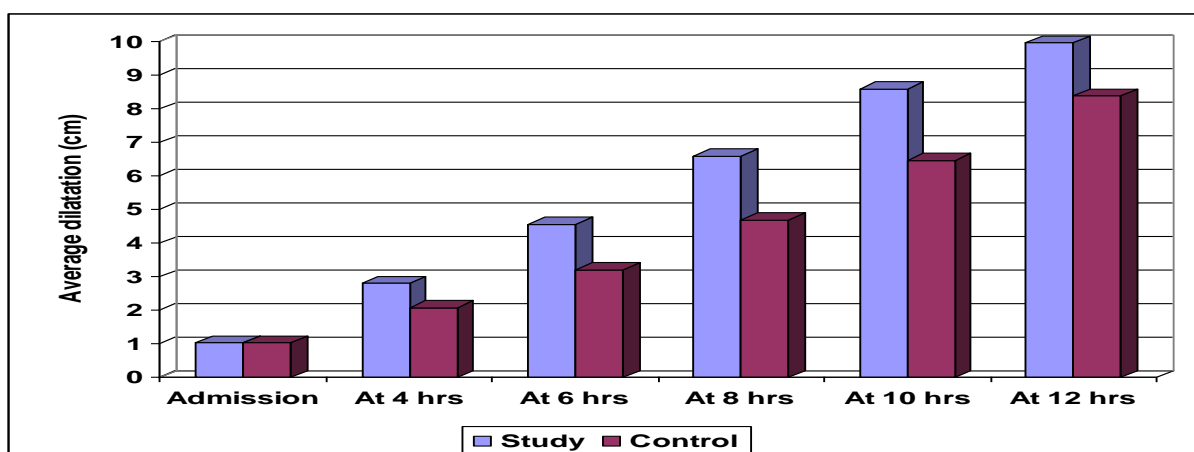| Dilatation on	Study (n=30)		Control (n=30)		t Value	P Value
	Mean	SD	Mean	SD		
Admission	1.03	.183	1.03	.183	0	1
At 4 hrs	2.80	.407	2.07	.254	8.38	<0.0001
At 6 hrs	4.57	.568	3.20	.484	10.03	<0.0001
At 8 hrs	6.60	.621	4.70	.651	11.56	<0.0001
At 10 hrs	8.60	.621	6.47	.819	11.36	<0.0001
At 12 hrs	9.97	.186	8.40	.770	10.65	<0.0001

Figure 1: Bar diagram showing comparison of cervical dilatation on admission, 4hrs, 6hrs, 8hrs, 10hrs, 12hrs in study and control group.

The (Table 2) and (Figure 1) shows that the mean rate of cervical dilatation, on admission in study group and control group is same i.e. 1.03. But at 4 hrs, 6 hrs, 8 hrs, 10 hrs, and 12 hrs the mean rate of cervical dilatation among study group is 2.80,4.57,6.60, 8.60, 9.97 respectively which is significantly higher than that of control group i.e. 2.07, 3.20, 4.70, 6.47 and 8.40 at 4 hrs, 6 hrs, 8 hrs, 10 hrs, 12 hrs respectively.

Table 3: Comparison of cervical effacement on admission, 4hrs, 8hrs, 12 hrs in study and control group

Effacement on	Study (n=6)		Control (n=6)		t Value	P Value
	Mean	SD	Mean	SD		
Admission	10.33	1.826	10.33	1.826	0	1
At 4 hrs	28.00	4.068	20.67	2.537	8.38	<0.0001

At 6 hrs	45.67	5.683	32.00	4.842	10.03	<0.0001
At 8 hrs	64.33	13.309	47.00	6.513	6.41	<0.0001
At 10 hrs	86.00	6.215	64.67	8.193	11.36	<0.0001
At 12 hrs	99.67	1.826	84.00	7.701	10.84	<0.0001

The data presented in above (Table 3) and (Figure 2) shows that the mean percentage of cervical effacement on admission in study group and control group is same i.e. 10.33. But at 4hrs, 6hrs, 8hrs, 10hrs, and 12hrs the mean percentage of cervical effacement in study group is 28.00, 45.67, 64.33, 86.00, 99.67 respectively which is significantly higher than that of control group i.e. 20.67, 32.00, 47.00, 64.67 and 84.00 at 4hrs, 6hrs, 8hrs, 10hrs, 12hrs respectively.
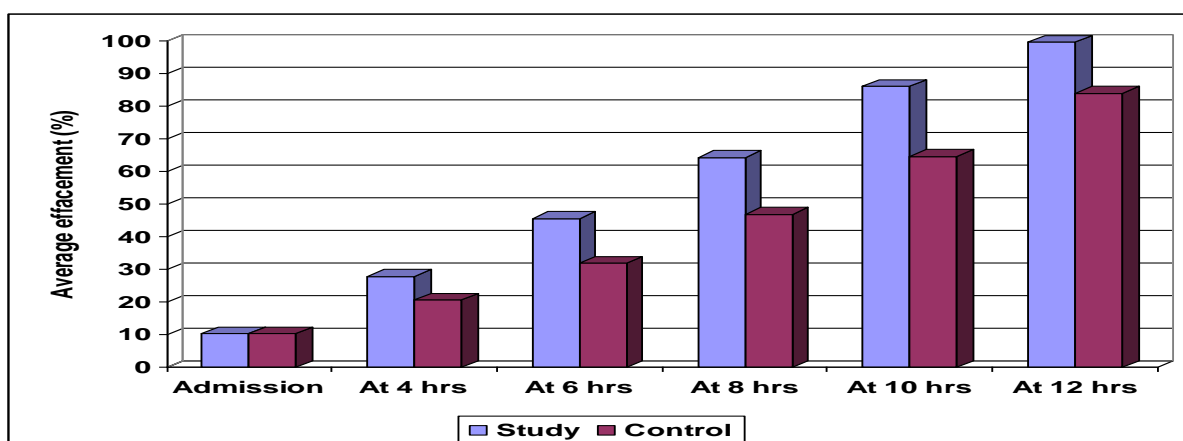

Figure 2: Bar diagram showing comparison of cervical effacement on admission, 4hrs, 6hrs, 8hrs, 10hrs, 12hrs in study and control group

Table 4: Comparison of bags of membranes on admission, 4hrs, 8hrs, 12 hrs in study and control group

Bags of membranes on	Study		Control		FET: P Value
	(f)	**(%)**	**(f)**	**(%)**	
Admission: Intact	30	100	30	100	1
At 4 hrs: Intact	30	100	30	100	1
At 6 hrs: Intact	30	100	30	100	1
At 8 hrs: Intact	30	100	30	100	1
At 10 hrs: Rupture	7	23.33	0	0	0.011
At 12 hrs: Rupture	23	76.67	4	13.33	<0.0001
FET= Fisher exact test					

The data presented in above (Table 4) and (Figure 3) shows that the bag of membranes are intact from admission to 8 hrs among both study and control group. At 10 hrs 23.3% of mother's bag of membrane were ruptured among study group. At 12 hrs 76.6% of mothers were ruptured their bag of membranes among study group while only 13.3% of mothers were ruptured their membranes in control group.
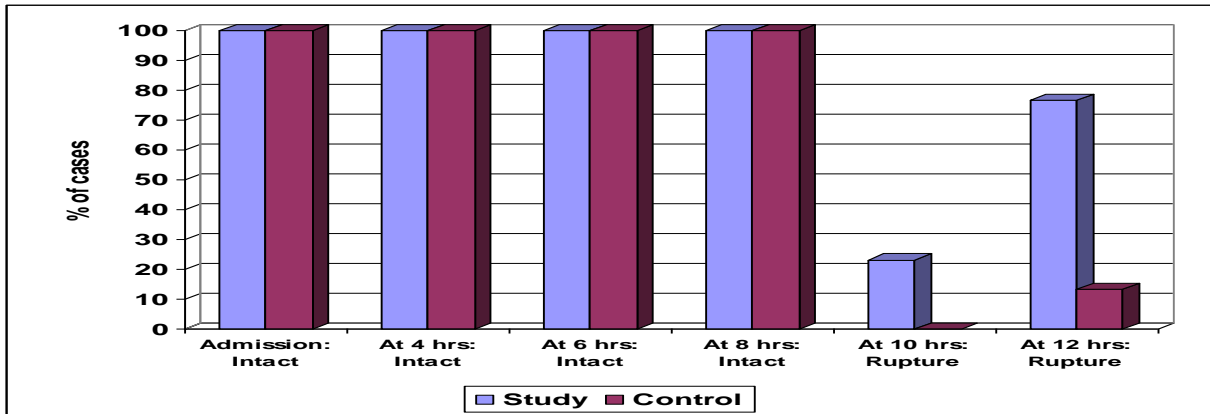
Figure 3: Bar diagram showing comparison of bag of membranes on admission, 4hrs, 6hrs, 8hrs, 10hrs, 12hrs in study and control group

Section 3

Table 5: Mode of delivery wise distribution of cases in study and control group

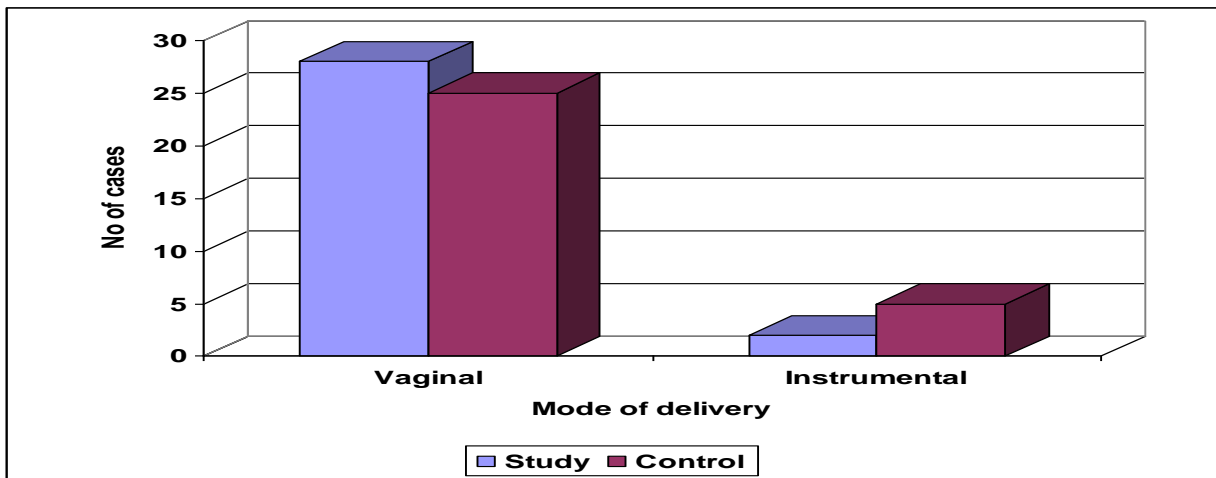| Mode of Delivery	Study		Control		Total	
	(f)	**(%)**	**(f)**	**(%)**	**(f)**	**(%)**
Vaginal	28	93.33	25	83.33	53	88.33
Instrumental	2	6.67	5	16.67	7	11.67
Total	30	100	30	100	60	100

Fisher exact test: P=0.42

Figure 4: Bar diagram showing mode of delivery wise distribution of cases in study and control group

The data presented in above (Table 5) and (Figure 4) shows regarding the mode of delivery, 93.3% of mothers among study group delivered vaginally which is higher than that of control group i.e. 83%. Only 6.6 % of mothers had undergone instrumental delivery in study group which is lower than that of control group i.e. 16.6%.

Table 6: Augmentation of labor wise distribution of cases in study and control group

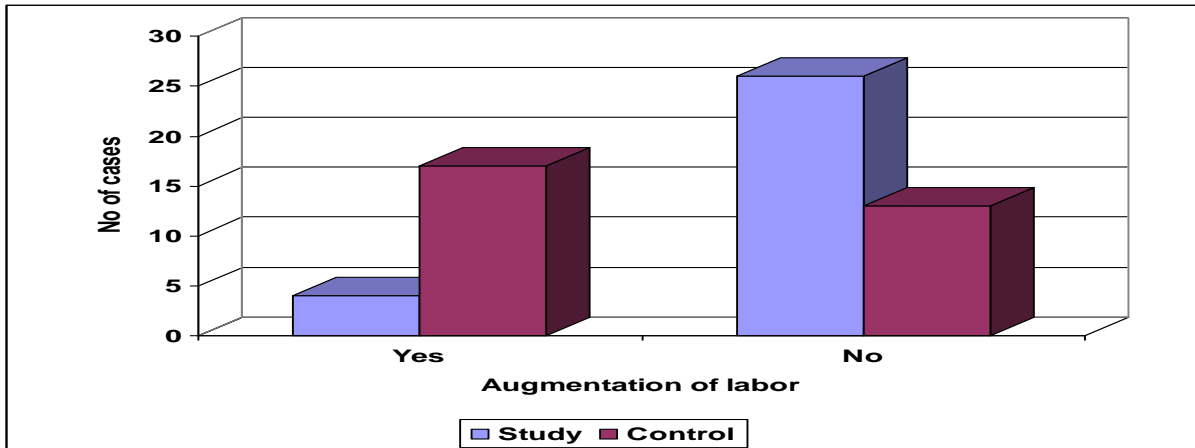| Augmentation of Labour	Study		Control		Total	
	(f)	**(%)**	**(f)**	**(%)**	**(f)**	**(%)**
Yes	4	13.33	17	56.67	21	35
No	26	86.67	13	43.33	39	65
Total	30	100	30	100	60	100

Chi-square = 12.38, P<0.0001

Figure 5: *Bar diagram showing augmentation of labor wise distribution of cases in study and control group*

Data presented in above table shows the augmentation of labor, 13.3% of mothers among study group are augmented with oxytocin drip which is significantly lower than that of control group i.e. 56.6% as P<0.0001

Table 7: *Duration of labor at 1ˢᵗ stage wise distribution of cases in study and control group*

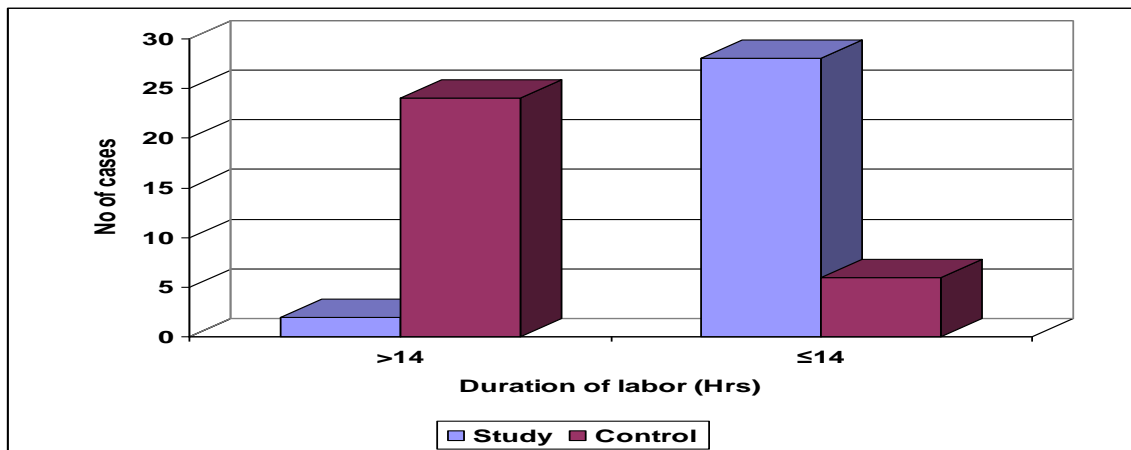| Duration of labor (Hrs)	Study		Control		Total	
	(f)	(%)	(f)	(%)	(f)	(%)
>14	2	6.67	24	80	26	43.33
≤14	28	93.33	6	20	34	56.67
Total	30	100	30	100	60	100

Chi-square = 32.85, P<0.0001

Figure 6: *Bar diagram showing duration of labor at 1ˢᵗ stage wise distribution of cases in study and control group*

Data presented in above (Table 7) and (figure 6) shows the duration of labor, only 6.6 % of primigravida mothers among study group were >14 hrs of 1ˢᵗ stage of labor while 80 % of mothers among control group, which is significantly higher than that of study group as P<0.0001

Table 8: *Duration of labor at 2nd stage wise distribution of cases in study and control group*

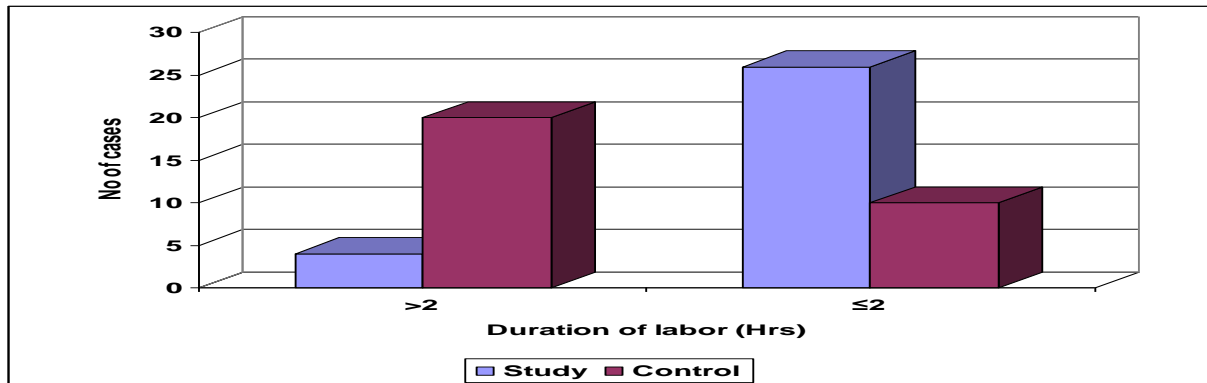| Duration of labor (Hrs)	Study		Control		Total	
	(f)	(%)	(f)	(%)	(f)	(%)
>2	4	13.33	20	66.67	24	40
≤2	26	86.67	10	33.33	36	60
Total	30	100	30	100	60	100

Chi-square = 17.78, P<0.0001

Figure 7: *Bar diagram showing duration of labor at 2nd stage wise distribution of cases in study and control group*

Above (Table 8) and (Figure 7) shows the duration of 2nd stage of labor, only 13.3 % of primigravida mothers were having the duration of 2nd stage of labor is more than 2 hrs in study group which is significantly lower than that of control group i.e. 66.6 % as P<0.0001

Table 9: *Maternal complication wise distribution of cases in study and control group*

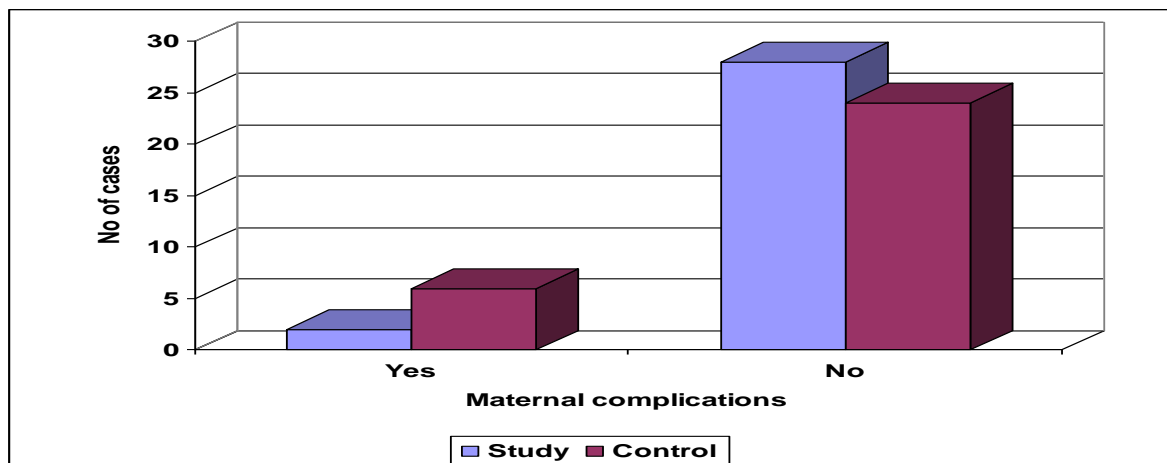| Maternal Complication	Study		Control		Total	
	(f)	(%)	(f)	(%)	(f)	(%)
Yes	2	6.67	6	20	8	(13.33)
No	28	93.33	24	80	52	(86.67)
Total	30	100	30	100	60	(100)

Fisher exact test: P=0.25

Figure 8: *Bar diagram showing maternal complication wise distribution of cases in study and control group*

Above (Table 9) and (Figure 8) shows the maternal complication, 6.6 % of mothers delivered with complications in study group, while 20% of mothers delivered with complications in control group, which is not statistical significant as P>0.05

Table 10: *Fetal complication wise distribution of cases in study and control group*

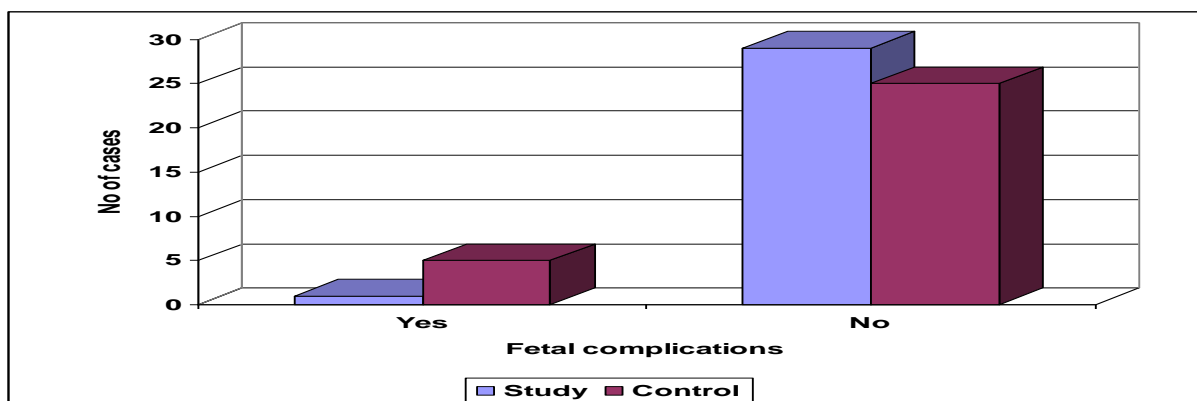| Fetal complication	Study		Control		Total	
	(f)	(%)	(f)	(%)	(f)	(%)
Yes	1	3.33	5	16.67	6	(10)
No	29	96.67	25	83.33	54	(90)
Total	30	100	30	100	60	(100)

Fisher exact test: P=0.19

Figure 9: *Bar diagram showing fetal complication wise distribution of cases in study and control group*

(Table 10) and (Figure 9) shows the comparison of fetal complication, 3.3 % of fetus delivered with complication among study group and 16.6 % of fetus delivered with complication among control group, which is not statistical significant as P>0.05.

DISCUSSION
The findings of the present study conclude that ambulation during first stage of labor was effective in reducing the duration of labor and to bring out good maternal and fetal outcome. Also ambulation did not have any adverse effect on maternal and neonatal outcome. It was observed by the investigator that having the choice to ambulate is well accepted by primigravida mothers when they were told about the potential benefits of ambulation. Also it is a cost effective intervention which the nurse can implement independently. Only 6.6 % of primigravida mothers among study group were >14 hrs of 1st stage of labor while 80 % of mothers among control group, which is significantly higher than that of study group as P<0.0001. only 13.3 % of primigravida mothers were having the duration of 2nd stage of labor is more than 2 hrs in study group which is significantly lower than that of control group i.e. 66.6 % as P<0.0001. 13.3% of mothers among study group are augmented with oxytocin drip which is significantly lower than that of control group i.e. 56.6% as P<0.0001. Following studies also supports the present study:

Deliktas A, Kukulu K (2017), conducted a study in Turkey on A meta-analysis of the effect on maternal health of upright positions during the second stage of labour, without routine epidural analgesia. The aim of the study was to detect the effect on maternal health of upright

positions during the second stage of labour. A meta-analysis design was used based on the Cochrane Handbook. Result of the study reveals that, it was detected that the ratio of instrumental labour and episiotomy was lower.

Kumud, Avinash K.R, Seema C. (2013) conducted a study on Effect of upright positions on the duration of first stage of labour among nulliparous mothers to determine the effects of upright positions (including standing, sitting) on duration of first stage of labour among nulliparous mothers. A quasi-experimental study was undertaken to determine the effect of upright positions (including standing, sitting) on duration of first stage of labour among nulliparous mothers. Sixty nulliparous mothers with single live fetus in cephalic presentation, between 32-41 weeks of gestation were included. After selection by purposive sampling method women were consecutively randomly allocated into study (group I) and control (group II) groups, each with 30 patients. Upright positions were given to group-I during active phase of first stage of labour. Progress of labour was assessed through Partograph. The mean duration of active phase of 1st stage of labour was 4 hours in Group-I compared to 6 hours in Group-II (P value: <0.001). The mean reduction in duration of active phase of first stage of labour in Group-I was 2 hours. The results of the study concluded that maintenance of upright positions during the first stage of labour reduces the duration of first stage of labour.

Ben Regaya L, Fatnassi R, Khlifi A, Fékih M, Kebaili S, Soltan K, et al (2010) conducted a study on Role of de-ambulation during labour: A prospective randomized study to assess the effects of ambulation during the first stage of labor on the duration of labor and other maternal and infant outcomes. Results revealed that Upright position reduces significantly (for about 34%) the duration of the first stage of labor (P<0.0001), the pain intensity, the oxytocin consumption (P=0.001), the rate of delivery by cesarean section and of instrumental deliveries. Upright position leads also to a net improvement of the maternal outcome (7% side effects versus 13%) and the fetal outcome (net improvement of the Apgar's score at first and fifth minute, and reduction of a factor 5 of the rate of transfer to the neonatology clinical care unit. Our study allowed to confirm the benefits of ambulation on labor progress as well as on the maternal comfort and the maternal-fetal outcome.

Implications of the study
Education
- As the first and major step in the nursing process is assessment which involves collection, organization and analysis of information related to health, this study will help in assessment of effectiveness of ambulation during first stage of labor in primigravida mothers.
- It can be further recommended to include & give emphasis on assessment of effectiveness of ambulation during first stage of labor in primigravida mothers in the curriculum.

Administration
- It will serve as a useful base in understanding the present scenario of Indian Primigravida women, their outcome of labor and the effect of ambulation during first stage of labor on outcome of labor.
- Administrative authorities can recommend use of ambulation during first stage of labor as a routine intervention in labor room to assess outcome of labor.

Community
It would be a helpful intervention for community health nurse, while going for home visits she can give information & teaching related to ambulation during labor and its effects on outcome of labor.

Clinical

- It would be a helpful intervention for doctors, nurses & students working in obstetrical set up to assess effect of ambulation during first stage of labor on outcome of labor among primigravida mothers and give information & teaching related to ambulation among antenatal mothers.
- This can also contribute in decreasing the maternal and neonatal morbidity rate to some extent.

Research

- Nursing research is an essential component of today's nursing education.
- The research is the only possible method to generate evidence for carrying out
  Nursing care.
- A similar study can be conducted on a large sample for generalization.
- A similar study can be conducted to find the effectiveness of ambulation between primigravida and multigravida mothers.

RECOMMENDATIONS

- A similar study may be undertaken to determine the effect of ambulation on the physiological parameters of the women in labor.
- A comparative study can be conducted to assess the effectiveness of ambulation versus selected antenatal exercises in reducing the duration of labor among primigravida mothers.
- A study can be conducted to assess the relationship between the parturient positions and perceptions of labor pain

intensity among primigravida mothers.
- A study can be conducted to assess the maternal and fetal complications due to adoption of supine position in labor.

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