Original Article

"Effectiveness of Ambulation During First Stage of Labor on Maternal Parameters Among Primi Mothers in A Selected Hospital at Mangaluru"

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Abstract

Introduction: The birthing women experiences, many demanding sensation and discomfort during labour and child birth. The childbearing women commonly tensed about childbirth and delivery. Ambulation during first stage of labour eases the process and it became a popular measure during this phase. Ambulation has also been found to increase foeto-maternal circulation which in turn increases the well-being of the new-born as well. Through the literature review, movement in labour to facilitates the progress of labour and enhance child birth satisfaction. This consciousness made the researcher to supply or issue the method of ambulation during the first stage of labour. With this aim, the study was conducted to assess the effectiveness of ambulation on maternal parameters in first stage of labor among the primi mother.

Materials and Methods: A quasi experimental posttest only control group design was adopted to evaluate the efficacy of ambulation during first stage of labor on maternal parameters among primi mothers. Non probability purposive sampling technique was used to recruit 40 primi mothers who are in first stage of labor and were assigned into experimental group and control group. A structured questionnaire was used to collect the demographic variable; Numerical pain rating scale was used to assess the intensity of pain, Tool to assess the frequency and duration of uterine contraction, Stethoscope to assess the foetal heart rate and opinionnaire on ambulation was used to assess the maternal parameters. Tool was administered for 20 minutes at different time interval for experimental group only. Mothers in the control group underwent routine treatment. The data obtained was analyzed and interpreted using descriptive and inferential statistics.

Results: The study findings showed that there is significant difference in the pain level in both groups. The mean and standard deviation in 2nd post intervention in experimental group is 3.35±0.48 and in control group 2.95± 0.22. There was significant difference and comparison of cervical dilatation among both the groups. The mean and standard deviation in 2nd post intervention in experimental group is 2.20 ±0.41 and in control group 2.10 ± 0.30. The comparison of frequency of contraction among both the groups is significant.In this mean and standard deviation in 2nd post intervention in experimental group is 2.20 ± 0.41 and in control group 2.10 ± 0.00. The comparison of duration of contraction among both the groups is significant. In this mean and standard deviation in 2nd post intervention in experimental group is 2.05 ± 0.68 and in control group 2.00 ± 0.00 was statistically significant. The comparison of FHR among both the groups is significant. In this mean and standard deviation in 2nd post intervention in experimental group is 3.80 ± 0.41 and in control group 3.75 ± 0.63. There is no significant difference in control group. There was no significant association between the selected demographic variables with maternal parameters such as pain, cervical dilatation, frequency of contraction, duration of contraction in experimental and control group. There is a significant association between age and fetal heart rate in experimental group.

Conclusion: The study concluded that the ambulation technique is effective to reduce the duration of labor in first stage among primi mothers. The mothers in the experimental group who were administered ambulation technique experienced reduction in the duration of labor.

Keywords: Ambulation, First stage of labour, maternal parameters and Primi mother

INTRODUCTION

Labor is one of the significant events in every woman's life[1]. The child bearing women experience many demanding sensation and discomfort during process of child birth. Pregnant women commonly worry about tremendous pain, undue duration and process of labor.[2] In the clinical setting, pain measures must be simple, and easily understood by the patient. Ambulation has become more popular in first stage of labour and also has been found to raise maternal and fetal circulation which in turn increases the wellbeing of the newborn.

During the first stage of labor the mothers usually prefers to move about. During this period, therefore she should not be compelled to take to her bed unless she feels so inclined[3]. If the membranes are intact and the women is allowed to walk

about, this attitude prevents compression and encourages descend of head[4.] Duration of the first stage is shortened in 25% and cephalic moulding is not increased, the incidence of forceps delivery diminished in the ambulant group.[5]When allowed the freedom to ambulate and change position during labor and birth, many women up to choose this as it has become a more effective form of pain relief.[6]

A prospective study was conducted among antenatal mothers in France on ambulatory epidural anesthesia and duration of labor. Purposive technique was used for the collection of 221 women in labor. Out of the sample taken, 65% were taken under experimental group and other 35% of the participants were under control group. Women randomized to ambulate. The result revealed that there was a significant difference noted in labor duration (17.34±109.9 min v/s 236.4±130.6 minutes). Hence the study concluded that walking with epidural analgesia shortened labor duration but has no other effect on progress and outcome of labour.[7]

There are a number of possible causes of prolonged labor. During the latent phase, slow effacement of the cervix can cause labor time to increase. During the active phase, if the baby is too large, the birthing canal is too small or the woman's pelvis is too small, delivery can take longer or fail to progress. Carrying multiples may also lead to prolonged labor, as might weak uterine contractions, or an incorrect position of the baby. Research has also linked prolonged labor or failure to progress to psychological factors, such as worry, stress or fear. Additionally, certain pain medications can slow or weaken your contractions[8].

MATERIALS AND METHODS

A quasi experimental posttest only control group design was adopted to evaluate the efficacy of ambulation during first stage of labor on maternal parameters among primi mothers. Non probability purposive sampling technique was used to recruit 40 primi mothers who are in first stage of labor and were assigned into experimental group and control group (20 each). A structured questionnaire was used to collect the demographic variable; Numerical pain rating scale was used to assess the intensity of pain, Tool to assess the frequency and duration of uterine contraction, Stethoscope toassess the foetal heart rate and opinionnaire on ambulation will be used to assess the maternal parameters. Tool was administered for 20 minutes at different time interval for experimental group only. Mothers in the control group underwent routine treatment. The data obtained was analyzed and interpreted using descriptive and inferential statistics.

STATISTICAL ANALYSIS

The collected data were coded, organized, tabulated, analysed and interpreted using by descriptive and inferential statistics. The analysis was performed by using IBM SPSS Statistics 23. Repeated Measure ANOVA was used to find maternal parameters. To test the significant association between the maternal parameters and demographic factor, chi-square ($\chi 2$) was computed .The level of significance was set at 0.05.

RESULTS

Part 1: Description of demographic characteristics of Primi mothers

Table 1: Frequency and percentage distribution of demographic characteristics of primi mothers in both the group

Demographic variables	Interventional group	Control group
Variable	**Frequency &percentage**	**Frequency &percentage**
1. Age		
18-22	9(45%)	7(35%)
23-26	9(45%)	11(55%)
27 and above	2(10%)	2(10%)
2. Educational status		
Primary education	3(15%)	3(15%)
High school	15(75%)	16(80%)
PUC and above	2(10%)	1(5%)
3. Type of work		
Sedentary worker	2(10%)	1(5%)
Moderate worker	18(90%)	19(95%)
Heavy worker	-	-
4. Area of residence		
Urban	8(40%)	2(10%)
Rural	12(60%)	18(90%)
5. Type of family		
Nuclear	2(10%)	4(20%)
Joint	17(85%)	12(60%)
Extended	1(5%)	4(20%)
6. Religion		
Hindu	-	2(10%)
Christian	-	-
Muslim	20(100%)	18(90%)
7. Body built		

Thin	1(5%)	-
Moderate	19(95%)	20(100%)
Obese	-	-
8. Height in cms		
140-145	4(20%)	-
146-150	8(40%)	15(75%)
151-155	8(40%)	5(25%)
9. Previous information received		
Yes	20(100%)	20(100%)
No	-	-
10. Source of information on ambulation		
Mass media	-	-
Neighbours	1(5%)	-
Health professionals	1(5%)	2(10%)
Family members	18(90%)	18(90%)
11. Weight gain during pregnancy		
10kg	20(100%)	18(90%)
12kg	-	2(10%)
>12kg	-	-
12. Pain management during first stage of labour		
Yes	-	-
No	20(100%)	20(100%)

It can be noted from the table 1 that in the experimental and control group most of the study participants were in the age group of 23 to 26 years, most of the women were educated up to high school level in interventional and control group. Majority of the primi mothers in the interventional and control group were moderate worker, were living in joint family residing at rural area. Majority of the women in the experimental and control group were Muslims and moderately built, most of them were above 146 to 150cm in height. In both the group majority of them were received the information about ambulation from family members. Majority of them were gained weight about 10kg during pregnancy and not received any pain management during first stage of labour.

Part 2: Effectiveness of ambulation on maternal parameters among mothers who are in first stage of labor.

Table 2: Pain intensity among mothers in first stage of labour within experimental and control group.
n=20+20

	Pre intervention	1st post intervention	2nd post intervention	Within group	
Group	**Mean + SD**	**Mean + SD**	**Mean + SD**	**F**	**P value**
Experimental group	2.10 + 0.30	2.20 ± 0.41	3.35 ± 0.48	135.81	0.01*
Control group	1.95 + 0.22	2.10 + 0.30	2.95 + 0.22	72.86	0.01*

F = Repeated Measure ANOVA * p<0.05= Significant

It can be inferred from table 2 that mean and standard deviation of pain score of experimental primi mothers were high in after therapy (M= 3.35, SD=0.48) in comparison with before therapy level of pain score ((M= 2.10, SD=0.30). in control group after therapy pain score was high (M= 2.95 , SD=0.22) in comparison with the level of pain score before therapy (M= 1.95 , SD=0.22). the difference was found statistically significant at 0.05 level of significance and can be attributed to the effectiveness of ambulation during first stage of labour. Thus the null hypothesis H_0 was rejected.

Table 3: Comparison of pain among mothers in first stage of labour between groups. n=20+20

Group	Between group	
	F	p value
Experimental group		
Control group	7.12	0.01*

*significant

Table 3 describes the comparison of pain among both the groups. F= Repeated measure ANOVA was used for the analysis. Since the p value is less than 0.05, it is concluded that is significant difference in the pain level between experimental and control group. Hence ambulation is effective in increasing pain.

Table 4: cervical dilatation among mothers in first stage of labour within experimental and control group.
n=20+20

	Pre intervention	1st post intervention	2nd post intervention	Within group	
Group	**Mean + SD**	**Mean + SD**	**Mean + SD**	**F**	**p value**
Experimental group	1.10 + 0.06	1.90 ± 0.30	2.20 ± 0.41	96.65	0.01*
Control group	1.05 + 0.22	2.00 + 0.00	2.10 + 0.30	234.33	0.01*

F = Repeated Measure Anova ** p<0.05= Significa*nt

Table 4 describes cervical dilatation among mothers in first stage of labour within experimental and control group. F= Repeated measure ANOVA was used to analysis. In this mean and standard deviation in 2nd post intervention in experimental group is 2.20 ± 0.41 and in control group 2.10 ± 0.30. P value is less than 0.05. Hence there is significant difference in both the group.

Table 5: Comparison of cervical dilatation among mothers in first stage of labour between experimental and control group

Group	Between group	
	F	p value
Experimental group	0.08	<0.05*
Control group		

*significant

Table 5 shows that the difference in cervical dilatation among mothers in first stage of labour between groups. F= Repeated measure ANOVA was used to analyse. p value is less than 0.05,it is concluded that is significant difference of cervical dilatation between experimental and control group

Table 6: Frequency of contraction among mothers in first stage of labour within experimental and control group.
n=20+20

Group	Pre intervention	1st post intervention	2nd post intervention	Within group	
	Mean + SD	Mean + SD	Mean + SD	F	p value
Experimental group	1.55 + 0.51	2.20 ± 0.69	2.20 ± 0.41	11.84	0.02*
Control group	1.95 + 0.22	2.00 + 0.00	2.00 + 0.00	1.00	0.33

*significant

Data in table 6 shows that there is significant difference in frequency of contraction in the intervention group compared to control group (p<0.05). F= Repeated measure ANOVA was used to analysis. In this mean and standard deviation in 2nd post intervention in experimental group is 2.20 ± 0.41 and in control group 2.00 ± 0.00. Hence there is significant difference in pre and post intervention in experimental group. Since there is p value more than 0.05, so there is no significant difference in the frequency of contraction among control group.

Table 7: Comparison of significant difference in frequency of contraction among mothers in first stage of labour between groups

n=20+20

Group	Between group	
	F	p value
Experimental group	9.43	0.01*
Control group		

*significant

Table 7 describes the comparison of frequency of contraction among both the groups. F= Repeated measure ANOVA was used for the analysis. Since the p value is less than 0.05, it is concluded that there is significant difference in the frequency of contraction between both the groups.

Table 8: Duration of contraction among mothers in first stage of labour within experimental and control group.
n=20+20

Group	Pre intervention	1st post intervention	2nd post intervention	Within group	
	Mean ± SD	Mean ± SD	Mean ± SD	F	p value
Experimental group	1.45 + 0.51	1.70 ± 0.47	2.05 ± 0.68	7.11	0.01*
Control group	1.90 + 0.30	2.00 + 0.00	2.00 + 0.00	2.11	0.16

F = Repeated Measure Anova * p<0.05= Significant

Table 8 shows that the mean and standard deviation in 2nd post intervention in experimental group is 2.05 ± 0.68 and in control group 2.00 ± 0.00. It shows that the p value is less than 0.05; hence there is significant difference in the pre and post intervention in experimental group. Since there is p value more than 0.05, there is no significant difference in the duration of contraction in control group.

Table 9: Comparison of significant difference between Experiment and control group
n=20+20

Group	Between group	
	F	p value
Experimental group	4.59	0.01*
Control group		

*significant

Data in table 9 describes the comparison of duration of contraction among both the groups. F= Repeated measure ANOVA was used for the analysis. Since the p value is less than 0.05, it is concluded that is significant difference in duration of contraction between experimental and control group.

Table 10: Foetal heart rate among mothers in first stage of labour within experimental and control group.
n=20+20

Group	Pre intervention	1st post intervention	2nd post intervention	Within group	
	Mean ± SD	Mean ± SD	Mean ± SD	F	p value
Experimental group	3.40 + 0.88	3.50 ± 0.82	3.80 ± 0.41	2.83	<0.05*
Control group	3.40 + 0.50	3.40 + 0.50	3.75 + 0.63	2.38	0.10

Table 10 shows that the mean and standard deviation in 2nd post intervention in experimental group is 3.80 ± 0.41 and in control group 3.75± 0.63. It shows that the p value is less than 0.05; hence there is significant difference in the pre and post intervention in experimental group. Since there is p value more than 0.05, there is no significant difference in the Foetal heart rate in control group.

Table 11: Comparison of foetal heart rate among mothers in first stage of labour in experimental and control groups
n=20+20

Group	Between group	
	F	p value
Experimental group		
Control group	0.07	0.01*

*significant

Table 11 describes the comparison of foetal heart rate among both the groups. F= Repeated measure ANOVA was used for the analysis. Since the p value is less than 0.05, it is concluded that is significant difference in foetal heart rate between experimental and control group.

Part 3: Assess the level of satisfaction of ambulation among primi mothers

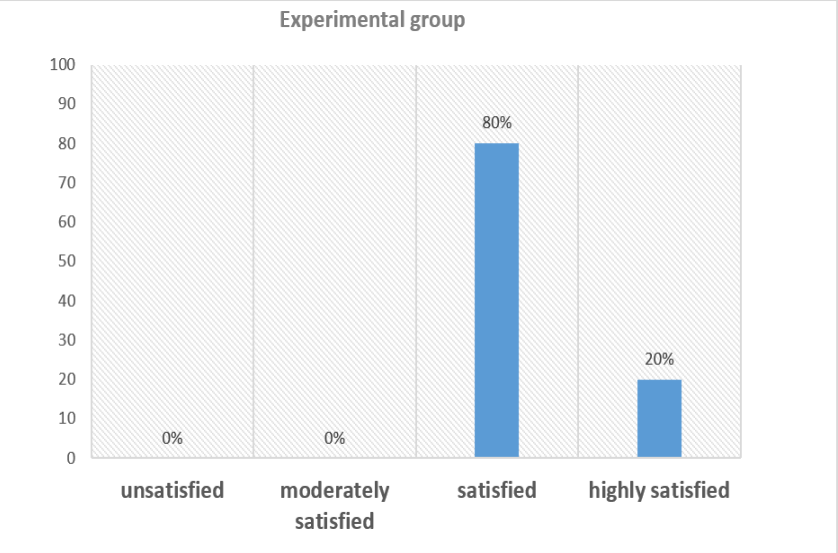

Figure 1: Level of satisfaction on ambulation among mothers

The data presented in figure 1 reveals that 80% of the mothers in the experimental group were satisfied and 20% were highly satisfied and in control group all the mothers were satisfied with ambulatory nursing care during the first stage of labour and none of the mothers expressed low satisfaction with ambulatory nursing care

Part 4: Association of maternal parameters with selected demographic variables

To test the significant association between the maternal parameters and demographic factor, chi-square ($\chi 2$) was computed. To find out level of significance hypothesis was stated as follows;

- **H_2:** There will be significant association between the maternal parameters in first stage of labor among the primi mother with selected demographic variables in the intervention and control group.

Table 12: Association between the maternal parameters in first stage of labour among the primi mother with selected demographic variables in experimental and control group

n=20+20

Demographic variables	Maternal parameters	Experimental group		Control group	
		χ2value	p value	χ2value	p value
Age	Pain	4.56	0.10	0.86	0.65
	Cervical dilatation	0.24	0.88	0.86	0.65
	Frequency of contraction	3.83	0.14	0.86	0.65
	Duration of contraction	3.83	0.14	1.81	0.40
	Foetal heart rate	15.70	0.01*	2.25	0.32

Statistical test used: chi square. *significant (p<0.05)

It was observed from table 12 that there was no significant association between the age with maternal parameters such as pain, cervical dilatation, frequency of contraction, duration of contraction in experimental and control group. Since the p value is more than 0.05 and there is a significant association between age and foetal heart rate in experimental group. Since p value is less than 0.05. Hence it is significant.

Table 13: Association between the maternal parameters in first stage of labour among the primi mother with type of work in experimental and control group

n=20+20

Demographic variables	Maternal parameters	Experimental group		Control group	
		χ2value	p value	χ2value	p value
Type of work	Pain	3.95	0.04*	0.05	0.81
	Cervical dilatation	0.24	0.61	0.05	0.81
	Frequency of contraction	2.71	0.09	20.00	0.01*
	Duration of contraction	1.81	0.17	0.11	0.73
	Foetal heart rate	5.55	0.13	0.70	0.40

Statistical test used: chi square. *significant (p<0.05)

It was observed from table 13 that there was no significant association between the type of work with maternal parameters such as cervical dilatation, duration of contraction and foetal heart rate in experimental and control group. Since the p value is more than 0.05 and there is a significant association between type of work and pain.

Table 14: Association between the maternal parameters in first stage of labour among the primi mother with height in centimetres in experimental and control group

n=20+20

Demographic variables	Maternal parameters	Experimental group		Control group	
		χ2value	p value	χ2value	p value
Height in cms	Pain	0.55	0.75	0.3	0.55
	Cervical dilatation	1.94	0.37	3.15	0.07
	Frequency of contraction	0.30	0.85	0.35	0.55
	Duration of contraction	1.81	0.40	0.74	0.38
	Foetal heart rate	3.29	0.77*	4.44	0.03*

Statistical test used: chi square. *significant (p<0.05)

It was observed from table 14 that there was no significant association between the height in cms with maternal parameters such as pain, cervical dilatation, frequency of contraction, duration of contraction in experimental and control group. Since the p value is more than 0.05 and there is a significant association between height in cms and foetal heart rate. Hence p value is less than 0.05. Hence it is significant.

DISCUSSION

The findings of this study have been discussed with that of other studies available in the literature. The findings of the study are discussed under the following headings:

Part 1: Description of demographic characteristics of Primi mothers.

The present study revealed that majority of the mothers were (45%) in experimental group and (55%) in control group were in the age group of 23-26 years, (45%, 35%) of women were in the age group 18-22.Whereas only (10%) of women in both the groups belongs to the age group of 27 and above. Greater number of the women (75%) in experimental and (80%) in control group had high school education, (15%, 5%) have primary education. Whereas (10%, 5%) have PUC and above education. In the control group (95%) and experimental group (90%) were moderate workers. Whereas (10%, 5%) were sedentary worker. Majority of the mothers in the intervention group (90%) and control group (95%) were living in rural areas whereas (40%, 10%) were living in urban area. Most of the women in experimental group (85%) and (60%) in control group were living in joint family. (20%, 10%) belongs to nuclear family. Whereas only (5%, 20%) belongs to extended family. Most of the women (100%) in experimental group and (90%) of women in control group belongs to Muslims .whereas only (10%) of women in control groups belongs to Hindu religion. All highest number of the women

(95%) in experimental group and (100%) in control group were moderately built. In the control group (75%) of participants and (40%) in experimental group were 146-150cm in height. (40%, 25%) was 151-155cm in height. Whereas (20%) in experimental group were 140-145cm in height. All the women (100%) received previous information about ambulation in both the group. Majority of the mothers in the intervention group (90%) and control group (90%) were received information about ambulation from family members ,(5%, 10%) received information about ambulation from health professionals. whereas (5%) in experimental group were received information about ambulation from neighbours. Majority of the mothers in the intervention group (100%) and control group (90%) gained 10kg of weight. Whereas (10%) in control group gained 12 kg of weight during pregnancy. All the mothers (100%) in both the group not received any pain management.
A similar study was conducted at Apollo Hospital, Chennai; Tamilnadu reveals that the frequency and percentage distribution of demographic variables of primi mothers in control group revealed that most of the mothers were in the age group of 21-25 years (56.67%), doing moderate work (60%) and residing at urban area (53.33%). Half of them were living in joint family (50%).[6]

Part 2: Effectiveness of ambulation on maternal parameters among mothers who are in first stage of labor.

- A present study shows that there is arbitrary increase in the pain level from 1st observation to 3rd observation in both the group and the compute the difference within the group repeated measure ANOVA was used. The p value is less than 0.05 which showed that there is significant difference in the pain level in both within and between groups.
- There was significant difference and comparison of cervical dilatation among both the group. The mean and standard deviation in 2nd post intervention in experimental group is 2.20 $\pm$ 0.41 and in control group 2.10 $\pm$ 0.30.
- The comparison of frequency of contraction among both the groups is significant. In this mean and standard deviation in 2nd post intervention in experimental group is 2.20 $\pm$ 0.41 and in control group 2.10 $\pm$ 0.00. Hence there is significant difference in pre and post intervention in experimental group. Since there is p value more than 0.05, so there is no significant difference in the frequency of contraction among control group.
- The comparison of duration of contraction among both the groups is significant. In this mean and standard deviation in 2nd post intervention in interventional group are 2.05 $\pm$ 0.68 and in control group 2.00 $\pm$ 0.00. There is no significant difference in the duration of contraction in control group.
- The comparison of FHR among both the groups is significant. In this mean and standard deviation in 2nd post intervention in experimental group is 3.80 $\pm$ 0.41 and in control group 3.75 $\pm$ 0.63. There is no significant difference in control group.

A similar study was conducted to assess the mean and standard deviation of pain scores of the control group parturient mothers were high in after therapy (M=7.99, SD= 0.534) compared to the level of pain score before therapy (M=6.64, SD=0.994). In the experimental group the pain score after therapy was low (M=5.05, SD=0.72) compared to the level of pain score before therapy (M=6.75, SD=0.75). The difference was found statistically significant at $p<0.001$. And can be attributed to the effectiveness of ambulatory nursing care. [7]

Part 3: Assess the level of satisfaction of ambulation among primi mothers

In the present study level of satisfaction reveals that 80% of the mothers in the experimental group were satisfied and 20% were highly satisfied the ambulatory nursing care during the first stage of labour and none of the mothers expressed low satisfaction with ambulatory nursing care
A similar study was conducted to assess the level of satisfaction and it reveals that all the mothers in the experimental group were (100%) highly satisfied withambulatory nursing care during the first stage of labour and none of them expressed low satisfaction with ambulatory nursing care.[8]

Part 4: Association of maternal parameters with selected demographic variables.

In intervention group there was no significant association between age, education, type of work, area of residence irrespective of the demographic variables all the maternal parameters were not changed before and after therapy. Hence no statistics could be calculated for association between demographic variable and maternal parameters after the therapy in control and intervention group.
In control and intervention group there was no significant association between the demographic variables and maternal parameters after the therapy. This denotes that maternal parameters were not influenced by demographic variables and hence the ambulatory nursing needs to be enhanced by the midwives by practicing complementary and alternative therapies during child birth.

A similar study shows that there was no significant association observed between the selected demographic variables and feto-maternal parameters as well as between selected obstetric variables and the fetomaternal parameters in control and experimental group of parturient mothers after therapy irrespective of the demographic variables all the feto maternal parameters were same in control and experimental group. Hence no statistics could be calculated for association between labour pain and demographic variables before the therapy in control and experimental group. There was no significant association found between the obstetric variables and feto- maternal parameters among control and experimental group.[10]

LIMITATIONS

The study is limited to Primigravida mothers, who are in 36weeks to 42weeks of gestation in First stage of labour, who are willing to participate in ambulation and who are not with risk of pregnancy.

CONCLUSION

The study concluded that the ambulation technique is effective to reduce the duration of labor in first stage among primi mothers. The mothers in the experimental group who were administered ambulation technique experienced reduction in the duration of labor.

Consent and ethical approval

Formal permission was obtained from the Yenepoya Ethics Committee-II, Yenepoya Deemed to be University, an institutional ethics committee for human research, with the approval number is YEC2/143. Written Consent was obtained from each subject after giving assurance of confidentially.

Conflict of Interest: No Conflict of Interest

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REFERENCES

1. Albers LL, Anderson D, Cragin L, Daniels SM, Hunter C, Sedler KD, Teaf D. The relationship of ambulation in labor to operative delivery. Journal of Nurse- Midwifery.1997; Jan 42(1):4-8.
2. Lubra A. Labor pain experience and intensity. Int J NursPract.2005; 11(1):33-5
3. Storton S. provides the birthing women with freedom of movement to walk, move, and assume positions of her choice. J Perinat Educ.2007; 16(1):25-7.
4. Karraz MA. Ambulatory epidural anesthesia and the duration of labor. International journal of gynecology& obstetrics.2003 Feb;80(2):117-22.
5. Prabhakar D, George LS, Karkada S. effectiveness of ambulation during first stage of labor, on the outcome of labor among primigravid women in selected hospital of Palakkad District, Kerala. International journal of nursing education. 2015;7(1):1-6.
6. Mathew A, Nayak S, Vandana K.A comparative study on effect of ambulation and birthing ball on maternal and new-born outcome among primigravida mothers in selected hospitals in Mangalore.(2012):2-5.
7. Lawrence A, Lewis L, Hofmeyr GJ, Styles C. Maternal positions and mobility during first stage labour. Cochrane Database of Systematic Reviews 2013(8).
8. B.Munirekha. effect of ambulation during 1st stage of labour on fetomaternal parameters among primigravida mothers in selected hospital, Tirupathi, A.P. Journal of nurse midwifery and maternal health2(3), Sept-Dec 2016: 141-149
9. Gaston Johansson, F.,Fridh, G. Turner, Norvell, K.(200).Progression of labour pain in primipara and multipara women, Journal of obstetrics and Gynaecology ,72,423-41.
10. Hemrninki,E.,Lenck,M.,Saari Korki,S,Let al.,.(1985).Ambulation versus Oxytocin in protrcted labour.European Journal of Obstetrics and Gynecology Reproductive Biology,20(10) ,199-208