National Journal of Physiology, Pharmacy and Pharmacology

RESEARCH ARTICLE

Comparison of the effectiveness of reflexotherapy with skilled birth attendant on labor outcomes in terms of psychophysiological variables among primigravid women – A pilot study

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Received: April 05, 2018; **Accepted:** April 28, 2018

ABSTRACT

Background: Nonpharmacological interventions are gaining momentum in managing women in labor. Hence, dissemination of data on current evidence is mandatory, to persuade the professional midwives to equip themselves with complementary therapies to enhance the efficacy of their interventions in labor. **Aims and Objectives:** This study aims to provide evidence for the effectiveness of reflexotherapy (RT) in comparison with skilled birth attendant (SKB) on labor outcomes among primigravid women regarding psychophysiological variables. **Materials and Methods:** A true experimental design with simple random sampling method was employed for the study. Forty-five gravid women, 15 in each group, between 37 and 40 weeks of gestation were included in the study after voluntary informed consent. The control group (CO) was given a routine care in the labor room, application of RT 45 min at 3–4 cm of cervical dilatation was given to the RT group. Instructional, emotional, and physical support with continuous presence from 3 to 4 cm of cervical dilatation until the end of the third stage was ensured to the SKB. The tools used were anxiety in labor assessment scale (modified Dass21) stress in labor assessment scale (modified Dass21) and physiological parameters monitoring chart. **Results:** The Kruskal–Wallis one-way ANOVA on Ranks showed a significant difference between the control, SKB, and RT groups in the postdelivery assessment of labor anxiety ($P \leq 0.001$) and labor stress ($P \leq 0.001$). One-way ANOVA showed no significant difference between the control, SKB and RT group in both diastolic and systolic blood pressures, temperature and fetal heart rate, while there was significant difference at 30 minutes ($P = 0.004$) after the intervention and at 7–8 ($P = 0.029$) centimeters of cervical dilation in the pulse rate. Kruskal wallies One-way ANOVA on Ranks showed no significant difference in the Apgar score. **Conclusion:** RT and the presence of a SKB are effective in reducing labor anxiety and labor stress, whereas it has no effect on the physiological parameters in labor except the pulse rate.

KEY WORDS: Reflexotherapy; Skilled Birth Attendant; Psycho Physiological Variables

Access this article online	
Website: www.njppp.com	Quick Response code
DOI: 10.5455/njppp.2018.8.0415628042018	

INTRODUCTION

Labor is a most poignant and fruitful moment in a woman's life. Labor process could be an exceedingly terrifying experience for women, especially the first births. Physical sensations range from uneasiness to severe pain. Assisting the woman to lighten up and be conscious of the condition may help to bring down

the physical pain and emotional distress of labor and birth.[1] The demographics of India shows that the birth rate of the country is 19/1000 population as per the demographics profile 2018.[2] Cesarean births in India are skyrocketing. Until 2010, cesarean sections were limited to 8.5% of all deliveries in the country and it was within the recommended rate by the WHO that is 10–15%. However, at present, the number has escalated in many parts of the country reaching as high as 41% in Kerala, and 58% in Tamil Nadu estimated by the ICMR school of public health.[3] The leading factors in this trend of increasing rate of cesarean section are that more and more women are asking for C-sections that have no medical rationale, that the number of women who genuinely need a cesarean is increasing, that liability pressure on health-care providers is driving rates up.[4] Normal vaginal delivery is attributed to a decrease in postpartum discomfort, earlier recovery, and quicker return to the normal life activities. Considering the physical aspects of normal labor such as the pain of contractions, fear about the condition of the baby, frequent painful procedures such as per vaginal examinations, the long process of the first stage of labor, the emotional aspects such as the absence of a support person, feeling of loss of control over the whole situation, lack of attention and care from the health-care team and the neglect, loneliness, and suffering expected in those moments make natural childbirth natural birthing process is avoided by some couples.[5]

There are multiple factors that affect a woman's ability to cope with her labor including her personal social and cultural, values and place of birth setting and effect of provider characteristics.[6] Labor stress has been linked to detrimental outcomes including immunosuppression, fluid and electrolyte imbalance, delayed wound healing, diminished uterine contractions, and prolonged labor in the mother.[7] Labor stress may also contribute to depression, concerns regarding children, concerns about parenting capacities, negative interpretations of the pregnancy experience, and decreased confidence.[8] Labor stress was found to have a statistically significant positive relationship with a number of labor hours. The correlation between perceived labor stress and a number of labor hours is a reasonable one since the longer the labor, the more stressful it may become.[9,10]

Reflexology as a natural healing art based on the principle that there are reflexes in the feet, hands, and ears and their referral areas within zone-related areas, which correspond to every part, gland, and organ of the body. Through the application of pressure on these reflexes without the use of tools, crèmes, or lotions, the feet being the primary area of application, reflexology relieves tension, improves circulation, and helps promote the natural function of the related areas of the body.[11]

Reflexology helps the body to relax at a stressful time and to reach the optimum level of natural functioning. Working these specific reflexes will never cause premature labor. During the process of labor reflexology helps with regulating contractions, reducing pain, backache, helping with bladder and bowel movement, releasing retained placenta, and normalizing breathing.[12] The incorporation of reflexology into midwifery practice is growing wider in recent years in response to a rising concentration on alternative and complementary therapies and theinclusion of new skills into midwifery practice.[13] Childbirth is portrayed as a multifaceted experience. The sense of security, perceived control, level of labor pain personal support, midwifery care, analgesia given, and involvement in decision-making contributions to better child health experience.[14] There is considerable support by midwives for the use of complementary and alternative medicine by expectant women. Despite this enthusiasm, currently, there are few educational opportunities and only limited research evidence regarding CAM use in midwifery practice. These shortfalls need to be addressed by profession. Midwives are encouraged to have an open dialogue with childbearing women, to document use and to base any advice on the best available evidence.[15] Hence the comparison of the effectiveness of reflexotherapy with the presence of skilled birth attendant on psycho physiological parameters of primi gravid women in labour is done.

MATERIALS AND METHODS

Objective

To compare the effectiveness of reflexotherapy with the presence of skilled birth attendant on psycho physiological parameters of primi gravid women in labour

Research Design

This was a quantitative approach with true experimental design.

Participants

Forty-five primigravid women, 15 for the routine care group, 15 for the birth attendant group, and 15 for the RT group, were taken using simple random sampling technique.

Inclusion and Exclusion Criteria

Primigravid women who completed 37 weeks of gestation, with normal singleton pregnancy and vertex presentation, the absence of medical and obstetric complications affecting normal labor, presence of no mental illness, and ability to read and understand English or Malayalam were the criteria for inclusion. Primigravid women with malpresentation, cephalopelvic disproportion. Antepartum hemorrhage, hydroamniosis, pre eclampsia, placenta previa and those on pain-relieving medications were excluded from the study.

Procedure for Data Collection

Random selection of three succeeding days a week for data collection and further random allotment of these 3 days of each week to routine care (control), SKB and reflexology group was done. Those in the control group (CO) were given

routine care in the labor room. The investigator remained in the labor room as an observer. To the SKB group, instructional support was provided giving to each primigravid woman a leaflet on labor and delivery which put in plain words what is labor, the stages of labor, the signs of labor, the interventions considered as part of normal labor, and how to stay comfortable during the process of labor during pre-labor period and encouraged them to read it and clarify doubts. From 3–4 cm of cervical dilatation emotional support was offered by staying close to the primigravid woman treating her with respect, being kind and gentle in dealing with her, clearing her doubts, addressing her by name, attempting to reduce her pain and anxiety, boosting her self-confidence, and distracting her during painful contractions. Physical support was rendered assisting the primigravid woman in labor to meet the nutritional and elimination needs and helping her to reposition herself, which will facilitate her go through the process with more ease.

Foot RT was applied to the third group at 3–4 cm of cervical dilatation on both the foot simultaneously for 45 min. Reflexology session had 19 stages as follows: 1 - Preliminaries which included mild massage on the whole foot. This was followed by the application of pressure in the reflex centers related to 2 - pituitary gland, 3 - the head, 4 - throat, thyroid, and thymus gland 5 - shoulder area 6 - lung and heart area, 7 - back of the chest, 8 - bronchial area, 9 - the diaphragm, esophagus, stomach and pancreas 10 - spleen liver and gallbladder, 11 - the small intestine 12 - the large intestine, 13 - the lymphatic system, 14 - the urinary bladder, 15 - uterus vagina, ovary, prostate, penis, testes 16 - rectum 17 - shoulder, arm, hand, legs, elbow, hips, knee joint, and spinal nerves 18 - The spinal column, 19 - The solar plexus. After the completion of the whole of the foot, in a sequence and systematic manner, pressure was applied in the reflex centers related to pituitary located on the center of the big toe, uterus on both the feet in the hollows under the inner ankle bones or the indented region between the inner ankle and the sole and solar plexus in the border of upper and middle on third of the sole where foot wrinkle is created, when the sole bends.

Assessment of all the three groups were done at same intervals. Bio-physiological parameters included monitoring of the systolic and diastolic blood pressure, pulse rate, and fetal heart rate, and Apgar score which was done at prelabor and at 30 min after intervention and 6–7 cm of cervical dilation. On the second postpartum day, stress in labor scale (adapted from DASS 21 and modified), anxiety in labor scale (adapted from DASS 21 and modified) was used to assess the anxiety and stress in labor.

Tool for Data Collection

Demographic datasheet of primigravid women, stress in labor scale (adapted from DASS 21 and modified), anxiety in labor scale (adapted from DASS 21 and modified), bio-physiological parameters monitoring chart (temperature, pulse rate, systolic and diastolic blood pressure, and fetal heart rate and Apgar score).

Ethical Consideration

The approval for conducting the study was obtained from the Institutional Human Ethics Committee of Saveetha University (003/07/2017/IEC/SU) and the administrator of of Dhanya Hospital Chalakudy, Kerala.

Statistical Analysis

Kruskal–Wallis one-way ANOVA on Ranks and Friedman one-way RM ANOVA on Ranks for comparison of stress in labor and anxiety in labor and one-way ANOVA and unpaired *t*-test for comparison of physiological variables and the Kruskal–Wallis one-way ANOVA on Ranks for the comparison of Apgar score.

RESULTS

The Demographic Characteristics of PrimiGravid Women [Table 1]

Most of the participants in the control (73%) SKB (67%) and RT group (80%) belonged to the age group between 21 and 30 years. The educational qualification of majority in the control (60%), SKB (67%) and RT (60%) groups were graduation and postgraduation. About 40% in control, 53% in the SKB and 40% in the RT group were housewives. The gestational age was 39–40 weeks for 40% control, 53% SKB, and 47% RT group. All the participants in all the three groups had wanted pregnancy. The pre pregnant weight was between 41 and 50 kg and 51–60 kg (40%, and 47%), (40% and 53%), (47% and 53%) for the control, SKB and RT group, respectively. The height of the most of the participants in the control (60%), SKB (70%) and RT (70%) were between 151 and 160 cm. About 93% in the control, 93% in the SKB and 87% in the RT group had their pre pregnant body mass index between 18.51 and 24.9. About 87% of control, 93% of SKB, and 80% of RT group had no prenatal classes. The onset of labor of all the participants (100%) was induced and the induction was done with the use of oxytocin.

Comparison of the Effectiveness of Control, SKB RT on Physiological Variables [Table 2]

One-way ANOVA showed no significant difference between the control, SKB and RT, at pre labor ($P = 0.470$), at 30 min after the intervention ($P = 0.0.446$), and at 7–8 cm of cervical dilation ($P = 0.576$) in the systolic blood pressure. Unpaired *t*-test showed no significant difference within the control ($P = 0.336$), SKB ($P = 0.126$) and RT group ($P = 0.433$) at prelabor, 30 min after the intervention, and at 7–8 cm of cervical dilation in the systolic blood pressure.

Table 1: Description of primi gravid women according to their demographic characteristics

Demographic. characteristics	Categories	*n*=15 (%)			Statistics
		(CO)	(SKB)	(RT)	
Age (years)	18-20	1 (7)	2 (13)	0 (0)	As it was a pilot study and the sample size was smaller χ^2 test was not carried out
	21-25	6 (40)	7 (47)	8 (53)	
	26-30	5 (33)	3 (20)	4 (27)	
	31-35	3 (20)	3 (20)	3 (20)	
Education	Postgraduate	3 (20)	3 (20)	4 (27)	
	Graduate	6 (40)	7 (47)	5 (33)	
	Higher secondary	4 (27)	3 (20)	2 (13)	
	High school	2 (13)	2 (13)	4 (27)	
	Middle school0	0 (0)	0 (0)	0 (0)	
Occupation estational age	Professional	3 (20)	4 (27)	4 (27)	
	Technical worker	5 (33)	3 (20)	3 (20)	
	Daily wage worker	1 (7)	0 (0)	2 (13)	
	House wife	6 (40)	8 (53)	6 (40)	
	37-38 weeks	4 (27)	3 (20)	4 (27)	
	38-39 weeks	5 (33)	4 (27)	4 (27)	
	39-40 weeks	6 (40)	8 (53)	7 (47)	
Type of pregnancy	Wanted	15 (100)	15 (100)	15 (100)	
	Un wanted	0 (0)	0 (0)	0 (0)	
Weight (kg)	41-50	6 (40)	6 (40)	7 (47)	
	51-60	7 (47	8 (53)	8 (53)	
	61-70	2 (13)	1 (7)	0 (0)	
Height (cm)	146-150	1 (7)	1 (7)	1 (7)	
	151-155	5 (33)	7 (47)	7 (47)	
	156-160	4 (27)	5 (33)	5 (33)	
	161-165	5 (33)	2 (13)	2 (13)	
Body Mass Index	Below 18.50	1 (7)	1 (7)	2 (13)	
	18.51-24.9	14 (93)	14 (93)	13 (87)	
	25.00-29.90	0 (0)	0 (0)	0 (0)	
	30.00 above	0 (0)	0 (0)	0 (0)	
Previous AN classes	Yes	2 (13)	1 (7)	3 (20)	
	No	13 (87)	14 (93)	12 (80)	
Type of onset of labour	Spontaneous	0 (0)	0 (0)	0 (0)	
	Induced	15 (100)	15 (100)	15 (100)	
Method of Induction	Oxytocin	15 (100)	15 (100)	15 (100)	

n=45, CO: Control group, SKB: Skilled birth attendant, RT: Reflexo therapy

One-way ANOVA showed no significant difference between the control, SKB and RT group at pre labor ($P = 0.334$), at 30 min after the intervention ($P = 0.120$), and at 7–8 cm ($P = 0.827$) of cervical dilation in the diastolic blood pressure. Unpaired *t*-test showed significant difference within the control ($P = 0.001$) and SKB groups ($P = 0.003$) whereas no significant difference was found within the RT group ($P = 0.227$) at pre labor, 30 min after the intervention and at 7–8 cm of cervical dilation, respectively, in the diastolic blood pressure.

One-way ANOVA showed no significant difference between the control, SKB and RT group at prelabor ($P = 0.691$), while there was significant difference at 30 min after the intervention ($P = 0.004$) and at 7–8 cm ($P = 0.029$) of cervical dilation in the pulse rate. Unpaired *t*-test showed no significant difference within the control ($P = 0.008$) SKB ($P =0.0.063$) and RT ($P = 0.316$) groups at pre labor, 30 min after the intervention and at 7–8 cm of cervical dilation, respectively, in the pulse rate.

One-way ANOVA showed no significant difference between the control, SKB and RT group at pre labor ($P = 0.953$), at 30 min after the intervention ($P = 0.986$) and at 7–8 ($P = 0.871$) centimeters of cervical dilation in the temperature. Unpaired *t*-test showed significant difference within the

Table 2: Comparison of the effectiveness control, SKB, and RT groups physiological variables

Variable	Group	Mean±SE	One-way ANOVA			Un paired *t*-test		
			Co pre SBA pre RT Pre	Co 30 SBA 30 RT 30	Co 6-7 SBA 6-7 RT 6-7	Co pre versus 30 Co pre versus 6-7 Co 30 versus 6-7	SBA pre versus 30 SBA pre versus 6-7 SBA30 versus 6-7	RT pre versus 30 RT pre versus 6-7 RT 30 versus 6-7
SBP	Co pre	114.000±16.388	F=0.769	F=0.822	F=0.835	F=1.120	F=2.178	F=0.853
	SBA pre	107.333±13.345	*P*=0.470	*P*=0.446	*P*=0.441	*P*=0.336	*P*=0.126	*P*=0.433
	RT pre	111.333±14.573						
	Co 30	116.667±14.475						
	SBA 30	112.667±15.337						
	RT 30	110.000±13.093						
	Co 6-7	122.000±13.732						
	SBA 6-7	118.000±13.202						
	RT 6-7	116.000±11.832						
DBP	Co pre	72.000±5.606	F=1.127	F=2.227	F=0.191	F=10.111	F=3.702	F=1.535
	SBA pre	74.000±7.368	*P*=0.334	*P*=0.120	*P*=0.827	*P*<0.001	*P*<0.030	*P*=0.227
	RT pre	75.333±5.164						
	Co 30	78.000±4.140						
	SBA 30	74.000±5.071						
	RT 30	75.333±6.399						
	Co 6-7	80.000±5.345						
	SBA 6-7	79.333±5.936						
	RT 6-7	78.667±6.399						
PR	Co pre	78.667±7.198	F=0.373	F=6.226	F=3.857	F=5.431	F=2.960	F=1.185
	SBA pre	76.9333±8.031	*P*=0.691	*P*=0.004	*P*=0.029	*P*=0.008	*P*=0.063	*P*=0.316
	RT Pre	79.067±6.227						
	Co 3-0	83.7333±5.750						
	SBA 3-0	77.867±5.750						
	RT 3-0	75.400±6.610						
	Co 6-7	87.067±7.959						
	SBA 6-7	81.067±7.630						
	RT 6-7	80667±5.327						
	SBA pre	16.67±1.033						
	RT Pre	16.667±0.816						
	Co 30	17.867±1.356						
	SBA 30	16.867±0.834						
	RT 30	15.733±0.884						
	Co 6-7	19.333±1.496						
	SBA 6-7	18.67±1.438						
	RT 6-7	18.133±1.506						

(Contd...)

Table 2: ***(Continued)***

Variable	Group	Mean±SE	One-way ANOVA			Un paired *t*-test		
			Co pre SBA pre RT Pre	Co 30 SBA 30 RT 30	Co 6-7 SBA 6-7 RT 6-7	Co pre versus 30 Co pre versus 6-7 Co 30 versus 6-7	SBA pre versus 30 SBA pre versus 6-7 SBA30 versus 6-7	RT pre versus 30 RT pre versus 6-7 RT 30 versus 6-7
Temp	Co pre	98.333±0.511	F=0.084 *P*=0.953	F=0.0145 *P*<0.986	F=0.138 *P*=0.871	F=3.702 *P*=0.030	F=3.795 *P*=0.031	F=17.73 *P*=0.023
	SBA pre	198.280±0.465						
	RT Pre	98.320±0.489						
	Co 30	98.567±98.547						
	SBA 30	98.547±0.325						
	RT 30	98.560±0.295						
	Co 6-7	98.713±0.380						
	SBA 6-7	98.653±0.342						
	RT 6-7	98.707±0.301						

n=45, CO: Control group, SKB: Skilled birth attendant, RT: Reflexo therapy

control (P = 0.023) SKB (P = 0.031) and RT (P = 0.030) groups at pre labor, 30 min after the intervention and at 7–8 cm of cervical dilation, respectively, in the temperature.

Comparison of the Effectiveness of Control, SKB RT on Fetal Heart Rate [Table 3]

One-way ANOVA showed no significant difference between the control, SKB and RT group at pre labor (P = 0.508), at 30 min after the intervention (P = 0.205) and at 7–8 cm of cervical dilation in (P = 0.576) the fetal heart rate. One-way repeated measures of ANOVA showed no significant difference within the RT (P = 0.240), SKB (P = 0.077) and control (P = 0.428), at different stages of labor.

Comparison of the Effectiveness of Control, SKB RT on Apgar Score [Table 4]

The Kruskal–Wallisone-way ANOVA on ranks showed no significant difference between the control, SKB and RT groups at Imt (P = 0.803) and at 5 min (P = 1.000) after birth.

Comparison of the Effectiveness of Control, SKB RT on labor Stress and Anxiety [Table 5]

The Kruskal–Wallisone-way ANOVA on Ranks showed significant difference between the control, SKB and RT groups in the postdelivery assessment of labor stress ($P \leq$ 0.001). Students Newman–Keul method showed significant difference in the labor stress between the control and RT group ($P \leq 0.001$), SKB and RT group ($P \leq 0.001$) and control and SKB group ($P \leq 0.05$).

The Kruskal–Wallis one-way ANOVA on Ranks showed significant difference between the control, SKB and RT groups in the post-delivery assessment of labor anxiety ($P \leq$ 0.001). Student-*Newman–Keuls* method showed significant difference in the labor anxiety between the control and RT group ($P \leq 0.001$), SKB and RT group ($P \leq 0.001$) and control and SKB group ($P \leq 0.001$).

DISCUSSION

The present study showed no significant difference between the RT, SKB and Routine care group at pre labor, at 30 mt, after the intervention, and at 7–8 cm of cervical dilation in the diastolic blood pressure, systolic blood pressure with a gradual increase only in the diastolic blood pressure of control and SKB group as the labor progressed. These findings were matched with the result of another study, where the mean scores of systolic and diastolic blood pressure of the mothers in the study and control group had no significant difference neither before or after intervention.[16]

The present study showed significant difference in the pulse rate of RT, SKB and routine care group at 30 min after the intervention and at 7–8, cm of cervical dilation and a gradual increase in the pulse rate of control group. Maternal heart rates showed no decelerations; the proportion of tracings with accelerations increased as labor advanced, most of them coinciding with uterine contractions or bearing down efforts. The FHRs had both decelerations and accelerations.[17] When the uterus contracts during labor, an additional 300 ml–500 mls of blood enters the circulation. The heart rate may also be increased by pain, anxiety and fear.[18] The present study shows that RT and the presence of a SKB are effective in maintaining the pulse rate within the normal range of the individual.

Table 3: Comparison of the Effectiveness of Control, SKB, and RT groups Fetal Heart Rate

Variable	Group	Mean±SE	One-way ANOVA	One-way RM ANOVA		
				C–Pre versus C–30 Ns C–Pre versus C–67 Ns C–30 Ns C–67 Ns	BA Pre versus BA 30 Ns BA Pre versus BA 6-7 Ns BA 30 Ns BA 6-7 Ns	RT Pre versus RT 30 Ns RT Pre versus RT 6-7 Ns RT 30 Ns RT 6-7 Ns
FHR	C-pre	141.533±9.775	F=0.688	F=0.874	F=2.189	F=1.504
	BA-pre	140.933±7.887	*P*=0. 508	*P*=0.428	*P*=0.077	*P*=0.240
	RT-pre	138.000±8.718				
	C–30	143.467±7.577	F=1. 644			
	BA30	140.400±8.458	*P*=0. 205			
	RT30	138. 133±8. 193				
	C–67	143.133±8. 576	F=0. 560			
	BA67	142.400±8.322	*P*=0. 576			
	RT67	140. 000±8.552				

n=45, CO: Control group, SKB: Skilled birth attendant, RT: Reflexo therapy. NS: Not significant

Table 4: Comparison of the effectiveness of control, SKB, and RT groups on APGAR SCORE

Parameter	Group	Median (25 and 75 percentile)	Kruskal wallies one way ANOVAon ranks
Apgar score at 1 min	CO	9.000 (9.000, 9.000)	H=0.440 Df=2 *P*=0.803
	SBA	9.000 (9.000, 9.000)	
	RT	9.000 (9.000, 9.000)	
Apgar score at 5 min	CO	10.000 (10.000,10.000)	H=0.000 Df=2 *P*=1.000
	SBA	10.000 (10.000,10.000)	
	RT	10.000 (10.000,10.000)	

n=45, CO: Control group, SKB: Skilled birth attendant, RT: Reflexo therapy

Table 5: Comparison of the effectiveness control, SKB and RT groups on stress anxiety and birth satisfaction

Parameter	Group	Median (25 and 75 percentile)	Kruskal–Wallis One-way ANOVA on Ranks
Stress	CO-post	25.00 (21.00, 29.00)	H=25.690 Df=2 *P*≤0.001
	SKB-post	20.00 (17.00, 25.00)	
	RT-post	15.00 (15.00,16.00)	
Anxiety	CO-post	7.00 (7.00, 8.00)	H=33.714 Df=2 *P*<0.001
	SKB-post	6.00 (5.00, 6.00)	
	RT-post	4.00 (3.00, 5.00)	

n=45, CO: Control group, SKB: Skilled birth attendant, RT: Reflexo therapy

The present study showed no significant difference in the temperature of Reflexotherapy, Skilled birth attendant and Routine care group at 30 min after the intervention and at 7–8, cm of cervical dilation and a gradual increase in temperature within the groups. The mean temperature during labor in the complete study population increased from 37.1°C at the beginning of labor to 37.4°C.[19]

The results regarding Apgar score in the first and fifth minute in the present study showed no significant difference between the control, SKB and RT group which is consistent with the findings of McNeill.[20] Showed that using reflexology during labor. However, Hanjani.[21] and Valini *et al*. (2011).[22] reported that their study showed that Apgar score was significantly higher after reflexology. Continuous pain and fear in the labor affects respiratory system, circulatory, endocrines, and other activities of the body that would lead to hard and difficult labor and consequently would increase rate of labor with instruments and cesarean and reduce the Apgar score Valiani *et al*. (2011).[22] The difference in the findings may be that, only primigravid women who progressed with normal labor was the study samples in the present study.

Reduction in anxiety and stress in labor among primigravid women was observed in the present study with significant difference in the scores between the control and RT group, SKB and RT group and control and SKB group. Lubna and Eileen[9] disclosed a significant negative correlation ($r = -0.36$, $P < 0.01$) between labor stress and nursing support. The study of Lee[23] found that considerable difference presents in before and after reflexology regarding reduction of depression and stress of middle aged women. The study of Devilata[24] found pre-delivery preparation effective in reducing anxiety among primigravida mothers. Excessive anxiety triggers "fight-or-flight" response, which, in turn, may amplify painful stimuli from the uterus and the cervix and make pain more intense. Fear of pain may be one component of labor-related anxiety and has a high correlation with pain levels reported during the first-stage labor.[25]

CONCLUSION

With the current emphasis on evidence-based care, studies on labor support and the use of complementary therapies in labor are probably the most relevant research for intrapartum nurses to apply to their practice. Delving into these interventions are essential to advance intrapartum nursing knowledge and to help determine standards of care. Such knowledge ultimately guides nursing care toward improving maternal-infant health outcomes in the childbearing population. As the focus on non-pharmacological methods during labor is growing popular the investigator propose that the complementary therapies which are cost-effective, noninvasive and independent intervention could be integrated into the curriculum of nursing and midwifery education and hospitals may set aside complimentary and supportive therapies for the choice of the clients.

ACKNOWLEDGMENT

We would like to thank the participants for their cooperation in this study and acknowledge our gratitude to the authorities of the hospital for granting permission to conduct the study.

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How to cite this article: Jijimole M, Abdul AJ, Vijayaraghavan R, Susila C. Comparison of the effectiveness of reflexotherapy with skilled birth attendant on labor outcomes in terms of psychophysiological variables among primigravid women – A pilot study. Natl J Physiol Pharm Pharmacol 2018;8(8):1179-1187.

Source of Support: Nil, **Conflict of Interest:** None declared.