"A study to assess the effectiveness of circular hip massage on pain during the first stage of labour among parturients in selected hospitals, Bengaluru".

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Abstract : The present study was conducted to assess the effectiveness of circular hip massage on pain during the first stage of labour among parturients in selected hospitals Bengaluru. The objectives of the study were to assess the effectiveness of circular hip massage on labour pain among parturients between the experimental and control groups and to determine the association between labour pain scores of parturients following circular hip massage and selected sample characteristics in the experimental and control groups.

The conceptual framework adopted for the study was based on Sr. Callista Roy's adaptation model. The research design for the study was a quasi-experimental post-test-only control group design with a quantitative evaluative approach. The instrument used in the study consisted of three sections. Section one was sample characteristics, section two was the Numerical Pain Rating Scale, and section three was the Compliance Sheet. Thirteen experts established the content validity of the tool. The pilot study was conducted to assess the feasibility of the main study. The study sample comprised 40 parturients from a selected Hospital who were selected based on a purposive sampling technique considering both inclusion and exclusion criteria. Descriptive and inferential statistics analyzed the data collected. In the experimental group, the researcher provided a detailed explanation of the purpose and schedule of the study. Written informed consent was obtained from parturients after assuring anonymity and confidentiality of the information obtained. The sample characteristics were assessed using a structured interview schedule. Intervention in the form of circular hip massage was given for 15 minutes with an interval of one hour during the latent and active phases of the first stage of labour. The researcher documented four consecutive pain readings following four episodes of circular hip massage. However, the sample was free to ask for more episodes of circular hip massage, which was documented using a compliance sheet for parturients in the experimental group.

The mean pain score in the experimental group (2.6) is less than the control group (5.3). The mean difference is 2.7. The computed independent 't' value is 16.765, which is greater than the table value (t38 =1.960) at a 0.05 level of significance. Hence, there is a statistically significant difference in pain scores during the first stage of labour among parturients following circular hip massage between the experimental and control groups.

In the experimental group, the computed chi-square values for the pain scores and selected sample characteristics were lesser than their respective table values, except for religion ($\chi2$ =6.111) and regular antenatal visit ($\chi2$ = 7.200), which were greater than their corresponding table values. In the control group, the computed chi-square values for pain scores and all the selected sample characteristics were lesser than their respective table values.

In the experimental group, a majority (80%) of the parturients during the first session, 65% each in the second and third sessions and 45% in the fourth session received circular hip massage for 15 minutes. Fifteen percent of the parturients during the first session, 35% each in the second and third sessions and 55% in the fourth session received circular hip massage for 20 minutes, and only 5% of them received it for 25 minutes only during the first session. Parturients who received circular hip massages had good compliance during the initial session, ranging from 15 minutes to 25 minutes.

Thus, the findings of the study concluded that circular hip massage is effective on pain during the first stage of labour among parturients.

Keywords: circular hip massage, pain, first stage of labour, parturients.

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INTRODUCTION

"When you change the way you view birth, the way you birth will change".

<div align="right">-Marie Mongan</div>

Pregnancy is a unique, exciting and often joyous time in a woman's life, as it highlights the woman's amazing creative and nurturing powers while providing a bridge to the future. Pregnancy comes with some cost; however, a pregnant woman needs to be responsible to best support the health of her future child. The growing fetus depends entirely on its mother's healthy body for all needs. Consequently, pregnant women must take steps to remain as healthy and well-nourished as they possibly can.[1]

Pain during labour is caused by contractions of the muscles of the uterus and by pressure on the cervix. This pain can be felt as a strong cramping pain on abdomen, groin and back, as well as achy feeling. Some women experience pain in their sides or thighs as well. Other causes of pain during labour include pressure on the bowel and bladder by the baby's head and the stretching of the birth canal and vagina.[2]

Massage and touch can be a powerful and effective tool for helping women during childbirth. The use of massage is not a new concept. The earliest record of massage therapy dates back to 2400 BCE in the Tomb of Akmanthor. It has been indicated that massage was also used in ancient India, China, and Japan[3]. In India, massage therapy was considered a sacred system of natural healing. Used by Hindus in Ayurveda "life health" medicine, massage therapy was a practice passed down through generations to heal injuries, relieve pain, prevent and cure illnesses. Promoters of Ayurveda believe that illness and disease are caused when people are out of sync with the environment. Massage is believed to restore the body's natural and physical balance so that it can heal naturally. In the early 1800s, Swedish doctor/gymnast/teacher Per Henrik Ling created a method that became known as the Swedish Movement Cure to help relieve chronic pain. Physical therapy was licensed in the 1950s; massage therapy had its own category. The American Massage Therapy Association (AMTA) was established and laid the groundwork for today's massage practitioners by establishing ethics and education standards. Between 1970 and 2000, massage therapy experienced a transformation, as people chose to live healthier lifestyles and preferred more holistic approaches to health care, pain management and restoring and maintaining healthy bodies. Today, many realize that "massage is good medicine."[4]

With the right massaging techniques, medical interventions, such as forceps, cesarean birth, and synthetic oxytocin hormone are reduced. A masseur can also increase a woman's pain perception and threshold during labor, thus, reducing the need for pain medications. Massage during labor is proven to decrease the chances of postpartum depression. It also provides emotional support, reassurance, and decreases fear and anxiety. Typically, after a woman in labor is massaged, they feel relaxed and have enhanced confidence in themselves, and the birth process. Vagal activity is a process that results in various effects, such as reduction of heart rate, vasoconstriction or dilation of vessels, immune system regulation, glandular activity in the lungs, heart, and digestive tract. Massages help improve oxytocin levels. Oxytocin is the hormone responsible for reduced anxiety, blood pressure, and it can have a sedative effect. According to Tiffany Field, moderate massages elicit a significant increase in vagal activity. It increases cerebral flow in various brain regions concerned with stress and depression regulation. Psychological stressors reduce vagal activity during pregnancy, but increased vagal activity decreases blood pressure, cortisol, and heart rate. Massaging helps reduce the need for the augmentation of contractions with synthetic oxytocin. When using effective stimulating-abdominal massaging techniques, the strength and frequency of contractions may also increase.[5]

Women appreciate any holistic approaches, which reduce pain and enhance feelings of well-being during their labour and there have been several randomized trials of massage that report a perception in women of pain reduction if massaged during labour. The Royal College of Midwives Alliance Program in 2010 produced a leaflet "Revealing the evidence behind the magic of touch" This leaflet states that studies have proved that Pain relief in pregnancy from leg and back ache and a better night's sleep, less stress and anxiety for mothers to be and their partners, fewer pre-term babies and low birth weights, shorter labour, less pain ,stress and anxiety during labour, fewer medical interventions.[6]

Modern and scientific evidence supports the use of massage during labour. A study conducted to assess the effect of massage therapy on the duration of labour found that those who received massage therapy during the first and second stages of labour had a significant decrease in labour duration as compared to the control group. There was also evidence of improved Apgar scores in newborns in the first and fifth minute. [7]

Massage during labour is an effective pain control method. A study states that a 30-minute massage during labour conducted in three phases resulted in self-reported reduced pain, decreased anxiety and increased satisfaction during labour.[8]

Massage therapy is effective in reducing pain, stress hormones and symptoms associated with chronic low back pain. Adults (M age = 39.6 years) with low back pain with a duration of at least six months received two 30-min massage or relaxation therapy sessions per week for five weeks. Participants receiving massage therapy reported experiencing less pain, depression, anxiety and their sleep had improved. [9]

Mechanisms by which massage works to relieve pain during labour – both result in reduced levels of the stress hormone cortisol and increased levels of serotonin and dopamine. These two mechanisms can be summarized as follows: Gate Control Theory: Massage causes a surge in pleasurable sensations thereby lessening the degree to which the brain is receptive to competing painful sensations. Diffuse Noxious Inhibitory Control: Intense massage causes a certain level of pain thereby stimulating the brain into flooding the body with endorphins ,the hormone produced after exercise include proponents of this method say that "pain inhibits pain". The simple act of touch can be reassuring and may be particularly beneficial to the mother. This is because it serves to affirm and, demonstrates support for her, and helps to remind her that although she is the one who is experiencing contractions and physically giving birth, she is not alone.[10]

There are many potential benefits of massage, before, during and after pregnancy. Some of those benefits are: reduced pain in the muscles and joints, especially the back, which can often get sore during pregnancy, improved circulation and blood oxygenation, which can be helpful for the baby, reduced swelling, reduced muscle tension, reduced anxiety and stress.[11]

The experience of labour pain is different in women and it is affected by several psychological and physiological factors and its intensity may vary significantly. During labour majority of women need pain relief. Strategies of pain management include pharmacological and non-pharmacological interventions. Evidence suggests that non pharmacological methods are helpful to reduce labour pain. All studies on back massages show that it is effective to relieve pain during labour.[12]

Comfort measures that provide natural pain relief can be very effective during labor and childbirth. They provide pain relief and reduce the need for narcotic analgesia or anesthesia by naturally creating competing impulses in stimuli of labor contractions from reaching the brain.[13]

As many women seek to avoid pharmacological strategies for pain management in labour, the use of alternative therapies is increasing, with nearly 50% of women of childbearing age accessing complementary and alternative medicine (CAM).[14]

Non pharmacologic pain management is not to make pain disappear, but rather to ease pain, improve the ability to cope with the pain, and improve the overall experience of childbirth. These strategies can be helpful when there is a personal preference to avoid medications or in low-resource settings. Strategies include breathing/relaxation techniques, movement/yoga, using a birthing ball, applying heat or cold, warm shower or water immersion, touch and massage, acupressure or acupuncture, music therapy, and aromatherapy. The decision to use pain medications is largely a personal one. Some mothers wish to avoid medications completely; others want to wait to see how labor progresses and ask for pain relief as needed; and others want complete pain relief as early as possible during labor. [15]

A Systematic Review and Meta-analysis of Randomized Controlled Clinical Trials was done in Iran to assess the effect of massage therapy on labor pain reduction in primiparous women. In this meta-analysis, the databases of Web of Knowledge, PubMed, Scopus, Cochrane, Iranmedex, Scientific Information Database (SID), and Magiran were searched for published articles in English and Persian language up to January 2016. Among the studies, with regard to the inclusion and exclusion criteria, 10 studies were selected. Data were analyzed by using Stata software version 11, and standard mean difference (SMD) of effects of massage therapy was calculated. The heterogeneity among studies was evaluated by the Chi square based Q test and I2 statistics. The results of Chi square based on Q test and I2 statistics showed heterogeneity among studies in the latent phase (Q = 63.52, p value < 0.001 and I2 = 87.4%), active phase (Q = 26.42, p value < 0.001, and I2 = 77.3%), and transitional phase (Q = 104.84, p value (Q = 104.84, p value <0.001, and I2 = 95.2%). Results showed that massage therapy reduces labor pain in the latent phase (SMD = −1.23, 95% CI: −1.73 to −0.74), active phase (SMD = −1.59, 95% CI: −2.06 to −1.12), and transitional phase (SMD = −1.90, 95% CI: −3.09 to −0.71). In conclusion the study provides valid evidence for the effect of massage therapy in Iran for labor pain relief. Therefore, the use of massage therapy can be recommended in the primiparous women.[16]

NEED OF THE STUDY.

Pregnancy massage stimulates the body's release of endorphins, which are chemicals produced by the pituitary gland. These act as a natural painkiller and provide welcome relief from labour pain, stimulating a positive outlook on the whole experience. The benefits of pregnancy massage, or of any massage, are not just physical. Pain relief is mental relief as well, and pregnancy massage has a soothing effect on the mother's nervous system. An elevated mood reduces a labouring mother's perception of pain and makes the experience less strenuous, as labour is laborious, and sometimes it lasts hours. Hence pregnancy massage to help ease the labour will help to ensure that the overall experience is as pleasant and exciting as it should be.[17]

A Quasi experimental designed study was conducted to evaluate the effectiveness of back massage among pregnant women in first stage of labour admitted in labour room in selected hospital, Gurugram, Delhi NCR. Purposive sampling method was used to select 60 pregnant women. Modified universal pain assessment scale was used to assess the level of pain. The study result showed that in experimental group 93.4% women had mild pain, 6.6% women had moderate pain and no women had severe pain during 5-7cm cervical dilatation. 70% women had mild pain, 30% women had moderate pain and no women had severe pain during 8-10 cm cervical dilatation. Thus back massage was effective in reducing the pain among pregnant women in first stage of labour admitted in labour room.[18]

A systematic review on massage for pain relief during labour found that overall, massage is beneficial for decreasing pain, anxiety and increasing satisfaction with the birth. Most of the studies had a small number of participants. However, in light of the potential benefits of massage and the fact that there is no evidence of harm, massage should be an available option for all parturients during labour for pain relief.[19]

A study control experimental type of study was conducted to assess the effects of low back massage on perceived birth pain and satisfaction. The study sample consisted of 62 pregnant women (massage group = 31, control group = 31). Massage was applied to the study group in three phases during intrapartum period. The massages were done at the end of latent, active and transition phases (at cervical dilatation 3–4 cm, 5–7 cm, 8–10 cm) correspondingly. The VAS (visual analogue scale) scores were evaluated three times during all phases. This study has found that lower back massage has a significant effect on reducing labor pain and increasing the satisfaction with birth. Positive feedback from women about massage and the request for massage shows that non-pharmacologic pain relief is important and useful for easing the pain, feeling self-confidence and developing massage, reflexology and other manual methods for pain management in labour positive interactions with surrounding people.[20]

Massage, may have a role in reducing pain, reducing length of labour and improving women's sense of control and emotional experience of labour, although the quality of evidence varies from low to very low and few trials reported on the key GRADE (Group Reading Assessment and Diagnostic Evaluation) outcomes. Few trials reported on safety as an outcome. There is a need for further research to address these outcomes and to examine the effectiveness and efficacy of these manual methods like massage for pain management.[21]

A quantitative, randomized controlled trial (RCT) designed study was conducted to assess the effectiveness of lower back massage on reducing labor pain among primiparous. This study was carried out in Maternity and Children's Hospital (MCH) in Jeddah, Saudi Arabia. It was divided into four parts: Part I: It assesses the mothers' demographic and current labor data. Part II: It

assesses the pain intensity before applying the intervention by visual analogue scale (VAS), as well, it assesses the mothers' expression during labor. Part III: It assesses the pain intensity after 30 minutes of implementing the intervention by VAS, as well, it assesses the mothers' expression during labor. Then, it evaluates the mothers' satisfaction from intervention by using Likert Scale. Part IV: Partogragh sheet for mothers' assessment. The researcher used a purposive sampling. The sample consisted of 60 mothers in the first stage of labor divided into two groups; experimental (30 mothers) and control group (30 mothers). The study results showed that experimental group had lower pain intensity at 4cm and 6cm (p< 0.05)in comparison with control group, but at 8cm no significant difference found between both groups (p> 0.05). In addition mothers in experimental group were more satisfied in comparison with control group. The study concluded that a lower back massage is an effective, non- invasive and alternative intervention, to reduce labor pain and increase the level of mothers' satisfaction.[22]

A randomized trial was conducted to assess if massage reduced severity of pain during labour. The Participants included 46 women pregnant at ⩾ 37 weeks gestation with a single fetus, with spontaneous onset of labour, 4-5cm of cervical dilation, intact ovular membranes, and no use of medication after admission to hospital. Experimental group participants received a 30-min lumbar massage by a physiotherapist during the active phase of labour. A physiotherapist attended control group participants for the same period but only answered questions. Both groups received routine perinatal care. The primary outcome was pain severity measured on a 100mm visual analogue scale. Secondary outcomes included the Short Form McGill Pain Questionnaire, pain location, and time with regards to analgesic medication use. After labour, a blinded researcher also recorded duration of labour, route of delivery, neonatal outcomes, and the participant's satisfaction with the physiotherapist during labour. The study concluded that massage reduced the severity of pain in labour, despite not changing its characteristics and location.[23]

A study to assess the comparison between massage and music therapies to relieve the severity of labor pain. Hundred and one primigravidae who were hospitalized for vaginal delivery were recruited and randomly stratified into two groups of either massage (n = 51) or music (n = 50) therapies. Pain was measured using the visual analog scale and the two groups were compared in terms of pain severity before and after the interventions. The result showed that mothers in the massage therapy group had a lower level of pain compared with those in the music therapy group (p = 0.009). A significant difference was observed between the two groups in terms of pain severity after intervention (p = 0.01). Agonizing, or most severe, labor pain was significantly relieved after massage therapy (p = 0.001). the study concluded that massage therapy was an effective method for reducing and relieving labor pain compared with music therapy and can be clinically recommended as an alternative, safe and affordable method of pain relief where using either pharmacological or no pharmacological methods are optional.[24]

A massage can be performed at many stages during labour, and each reaps different rewards. For example, pre-labour massage can help the expectant mother relax and perhaps catch some sleep, while massaging further on can help stimulate movement and even control pain. During early labour, contractions start to get more intense, but the mother generally can still talk and interact. It is imperative during this time for the mother to stay relaxed so she can conserve her energy for active labour, so relaxing massage techniques are still beneficial during this period. When in labour, back pain is a common complaint. If this is the case, a gentle, kneading massage can alleviate some of that discomfort; this kind of massage is especially good for aching pains. A massage with strong pressure can also be used to alleviate any sharp pains a woman might feel. Many women need the massage for emotional support, not just to alleviate physical pain. Additionally, she is only numb from the waist down, so massage in other areas of her body can still be extremely beneficial.[25]

A randomized controlled clinical study was conducted to study the effect of massage therapy on labor pain reduction in primiparous women in Iran. In this meta-analysis, the databases of Web of Knowledge, PubMed, Scopus, Cochrane, Iranmedex, Scientific Information Database (SID), and Magiran were searched for published articles in English and Persian language upto January 2016. Among the studies, with regard to the inclusion and exclusion criteria, 10 studies were selected. Data were analyzed by using Stata software version 11, and standard mean difference (SMD) of effects of massage therapy was calculated. This study provided valid evidence for the effect of massage therapy in Iran for labor pain relief. Therefore, the use of massage therapy can be recommended in the primiparous women.[26]

A quasi experimental study was conducted among 56 primi mothers (28 experimental and 28 control groups) selected purposively in the active room of the maternity ward in Nepal. Mothers who met the inclusion criteria were assigned non-randomly into experimental (received usual labor care and mustard oil back massage) and control groups (received usual labor care). The Visual Analogue Scale (VAS) was used to assess labor pain before and after 15 minutes of intervention in both groups, and the data was analyzed by descriptive and inferential statistics using SPSS version 16 software. The result concluded that back massage was effective in reducing labor pain and the findings of the study was helpful to those planning to include labor pain relief measures in maternity wards.[27]

A Comparative Study was conducted to evaluate the effectiveness of back massage versus hot application on back pain during the active phase of labour among the intranatal women admitted in Gian Sagar Medical College and Hospital, Ramnagar, Rajpura, Patiala, Punjab. An evaluative approach with posttest only design was used for the present study. Sample consisted of 40 intranatal women with back pain (20 hot application group and 20 back massage group), who met the inclusion and exclusion criteria. Assessment was done in terms of confirmation of back pain and intensity of pain by using NRS (Numerical Rating Scale). Data were analyzed by using descriptive and inferential statistics. The result showed that there was a significant difference in pain score between subjects of back massage group and hot application group. Hence back massage was more effective than that of hot application. The study concluded that there was significant difference found in back massage and hot application i.e. back massage was found to be significantly more effective on back pain as compared to hot application.[28]

A study was conducted to examine the effects of back massage and relaxation training on the act of labor. Fifty eligible full term primigravidae women with cephalic presented normal singleton fetus participated in the study. They were all complaining from true labor pain and expected to deliver normally within few hours. Women were divided randomly into two equal groups. The control group (A) received only traditional maternity ward care while women in the study group (B) received traditional maternity ward care as well as sets of massaging techniques and relaxation training during the active phase of 1st stage of labor. Evaluation was done by measuring labor pain perception intensity by using Present Pain intensity scale (Ppi), duration of the first stage of labor, mode of delivery and blood serotonin level. Initial evaluation was done when cervical dilatation became ⩾ 3cm ⩽ 5cm

then repeated at 7-8 cm of cervical dilatation for both groups. The study concluded that back massage and relaxation training can be considered as alternative, safe, affordable and most inexpensive yet effective method of relieving pain in the1st stage of labor. It can also assist women to have empowered birth experiences, reduce the negative impact of labor .[29]

A randomized controlled clinical trial was conducted to study the effect of distraction techniques on pain and stress during labor was conducted on 68 pregnant women. Blocked randomization was done for the participants, the intervention group received distraction techniques in four sessions. Questionnaires of Fear of Childbirth (W-DEQ version A- which is the Wijma Expectancy/ Experience Questionnaire) and PSS (Perceived Stress Scale) once were completed before intervention and again at the 36th week for the W-DEQ and in the active phase for the PSS (perceived stress scale) through interviews. The pain was assessed through VAS (Visual Analogue Scale) during active phase per hour. Data were analyzed by independent t-test and ANCOVA. The mean of perceived stress during labor in the intervention group was significantly less than that of the control group (AMD: -3.2; 95% CI: -0.8 to -6.0; P = 0.01). The mean (SD) of pain intensity during labor was less in the intervention group compared to the control group (6.2 vs. 7.5; P < 0.001). According to the results, distraction techniques can reduce the pain and stress of labor, but further studies by using the distraction techniques are needed to reach a decisive conclusion.[30]

There are many drug-free ways to manage pain. It is recommended that these be used as a first-line method for pain relief and be continued throughout labour even if medications are used. Drug-free pain relief techniques reduce the need for obstetric interventions and their associated risks and side-effects. They also increase breastfeeding rates and improve the mother's satisfaction with the birth.[31]

Tiffany Field, director of the Touch Research Institute at the University of Miami Health System, published the results of her study in 2010 where, the pregnant women's partners were first instructed on how to massage the back and the legs, the areas that experience the most pain, in a side-lying position. They then massaged their partners during the first 15 minutes of every hour of labor. The study found that women who received massage therapy experienced significantly less pain and their labors were, on average, three hours shorter with less need for medication.

A meta-analysis study of other studies, including those related to pain syndrome and stress reduction in pregnancy was conducted to assess the Cortisol decreases and serotonin and dopamine increase following massage therapy, The findings showed that cortisol levels decreased by an average 31 percent when cortisol was examined in saliva or urine. When serotonin and dopamine were assessed in urine, the researchers noted an average increase of 28 percent and 31 percent, respectively and concluded that the decreased cortisol levels and the increased serotonin and dopamine levels effected positive outcomes on stressful experiences, which would include labor.[32]

A quasi experimental study was conducted to assess the effect of sacral massage on pain during first stage of labour among the mothers in government medical college and hospital in Tiruvannamalai, India. The study involved selection of 30 samples by the non-probability convenience sampling technique and interpreted by using descriptive and inferential statistics. The study reflected that in experimental group 11 (73.3%) of the mothers were having moderate pain, four (26.7%) had severe pain, and in control group 12 (80%) had moderate pain, three (20%) had severe pain, 't' test which was computed between pretest and post test scores of the sample group indicated that the sacral massage was effective. The study showed that there is significant difference between pre-test and post-test pain in pregnancy and that there is no significant association between the variables. Thus this study examined currently available evidence supporting the use of alternative and complementary therapies for pain management in labour.[33]

To be successful in the use of non-pharmacological pain relief in labour: - 1) Caregivers i.e. obstetricians and nurses must have a change of attitude. 2) Women need to be informed of the various alternatives available to them. 3) Care-givers should stop regarding "normal" labour and birth as a medical event. 4) Pharmacological pain relief should be used as a last and not first resort.[34]

A Systematic review and Bayesian network meta-analysis based on PRISMA-NMA was conducted to compare and rank the efficacy and safety of non-pharmacological interventions in the management of labour pain. Forty three studies involving nine non-pharmacological interventions were included. The Bayesian network meta-analysis showed that acupressure (SMD (Standardized Mean Difference) = -2.00, 95% CrI -3.09 to -0.94), aromatherapy (SMD = -2.01, 95% CrI -3.70 to -0.35) and massage therapy (SMD (Standardized Mean Difference) = -1.26, 95% CrI -2.26 to -0.30) had significant positive effects on alleviating labour pain, with aromatherapy being the most effective. The results also revealed that yoga (SMD = -130.85, 95% CrI -212.01 to -59.32) and acupressure (SMD = -10.14, 95% CrI -20.24 to -0.41) were the most effective interventions for shortening the first stage and the second stage of labour, respectively. The evidence in the network meta-analysis illustrates that non-pharmacological interventions are effective and safe for labour pain management in low-risk pregnant women. In the future, well-designed studies are needed to validate the conclusion of this network meta-analysis. The results support the use of non-pharmacological interventions, especially aromatherapy and acupressure, to relieve labour pain in low-risk pregnant women. Non-pharmacological interventions for labour pain management are recommended to apply according to women's preference and values.[35]

An analytical descriptive study was conducted to assess the perception toward non-pharmacological strategies in relieving labor pain. The study was conducted to determine the perception, actual practices and perceived barriers among health-care providers regarding non-pharmacological pain relief during labor as well as explore women's opinion towards their labor pain management experience. The study included 88 health-care providers such as doctors, registered nurses and interns and 400 healthy puerperal women who experienced uncomplicated normal deliveries performed at Abha Maternity Hospital between December 2012 and April 2013. Data were collected using self-administered structured questionnaires and each participant was invited to share his/her experiences in a one-to-one interview format. Analysis of data obtained showed that most of the samples reported that they knew of different types of non-pharmacological pain relief methods and expressed their agreement towards their different benefits. On the other hand, lack of time, regulatory issues, lack of knowledge, patient unwillingness and strong beliefs in analgesia were recorded as the highest barrier percentage, while women who went through childbirth reported moderate levels of satisfaction regarding their birth experience. Role and benefits of non-pharmacologic methods of pain relief during labor cannot be ignored. There are many barriers preventing non-pharmacological pain therapies from being used related to hospital regulations and

policies. In addition, most women denoted that they were able to cope with labor pain through non-pharmacological management.[36]

A descriptive phenomenological study was conducted to assess the Nurses and midwives' experiences of using non-pharmacological interventions for labour pain management in Ghana. Fifteen nurses and midwives working in labour wards of two hospitals in Ghana were interviewed. Data analysis was guided by the principles of coding by Bailey and the constant comparative approach to generate themes. Ethics approval was obtained from the 37 Military Teaching Hospital Institutional Review Board in Ghana. The studies revealed that nurses and midwives were familiar with some non-pharmacologic approaches such as sacral massage, deep breathing, and diversional therapy; and frequently use them in their practice to manage labour pain. The frequent usage of these methods has been reported in previous studies and can be attributed to the familiarity of the midwives with these approaches. Other less frequently used methods like ambulation, cold shower, cold and warm compresses were also reported by nurses and midwives in the present study. While insufficient knowledge may account for the less frequent use of these methods, other factors such as inadequate human and material resources may have contributed to this observation, similar to what has been reported in other studies.[37]

3.1 Population and Sample

The population of the study comprises parturients in the first stage of labour. In the study, the sample comprised of parturients in selected Hospitals Bengaluru. The study subjects consist of n = 40 parturients: experimental group (n_1) = 20 and control group (n_2) = 20. The study subjects were selected through a Convenience Sampling technique.

3.2 Data and Sources of Data

Inclusion criteria:
Parturients who were: Primi or multi , In the first stage of labour , able to communicate in English or Kannada, with spontaneous or induced labour.
Exclusion criteria: Parturients who were: not willing to participate and at risk.

3.3 Theoretical framework:

Independent variable: Circular Hip Massage.
Dependent variable: Pain during first stage of labour.
Extraneous variables: Age (in years), education, occupation, duration of married life, religion, parity, family income per month (In Rupees), source of information regarding complementary therapies, regular antenatal visits and exercise during pregnancy.

Conceptual framework

The research study adopted Sr. Callista Roy's adaptation model.
The Adaptation Model of Nursing was developed by Sister Callista Roy in 1976. Roy explained that adaptation occurs when people respond positively to environmental changes, and it is the process and outcome of individuals and groups who use conscious awareness, self-reflection, and choice to create human and environmental integration.
The key concepts of Roy's Adaptation Model are made up of four components: person, health, environment, and nursing.
According to Roy's model, a person is a bio-psycho-social constantly interacting with a changing environment. He or she uses innate and acquired mechanisms to adapt. The model includes people as individuals and in groups such as families, organizations, and communities. This also includes society as a whole.
The Adaptation Model states that health is an inevitable dimension of a person's life and is represented by a health-illness continuum. Health is also described as a state and process of being and becoming integrated and whole.[38]
Environment:
• Focal - internal or external and immediately confronting the person
• Contextual- all stimuli present in the situation that contribute to the effect of the focal stimulus
• Residual-a factor whose effects in the current situation are unclear
• All conditions, circumstances, and influences surrounding and affecting the development and behavior of persons and groups with particular consideration of mutuality of person and earth resources, including focal, contextual and residual stimuli.[39]
Person:
Bio-psycho-social constantly interacts with a changing environment, uses innate and acquired mechanisms to adapt and includes people as individuals or in groups-families, organizations, communities, and society.[40]
Health:
Health is defined as the state where humans can continually adapt to stimuli. Because illness is a part of life, health results from a process where health and illness coexist. If humans can continue to adapt holistically, they will be able to maintain health to reach completeness and unity within themselves. If they cannot adapt accordingly, the integrity of the person can be affected negatively.[41]
Nursing:
Roy defines nursing as a "health care profession that focuses on human life processes and patterns of people with a commitment to promote health and full life potential for individuals, families, groups, and the global society". Roy believes nursing is a promoter of one's ability to adapt and to develop coping mechanisms and positive outcomes from constant stimuli exposures.[42]
The main concepts of Roy's adaptation model are input, throughput, output and feedback.
Input: Input refers to the stimuli that arise from the environment and can be classified as focal, contextual and residual.[43]
Focal stimuli: It refers to internal or external and immediately confronting the person.[43] In this study, it refers to pain during the first stage of labour.
Contextual stimuli: It refers to all stimuli present in the situation that contribute to the effect of focal stimulus.[43] This study refers to anxiety, loss of control, confusion, joy, happiness, and lack of cooperation with companions and staff.

Residual stimuli: It refers to a factor whose effects in the current situation are unclear.[43]In this study, it refers to age in years, education, occupation, duration of married life, religion, parity, family income per month (in rupees), source of information regarding complementary therapies, regular antenatal visits and exercise during pregnancy.

Throughput: It includes control process and effectors.[43]

Control process: The control process includes the biological and psychological coping mechanisms of mothers. These coping mechanisms are regulated by regulator and cognator subsystems.[43]

Regulator: In this study, it refers to neural, chemical and endocrine processes of childbirth.

Cognator: In this study, it refers to pain during labour and experiences of parturient mothers

Effector: In this study, it refers to responses carried out through the effectors. There are four modes of effects. They are physiological, self-concept, role function and interdependence modes.[43]

Physiological modes: Behavior in this mode is a manifestation of the physiological activity of all the cells, tissues, organs, and systems of the body.[43] In this study, it refers to pain during labour

Self-concept mode deals with the person's beliefs and feelings about himself/herself.[43] It can include self-control and self-esteem, which is not being studied.

Interdependence mode: It is associated with one's relationships and interactions with others and the giving and receiving of love, respect, and value.[43] It can include family members, social and religious organizations and health care providers, which is not being studied.

Role function: Involves the position one occupies in society; behavior's associated with one's position (role) in society. [43] Daughter, wife, consumer of health care and mother

Output: In this study, an adaptive response is the positive experiences of the mother, and an ineffective adaptation is the negative experiences of the mother about childbirth

Feedback: If negative experiences happen, the study can be continued, but in this study, it is not included.

RESEARCH METHODOLOGY

A quantitative evaluative approach was adopted to determine the effectiveness of circular hip massage on pain during the first stage of labour among parturients. A Quasi-experimental post-test-only control group design was used for the study.

3.4 Statistical tools and econometric models

The tools were prepared based on the objectives of the study

The following steps were carried out before the selection and development of the tool.

• Review of literature from related studies, books, journal articles and internet search
• Opinions and suggestions from the experts
• Researcher underwent a certificate course for Circular Hip Massage
• Personal consultations and discussions with nursing experts.

The tools for the study consist of:-

Section A: Sample characteristics

Age(In years), education, occupation, duration of married life, religion, parity, family income per month (In Rupees), source of information regarding complementary therapies, regular antenatal visits and exercise during pregnancy.

Section B: Numerical pain Rating scale:

It is a standardized tool for assessing the level of pain. A standard 10-point numerical pain scale was used for assessing pain during Labour '0' means no pain and '10' means severe pain.

Section C: Compliance sheet:

The sheet records the duration of circular hip massage administered for each sample in the experimental group, the minimum being 15 minutes each time.

The tool for the study was validated by 13 experts comprising eight Obstetrics and Gynaecological nursing faculty, four obstetricians and one Statistician. The tools were found to be adequate, and the suggestions from experts were incorporated.

3.4.1 Descriptive Statistics

• The reliability of the Numerical Pain Rating Scale was standardized (r=1)
• The reliability of the Numerical Pain Rating Scale in the study was computed by inter-rater reliability using the Karl Pearson correlation coefficient formula. r= 0.83, which is >0.7

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x2 - (\sum x)2][n\sum y2 - \sum y)2]}} \qquad r\,full = \frac{2(r\,half)}{1 + r\,half}$$

Hence, the tool was found to be reliable for the study.

IV. RESULTS AND DISCUSSION

4.1 Results of Descriptive Statics of Study Variables

Table 1: Overall mean, SD, and independent 't' value of pain scores during the first stage of labour among parturients following circular hip massage between experimental and control groups.

$n_1=20; n_2=20$

Groups	Mean	SD	Unpaired t-Value	df	Sig. (p-value)	Inference
Experimental Group	2.6	0.4	16.765	38	0.0001*	S*
Control Group	5.3	0.6				

Note: S* refers to Significant.

The data presented in the table reveals that the mean pain scores in the experimental group (2.6) is lesser than the control group (5.3). The mean difference is 2.7. The computed independent t value is 16.765, which is greater than the table value (t38 =1.960) at a 0.05 level of significance. Hence the research hypothesis H1 is accepted, stating that there is a statistically significant difference in pain scores during the first stage of labour among parturients following circular hip massage between the experimental and control group.

Table No. 2: Repeated measures ANOVA for pain scale scores following circular hip massage in Experimental group.

$n_1=20; n_2=20$

Group	Source	SS	df	MS	F	P
Experimental Group	Between	16.5	3	5.5	46.810	0.00000
	Subject	13.7	19	0.7		
	Error	6.7	57	0.1		
Control Group	Between	14.7	3	4.9	31.452	0.00000
	Subject	26.1	19	1.4		
	Error	8.8	57	0.2		

The above table depicts the repeated measures -ANOVA (Within the group) for pain Scores following circular hip massage in experimental and control groups. In the experimental group, the F value of pain (46.810) is greater than the table value in terms of $p < 0.05$ level, similarly in the control group, the F value of postoperative pain (31.452) is greater than the table value in terms of $p < 0.05$ level. Hence the research hypothesis H1 is accepted, stating that there is a statistically significant difference in statistically significant difference in labour pain scores among parturients following circular hip massage between experimental and control group.

Section III: Association between sample characteristics and pain scores during the first stage of labour among parturients in the experimental and control group.

Table 3: Association between sample characteristics and pain scores during first stage of labour among parturients in the experimental group

Sample Characteristics	Mild Pain	Moderate Pain	Chi-Square Value	df	Sig. (p-value)	Inference
Age in years						
19 - 24	7	1	0.602	2	0.739	NS
24 - 29	4	1		(5.991)		
29 - 34	5	2				
Religion						
Christian	1	2	6.111	2	0.047	S*
Hindu	7	2		(5.991)		
Muslim	8	0				
Education						
High School	4	1	1.458	3	0.691	NS
PUC	6	2		(7.815)		
Diploma	4	0				
Graduate and above	2	1				
Occupation						
Government Employee	1	1	6.145	3	0.1	S*
Private Employee	4	1		(7.815)		
Self Employed	0	1				
Homemaker	11	1				
Family Income per Month (in rupees)						
<10000	1	0	1.666	2	0.434	NS
10001-20000	4	0		(5.991)		
>30000	11	4				

Duration of married life (in years)						
1-3 Years	11	2	5.256	3	0.153	NS
4-6 Years	1	2		(7.815)		
7-9 Years	2	0				
10-12 Years	2	0				
Source of information regarding nonpharmacological therapies used for labour pain						

No information	11	2	1.089	3 (7.815)	0.779	NS
Family and friends	2	1				
Printed materials	1	0				
Mass media	2	2				
Parity						
Primigravida	10	2	0.0001	1 (3.841)	0.999	NS
Multipara	6	2				
Did you have regular antenatal visits?						
Yes	16	4	7.2	1 (3.841)	0.007	S*
No	0	0				
Did you exercise during pregnancy?						
Yes	3	2	0.416	1 (3.841)	0.518	NS
No	13	2				

Note: S* and NS refer to Significant and non- Significant association respectively

The computed chi square values for the pain scores and selected sample characteristics in experimental group were lesser than their respective table values, except for religion ($\chi2$ =6.111), and regular antenatal visit ($\chi2$ = 7.2) which is greater than their corresponding table values. Hence H_2 is accepted stating that there is statistically significant association between pain scores during first stage of labour among parturients following circular hip massage with selected sample characteristics in experimental group and H_2 is rejected for remaining sample characteristics.

Table 4: Association between sample characteristics and pain scores during first stage of labour among parturients in the control group

n_2=20

Sample characteristics	Moderate Pain	Severe Pain	Chi-Square Value	df	Sig. (p-value)	Inference
Age in years						
19 - 24	8	3		2		
24 - 29	4	2	0.086	(5.991)	0.957	NS
29 - 34	2	1				
Religion						
Christian	1	2		2		
Hindu	5	2	2.403	(5.991)	0.3	NS
Muslim	8	2				
Education						
Primary	1	0				
High School	2	3				
PUC	5	1				
Diploma	2	2	5.555	4	0.234	NS

Graduate and above	4	0		(9.488)		
Occupation						
Government Employee	1	0				
Private Employee	5	1	1.529	3 (7.815)	0.675	NS
Self Employed	1	1				
Homemaker	7	4				
Family Income per Month (in rupees)						
10001-20000	6	2	0.34	2 (5.991)	0.843	NS
20001-30000	3	2				
>30000	5	2				

Note: S* and NS refer to Significant and non-significant association respectively.

The computed chi square values for the pain scores and selected sample characteristics in control group were lesser than their respective table values,. Hence H_2 is rejected stating that there is no statistically significant association between pain scores during first stage of labour among parturients with selected sample characteristics in control group.

Table 5: Frequency and percentage distribution of parturients according to the time duration of circular hip massage in Experimental Group

$n_1=20$

No of Sessions	Time duration	Frequency	Percentage
1	15 minutes	16	80
	20 minutes	3	15
	25minutes	1	5
2	15 minutes	13	65
	20 minutes	7	35
3	15 minutes	13	65
	20 minutes	7	35
4	15 minute	9	45
	20 minutes	11	55

The above table depicts that in the experimental group during the first session, majority (80%) of the parturients received circular hip massage for 15 minutes, 15% of them received for 20 minutes and 5% of them received for 25 minutes. During second session more than half (65%) of them received circular hip massage for 15 minutes and 35% of them received for 20 minutes. During the third session most (65%) of them received circular hip massage for 15 minutes and 35% of them received for 20 minutes. During the fourth session little less than half (45%) of them received circular hip massage for 15 minutes and little more than half (55%) of them received for 20 minutes.

Major findings of the study
Section I: Sample characteristics
Age:
In the experimental group, little less than half (40%) of parturients were under the age group of 19-24 years, and a quarter (25%) of the parturients belonged to the age group of 24-29 years, and 35% mothers belonged to the age group between 29-34 years. In the control group, a little more than half (55%) of the parturients belonged to the age group of 18-24 years, 30% belonged to the age group of 24- 29 years, and 15% were aged between 29-34 years. (p=0.338)
Religion:
In the experimental group, 15% of the parturients were Christians, little less than half (45%) were Hindus, and 40% were Muslims. Whereas in the control group, 15% were Christians, 35% of them were Hindus, and half (50%) of them were Muslims. (P = 0.789)
Education:
In the experimental group, none of the parturients had completed their primary school education, a quarter (25%) of them had finished high school, little less than half (40%) of them completed pre-university, little less than a quarter (20%) of them had finished diploma, and 15% of them were graduates and above. Whereas in the control group, only 5% of the parturients had completed their primary school, a quarter (25%) of them finished their high school, 30% of them had finished pre-university. Little less than a quarter (20%) of them completed diploma and a little less than a quarter (20%) of them had completed their graduation and above. (p=0.839)

Occupation:
In the experimental group, 10% of the parturients were government employees, a quarter (25%) of them were private employees, 5% were self-employed and most (60%) of them were homemakers. Whereas in the control group, only 5% of them were government employees, little more than a quarter (30%) were private employees, 10% of them were self-employed and little more than half (55%) of them were homemakers. (p=0.849)
Income per month (In Rupees):
In the experimental group, 5% of the parturients had income below Rs. 10,000, and a little less than a quarter (20%) had income between Rs. 30000 and above. Whereas in the control group, none of them had income below Rs.10,000, little less than half (40%) of them had income from Rs.10001- 20000, a quarter (25%) of them had Rs.20001-30000 and 35% of them had more than Rs.30000 and above. (p=0.016)
Duration of married life:
In the experimental group, most (65%) of parturients were married for 1-3 years, 15% of them were married for 4-6 years, 10% of them were married for 7-9 years and 10-12 years, respectively. Whereas in the control group, a little more than half (55%) of the parturients were married for 1-3 years, little less than half (45%) of the parturients were married for 4-6 years, and none of them were married for 7-9 years and 10-12 years respectively. (p=0.06)
Source of information:
In the experimental group, most (65%) of the parturients received no information, 15% of them received information through family and friends, only 5% of them received information through printed materials, and 15% received it through mass media. Whereas in the control group, a little less than half (45%) of parturients received no information, little more than a quarter (30%) of them received information through family and friends, none of them received through printed materials, and a quarter (25%) of them received information from mass media. (p=0.357)
Parity:
In the experimental group, most (60%) of the parturients were primipara, and little less than half (45%) were multiparas. In the control group (40%) of them were primiparas, and little more than half (55%) were multiparas. (p=0.526)
Antenatal visits:
In the experimental and control groups, all (100%) of the parturients had regular antenatal visits, respectively. (p=1)
Exercise regime:
In the experimental and control groups, a quarter (25%) of parturients exercised during pregnancy and three-quarters (75%) of them in both groups did not exercise during pregnancy. (p=1)
A quasi experimental, non – equivalent pre test – posttest control group designed study, was conducted to assess the effectiveness of circular hip massage on first stage labour pain among primigravida mothers at MBMM Hospital, Kerala. Sample size was 40 primigravida mothers. The sampling technique was purposive sampling technique. An interview schedule was used to collect data comprising of selected variables and Visual Analogue Pain Scale. It was validated by five experts. Inter – rater method was used to find the reliability of the tool. The reliability of the tool was r = 0.87. The reliability coefficient was found to be high. Pilot study was conducted among eight primigravida mothers. The data gathered were analyzed by descriptive and inferential statistics using SPSS version 10. The interpretation was made on the basis of objectives of the study. Findings of the study revealed that there was a significant reduction in the intensity of the labour pain after administering the circular hip massage among the primigravida mothers (p < 0.05). The result showed that there was no significant association in relation to selected variables and labour pain. The conclusion of the study was that, primigravida mothers had a reduction in the labour pain as evidenced by the results shown in Visual Analogue Pain Scale. Hence circular hip massage was found to be a cost effective procedure in reducing labour pain among primigravida mothers.[62]
Section II: Description of difference in pain scores during the first stage of labour among Parturients following circular hip massage between experimental and control groups
•	Percentage distribution of pain scores during first stage of labour among Parturients in experimental and control groups.
In the experimental group, the majority (80%) of the parturients had mild pain, a little less than a quarter (20%) of them had moderate pain, and none of them had severe pain, whereas in the control group, none of the parturients had mild pain, most (70%) of them had moderate pain and a little more than quarter (30%) of them had severe pain.

Overall mean, SD, and independent 't' value of pain scores during the first stage of labour among parturients following circular hip massage between experimental and control groups.

The mean pain scores in the experimental group (2.6) is lesser than the control group (5.3). The mean difference is 2.7. The computed independent t value is 16.765, which is greater than the table value (t38 =1.960) at a 0.05 level of significance. Hence the research hypothesis H1 is accepted, stating that there is a statistically significant difference in pain scores during the first stage of labour among parturients following circular hip massage between the experimental and control group.

The above findings were supported by a quasi-experimental study conducted to assess the effectiveness of circular hip massage and knee press massage towards intensity change of labour pain. The research subjects were 52 pregnant mothers from March to July 2018 at the Maternity Home (RB) and Practice Midwives (BPM) in the Kudus Regency. Based on the Wilcoxon test, the circular hip and knee press massage methods effectively overcame the pain of delivery (p <0.05). Computations using the Mann-Whitney Test concluded that there is a difference in the effectiveness of circular hip and knee press massage on the intensity change of labour pain. The intensity changes of labour pain with circular hip massage (CHM) were 0.9, with a median of 1 (SD 0.445). Meanwhile, the intensity changes of labour pain with knee press massage (KPM) were 0.38, with a median of 0.5 (SD 0.697). The study concluded that the circular hip massage and knee press massage methods are effective for treating labour pain. [58]

Section III: Association between sample characteristics and pain scores during the first stage of labour among parturients in the experimental and control group

Association between sample characteristics and pain scores during the first stage of labour among parturients in the experimental group

The computed chi-square values for the pain scores and selected sample characteristics in the experimental group were lesser than their respective table values, except for religion ($\chi2 =6.1$11) and regular antenatal visit ($\chi2 = 7.200$), which were greater than their corresponding table values. Hence H_2 is accepted, stating that there is statistically significant association between pain scores during the first stage of labour among parturients following circular hip massage with religion and regular antenatal visits in the experimental group, and H_2 is rejected for the remaining sample characteristics.

Association between sample characteristics and pain scores during the first stage of labour among parturients in the control group

The computed chi-square values for the pain scores and selected sample characteristics in the control group were lesser than their respective table values. Hence H_2 is rejected, stating that there is no statistically significant association between pain scores during the first stage of labour among parturients with selected sample characteristics in the control group.

A quasi experimental, non-equivalent pretest, posttest control group design was conducted to assess the effectiveness of circular hip massage on first stage labour pain among primigravida mothers at Rathmaternity Hospital, Chennai. The objectives of the study were, to assess the significant difference between the pre and post-test mean labour pain scores among primigravid mothers in experimental group in relation to circular hip massage, to compare the significant mean difference in labour pain score among primigravid mothers in the experimental and control group. The sampling technique used in the study was purposive sampling technique. The sample size was 40, 20 in experimental and 20 in control group. Factors like nature of study, availability of sample, time, money and material were considered while deciding the sample size. To collect the data an interview schedule used comprised of selected variables and Visual Analogue Pain Scale to measure the level of labour pain. The data gathered were analyzed by descriptive and inferential statistics using SPSS version 10. Findings of the study revealed that there was a significant reduction in the intensity of labour pain after administering the circular hip massage among the primigravid mothers (p < 0.05). The study concluded that, primigravid mothers experienced a reduction in the labour pain as measured by Visual Analogue Pain Scale. Hence circular hip massage was found to be a cost-effective procedure in reducing labour pain among primigravid mothers.[59]

Section IV: Description of compliance to circular hip massage among parturients in the experimental group

In the experimental group during the first session, majority (80%) of the parturients received circular hip massage for 15 minutes, 15% of them received for 20 minutes and 5% of them received for 25 minutes. During second session more than half (65%) of them received circular hip massage for 15 minutes and 35% of them received for 20 minutes. During the third session most (65%) of them received circular hip massage for 15 minutes and 35% of them received for 20 minutes. During the fourth session little less than half (45%) of them received circular hip massage for 15 minutes and little more than half (55%) of them received for 20 minutes.

A Quantitative evaluative approach with Quasi experimental time series designed Study was conducted to assess the effectiveness of circular hip massage on labour pain during first Stage of labour among primigravid women, at Selected Hospital, Salem. Non probability convenience sampling technique was used to select 60 primi gravid women among which 30 were assigned to experimental group and 30 were assigned to control group during first stage of labour. Structured interview schedule was used to collect data and Numerical Pain Intensity Scale was used to assess the level of labour pain. Circular hip massage was given for 15 minutes every one hour interval for four observations and level of pain was assessed before and after each interventions. The collected data was analyzed and findings shows that, in experimental and control group 11(36.7%) and 15(50%) of primigravid women were in the age group of 26-30 yrs , 7(23.3%) and 8(26.7%) completed their higher secondary education, 17(56.7%) and 17(56.7%) of women were employed, 14(46.7%) were sedentary workers, 18(60%) of them were moderate workers, 17(56.7%) were in 39 weeks of gestation, 19(63.3%) mothers were in 40 weeks of gestation. The mean differences on level of labour pain in experimental group were 2.00, 2.33, 2.16, and 2.33, where as in control group values were 0.23, 0.13, 0.06 and 0.16. In experimental group the calculated 't' value on level of labour pain before and after circular hip massage was 15.76, 16.85, 25.73 and 26.65 which is significant at p<0.05 level. Hence H_1 was retained. In experimental group the pre and posttest mean score was 9.90±0.30, 7.56±0.50 whereas in control group the pre and posttest mean score was 8.83±0.64, 9.00±0.58 respectively. So there was a significant difference in pre and post test score on level of labour pain in experimental and control group at p<0.05 level. Hence H_2 was retained. The chi-square test revealed that hypotheses H3 was rejected for both experimental and control group except for occupation($\chi2=6.21$) and weeks of gestation($\chi2=6.21$) in experimental group at p<0.05

level. Circular Hip Massage is one of the non-pharmacological pain relief measures during labour and since it is a non-invasive, inexpensive and applicable technique, it can be used by a skilled and trained midwife in reducing the level of labour pain.[63]

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