EFFECT OF BIRTHING BALL EXERCISE ON LABOUR PAIN AND LABOUR OUTCOME AMONG PRIMIGRAVIDAE PARTURIENT MOTHERS AT AIIMS, JODHPUR.

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All India Institute of Medical Sciences, Jodhpur

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Master of Science in Nursing

(Obstetrics and Gynaecological Nursing)

By

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DECLARATION BY THE CANDIDATE

I hereby declare that the thesis entitled "Effect of birthing ball exercise on labour pain and labour outcome among primigravidae parturient mothers at AIIMS, Jodhpur" has been prepared by me under the guidance of Mr. Himanshu Vyas, Associate Professor, College of Nursing AIIMS Jodhpur, Mrs. Mamta, Assistant Professor, College of Nursing AIIMS Jodhpur and Dr. Pratibha Singh, Professor & Head, Department of Obstetrics and Gynecology, AIIMS Jodhpur. No part of this thesis has formed the basis for the award of any degree previously.

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LIST OF ABBREVIATION USED

Artf   : Artificial

CNO : Chief Nursing Officer

CS   : Caesarean Section

df   : Degree of freedom

EBP : Evidence Based Practice

f   : Frequency

F.VD :Forceps vaginal delivery

Hrs.   : Hours

N   : Number of primigravidae parturient mothers

NVD : Normal Vaginal Delivery

%   : Percentage

PROM: Premature rupture of membrane

Spont.: Spontaneous

SD   : Standard Deviation

V.VD : Vacuum vaginal delivery

X^2 : Chi square

WHO : World Health Organization

ABSTRACT

INTRODUCTION:- Every woman having an essence of creation that arise from them by giving birth to a soul. As it is the most blessed time for them that comes in their life, child birth is a natural miracle of emergence and separation of offspring from the body of the mother.

AIM:- The aim of the study is to assess the effect of birthing ball exercises on the labour pain and labour outcome during the first stage of labour among primigravidae parturient mothers at AIIMS, JODHPUR

METHOD:- A quasi- experiment post-test only control group design was utilized in the study. A group of 60 primigravidae parturient mothers were included in the study and 30:30 subjects were assigned into two groups control and experiment group through non- probability consecutive sampling technique. The study was conducted in the labour room of AIIMS, Jodhpur. The intervention included birthing ball exercise to primigravidae parturient mother of the experimental group in the active phase of first stage of labour (>4cm cervical dilatation). There were 2 sessions of 20 min exercise at the subsequent gap of 1 hour which included four exercises in 2 positions one in sitting position (pelvic rocking forward and backward, ball bouncing and ball hip circle) and another in kneeling position (hugging the ball).VAS score was assessed in transition phase (cervical dilation 8-10cm) in both group and labour outcomes were assessed after delivery in both group. Mothers in control group received routine hospital care.

RESULT:- The findings of the present study revealed highly significant statistical difference between the two groups concerning the labour pain, improvement of the dilatation of the cervix and decreased duration of the labour in the experiment group. In addition, majority of mothers in experiment group underwent normal vaginal delivery with episiotomy as compared to control group. Findings also revealed high significant statistical difference in baby of both groups regarding APGAR Score, baby cried immediately after birth and admission to NICU at $p<0.05$.

CONCLUSION:- There are a variety of discomforts that a woman experience during labour. Reducing these discomforts is an important part of good nursing care. Non- pharmacologic methods like birthing ball helps to decrease these discomforts as it reduces the labour pain and also improves maternal and neonatal outcome.

Keywords:- *birthing ball, labour pain, maternal outcome, neonatal outcome*

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CHAPTER 1

INTRODUCTION

INTRODUCTION

"Giving birth and being born brings us into the essence of creation, where the human spirit is courageous and bold and the body, a miracle of wisdom."

– Harriet Hartigan

BACKGROUND OF THE STUDY

Every woman having an essence of creation that arise from them by giving birth to a soul. As it is the most blessed time for them that comes in women's life, giving birth to a baby is a natural and physiological process of expulsion and separation of offspring from the body of the mother.[15]

The onset of labour might be intricate physiological process and in this way it cannot be effectively characterized by one event. Although labour is a continuous process and it involves body physiology during which the conceptus, membranes and afterbirths are expelled out from the mothers body, it occurs between 37 to 42 wks.[2] As stated by Indian birth reports, in India birth rate is 18.2 births/1,000 populations.[3] Labour is considered as the most prominent incidents in a women's life. When pregnancy has negative result, it adversely affects the physiological condition of the women like hormonal changes, alteration in blood volume, weight changes, etc.[2]

As labour is the natural physiological process so it is greatly linked with properly compatible management. While the improper handling may result in dystocia, prolonged and/or obstructed labour, that may lead to maternal exhaustion, postpartum haemorrhage and puerperal sepsis.[6]

Eventually, of importance for reduction of maternal mortality rate (MMR) by three- quarters is one of the Millennium Development Goals (MDGs). In India the rate has declined from 167 deaths for every 100,000 live births in 2011- 2013 to 130 deaths for every 100,000 live births in 2014-2016 and to 122 deaths in 2015- 2017, registering a 6.15% reduction since the last survey figures of 2014- 2016, consistent with the special bulletin of the office of the Registrar General[4]. The maternal death rate (MMR) of Rajasthan has declined by 45 points (18.4%) from 244 in 2011-13 to 199 in 2014-16. The institutional delivery currently is 84% in Rajasthan, while all India is 79%. In 2016, the institutional delivery in Rajasthan was 79% and for India it was 76%.[5]

Labouring women suffer from one of the most horrible pain that could be experienced by human beings as it has been reported. Labour is combined with harsh and long lasting pains that fluctuate continuously between variant levels as has been stated by numerous labouring women.[7]

It is assumed that the described levels of pain are majorly altered according to the level of fear, stressor anxiety the women might be experiencing which would consequently impact the whole labour event.[8] In such case, it is fundamental to manage the felt pain well to support the labouring process. Various approaches have been used to severity of pain, among which is the injection of the analgesics pethidine which leads when administered intramuscularly to a feeling of dizziness, nausea and vomiting in women and a

number of symptoms in their born children such as compromised sucking effort and breastfeeding.[9]

Nowadays midwifery models are utilizing for normal birth that provides the entire care element; namely psychological, emotional and spiritual ones.

There is influence of maternal position on physiological and anatomical alteration that would consequently impact other labour related factors such as powers, passage, passenger and psyche. It also directs the attributes and efficiency of uterine contractions, foetus condition, women convenience and labour progress. The contemporize practices emphasize to reduce the use of pharmacological approach and suggest suitable alteration such as the birthing ball exercises which manage to decrease delivery pain and limit the use of drugs. These exercises were proved to improve pelvic rotation, improve circulation in pelvic area and enhance the pelvic mobility of pregnant women. During the performance of such exercises, the woman is required to be sitting down in an upright position, which would eventually speed up the delivery process and help relaxation and decrease the labour pain.[10]

The labour process is divided into four stages that require constant and continuous supervision throughout the parturition. The first stage also known as cervical stage that begins with the onset of true labour pain and ends with the full dilatation of the cervix. The second stage which starts from full dilatation of the cervix and ends with expulsion of the foetus from the vaginal canal. And the third stage begins after expulsion of foetus to expulsion of placenta and membranes and its duration is 15 minutes and the fourth stage is

the observation phase that requires continuous monitoring for at least one hour after expulsion of the afterbirth.[16]

First stage begins with regular uterine contractions and ends with complete cervical dilatation at 10 cm. it is divided into 3 phases' i.e latent phase, active phase, and transition phase.

The latent phase begins with mild, irregular uterine contractions that soften and shorten the cervix. Cervical effacement is the thinning and stretching of the cervix. The degree of cervical effacement could also be felt during a vaginal examination. A 'long' cervix implies that effacement has not yet occurred. Latent phase ends with the onset of active first stage, and this transition is defined retrospectively. The active phase usually takes up at about 4 cm of cervical dilation and is characterised by rapid cervical dilation and descent of the presenting fetal part. And in transition phase cervix almost fully dilated (8-10cm) baby moves down further into pelvis, putting pressure on mother's bottom. Contractions may be strong, progressive and more rhythmic coming every two to three minutes and lasting 60 seconds.

The duration of labour varies widely, Its average duration is 12 hours in primigravidae and 6 hours in multiparae.[1]

First stage of the labour is also known as dilating stage or cervical stage. In primigravidae its average duration is 12 hours and 6 hours in multigravida mothers. The first stage is further split into 3 phases. The latent phase of first

stage of labour or the early phase begins when true labour starts with the contraction and ends with the four centimetre dilatation of cervix and active phase or active labour starts when cervix about 4cm with regular uterine contraction. Duration of active phase of labour usually 8-9 hours in primigravidae mothers and 5 hours in multigravida mothers. Transition phase when contractions reach their peak of intensity cervical dilatation increases from 8-10 cm and the contractions lasts for 60-90 seconds.[17]

Maternity care, a field where the mother is seen all in all being requires the application of substitute and contemporary modalities in diminishing agony is the foremost priority. The effectiveness of the alternative modalities is proved by many studies. Different alternative and contemporary modalities used are continuous labour support, hydrotherapy, intra dermal water block, positioning and walking, touch and massage, acupuncture, birthing ball, aromatherapy etc. These practices offer a lot of opportunities for reducing pain and can be combined with each other. These alternative therapy or modalities are helpful in progress of labour process and promotes sense of well-being by alleviate labour pain and reduce the use of pharmacological treatment for pain relief. They can be discontinued immediately if they don't help or in the unlikely event that they cause a problematic circumstances or events. [18]

Originally birthing ball was developed in 1963 and it has been using as physiotherapy for neurodevelopment treatment. So, first time used in 1980 birthing ball was found as a childbirth device by Perez and Simkin. In 2001

Perez affirmed that the birthing ball was physically beneficial for women during pregnancy and parturition by providing adequate positioning.[11]

Birthing ball is air filled elastic ball which is sufficiently able to support the weight of the mother. Literature review suggests that it helps to widening and flexing the pelvic bone and pelvic joints and aids in the descent of the baby through vaginal canal more easily and also facilitate in the strengthening of the pelvic floor muscle, which plays an important role in the bearing down phase of the childbirth. The birthing ball can helps in changing positions and it can be used as a comfort measures for parturient women.[12]

Birthing ball available in different size, generally favourable size for labouring mothers is 65cm which varies somewhat depending on the mother's height. Mothers who are tall 5"10" or taller, might also select large ball of 75cm. the birthing ball should be big enough to permit sitting and comfortably leaning of the legs at angle of 90 degree. The ball is less complicated to get onto and to rise from a normal chair, couch or the ground. Comfort and convenience is one of the advantages; however other advantages include natural rhythm, readjustment, support, movement, alignment, assistance, relaxation and dilatation.[13]

Various positions used for birthing ball exercise but sitting over the birthing ball promote a natural oscillation and better circulation in the pelvis, also fostering descent of the foetus. The birthing ball allows perineal support without causing coercion over it and also aid in keeping the foetus aligned in the pelvis. The

birthing ball exercise in sitting position is almost same to a squatting position which leads to widening the pelvis and also helps in speed up the labour.[14]

NEED AND SIGNIFICANCE

Child birth is a vital event in the life of any women; it positively affects the mother as well as her family. Women experience a wide range of pain in labour especially among the primigravidae women. Throughout the childbearing period, women experience severe pain that makes them intimidated and anxious causing the increase level of epinephrine. These changes negatively impact both the pain level and the duration of the first and second stages of labour.[2]

A report from the National Family and Health Survey has shown that there is a remarkable rising in the rate of caesarean births in India. While the WHO suggests that the rate of caesarean delivery to be 10-15%, the data was 17.2% for India during the period from Jan 2015 to Dec 2016. This is higher than the rate seen in developed countries such as the Netherlands and Finland. The report says that if this trend will continues, India could soon have the largest number of C-section births in the world.

A 2018 report in The Lancet pointed out that the prevalence of maternal mortality and morbidity is higher after caesarean than after vaginal birth. Also, it is noted to be associated with an "increased risk of uterine rupture, abnormal placentation, ectopic pregnancy, stillbirth, and preterm birth." Many studies have pointed out that babies born via C-section have less bacterial exposure,

which in turn alters their immunity and gut micro biome diversity. Children tend to have increased chances of allergy, asthma, and childhood obesity.

The study noted the LSCS rates varied widely across States, with just 5.8% in Nagaland to 57.7% in Telangana. When taking socioeconomic conditions into account, the result found that the rate of C-section was as small as 4.4% among the poorest group to 35.9% among the richest quintile.

Labour requires normal continuous milestones to achieve normal delivery and if unsuccessful, it may leads to abnormal progress of labour. Women in the developing countries usually prefers rest and stick to a bed during the first stage of labour.[19] Lying on supine put the foetus and uterus pressure on the blood vessels in the abdomen which creates hindrance in the blood supply and increased chances of dystocia or a prolonged bearing down phase or pushing phase of labour. On the other hand, throughout the last few decades, a clear advance was observed in relation to the degree of protection and restfulness of labouring women. There is emphasis over the non-pharmacological aspects to reduce the pain of the labouring women.[2]

The using of birthing ball can play a vital role as a non- pharmacological method of pain relief, as well as it also aid in enhancing the positive birth experience by achieving good labour progress and better labour outcomes. The birthing ball exerts an equal coercion on the perineum and there by quicken the dilatation and widening of pelvic outlet.[2] Therefore, this study aims

to explore the effectiveness of birthing ball exercises on the labour pain and labour outcome among primingravidae mothers.

AIM OF THE STUDY

The aim of the study is to assess the effect of birthing ball exercise on labour pain and labour outcome during the first stage of labour among primigravidae parturient mothers at AIIMS, Jodhpur.

PROBLEM STATEMENT

Effect of birthing ball exercise on labour pain and labour outcome among primigravidae parturient mothers at AIIMS, Jodhpur.

OBJECTIVE OF THE STUDY

1. To assess and compare the labour pain in primigravidae parturient mothers in experimental and control group.

2. To assess and compare the labour outcome in primigravidae parturient mothers in experimental and control group.

3. To determine the association of labour pain and labour outcome with selected personal variables.

OPERATIONAL DEFINITION

- **Birthing ball exercise:** Birthing ball exercise are the exercises done with the help of birthing ball which includes 4 exercises in 2 positions. Exercise includes pelvic rocking forward and backward, ball bouncing and ball hip circle in sitting position hugging the ball in kneeling down

position for 20 min. There will be 2 sessions for the exercises for 20 min at the subsequent gap of 1 hour during active phase of labour. Mothers will be allowed to change their position in between their exercises whenever they want.

(Birthing ball refers to a large filled rubber ball of 55cm to 75cm according to their body size which will be provided by the researcher).

- **Labour pain:** labour pain is the subjective experience of pain during labour by primigravidae parturient women. It will be recorded by self-report on a VAS scale.

- **Labour outcome:** Refers to both maternal and neonatal outcome which includes,
    - Maternal outcome - Duration of labour, rate of cervical dilatation, rupture of membrane, mode of delivery, labour augmentation, analgesics during labour, maternal vital signs during labour which will be assessed by using WHO simplified partograph.

    - Neonatal outcome - Apgar score, admission to Neonatal Intensive Care Unit (NICU), and baby cried immediately after birth.

- **Primigravidae parturient** : A women who is pregnant for the first time and who is in labour and going to deliver a baby within a period of gestation between 37 to 42 weeks at AIIMS Jodhpur.

HYPOTHESIS

H0₁: There is no significant difference in labour pain in control group and experimental group.

Ha₁: There is significant difference in labour pain in control group and experimental group.

H0₂: There is no significant difference in labour outcome in control and experimental group

Ha₂: There is significant difference in labour outcome in control group and experimental group.

H0₃: There is no significant association of labour pain with selected demographic variables.

Ha₃: There is significant association of labour pain with selected demographic variables.

H0₄: There is no significant association of labour outcomes with selected demographic variables.

Ha₄: There is significant association of labour outcomes with selected demographic variables.

DELI MITATIONS

This study is delimited to primigravidae parturient mothers with more than 37 weeks period of gestation carrying a singleton foetus in cephalic presentation.

SUMMARY

This chapter discussed the background of the study, explained why it is important to conduct study, problem statement, aims and objectives of the study, operational definitions used in the study and delimitations of the study.

CHAPTER 2

REVIEW OF LITERATURE

REVIEW OF LITERATURE

This chapter focuses on literature review, which helps in set down the context and base for this study. Literature review refers to "setting summary of evidence on a research problem".[20]

It is a structured and logical arrangement of information that is deliberately choosing from scientific writings. It is fundamental part of scientific research and requires the systematic identification, reflection, critical analysis and reporting of existing information in relating to the existing problem.

Review of literature was done to assess in-depth information by using the key words such as birthing ball, labour pain, labour outcome, maternal outcome, neonatal outcome and birth experience among primigravidae mothers and in further exploring the research question and design the research methodology.

A comprehensive review of literature of articles from the year 2011 to 2019 was performed through standard databases such as Cochrane library, CINAHL, MEDLINE, PubMed and other unpublished studies from dissertations.

The review of literature has been categorized into 3 sections.

Section 1: Review related to effects of birthing ball on labour pain.

Section 2: Review related to effects of birthing ball on progress of labour and labour outcome and modes of delivery.

Section 3: Review related to the effects of various positions and techniques on labour pain and labour outcome.

SECTION 1:- Review related to effects of birthing ball on labour pain.

A RCT conducted to evaluate the effect of birth ball on the pain and self-efficacy of pregnant women during the child birth process. 178 participants were selected and randomly allocated to control and intervention groups. The questionnaires were given to the mothers at the 4cm and 8cm cervical dilatations. Results revealed birthing ball exercises could significantly improve child birth, self- efficacy and reduced pain in the intervention group as compared to the other group (P<0.001 in both cervical dilatations) also the score of self – efficacy was higher in the intervention group compared to the control group (P<0.001).[24]

A RCT to examine the effectiveness of a birth ball exercise programme during childbirth by measuring childbirth self-efficacy and childbirth pain was conducted at Taiwan. The study was conducted at two different labour units, one at a regional hospital and other at a medical centre, with 600 and 1022 annual births, respectively. 188 expectant mothers were recruited (recruitment rate: 47%) and were allocated through block randomisation method into the two arms of the study, but only 48 mothers in intervention group and 39 mothers in control group had finished the trial. Women completed the demographic and obstetrics information, the Childbirth Self-efficacy Inventory (CBSEI), and the short form of the McGill Pain Questionnaire (SF-MPQ) when the cervical dilations were 4cm and 8 cm. This study revealed that birth ball exercises provided statistically significant improvements in childbirth self-efficacy and pain. Mothers in the intervention group had shorter duration of

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labour of first stage, reduction in the use of epidural analgesia, and had lesser number of caesarean deliveries than the control group.[25]

A study to evaluate the efficacy of a birth ball exercise programme conducted by physiotherapists on pain relief, psychological care, and facilitation of the labour process at a labour ward in a Kwong Wah Hospital, Hong Kong. For before and after comparisons among 203 pregnant women case series design was utilised for this study. 181mothers were allotted in the latent phase of first stage of labour group and 22 were in group of without labour pain. The mothers were performed birth ball exercise .Results revealed that mothers who were exercising with birthing ball had shown significant difference in back pain level, stress and anxiety level, as well as the pressure level over the lower abdomen. This study concluded that birthing ball is effective in reducing labour pain.[26]

A study conducted to evaluate how a stability ball exercise programme influences low back pain and daily life interference across the second and third pregnancy trimester and the study was non-randomised and controlled, examining a target population of low-risk pregnancy women between 20 and 22 weeks of gestation located in a regional hospital in northern Taiwan. In total, 89 pregnant women participated out of 89 about 45 women were in the control group and 44 in the intervention group (who attended an antenatal stability ball exercise programme). This study revealed that after completing for demographic data and antenatal exercise status by propensity scores,

intervention group women who participated in the antenatal stability ball exercise programme reported significantly lesser low back pain and daily life interferences on compared to control group at 36 weeks of gestation.[27]

A study on Swiss ball to relieve pain of primiparous in active labour. This is a RCT with 40 primiparous women divided in control group and ball group, who carried out pelvic mobility exercises for 30 minutes during the active phase of labour. Numeric categorical scale was used to measure the labour pain, before and after therapy, by an assistant researcher. Partograph was used to investigate the Labour duration. The results revealed that there has been significant pain decrease in the study group (p<0.001). There has been no difference between groups in labour duration (p=0.37).[28]

A True experimental study conducted to evaluate the effectiveness of birthing ball technique on labour pain perception among primigravida women during first stage of labour. The study aimed was to evaluate the effectiveness of birthing ball technique on labour pain reduction in first stage of labour. Method used for this study True experimental design was adopted for the study. In pretest the majority of sample in Group I, 21 (70%) belongs to severe pain, (30%) belongs to moderate pain, and group II, 26 (86.6%) belongs to mild pain, (13.3%) belongs to moderate pain (4–6%). In post-test the majority of sample in group I, 27 (90%) belongs to moderate pain and three (10%) belongs to mild pain and in group II 30 (100%) belongs to severe pain. The pretest and post-test mean value for group I was 7.10 and 4.97. The pretest

and post-test mean value for group II was 4.97 and 5.00. The obtained Wilcoxon value for group I (-5.106) and group II (-4.849).The obtained P <0.000.[34]

A study on the effectivity of Birth Ball Exercise on Labour: a Systematic Literature Review. Birth ball exercise was effective to reduce pain during parturition. The duration and interval of uterus contraction was longer. The use of birth ball resulted higher the efficacy in the active phase of childbirth. It shows that the efficacy has an impact for about 30-40% at delivery. Women performing birth ball exercise had fewer use of epidural anaesthesia and lesser no. of caesarean section.[35]

A study on the application of yoga pranayama and gym ball exercise on labor pain during active phase at Pmb Desa Blahkiuh, Abiansemal, Badung. Quasi-experimental design was utilized for this study. The purpose of this study was to determine the effect of the application of yoga pranayama and ball exercise gym on labour pain. Sample included 40 respondents. Respondent selected by purposive sampling and divide into control group and intervention gro. The results of this study provide information to health care workers in reducing pain during delivery process in labouring women.[36]

A study on the effect of ball stability exercise versus foam roller exercise on low back pain during pregnancy.40 primigravidae and multigravida of second

trimester pregnant women complaining of low back pain were recruited in this study. Pregnant women were divided into 2 equal group; group A treated by ball stability exercises for twelve sessions, three times per week for four weeks and group B treated by foam roller exercises for twelve sessions, three times per week for four weeks. VAS has been taken as an assessment tool to measure the intensity of back pain. Results revealed that in post treatment there was a significant decrease ($P<0.01$) in intensity of low back pain and functional disability in group A and group B.[37]

SECTION 2: <u>**Review related to effects of birthing ball on progress of labour and labour outcome and modes of delivery.**</u>

A study to compare the effect of birthing ball versus ambulation on the maternal and newborn outcome among primigravidae mothers was conducted in Mangalore. 60 primigravidae mothers were randomly assigned in three groups with 20 samples in each group i.e; birthing ball, ambulation group and control group. Result were drawn that 95% primigravidae women who were given birthing ball therapy and 75% primigravidae women who were given ambulation group had normal vaginal delivery which revealed that the ambulation and birthing ball had improved the maternal and newborn outcome during labour.[21]

A study to assess the effectiveness of birth ball exercises on mode of delivery in primiparous women.54 primiparous women were randomly allocated to intervention and control groups. The intervention group had done birth ball

exercises for 4-6 weeks; on the other hand, hospital routine care was provided to the control group. The results of the study revealed that the 92.6% primiparous women had vaginal delivery and 7.4% had c-section in the intervention group, while in the control group 66.7% primiparous women delivered the baby through vaginal delivery and 33.3% underwent for c-section. Results were drawn that significant difference between the two groups in terms of mode of delivery (P=0.018).[30]

A quasi-experimental study was conducted to evaluate the effectiveness of pelvic rocking exercise by using sitting position on birth ball on labour progress during the first stage of labour. 80 parturient women were randomly assigned into two groups by using purposive sampling technique. The results revealed there is a statistically positive correlation between the effects of pelvic rocking birthing ball exercise on labour progress in terms of increased duration and frequency of uterine contractions, cervical dilatation and fetal head descent and decreased interval in intervention group. On the other hand, control group showed less progress with highly statically significant differences (<0.0001)*. In Addition the control group reported more pain score and also had longer duration of 1st, 2nd, and 3rd stage of labour than the study group. [23]

A RCT conducted to assess the effect of using birth ball on maternal and neonatal outcomes. The goal of the study was to investigate the impact of using birth ball on maternal and neonatal outcomes. In total, 100 primiparous women, 18-45 years were randomly divided into two groups of 50 study and

controls. The results revealed that the mean duration of labour was significantly lower in the intervention group compared with the control group (P<0.05). There were no significant difference in both the groups in terms of the need for oxytocin, Apgar score, birth weight and mode of delivery.[38]

A meta- analysis and systematic review on the impact of birth ball exercises on mode of delivery and length of labour. Finally five studies were included into the systematic review and meta- analysis. Result revealed that the included investigations had an alternate scope of value, generally lower than the standard level. The findings of the inspected articles showed that the group who utilised birth ball had shorter duration of active labour phase, on compared with control group (P=0.048). However, utilising birth ball had no statically significant effect on the length of the second stage of labour (P=0.128). Likewise use of birthing ball did not lead to increase in the rate of vaginal delivery (P=0.922) in study group.[33]

A descriptive study was conducted to investigate the utilization of the Swiss ball in the care of the parturient women in the obstetric care services. This study examined the attributes of its use in assisting parturient women by midwives. The study was based on the structured interview with 35 nurses who were providing support to parturient mothers. The study findings revealed that 100% of the Normal birthing centre and 40.9% of the obstetric centre owned the Swiss ball and the indications for the use were promoting fetal descent (32.4%), relaxation (19.7%), progression of the labour (17.1%),

exercise of the perineum (14.5%), pain relief (11.8%), psychological benefits and maternal movement.[22]

A study on utilising of the birthing ball during the first stage of labour and its impact on the progress of labour and outcome among nulliparous women at El- Nabawy El Mohandes Hospital, Egypt. The quasi- experimental design was utilised. They conducted their study on 120 labouring women; the study subjects randomly assigned into two group 60 in each control & experimental group. Results revealed that a high significant difference between the both groups concerning the improvement in the dilatation of the cervix and descent of fetal head that end in decreases period of the first and second labour stages in the study group. Also the study group reported less anxiety and pain score [2]

A quasi-experiment study to examine the effect of birthing ball exercises on the progress of first stage of labour.150 pregnant women were recruited and divided in two equal groups of 75 pregnant women in experimental and 75 in control group. Results revealed that there were no significant differences among control and experiment groups regarding general attributes and obstetric history which means that both groups were similar. Regarding impact of birthing ball exercises on first stage of labour: all units of Bishop Score were significantly better in intervention group that progress at first stage of labour among control and intervention groups. Administration of fluid was significantly more in experiment group than control group. Use of Oxytocin was significantly higher in intervention group (X^2= 27.170, P0.000). Uterine

contractions were significantly more in intervention group as compared to control group. There is reduction in the duration of first stage of labour among intervention than control groups (X²=19.718 , MEP).[39]

A pre- experimental study was conducted to assess the influence of Birthing Ball Technique on Length of Labour. The aim of this study was to know the effect of birthing ball on the duration of the first phase of active labour in PMB Sriwati. Total 30 pregnant women were recruited, and divided in two groups 15 primigravida women, and 15 multigravida women. The results revealed the birthing ball technique was effective in reducing the duration of labour in the first phase of labour in the active phase of the p-value of 0,000 <0.05.[40]

SECTION 3: <u>Review related to the effects of various position and techniques on labour pain and labour outcome.</u>

A study to compare the influence of three delivery positions on pain intensity during the second stage of labour. 96 primiparous pregnant women randomly allocated in the groups of lithotomy, sitting, and squatting positions who were hospitalized in the hospitals of Isfahan and Jahrom. The results revealed that In the latent phase of the second labour stage, mean pain intensity in lithotomy (2.27) and squatting positions (2.48) was significantly less than the mean pain intensity in sitting (5.33) position (P = 0.001). Pain intensity in the active phase of the second and third labour stages was significantly less in squatting position (6.14) group compared to the other two groups (7.59 and 7.41 in

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sitting and lithotomy positions, respectively) (P = 0.024).there is no significant difference in pain intensity in the fourth stage of labour in all three groups.[41]

A study to investigate the co-effect of pelvic special moves by birth ball and consumption of honey syrup on the intensity of labour pain in nulliparous women. In this study 70 pregnant women were randomly allocated into two groups of intervention and control. Once the contractions started, the intervention group started to perform pelvic tilt movements with birth ball and consume honey syrup at the same time. The control group received hospital routine care. VAS used to measure pain at every 30 minutes. The results revealed that in the intervention group reported decreasing pain intensity at every 30 minutes during the first 90th minute of the intervention.[42]

A RCT was conducted on the co- effects of Massage and Acupressure on relieving labour pain, reducing the duration of labour, and increasing delivery satisfaction. This RCT (n = 120) included three intervention groups (massage only, acupressure only, and massage + acupressure) and one control group, in which patients received no massage or acupressure treatment. The results revealed that In the latent phase of labour, the mean VAS scores of the massage-only group and massage + acupressure group were lower (4.56 ± 1.36 and 4.63 ± 1.52, respectively) than that of the control group (6.16 ± 1.46; $p < .01$). In the active and transition phases, the mean VAS scores of the massage-only group, acupressure-only group, and massage + acupressure group were significantly lower than that of the control group ($p < .01$ and $p <$

.001, respectively). During postpartum, the mean VAS score of the massage + acupressure group was lower (2.30 ± 0.70) than that of the control group (2.96 ± 0.72; p = .003). Cervical dilatation time, Apgar scores at 1 min and 5 min were similar among all of the groups (p > .05).[43]

A study was conducted to assess the impact of upright and ambulant positions versus lying down during the active phase of first stage of labour on labour outcomes among nulliparous women. Total 150 parturient women recruited and equally divided into intervention and control groups using randomization block technique. Significant differences (P < 0.05) were found between the two groups in terms of cervical dilation, fetal head descent, uterine contractions interval, and frequency. There is significant reduction in the duration of the first stage of labour in intervention group on compared with control group (P = 0.018). No significant differences (P > 0.05) were observed between the study and control groups in relation to emergency caesarean birth rates, oxytocin use, and neonatal outcomes.[44]

SUMMARY

This chapter dealt with reviewing literature, "Review of literature" concluded that the previous studies showed that birthing ball exercise have proved to be useful in reducing the duration of labour and labour pain of the labouring women, very few Indian studies were found during the review of literature.

CHAPTER 3

RESEARCH

METHODOLOGY

RESEARCH METHODOLOGY

This chapter dealt with the research methodology opted for this study to assess the effect of birthing ball exercise on labour pain and labour outcome among primigravidae parturient mothers. This stage of the study included selecting a suitable research design, variables, setting of the study, population, sample, and criteria for sample selection, sample size, sampling technique, development and description of the tool, content validity, pilot study and reliability of the tool, procedure for data collection and plan for data analysis.

RESEARCH APPROACH

Research approach is a choice of method for accomplishing the objectives of the study. The approach is the broad procedure for collecting data in a particular research situation. It depends on number of factors, such as nature of phenomenon to be studied, the majority of the concept, constraints of the setting and the research ability and agenda.

In present study "**Quantitative research Approach**" was used.

RESEARCH DESIGN

It can be defined as blueprint to conduct study that maximizes control over factors that could interfere with the validity of findings. The research design for the present study was "**Quasi- experimental post-test only design**" because this study is determined to assess the effect of birthing ball exercise on labour pain and labour outcome.

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┌─────────────────────────────────────────────────────────────┐
│                    RESEARCH APPROACH                         │
│                   Quantitative approach                      │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│                    RESEARCH DESIGN                           │
│      Quasi experimental post- test only control group design │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│                   SETTING OF THE STUDY                       │
│                 Labour room of AIIMS Jodhpur                 │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│                    SAMPLING TECHNIQUE                        │
│        Non- probability consecutive sampling technique       │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│                  SAMPLE AND SAMPLING SIZE                    │
│  Primigraviade parturient mothers at active phase of first   │
│        stage of labour with gestation age >37 weeks.         │
│   60 samples 30 in experiment group and 30 in control group  │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│          METHOD & TECHNIQUES OF DATA COLLECTION              │
│  Tool- demographic data, visual analogue scale, partograph,  │
│                        Apgar score                           │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│             DATA ANALYSIS AND INTERPRETATION                 │
│              Descriptive and inferential statstics           │
└─────────────────────────────────────────────────────────────┘
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FIGURE 1:- **: Diagrammatic representation of research methodology**

VARIABLES UNDER STUDY

Independent variable: birthing ball exercise is the independent variable in this study.

Dependent variable: labour pain and labour outcome among the parturient primigravidae mother are the dependent variables in this study.

Demographic variables: It consists of baseline characteristics of primigravidae mother such as age, gestation age, educational status, occupation, duration of marriage, religion, type of family, monthly income of family.

STUDY SETTING

The selection of an appropriate setting of study is significant because the setting can impacts the manner in which individuals carry on or feel and how they react. The setting is the physical location and conditions in which data collection takes place in the study. The present study was conducted in the labour room; All India Institute of Medical Sciences (AIIMS) Jodhpur.it is established by the Govt. of India's Ministry of health and family welfare under Pradhan Mantri Swasthya Yojana (PSSMY). This hospital is a well-functioning tertiary care centre since 2013 and presently functioning at a bed capacity of 960 beds.

TARGET POPULATION

Population refers to the entire assemblage of cases that meets designated sets of criteria. The need for defining a population for a research project arises out of requirements to specify the group to which the results of study can be applied.

Target population of present study comprised of primigravidae parturient mothers in the labour room at, AIIMS Jodhpur.

SAMPLING PROCESS

☐ **Sample:** A sample is a subset of population elements. Sample of present study was antenatal mothers diagnosed with gestational diabetes seeking antenatal care at AIIMS Jodhpur.

☐ **Sample size: 60**

Sampling size –

$N = 1 - n/Nx\ t^2\ (pxq)/d^2$,

N = required sample size

P = estimated delivery rates of selected Primigravida is 95% (0.95).

As per study conducted by Mathew A. (2012) [21] .95% primigravidae mothers underwent normal vaginal delivery after using birthing ball.

Z = table value at 0.05 level of significance is 1.96

D = absolute precision (acceptable margin of error) was assumed to be 5% (0.05)

$N = (1.44)^2\ (0.95 \times 0.05)/(0.05)^2$

N= 39.39

There are 80 samples. 40 samples are in experimental group and 40 samples in the control group..

Calculated sample size was 80 but due to COVID-19 pandemic, sample size was 60; 30 in experimental group and 30 in control group.

SAMPLING TECHNIQUE

Sampling technique refers to process of selecting subset of population in order to get data regarding a phenomenon in a way that it addresses the whole population. Sampling is necessary because it is more economical and efficient to work with a small group.

In the present study a **non-probability consecutive sampling** was chosen for sample selection. Non-probability consecutive sampling in which all the primigravidae parturient mothers meeting the inclusion criterion were included in the study.

The criterion for selection of sample was as follows: The criteria that specify the characteristics that the people in the population must possess are referred as inclusion criteria.

INCLUSION CRITERIA

This study includes

- Primigravidae parturient mothers (Age 18-35years) with spontaneous labour, in active phase of labour (>4cm cervical dilatation).
- Gestation week more than 37 weeks of gestation,
- Singleton foetus with cephalic presentation.

EXCLUSION CRITERIA

This study excludes

- Primigravidae mothers with high risk pregnancy.

- Conceived after treatment of infertility.

- Mother who are obese, overweight and short stature with increased risk of fall.

- Physically challenged mother.

DESCRIPTION OF TOOLS

The tools for data collection were self-structured and standardized tool and were developed by reviewing literatures, journals, opinion of experts and consulting with guide and co-guide. It consisted of following sections.

Table1: Description of tool

S.NO	TOOL	PURPOSE	TECHNIQUE
1.	Socio-demographic variable	To collect baseline information.	interview
2.	VAS Score	to assess the intensity of labour pain.	Self-reporting
3.	Partograph	To assess the maternal outcome.	Observation
4.	APGAR Score	To assess the neonatal outcome.	Observation

Section A:

Demographic data to get baseline data obtained from the primigravidae mother such as age, gestation age, educational status, occupation, duration of marriage, religion, type of family, monthly income of family.

Section B:

Visual analogue pain severity scale (VAS) is a standardized 10cm scale used to assess the pain intensity after intervention. Intervention was given when the mother in the experiment group was on the active stage of labour that is >4cm cervical dilatation and assessment of the pain was done at transition phase of labour that is 8-10cm of cervical dilatation in both control and experiment group.

Labour pain was assessed based on the self-report of the primigravidae parturient mothers.

Section C

Labour outcome as it include maternal outcome and neonatal outcome. Standardized WHO tool partograph was used to assess the maternal outcome. This tool was used by the researcher to measure the duration of labour, rate of cervical dilatation, rupture of membrane, labour augmentation, analgesics given and mode of delivery.

Neonatal outcome- by using APGAR Score (A-Appearance, P-Pulse rate, G-Grimace, A-Activity, R-Respiration) includes scoring severely depressed (0-3), moderately depressed (4-6), excellent condition (7-10), cried immediately after birth, and admitted to NICU.

Observation technique was used to mark the observations in the partograph and APGAR scoring.

INTERVENTION PROTOCOL

The researcher had administered the birthing ball exercises as mentioned below:-

- Birthing ball (65 cm) was provided by the researcher to the primigravidae mother (in experimental group) in the active phase of first stage of labour (i.e >4cm cervical dilatation) and primigravidae mothers were encouraged for doing exercise which includes 2 positions for 4 exercises.

- Exercise includes pelvic rocking forward and backward, ball bouncing and ball hip circle in sitting position hugging the ball in kneeling down position for 20 min. There were 2 sessions for the exercises for 20 min at the subsequent gap of 1 hour during active phase of labour. Mothers were allowed to change their position in between their exercises whenever they want.
    - ❖ After providing the sessions of exercise labour pain was assessed when cervical dilatation was 8-10cm by using Visual analogue scale (VAS) in both the group i.e. control and experiment group.
    - ❖ Labour outcome was assessed which includes maternal outcome and neonatal outcome after the delivery by using Partograph and Apgar score respectively.

- The session of birthing ball exercise was provided in labour room.

SAFETY MEASURES

- Birthing ball is a large air filled rubber ball of 55cm to 75cm according to their body size which was anti- burst and anti- slippery in nature. I have been used 65cm birthing ball for birthing ball exercise.

- Protective ring under the birthing ball was there to prevent any mis-happening during the sessions as it prevent from slipping /bursting of ball or fall of mother from the ball.

- Before starting the session, prior explanations of the procedure & Safety Precautions along with demonstration was provided to the mother as confidence boosting towards this exercise.

- Researcher and mother's relative was there to support throughout the session whenever mother wanted to change their position or quit the sessions she could.

- Before and after the completion of the birthing ball exercise session, birthing ball was cleaned with chlorhexidine gluconate I.P 0.5%/w/v Ethyl alcohol I.P 70%v/v solution and provided to the mother to prevent the mother from any kind of infection.

- Risk Profiling of Mothers was done prior to avoid any kind of mishappening.

❖ **POSTION:1**

FIGURE 2:- Primigravidae parturient mother in kneeling down position during birthing ball exercise.

❖ **POSITION:2**

FIGURE 3:- Primigravidae parturient mother in sitting position during birthing ball exercise

ETHICAL CONSIDERATION

- Ethical Clearance was obtained from the institutional Ethics committee AIIMS Jodhpur. Certificate Reference Number: AIIMS/IEC/2020-2021/3081, Date: -01/06/2020.

- Prior permission was taken from Principal, College of Nursing and Head of department of Obstetrics & Gynecology, AIIMS Jodhpur.

- Written Informed consent was obtained from each study subjects involved in the study.

- All the subjects were informed about their participation in the research, objectives of the study, duration of their involvement and probable use of findings of the study.

- Confidentiality of data was maintained and the study subjects were given full autonomy to withdraw from the study at any point of time.

CONTENT VALIDITY OF THE TOOL

Tool was validated from 7 experts from various institute of national importance (Annexure-VII) and certain modifications were done in the tool according to expert's and guide's suggestions. The content validity index was obtained after validation.

Experts gave their opinion regarding the tool and contents. The experts suggested in terms of relevance and appropriateness of the tools.

The content validity index for Demographic variable (1), VAS Score (0.86), Partograph (0.96) and APGAR Score (1).

All tools were found to be valid in terms of relevance and appropriateness.

RELIABILITY OF TOOL

- VAS scale, Partograph and APGAR Scoring are standardized assessment tool but still test retest method to assess the reliability was used.

- VAS Scale used for assessing labour pain and it has been shown to have test retest reliability(r=0.94: P<0.001) which shows that it is highly reliable for measuring pain.

- WHO simplified partograph used for assessing maternal outcome and it has been shown to have Co-efficient correlation (r=0.89) which indicated high degree of reliability.[46]

- APGAR is used for assessing neonatal outcome and it demonstrates high internal consistency measured by Cronbach's alpha of r=0.986.[47]

PILOT STUDY

- Pilot study was done from 31th Aug to 12th September, 2020. Pilot study was conducted on 10 primigravidae parturient mother coming into labour room at AIIMS Jodhpur were selected by Non probability consecutive sampling technique in which 5 mothers were in control group and 5 mothers in experimental group. Data was collected using structured and standardized tools.

The main objectives of pilot study were:

- To assess feasibility of the study
- To assess the practicability of the study

- To determine the reliability of data collection tool

- To determine the understanding and language clarity of the tool

Result of the pilot study indicated that study was found feasible, practical and language of data collection tool was clear and understandable to primigravidae parturient mothers. These mothers were excluded during main data collection of the study.

Problem faced during the pilot study

During pilot study I had faced many challenges during the study like mothers find difficult in doing 2nd session of exercise because mothers are being indulged in various kind of examinations, infusion and discomforts. But with the support of staff and doctors in labour room. I managed to complete my pilot study. Getting the samples was difficult due to COVID-19 pandemic.

DATA COLLECTION PROCEDURE

The formal permission was obtained to conduct the study from the concerned authorities of the institute

After explaining the purpose of study consent was taken from primigravidae parturients who fulfilled the inclusion criteria of the study. Confidentiality of the data was ensured to all participants

The researcher collected data related to demographic variables at the time of allocation of samples and samples were allocated to experiment group first then sessions of birthing ball exercises was provided to the experimental group during the active phase of labour and the mothers in control group hospital routine was followed.

Post-test was conducted to assess the labour pain when cervical dilation was 8-10cm in both groups by using visual analogue scale and labour outcomes was assessed after the delivery in both experimental and control group by using Partograph & Apgar Score.

Figure 4:- Schematic Presentation of Data Collection Procedure

PLAN FOR DATA ANALYSIS

Data was entered into master sheet and SPSS 20 version was used for the descriptive and inferential statistical analysis. Such as:

a. Descriptive statistical method:-

- Mean

- Frequency

- Percentage

- Standard Deviation

- Range

b. Inferential statistical method:-

- Chi square test to check the associations.

- t test to find the difference in means of two group

Analyzed data was interpreted and depicted with the help of tables and graphs.

SUMMARY

This chapter dealt with Research Methodology. Quantitative research approach and Quasi-experimental research design were used in this study. Study was conducted at labour room, AIIMS Jodhpur. Data were collected by observation and interview technique from 60 primigravidae parturient mothers and they were allotted into two groups, 30 in control group and 30 in experiment group by consecutive sampling technique. Socio-demographic variable used to collect general characteristics, VAS score used to assess labour pain, partograph and APGAR score utilized for assessing maternal outcome and neonatal outcome respectively. Collected data was entered into master sheet and SPSS 20 version was used for the descriptive and inferential statistical analysis.

CHAPTER 4
ANALYSIS, INTERPRETATION & DISCUSSION

ANALYSIS, INTERPRETATION AND DISCUSSION

This chapter deals with the result & discussion based upon analysis of data. Analysis and interpretation of the data was done in accordance with the objectives of the study.

Data analysis is the systematic organization and synthesis of research data and testing of research hypothesis. Interpretation is a process of making sense of the result of study and examining their implications.

The raw data collected was entered into master sheet, analyzed and interpreted by using descriptive and inferential statistics.

OBJECTIVES OF THE STUDY

1. To assess and compare the labour pain in primigravidae parturient mothers in experimental and control group.

2. To assess and compare the labour outcome in primigravidae parturient mothers in experimental and control group

3. To determine the association of labour pain and labour outcome with selected personal variables.

Data was collected from 60 primigravidae parturient mothers by using selected demographic variables, VAS Scale, Partograph and Apgar score to assess the effect of birthing ball exercise on labour pain and labour outcome among primigravidae parturient mothers. All data was tabulated and summarized in the Microsoft excel sheets. Data was analyzed and interpreted by using

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descriptive and inferential statistics. The $p < 0.05$ was considered as significant in the present study.

RESULT AND DATA ANALYSIS: -

The presentation of data organized and arranged in the following sections:

SECTION I: Description of sample characteristics socio demographic variables of primigravidae parturient mothers coming into labour room.

SECTION II: Assessment and comparison of labour pain by using VAS score in control group and experiment group.

SECTION III: Assessment and comparison of labor outcomes which includes maternal outcome and neonatal outcomes in control group and experiment group.

SECTION IV:- Association of labour pain with selected demographic variable in control group and experiment group.

SECTION V: Association of labour outcome with selected demographic variable in control group and experiment group.

SECTION1:- This section describes the sample characteristics of 60 primigravidae parturient mothers who participated in the study in frequency and percentage**.**

TABLE 2:- Frequency and percentage distribution of samples on demographic & obstetric variables in control and experimental group.

(N=60)

S.NO	SOCIO DEMOGRAPHIC VARIABLE	CONTROL GROUP(n=30) f(%)	EXPERIMENTAL GROUP(n=30) f (%)	χ2	df	p value
1	**Age group in years**					
	18-23	12(40%)	13(43.3%)	0.144	2	0.930
	24-29	16(53.3%)	15(64%)			(NS)
	30-35	2(6.7%)	2(6.7%)			
	Means ± SD	**24.5±3.63**	**24.3±3.68**			
2	**Gestational age in weeks**			4.887	2	0.086
	37-39 weeks	12(40%)	7(23.3%)			(NS)
	39.1-41 weeks	14(46.7%)	19(63.3%)			
	41.1-42 weeks	4(13.3%)	4(13.3%)			
	Means ± SD	**39.4±1.28**	**39.7±1.11**			
3	**Education**					
	No formal education	1(3.3%)	-			
	Primary	4(13.3%)	6(20%)	1.476	3	0.687
	Secondary	7(23.3%)	6(20%)			(NS)
	Graduation or above	18(60%)	18(60%)			
4	**Occupation**					
	Homemaker	29 (96.7%)	26 (86.7%)	-	-	-
	Private job/self employed	1 (3.3%)	4(13.3%)			
5	**Religion**					
	Hindu	28 (93.3%)	27(90%)	-	-	-
	Muslim	2(6.7%)	2 (6.7%)			
	Any others	-	1(3.3%)			
6	**Duration of marriage**					
	<1 years	5(16.7%)	5(16.7%)	4.960	2	0.083
	1-3 years	23(76.7%)	18(60%)			(NS)
	>3 years	2(6.7%)	7(23.3%)			
7	**Types of family**					
	Nuclear	2(6.7%)	3(10%)	1.542	2	0.462
	Joint	25(83.3%)	22(73.3%)			(NS)
	Extended	3(10%)	5(16.7%)			
8	**Monthly income of family**					
	<20,000	4(13.3%)	3(10%)	0.792	2	0.673
	20,000-30,000	8(26.7%)	10(33.3%)			(NS)
	>30,000	18(60%)	17(56.7%)			

Data presented in Table 2 revealed the socio demographic characteristics of the primigravidae parturient mothers more than half of the mothers in control group (54%) and 64% in experiment group belonged to age group of (24-29 yrs.).The mean age in control group was 24.5±3.63 years whereas in experimental group it was 24.4±3.68 years.

Almost half of the primigravidae mother in control group 46.7% and 63.3% in experiment group had completed to (39.1-41) gestation week & the mean gestation age in control group was 39.4±1.28 and in experiment group it was 39.7±1.11.

60% of primigravidae parturient in control and experiment group was graduated.

Majority of primigravidae parturient mothers (96.7%) in control group were homemakers and 3.3% had private job whereas in experiment group 86.7% primigravidae mothers were homemakers and 13.3% were self-employed.

Majority of primigravidae parturient mothers (93.3%) in control group and (90%) in experiment group were Hindu. 76.7% in control group and 60% in experiment group had duration of marriage between 1-3 years. Majority of primigravidae parturient mothers (83.3%) in control group and 73.3% in experiment group were living in Joint family.60% in control group and 56.7% in experiment group had family monthly income >30,000.

Chi- Square was calculated for experiment and control group to determine whether both groups are similar in characteristics before administration of

intervention. The findings revealed that both groups were similar in characteristics.

SECTION 2:- Assessment and comparison of labour pain between control and experiment group.

This section describes the comparison of labour pain among primigravidae parturient mothers in control and experiment group.

As this is post-test only control group design. Labour pain of the parturient mothers was assessed by VAS Score in control and experiment group.

H0$_1$:- There is no significant difference in labour pain in control group and experimental group.

TABLE 3:- VAS Score of Control and Experiment group   **(N=60)**

S.NO	Level of pain (vas score)	Control group(n=30) f (%)	Experimental group(n=30) f (%)
1.	Severe pain(7-9)	9 (30%)	25 (83.3%)
2.	Worst pain(10)	21 (70%)	5 (16.7%)

Labour pain was observed by VAS score through self-report by the mothers when the mothers were in transition phase of first stage of labour (8-10cm cervical dilatation).

There were no primigravidae parturient mothers with no pain, mild and moderate pain in experiment and control group.

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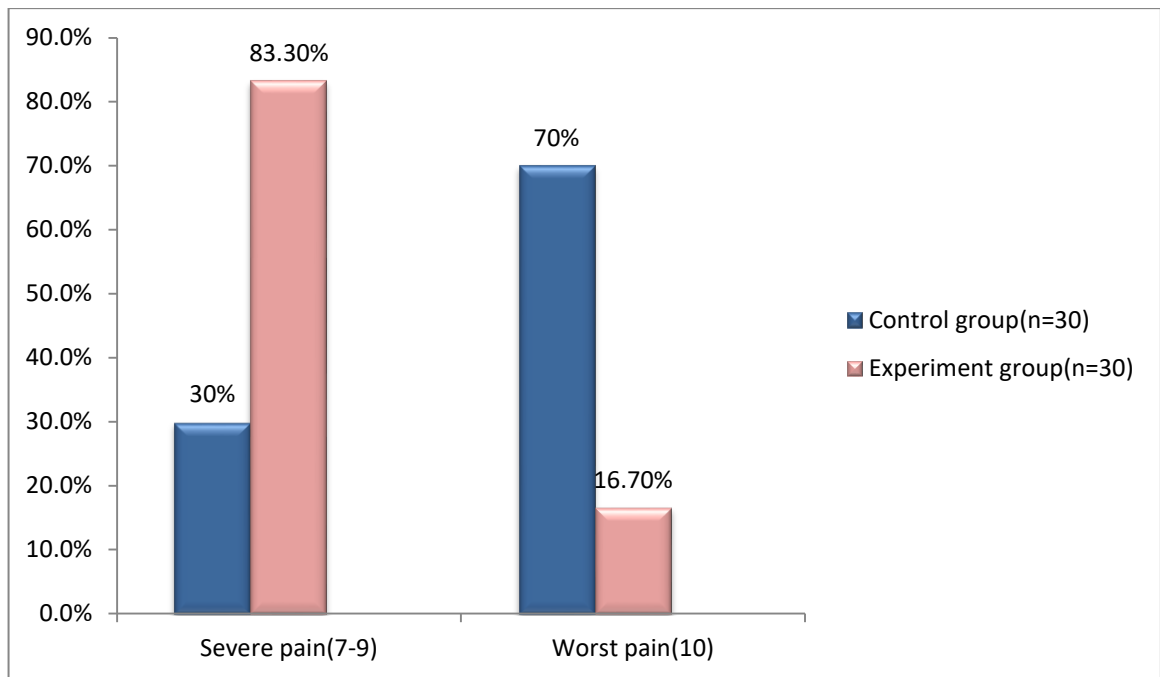
Figure 5:- Bar diagram depicting % distribution of labour pain in primigravidae parturient mothers

Data presented in Table 3 and Figure 5 represents that 70% primigravidae parturient mothers in control group reported for worst pain and 30% reported for severe pain whereas in experiment group only 16.7% expressed their pain as worst pain and 83.3% reported for severe pain

TABLE-4: Mean and standard deviation of pain scores (VAS) in control and experimental group.

	Labour pain (vas score) Mean±SD	df	t-value	p-value (N=60)
Control Group (n=30)	9.4±1.13	58	3.491	0.0010*
Experiment Group (n=30)	8.36±.97			

NOTE- *level of significance p<0.05, NS - non significant, *- significant*

Data presented in Table 4 shows the comparison of level of labour pain (VAS Score) in control group and experiment group. The Mean & Standard deviation of VAS score in control group was 9.4±1.13 as compared to experiment group mean VAS score was 8.36±.97.Unpaired t-test was used to test the hypothesis. Significance difference at level of p<0.05 was observed in the level of labour pain (VAS Score) of experimental and control group and it concluded that primigravidae parturient mothers who had used birthing ball during first stage of labour had reduced intensity of labour pain. Hence, the null hypothesis $H0_1$ was rejected.

SECTION 3:- Assessment and comparison of labour outcome in control group and experiment group.

This section describes the labour outcome among primigravidae parturient mothers in control and experiment group.

H0₂:- There is no significant difference in labour outcome in control and

experimental group

TABLE 5:- Comparison of maternal outcomes in control group and experiment group

(N=60)

S. NO	ITEMS	CONTROL GROUP(n=30) f(%)	EXPERIMENTAL GROUP(n=30) f(%)	χ^2/ fisher exact	df	P value
1	**Duration of labour(hrs)**					
	• 8-12hrs	1 (3.3%)	9(30%)	20.07	3	0.000
	• 12-16hrs	3(10%)	11(36.7%)			(S)
	• 16-20hrs	12(40%)	6(23.3%)			
	• 20-24hrs	14(46.7%)	3 (10%)			
	Means±SD	**19.2±3.17**	**14.4±3.90**			
2	**Rate of cervical dilatation**					
	• <1cm/hrs	23 (76.7%)	4 (13.3%)	27.09	2	0.000
	• 1cm/hrs	6(23.3%)	11(36.7%)			(S)
	• >1cm/hrs	1(3.3%)	15(50%)			
3	**Rupture of membrane**					
	• Spontaneous	11(36.7%)	13(43.3%)	1.195	2	0.550
	• Artificial	18(60%)	17(56.7%)			(NS)
	• Premature rupture of membrane	1(3.3%)	-			
4	**Augmentation/induction of labour**					
	• Not done	-	8(26.7%)	16.30	2	0.000
	• Done with oxytocin	17(56%)	20(66.7%)			(S)
	• Done with Cp gel	13(44%)	2(6.7%)			
5	**Analgesics during labour**					
	• Given	15(50%)	1(3.3%)	22.05	2	0.000
	• Not given	3(10%)	17(56.7%)			(S)
	• If any special medication	12(40%)	12(40%)			
6	**Maternal vitals during labour**					
	• Stable	28(93.3%)	30(100%)	2.068	1	0.150
	• Not stable	2(6.7%)	-			(NS)
7	**Mode of delivery**					
	• Normal vaginal delivery with episiotomy	16 (53.3%)	26(86.7%)	8.380	1	0.03 (S)
	• Forceps vaginal delivery	1(3.3%)	-			
	• Vacuum vaginal delivery	1(3.3%)	-			
	• Caesarean section	12(40%)	4(13.3%)			
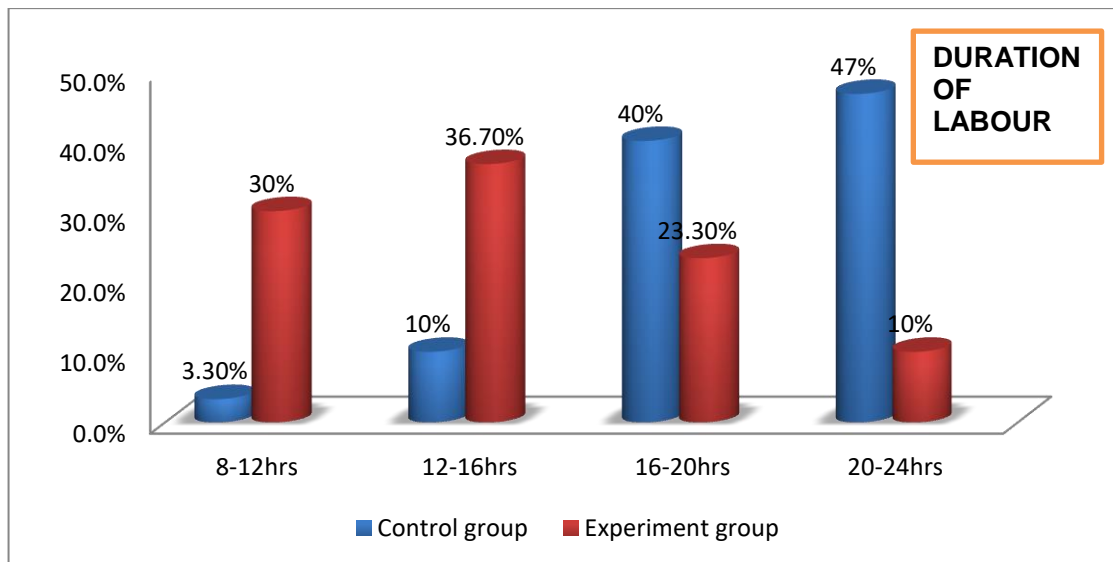
Figure 6:-Bar diagram depicting % distribution of Duration of labour among primigravidae parturient mothers in control and experiment group

Data presented in Fig 6 depicted the Duration of labour in which, primigravidae parturient mothers in control group who were provided routine care according to hospital policy and experiment group were provided birthing ball exercise. Finding suggests that the mean duration of labour in control group was 19.2±3.17 hrs (SD) where as in experiment group the mean duration of labour was reduced to 14.4±3.90 hrs (SD). The primigravidae parturient mothers after getting birthing ball exercises had significantly shorter duration of labour at $p < 0.05$.
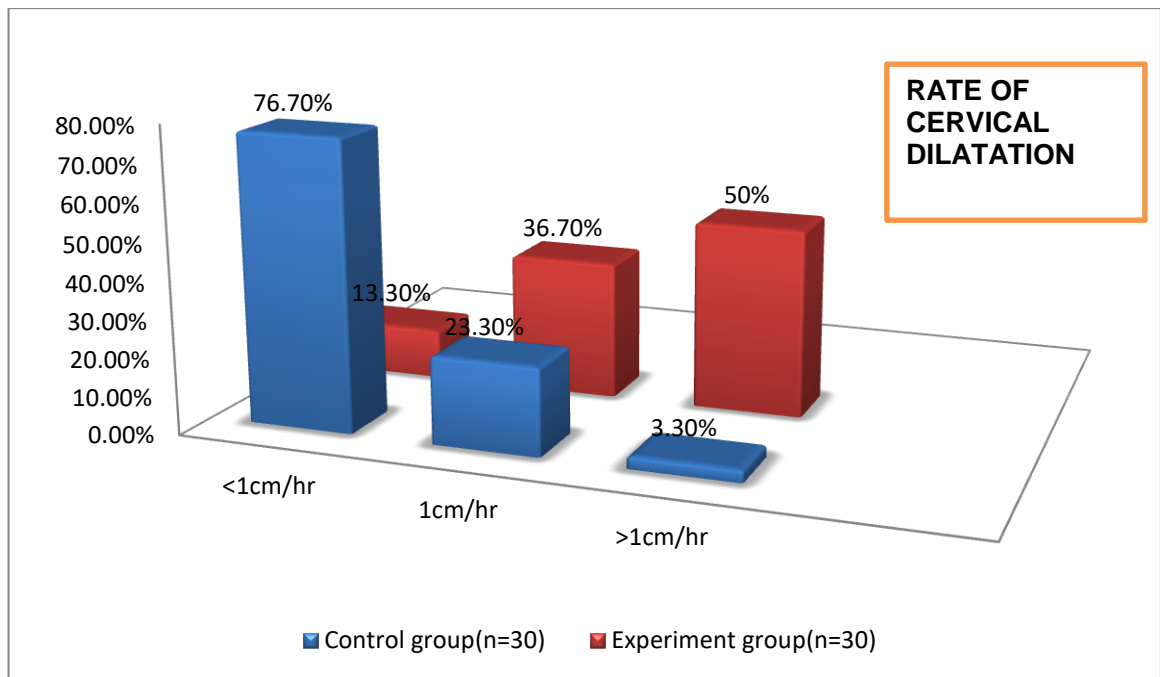
Figure 7:- Bar diagram depicting % distribution of rate of cervical dilatation among primigravidae parturient mothers in control and experiment group

This bar graph shown in Fig 7 represents that rate of cervical dilatation in majority of primigravidae parturient mothers (76.7%) in control group had <1cm/hr and 23.3% mothers had 1cm/hr cervical dilatation whereas in experiment group 13.3% population had <1cm/hr cervical dilatation 36.7% had 1cm/hr and 50% had >1cm/hr cervical dilatation. There were significant difference observed in control and study group through chi square at $p<0.05$.
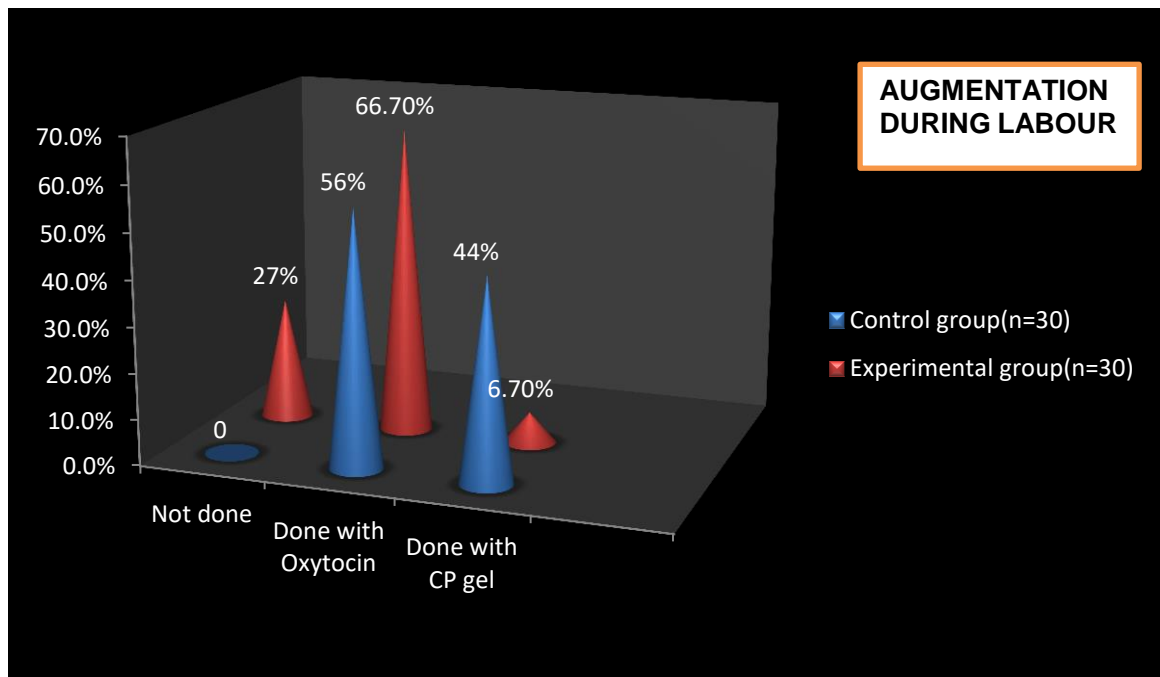
Figure 8:- Bar diagram depicting % distribution of Augmentation of labour among primigravidae parturient mothers in control and experiment group

This graph shown in Fig 8 represents data about Augmentation of labour in primigravidae mother so the more than half of primigravidae parturient mothers (56%) in control group are augmented or induced with oxytocin and 44% mothers are augmented with CP gel. None of them had progressed labour without augmentation whereas in experiment group 26.7% primigravidae parturient mothers had progressed labour without augmentation and majority (66.7%) had progressed labour after augmented with oxytocin and 6.7% mother needed to augmented with CP gel in experiment group.
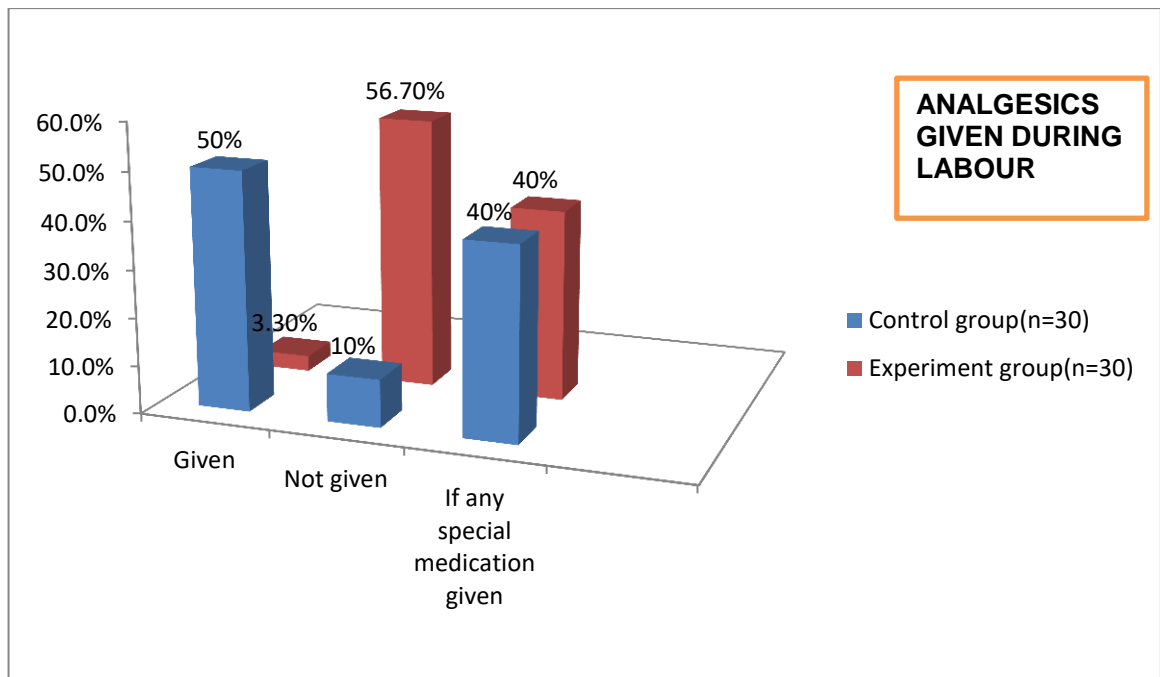
Figure 9:-:-Bar diagram depicting % distribution of Analgesics given during labour among primigravidae parturient mothers in control and experiment group

This bar graph shown in Fig 9 depicted the data about the use of analgesics during labour so there was half of the primigravidae parturient mother (50%) in control group were given analgesic named epidosin and 10 % mothers were not administered any kind of analgesics during labour and 40% in control group were given special medication i.e drotin which results in cervical ripening and act as muscle relaxant so helps in reducing pain whereas majority of primigravidae parturient mothers(56.7%) in experiment group were not given analgesics during labour whereas 40% were given drotin and 3.3% were given analgesics named epidosin during labour . Findings suggested that highly significant difference found in both groups at p<0.05 level of significance.
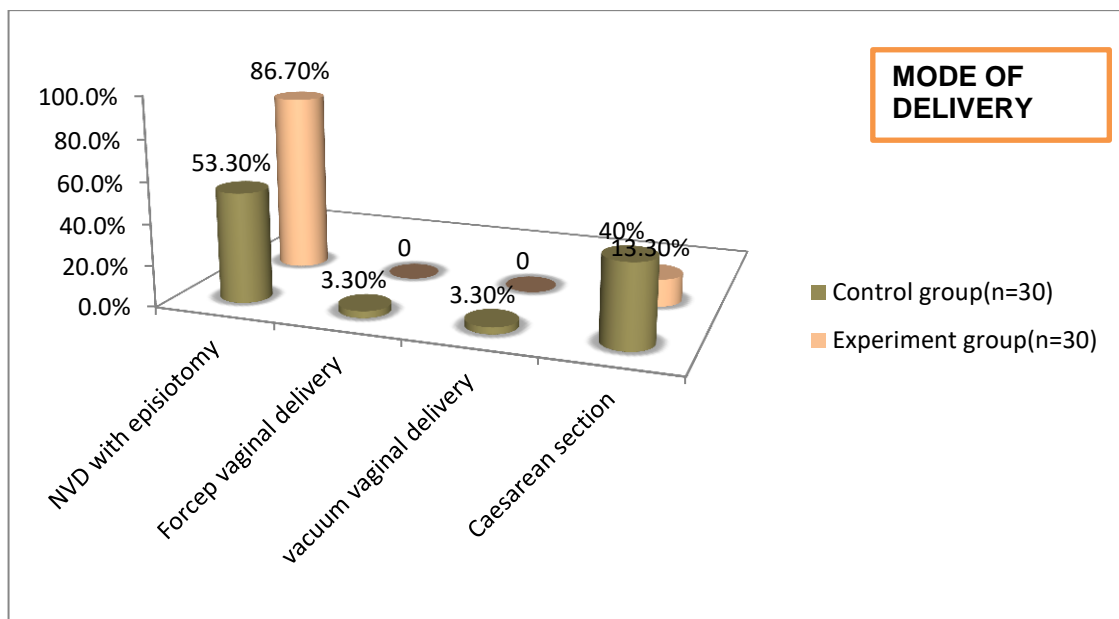
Figure 10:- Bar diagram depicting % distribution of Mode of delivery in control and experiment group

This bar graph shown in Fig 10 revealed the mode of delivery in both group so more than half of the primigravidae parturient mothers (53.3%) in control group underwent Normal vaginal delivery with episiotomy, 3.3% had forcep vaginal delivery and 3.3% population had vacuum vaginal delivery and 40% population had caesarean section whereas in majority of primigravidae mothers(86.7%) in experiment group delivered through Normal vaginal delivery with episiotomy and 13.3% mothers delivered through caesarean section and none of them in experiment group delivered through forcep and vacuum vaginal delivery and significant difference was observed in both group at p<0.05.

TABLE: 6:-Assessment and Comparison of Neonatal Outcome in control group and experiment group

S. NO	Items	Control group(n=30) f (%)	Experimental group(n=30) f (%)	χ^2	df	P value
1.	**Apgar score**			6.025	2	0.04
	• 7-10	23(76.7%)	29(96.7%)			(S)
	• 4-6	5 (16.7%)	-			
	• 1-3	2 (6.7%)	1(3.3%)			
2.	**Cried immediately after birth**			4.138	1	0.04
	• Yes	27 (90%)	29 (96.7%)			(S)
	• No	3 (10%)	1 (3.3%)			
3.	**Admission to NICU**			9.310	1	0.002
	• Yes	4 (13.3%)	1 (3.3%)			(S)
	• No	26 (86.7%)	29 (96.7%)			

Data presented in Table 5 represents that majority of newborn in control group that is 76.7% mother had delivered baby who had APGAR Score between (7-10) whereas in experiment group 96.7% primigravidae mothers had delivered baby who comes under the Apgar score between (7-10). There were significant differences observed in both groups.

90% baby delivered by the primigravidae parturient mothers in control group had cried immediately after birth and 10% baby had not cried whereas in 96.7% mothers in experiment group had delivered baby who cried immediately after birth. There were significant differences found in control and experiment group at p<0.05.

13.3% baby in control group needed to be admitted in NICU whereas only 3.3% babies in experimental group needed to be admitted in NICU.Significant difference at p<0.05 level of significance was observed in the labour outcome including the maternal and neonatal outcome of the control and experimental group, therefore null hypothesis $H0_2$ was rejected.

SECTION IV:- Association of labour pain with selected demographic variable in control and experiment group.

This section describes the association of labour pain among primigravidae parturient mothers

H0₃:- There is no significant association of labour pain with selected demographic variables.

Table: 7 Association of labour pain with selected demographic variable in control group**(n=30)**

SOCIO DEMOGRAPHIC VARIABLE	Labour pain			Fisher exact test	p- value
	Severe Pain	Worst Pain	df		
Age group in years					
18-23	2	10	2	2.107	0.365
24-29	6	10	2		(NS)
30-35	1	1	1		
Gestational age in wks					
37-39 weeks	2	10	2	2.122	0.421
39.1-41 weeks	5	9	2		(NS)
41.1-42 weeks	2	2	1		
Education					
No formal education	0	1	3	.780	1.00
Primary	1	3	3		(NS)
Secondary	2	5			
Graduation or above	6	12	1		
Occupation					
Homemaker	9	20	1	-	1.00
Private job/self employed	0	1	1		(NS)
			1		
Religion					
Hindu	8	20	1	-	1.00
Muslim	1	1	1		(NS)
Any others			1		
Duration of marriage					
<1 years	1	4	2	.937	1.00
1-3 years	8	15	2		(NS)
>3 years	0	2	1		
Types of family					
Nuclear	0	2	2	.804	1.00
Joint	8	17	2		(NS)
Extended	1	2	1		
Monthly income of family					
<20,000	1	3	2	.348	1.00
20,000-30,000	2	6	2		(NS)
>30,000	6	12	1		

Table:8 Association of labour pain with selected demographic variable in experimental group. **(n=30)**

SOCIO DEMOGRAPHIC VARIABLE	Labour pain		df	Fisher exact test	p- value
	Severe Pain	Worst Pain			
Age group in years				0.488	1.00
18-23	11	2	2		(NS)
24-29	12	3	2		
30-35	2	0	1		
Gestational age in wks				0.174	1.00
37-39 weeks					(NS)
39.1-41 weeks	6	1	2		
41.1-42 weeks	16	3	2		
	3	1	1		
Education				1.298	0.794
No formal education	0	0	2		(NS)
Primary	5	1	2		
Secondary	6	0			
Graduation or above	14	4	1		
Occupation				-	1.00
Homemaker	21	5	1		(NS)
Private job/self employed	4	0	1		
			1		
Religion				3.873	0.187
Hindu	23	4	2		(NS)
Muslim	2	0	2		
Any others	0	1	1		
Duration of marriage				2.851	0.243
<1 years	5	0	2		(NS)
1-3 years	13	5	2		
>3 years	7	0	1		
Types of family				1.252	0.743
Nuclear	3	0	2		(NS)
Joint	17	5	2		
Extended	5	0	1		
Monthly income of family			2	0.516	1.00
<20,000			2		(NS)
20,000-30,000	3	0	1		
>30,000	8	2			
	14	3			

Table 7 and 8 showed that no personal variable was found to be significantly associated with labour pain in control and experimental group at p<0.05 level of significance.

SECTION V:- Association of labour outcome with selected demographic variables.

H0$_4$:- There is no significant association of labour outcomes with selected demographic variables.

Table 9:- Association of duration of labour with selected demographic variable in control and experiment group.

Socio-demographic variables	CONTROL GROUP (n=30)							EXPERIMENTAL GROUP (n=30)						
	Duration of labour (in hrs)				df	Fisher exact test	P-value	Duration of labour (in hrs)				df	Fisher exact test	P-value
	8-12	12-16	16-20	20-24				8-12	12-16	16-20	20-24			
Age group in years														
18-23	0	2	5	5	6	3.664	0.970	5	1	5	2	6	9.868	0.06
24-29	1	1	6	8	6		(NS)	4	8	2	1	6		(NS)
30-35	0	0	1	1	1			0	2	0	0	1		
Gestational age in weeks														
37-39	0	2	5	5	6	3.007	0.980	2	4	1	0	6	6.156	0.386
39.1 - 41	1	1	5	7	6		(NS)	7	4	5	3	6		(NS)
41.1 – 42	0	0	2	2	1			0	3	1	0	1		
Education														
No formal education	0	0	1	0	9	13.422	0.106	0	0	0	0	6	3.337	0.836
Primary	0	2	0	2	9		(NS)	2	1	2	1	6		(NS)
Secondary	0	0	5	2	1			2	2	1	1	1		
Graduate and above	1	1	6	10				5	8	4	1			
Occupation					3							3		
Homemaker	1	3	11	14	3	3.803	0.533	9	8	6	3	3	3.055	0.397
Private job/self-employed	0	0	1	0	1		(NS)	0	3	1	0	1		(NS)
Religion														
Hindu	1	3	11	13	3	1.899	1.00	8	11	5	3	6	6.085	0.395
Muslims	0	0	1	1	3		(NS)	1	0	1	0	6		(NS)
Any other	0	0	0	0	1			0	0	1	0	1		
Duration of marriage														
<1 year	0	0	4	1	6	10.922	0.04	2	2	1	0	6	6.385	0.375
1-3 years	0	3	7	13	6		(S)	5	4	6	3	6		(NS)
>3 years	1	0	1	0	1			2	5	0	0	1		
Type of family														
Nuclear	0	0	2	0	6	7.075	0.347	0	1	2	0	6	5.354	0.473
Joint	1	3	10	11	6		(NS)	6	9	4	3	6		(NS)
Extended	0	0	0	3	1			3	7	1	0	1		
Monthly income of family														
<20,000	0	1	1	2	6	5.607	0.476	1	0	2	0	6	7.120	0.251
20,000-30,000	0	1	5	2	6		(NS)	4	2	2	2	6		(NS)
>30,000	1	2	6	10	1			4	9	3	1	1		

Table 9 shows that no personal variable was found to be significantly associated with duration of labour in control and experimental group at p<0.05 level of significance except duration of marriage in control group at p<0.05 level of significance.

Table 10:- Association of rate of cervical dilatation with selected demographic variable in control and experiment group.

Socio-demographic variables	CONTROL GROUP (n=30)						EXPERIMENT GROUP (n=30)					
	Rate of cervical dilatation (cm/hr)			df	Fisher exact test	p-value	Rate of cervical dilatation (cm/hr)			df	Fisher exact test	p-value
	<1	1	>1				<1	1	>1			
Age group in years												
18-23	9	3	0	4	4.020	0.499	2	1	10	4	9.961	0.01
24-29	13	2	1	4		(NS)	2	8	3	4		(S)
30-35	1	1	0	1			0	2	0	1		
Gestational age in weeks												
37-39	10	2	0	4	2.186	0.777	0	4	3	4	7.829	0.05
39.1 - 41	10	3	1	4		(NS)	3	4	12	4		(S)
41.1 – 42	3	1	0	1			1	3	0	1		
Education												
No formal education	1	0	0	6	5.803	0.726	0	0	0	4	1.839	0.848
Primary	2	2	0	6		(NS)	1	1	4	4		(NS)
Secondary	6	1	0	1			1	3	3	1		
Graduate and above	14	3	1				2	7	8			
Occupation				2						2		
Homemaker	22	6	1	2	2.200	1.00	4	8	14	2	2.358	0.318
Private job/self-employed	1	0	0	1		(NS)	0	3	1	1		(NS)
Religion												
Hindu	22	6	1	2	1.436	1.00	3	11	13	4	5.630	0.09
Muslims	2	0	0	2		(NS)	0	0	2	4		(NS)
Any other	0	0	0	1			1	0	0	1		
Duration of marriage												
<1 year	5	0	0	4	7.641	0.09	0	2	3	4	5.575	0.198
1-3 years	17	6	0	4		(NS)	4	4	10	4		(NS)
>3 years	1	0	1	1			0	5	2	1		
Type of family												
Nuclear	2	0	0	4	2.869	1.00	0	1	2	4	2.638	0.700
Joint	18	6	1	4		(NS)	4	9	9	4		(NS)
Extended	3	0	0	1			0	1	4	1		
Monthly income of family												
<20,000	3	1	0	4	1.974	1.00	0	0	3	4	6.542	0.110
20,000-30,000	6	2	0	4		(NS)	3	2	5	4		(NS)
>30,000	14	3	1	1			1	9	7	1		

Table 10 showed that no personal variable was found to be significantly associated with cervical dilatation in control and experimental groups at p<0.05 level of significance except age in years of participants and gestational age in experimental group.

Table 11:- Association of augmentation of labour with selected demographic variable in control and experiment group. **(N=60)**

SOCIO DEMOGRAPHIC VARIABLE	CONTROL GROUP (n=30)					EXPERIMENT GROUP (n=30)					
	Augmentation of labour		df	Fisher exact test	p-value	Augmentation of labour			df	Fisher exact test	p-value
	Done with oxytocin	Done with CP gel				Not done	Done with oxytocin	Done with CP gel			
Age group in years											
18-23	9	3	2	2.922	0.187	4	8	1	4	6.462	0.148
24-29	7	9	2		(NS)	2	12	1	4		(NS)
30-35	1	1	1			2	0	0	1		
Gestational age (wks)											
37-39 weeks	6	6	2	.781	.881	4	2	1	4	6.440	0.135
39.1-41 weeks	8	6	2		(NS)	3	15	1	4		(NS)
41.1-42 weeks	3	1	1			1	3	0	1		
Education											
No formal education	1	0	3	8.934	0.01	0	0	0	4	1.461	1.00
Primary	1	3	3		(S)	2	4	0	4		(NS)
Secondary	7	0	1			2	5	0	1		
Graduation or above	8	10				4	11	2			
Occupation											
Homemaker	17	12	1	-	.433	6	18	2	2	1.552	0.667
Private job/self	0	1	1		(NS)	2	2	0	2		(NS)
employed			1						1		
Religion											
Hindu	15	13	1	-	.492	6	19	2	4	6.503	0.190
Muslim	2	0	1		(NS)	2	0	0	4		(NS)
Any others			1			0	1	0	1		
Duration of marriage											
<1 years	4	1	2	3.179	.226	1	4	0	4	2.158	0.826
1-3 years	13	10	2		(NS)	6	11	1	4		(NS)
>3 years	0	2	1			1	5	1	1		
Types of family											
Nuclear	1	1	2	1.142	.777	1	1	0	4	8.394	0.04
Joint	15	10	2		(NS)	3	17	2	4		(S)
Extended	1	2	1			4	1	0	1		
Monthly income of family											
<20,000	3	1	2	0.973	.663	1	1	0	4	2.945	.674
20,000-30,000	5	3	2		(NS)	4	6	0	4		(NS)
>30,000	9	9	1			3	12	2	1		

Table 11 shows that no personal variable was found to be significantly associated with augmentation of labour in control and experimental group at p<0.05 except education level in control group and types of family in experimental group.

Table 12:- Association of analgesics given during labour with selected demographic variable in control and experiment group.   **(N=60)**

SOCIO DEMOGRAPHIC VARIABLE	CONTROL GROUP (n=30)						EXPERIMENT GROUP (n=30)					
	Analgesics given during labour			df	Fisher Exact test	p-value	Analgesics given during labour			df	Fisher exact test	p-value
	Given	Not given	Any Spc. Med.				given	Not given	Any Spc. Med.			
Age group in years	3	2	7	4	6.010	0.135	0	6	7	2	4.106	0.473
18-23	11	1	4	4		(NS)	1	9	5	2		(NS)
24-29	1	0	1	1			0	2	0	1		
30-35												
Gestational age in wks	4	1	7	4	5.276	.237	0	6	1	4	4.053	0.475
37-39 weeks	8	1	5	4		(NS)	1	9	9	4		(NS)
39.1-41 weeks	3	1	0	1			0	2	2	1		
41.1-42 weeks												
Education												
No formal education	1	0	0	6 6 1	4.195	.828 (NS)	0	0	0	4 4 1	1.529	1.00 (NS)
Primary	1	0	3				0	4	2			
Secondary	4	1	2				0	4	3			
Graduation or above	9	2	7				1	9	7			
Occupation												
Homemaker	15	3	11	2 2 1	2.137	.500 (NS)	0	15	10	2 2 1	0.956	1.00 (NS)
Private job/self employed	0	0	1				1	2	2			
Religion												
Hindu	13	3	12	2 2 1	1.831	.586 (NS)	1	15	11	2 2 1	5.264	0.380 (NS)
Muslim	2	0	0				0	2	0			
Any others									1			
Duration of marriage												
<1 years	3	0	2	4	1.346	1.00	0	5	0	4	5.574	0.196
1-3 years	11	3	9	4		(NS)	1	8	9	4		(NS)
>3 years	1	0	1	1			0	4	3	1		
Types of family												
Nuclear	1	0	1	4	1.914	.874	0	1	2	4	6.029	0.246
Joint	13	3	9	4		(NS)	1	11	10	4		(NS)
Extended	1	0	2	1			0	5	0	1		
Monthly income of family												
<20,000	2	1	0	4	6.736	0.030	0	2	1	4	1.837	1.00
20,000-30,000	2	2	4	4		(S)	0	6	4	4		(NS)
>30,000	11	0	7	1			1	9	7	1		

Table 12 :- No personal variable was found to be significantly associated with analgesics given during labour in experimental and control group at p<0.05 level of significance except for monthly income in control group.

Table 13:- Association of mode of delivery with selected demographic variable in control and experiment group. **(N=60)**

SOCIO DEMOGRAPHIC VARIABLE	CONTROL GROUP (n=30)							EXPERIMENT GROUP (n=30)				
	Mode of delivery				df	Fisher Exact test	p-value	Mode of delivery		df	Fisher exact test	p-value
	NVD	F. VD	V. VD	CS				NVD	CS			
Age group in years												
18-23	4	0	0	8	6	9.466	.083	11	2	2	0.491	1.00
24-29	11	1	1	3	6		(NS)	13	2	2		(NS)
30-35	1	0	0	1	1			2	0	1		
Gestational age (wks)												
37-39 weeks	5	1	0	6	6	8.310	.140	7	0	2	4.335	0.106
39.1-41 weeks	8	0	0	6	6		(NS)	17	2	2		(NS)
41.1-42 weeks	3	0	1	0	1			2	2	1		
Education												
No formal education	0	0	0	1	9	10.96	0.477				1.280	.618
Primary	3	0	0	1	9		(NS)	5	1	2		(NS)
Secondary	2	0	0	5	1			7	0	2		
Graduation or above	11	1	1	5				14	3	1		
Occupation												
Homemaker	15	1	1	12	3	4.193	1.00	22	4	1	-	1.00
Private job/self employed	1	0	0	0	3 / 1		(NS)	4	0	1		(NS)
Religion												
Hindu	14	1	1	12	3	3.537	.559	24	3	2	4.527	0.146
Muslim	2	0	0	0	3		(NS)	2	0	2		(NS)
Any others					1			0	1	1		
Duration of marriage												
<1 years	2	0	0	3	6	5.315	.675	5	0	2	1.980	.330
1-3 years	12	1	1	9	6		(NS)	14	4	2		(NS)
>3 years	2	0	0	0	1			7	0	1		
Types of family												
Nuclear	1	0	0	1	6	6.423	0.563	2	1	2	1.803	.452
Joint	12	1	1	11	6		(NS)	19	3	2		(NS)
Extended	3	0	0	0	1			5	0	1		
Monthly income of family												
<20,000	1	0	0	3	6	5.320	0.589	3	0	2	.805	.752
20,000-30,000	4	0	0	4	6		(NS)	8	2	2		(NS)
>30,000	11	1	1	5	1			15	2	1		

Table 13 No personal variable was found to be significantly associated with mode of delivery in experimental and control group at p<0.05 level of significance.

Table 14:- Association of APGAR SCORE with selected demographic variable

in control and experiment group.   **(N=60)**

	CONTROL GROUP (n=30)						EXPERIMENT GROUP (n=30)				
SOCIO DEMOGRAPHIC VARIABLE	APGAR score			df	Fischer Exact Test	p value	APGAR score		df	Fischer Exact Test	p value
	0-3	4-6	7-10				0-3	7-10			
Age group in years						.					
18-23	2	2	8	4	3.574	522	0	13	2	2.016	1.00
24-29	0	3	13	4		(NS)	1	14	2		(NS)
30-35	0	**0**	2	1			0	2	1		
Gestational age (wks)											
37-39 weeks	2	3	7	4	5.098	0.181	0	7	2	1.233	1.00
39.1-41 weeks	0	1	13	4		(NS)	1	18	2		(NS)
41.1-42 weeks	0	1	3	1			0	4	1		
Education											
No formal education	0	0	1	6	8.665	0.151				1.161	1.00
Primary	0	1	3	6		(NS)	0	6	2		(NS)
Secondary	1	3	3	1			0	7	2		
Graduation or above	1	1	16				1	16	1		
Occupation						1.00				-	1.00
Homemaker	2	5	22	2	1.689	(NS)	1	25	1		(NS)
Private job/self employed	0	0	1	2 1			0	4	1		
Religion											
Hindu	2	5	21	2	0.925	1.00	1	22	2	2.817	1.00
Muslim	0	0	2	2		(NS)	0	2	2		(NS)
Any others				1			0	1	1		
Duration of marriage											
<1 years	0	1	4	4	1.568	1.00	0	5	2	1.117	1.00
1-3 years	2	4	17	4		(NS)	1	17	2		(NS)
>3 years	0	0	2	1			0	1	1		
Types of family											
Nuclear	0	0	2	4	1.847	1.00	0	3	2	1.417	1.00
Joint	2	5	18	4		(NS)	1	21	2		(NS)
Extended	0	0	3	1			0	5	1		
Monthly income of family					6.133	0.113				1.497	1.00
<20,000	1	1	2	4		(NS)	0	3	2		(NS)
20,000-30,000	1	2	5	4			0	10	2		
>30,000	0	2	16	1			1	16	1		

*Note: *Significance at p level <0.05; NS: Not Significant at p level >0.05.*

Table 14:- No personal variable was found to be significantly associated with

APGAR Score in experimental and control group at p<0.05 level of

significance.

MAJOR FINDINGS OF THE STUDY

Sample characteristics

- Mean & SD age in years for primigravidae parturient mothers in control group was 24.5±3.63 whereas in experiment group 24.3±3.68

- Mean gestation week for primigravidae parturient mothers was 39.4±1.28 whereas in experiment group 39.7±1.11

- 60% primigravidae parturient mothers were graduated in both groups.

- Majority of primigravidae parturient mothers in control group (96.7%) and 86.7% in experiment group were homemaker.

- Majority of primigravidae parturient mothers in control group (93.3%) and 90% in experiment group were Hindu.

- About 76.7% in control group and 60% in experiment group had duration of marriage between 1-3 years.

- Majority of primigravidae parturient mothers in control group (83.3%) and 73.3% in experiment group were residing in joint family.

- About 60% primigravidae parturient mothers in control group and 56.7% in experiment group had family income > 30,000.

Finding related to labour pain in control and experiment group.

- Findings revealed that mean VAS score(labour pain) in control group was 9.4±1.13 as compared to experiment group mean VAS score was 8.36±.97. it showed that there was significant difference in level of labour pain among primigravidae parturient mothers in control and experimental group at $p < 0.05$ level of significance.

Findings related to labour outcome in control and experiment group

MATERNAL OUTCOME

- Finding suggests that the mean duration of labour in control group was more i.e 19.2±3.17 hrs as compared to experiment group 14.4±3.90 hrs.

- Majority of primigravidae mothers in control group (76.7%) had <1 cm/hr cervical dilation where as in experiment group 50% had >1cm/hr cervical dilation.

- There was no significant difference observed in rupture of membrane in control and experiment group.

- None of the primigravidae parturient mothers in control group had progressed labour without augmentation whereas 26.7% primigravidae parturient mothers in experiment group had progressed labour without augmentation.

- Half of the primigravidae parturient mothers (50%) in control group were given analgesics during labour whereas in experiment group only 3.3% primigravidae parturient mothers were given analgesics.

- Majority of primigravidae parturient mothers (93.3%) in control group and 100% in experiment group had stable vitals during labour.

- About 40% in control group underwent for caesarean section whereas in experiment group only 13.3% had gone for caesarean section.

NEONATAL OUTCOME

- The finding suggests that majority of newborn delivered by mothers in both groups had Apgar score between (7-10). Significant difference was found at $p<0.05$ in both groups.

- 90% baby in control group and 96.7% baby in experiment group cried immediately after birth.

- In control group (13.3%) babies required to be admitted in NICU where as in experiment group (3.3%) were admitted in NICU after the delivery.

DISCUSSION

In this section the major findings of the present study have been discussed with reference to the results obtained by other researchers.

For a long time, positions during labour were freely changed and modified according to parturient desires. Therefore, maternity nurses may suggest alternative position and support the women in choosing ones that are most conducive to her individualized needs and phase of labour. Labouring women usually respond to the signs given by their bodies by changing their positions between sitting upright, kneeling or any other posture in an attempt to discover the most comfortable and convenient for fitting the fetus through the pelvis.

The results of the study have been discussed according to the objectives and hypothesis of the study. The current study was conducted is to assess the effect of birthing ball exercises on the labour pain and labour outcome during the first stage of labour among primigravidae parturient mothers at AIIMS, JODHPUR. Total 60 primigravidae parturient mothers were enrolled in the study.

This study showed there were no significant differences observed among control and intervention groups regarding general characteristics and obstetric history this means that both groups were similar in characteristics before intervention. Results were supported by the quasi experimental study conducted by **Doaa Mustafa Ramadan Sheishaa1 et.al** to assess the effect of birthing ball exercises during pregnancy on the first stage progress of labour at the Antenatal clinic of Obstetrics & Gynecology Specialist center and labor unit at Mansoura University Hospitals of Egypt.[39]

The finding of the present study revealed that the there was a highly significant difference observed between the Control and experiment group level of labour pain VAS score (t=3.491, p<0.05).similar results were shown in RCT conducted by **Meei-Ling Gau et.al,** to investigate the effectiveness of a birth ball exercise programme during childbirth by measuring childbirth self-efficacy and childbirth pain at Taiwan.[25]

The current study revealed that the Mean & SD duration of labour in experiment group is **13.8±3.55** and in control group is **19.2±2.76.**there is significant shorter duration of labour in experiment group as compared to control group. Study conducted by **Rania E. Farrag et.al (2018)** on using of the birthing ball during the first stage of labour and its effect on the progress of labour and outcome among nulliparous women in the maternity unity located in El- Nabawy El Mohandes Hospital, Egypt shows similar results as per the findings of present study.[2]

On the other hand, the current study contradicts with **Simin et al., 2011** who tried to study the impact of utilizing the birth ball on pain during the active stage of delivery and reported that using of birthing ball had no significant effect on the time of cervical dilation and progress of labour.[45]

The current study represented the existence of a statistically significant difference between both groups regarding the cervical dilatation after intervention as the study group had a higher percentage in dilatation of the cervix compared to the control group.

As regard to labour outcomes, the present study revealed that the majority of the primigravidae parturient mothers (86.7%) in experiment group underwent

normal vaginal delivery with episiotomy whereas 53.3% primigravidae mothers in control group had NVD and 40% had CS 3.3% had forceps vaginal delivery and 3.3% had vacuum vaginal delivery. Additionally primigravidae parturient mothers who had used birthing ball exercise needed less augmentation and less use of analgesics. Experiment group showed better outcomes on compared to control group. In agreement with these findings **Kobra Mirzakhani et.al (2015)** conducted a study on the Effect of Birth Ball Exercises during Pregnancy on Mode of Delivery in primiparous women.[30] In partial agreement with the findings study by **Mathew et.al 2012** who stated that there is significant improvement in maternal outcome after the use of birthing ball therapy while 95% of birthing ball group underwent normal vaginal delivery.[21]

SUMMARY OF CHAPTER

This chapter dealt with the analysis and interpretation of data collected from 60 primigravidae parturient mother to assess the effect of birthing ball exercise on labour pain and labour outcomes among primigravidae parturient mothers. Tools used to collect socio demographic data, labour pain and labour outcome Data was collected and analysed by using SPSS version 20.

CHAPTER 5

SUMMARY, RECOMMENDATION & CONCLUSION

SUMMARY RECOMMENDATION & CONCLUSION

This chapter gives a brief account of the present study including conclusion drawn from the finding, limitation, implication of the study and recommendations for future research.

SUMMARY

A quasi experimental post-test only design study was conducted to assess the effect of birthing ball exercise on labour pain and labour outcome among primigravidae parturient mothers. A total of 60 primigravidae parturient mothers were selected for the study and assigned into two group i.e 30 in control group and 30 into experimental group through non- probability consecutive sampling technique. The primigravidae parturient mothers who were willing to participate and fulfilling the inclusion criteria were recruited for the study. Control group was provided conventional care and experimental group had received 2 sessions of birthing ball exercise for 20 min at the subsequent gap of 1 hr during active phase of first stage of labour. Labour pain was assessed by using VAS Score during transition phase in the both group and labour outcome was assessed after delivery through Partograph and Apgar score. Data was collected from September 2020 to October 2020 and analysed using SPSS version 20 with appropriate descriptive and inferential statistic.

STRENGTH OF THE STUDY:

Emphasize on non- pharmacological intervention to manage labour pain and for the improvement of labour outcomes.

LIMITATION OF THE STUDY

- Calculated Sample size was 40 but due to Covid-19 pandemic, sufficient sample was not available so total 60 subjects, 30 in control and 30 in experimental group were enrolled.

- Research findings cannot be generalized to larger population because of the small sample size.

IMPLICATIONS IN NURSING

Nursing is an art and science. It is based upon the current knowledge i.e. frequently changing with discoveries, ideas, techniques, methodologies and motivations. When nurses integrate the science and art of nursing in their practice, the quality of care provided to clients is at the level of excellence that benefits innumerable clients. The findings of the study had implications on nursing practices, nursing education, nursing administrations and nursing research.

1 Nursing Practice

The midwives who are working in maternity unit have an essential task to carry out in giving compelling and safe nursing care to the labouring mother in order to improve comfort of the mother, labour outcome and reduction of labour pain . This can be facilitated by motivating the nurse midwife practitioner to:

- Emphasize over the non- pharmacological aspects like birthing ball exercises, ambulation, and peanut ball exercise to providing comfort to parturient mothers in order to reduce labour pain.

- Create awareness among them about the effectiveness of birthing ball exercises during labour to improve labour outcome.

- Persuade and teach the family members to provide support and encourage the parturient mothers to perform the birthing ball exercise.

2. Nursing Education

- The nurse educator has the role in consolidation in the evidence based practice into the nursing curriculum for improving the labour process.

- The nursing institutions should provide chances for the nursing students to get exposed in the practice of birthing ball exercises during labour through various in service education, workshop/conference.

- AV aids (pamphlets, flash cards) can be draw up on birthing ball exercises to educate the labouring women.

3. Nursing Administration

The nurse administrator,

- Should encourage the management to follow a birthing ball exercises as a institutional policy and also arrange for an "ambient room". The intention of the ambient room is to establish a sound environment to promote comfort and exercise.

- Has a significant role in creating awareness to conduct the birthing ball exercises during first stages of labour among the parturient mothers.

- Can suggest the CNO to organize continuing nursing education regarding effect of birthing ball exercise on labour pain and labour outcome.

- Should give information about the birthing ball to all the nurses who are working in the labour unit.

- Should collaborate with the government and non-governmental organizations to develop policies and conduct awareness campaign on birthing ball exercise to emphasize on non-pharmacological modalities during labour.

4. Nursing Research

The nurse midwife researcher,

- Should disseminate the results of the study to the nurse practioners and student nurses through internet, journals, literature etc., and motivate them to apply EBP in clinical set up.

- Utilize evidence and findings in planning, implementing and evaluating the care of labouring mothers.

- The generalization of the study findings can be made by further replication of the study in different settings and larger populations.

RECOMMENDATION

On the basis of the findings, the following recommendations are offered for future nursing practice and research.

- Study can be replicated on large sample in different setting so that the findings can be generalized to large population.

- The study can be replicated in different settings i.e. in primigravidae parturient mothers of rural and urban settings to strengthen the findings.

- Increasing awareness among healthcare providers especially specialist nurses about the importance of practicing birthing ball exercises during pregnancy and labour must be put in consideration.

- Providing in-service training programs to maternity nurse concerning the benefit and how to utilize the birth ball during the first stage of labour with different anatomical position

- Healthcare providers especially nurse staff should receive the appropriate training to perform birthing ball exercises simply and effectively.

- Birthing ball exercises could be performed by all the pregnant women presenting to outpatient antenatal clinics to improve maternal labour progress and provide better pregnant women counselling.

CONCLUSION

Labour being the end of the long expectation of pregnancy, denotes the beginning of the extra uterine existence of the new born. To mark a good beginning, the process and experience of labour should not be wretchedness for the mother. Thus, the present study has shown that, practice of birthing ball exercise during labour had decreased the labour pain; improve the favourable labour outcome among the primigravidae parturient mothers. Hence the usage of birthing ball is an effective, simple and cost effective non pharmacological intervention and it can be used as an effective intervention during intra partum period.

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ANNEXURES

ANNEXURE I

अखिल भारतीय आयुर्विज्ञान संस्थान, जोधपुर
All India Institute of Medical Sciences, Jodhpur
संस्थागत नैतिकता समिति
Institutional Ethics Committee

No. AIIMS/IEC/2020/ 3085

Date: 01/06/2020

ETHICAL CLEARANCE CERTIFICATE

Certificate Reference Number: AIIMS/IEC/2020-21/ 3004

Project title: "Effect of birthing ball exercise on labour pain, and labour outcome among primigravidae parturient mothers at AIIMS Jodhpur"

Nature of Project:	**Research Project Submitted for Expedited Review**
Submitted as:	**Student Research Project, as a part of Academic Programme**
Investigator:	**Sujata Jha**
Supervisor:	**Mr. Himanshu Vyas**
Co-Supervisor:	**Dr. Pratibha Singh & Mrs. Mamta**

Institutional Ethics Committee after thorough consideration accorded its approval on above project.

The investigator may therefore commence the research from the date of this certificate, using the reference number indicated above.

Please note that the AIIMS IEC must be informed immediately of:
- Any material change in the conditions or undertakings mentioned in the document.
- Any material breaches of ethical undertakings or events that impact upon the ethical conduct of the research.

The Principal Investigator must report to the AIIMS IEC in the prescribed format, where applicable, bi-annually, and at the end of the project, in respect of ethical compliance.

AIIMS IEC retains the right to withdraw or amend this if:

- Any unethical principle or practices are revealed or suspected
- Relevant information has been withheld or misrepresented

AIIMS IEC shall have an access to any information or data at any time during the course or after completion of the project.

Please Note that this approval will be rectified whenever it is possible to hold a meeting in person of the Institutional Ethics Committee. It is possible that the PI may be asked to give more clarifications or the Institutional Ethics Committee may withhold the project. The Institutional Ethics Committee is adopting this procedure due to COVID-19 (Corona Virus) situation.

If the Institutional Ethics Committee does not get back to you, this means your project has been cleared by the IEC.

On behalf of Ethics Committee, I wish you success in your research.

Dr. Praveen Sharma
Member Secretary

Member secretary
Institutional Ethics Committee
AIIMS,Jodhpur

Basni Phase-2, Jodhpur, Rajasthan-342005, **Website:** www.aiimsjodhpur.edu.in, **Phone:** 0291-2740741 Extn. 3109
Email: ethicscommittee@aiimsjodhpur.edu.in

ANNEXURE II

Informed consent form (English)

Title of the project: The effect of birthing ball exercise on labour pain and labour outcome among primigravidae parturient women at AIIMS, jodhpur.

Name of the Principal Investigator: Sujata jha (M.Sc. Nursing)

Sample Identification No.

I_____D/o,S/o_____

_____R/o_____

_____ give my full, free, voluntary consent to be a part of the study "The effect of birthing ball exercise on perception of pain and labour outcome among primigravidae parturient women at AIIMS, jodhpur", the procedure and nature of which has been explained to me in my own language to my full satisfaction. I confirm that I have had the opportunity to ask questions.

I understand that my participation is voluntary and I am aware of my right to opt out of the study at any time without giving any reason.

I understand that the information collected about me and any of my records may be looked at by responsible individual from AIIMS, Jodhpur, Rajasthan or from regulatory authorities. I give permission for these individuals to have access to my records.

Date: _____   _____

Place: _____   Signature

This is to certify that the above consent has been obtained in my presence.

Date: _____   _____

Place: _____   Signature of Principal Investigator

Witness 1   Witness 2

_____   _____

Signature   Signature

Name: _____   Name: _____

अनुलग्रक
सूचित सहमति प्रपत्र

परियोजना का शीर्षक: एम्स, जोधपुर में प्रथम गर्भा प्रसवोन्मुखी महिलाओं में प्रसव पीड़ा और प्रसव के परिणाम पर बर्थिंग बॉल एक्सरसाइज के प्रभाव देखने के लिए अध्ययन !

प्रधान अन्वेषक का नाम: सुजाता झा (M.Sc. नर्सिंग)

नमूना पहचान सं।

मैं _____ डी / ओ, एस / ओ

_____ आर / ओ

_____मेरी पूरी, मुफ्त, स्वैच्छिक

सहमति दे अध्ययन का एक हिस्सा होने के लिए " एम्स, जोधपुर में प्रथम गर्भा प्रसवोन्मुखी महिलाओं में प्रसव पीड़ा और प्रसव के परिणाम पर बर्थिंग बॉल एक्सरसाइज के प्रभाव ।" और अध्यन की प्रक्रिया और प्रवर्ति मुझे अपनी पूरी संतुष्टि के लिए अपनी भाषा में समझाया गया है। मैं पुष्टि करती हूं कि मुझे प्रश्न पूछने का अवसर मिला है।

मैं समझती हूं कि मेरी भागीदारी स्वैच्छिक है और मुझे बिना कोई कारण बताए किसी भी समय अध्ययन से बाहर निकलने के अपने अधिकार के बारे में पता है।

मैं समझती हूं कि मेरे और मेरे किसी भी रिकॉर्ड के बारे में जानकारी एम्स, जोधपुर, राजस्थान के जिम्मेदार व्यक्ति या नियामक अधिकारियों से देखी जा सकती है। मैं इन व्यक्तियों को अपने रिकॉर्ड तक पहुंचने की अनुमति देता हूं।

दिनांक: _____ _____

स्थान: _____ हस्ताक्षर

यह प्रमाणित करना है कि मेरी उपस्थिति में उपरोक्त सहमति प्राप्त की गई है।

दिनांक: _____ _____

स्थान: _____ प्रमुख अन्वेषक के हस्ताक्षर

साक्षी 1 साक्षी 2

_____ _____

हस्ताक्षर हस्ताक्षर

नाम नाम _____

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ANNEXURE III (TOOL)

SECTION-A

SOCIO-DEMOGRAPHIC VARIABLE

सामाजिक जनसांख्यिकीय चर

Instructions: Please read the questions carefully and tick (✓) the appropriate answer.

निर्देश: कृपया प्रश्नों को ध्यान से पढ़ें और उपयुक्त उत्तर पर टिक (✓) करें।

1. Age (in years)
2. Gestational age (in weeks)
3. Education
   a) No formal education
   b) Primary
   c) Secondary
   d) Graduation and above
4. Occupation
   a) Homemaker
   b) Private job/ self employed
   c) Government job
   d) Government job
5. Religion
   a) Hindu
   b) Muslim
   c) Christian
   d) Any other
6. Duration of marriage-
   a) < 1 year
   b) 1-3 year
   c) >3 years
7. Types of Family
   a) Nuclear

क. वर्षों में आयु)

ख. गर्भकालीन आयु (सप्ताह में)

ग. शिक्षा
   I. निरक्षर
   II. प्राथमिक
   III. माध्यमिक
   IV. स्नातक या उससे ऊपर

घ. व्यवसाय
   I. गृहिणी
   II. निजी नौकरी / स्वरोजगार
   III. सरकारी नौकरी
   IV. अन्य

ङ. धर्म
   I. हिन्दू
   II. मुस्लिम
   III. ईसाई
   IV. कोई अन्य

च. शादी की अवधि-
   I. <1 वर्ष
   II. 1-3 वर्ष
   III. > 3 वर्ष

छ. परिवार का प्रकार
   I. एकल परिवार
   II. संयुक्त

b) Joint

c) Extended

III. विस्तारित

8. Monthly income of family

a) <20,000

b) **>20,000-30,000**

c) **>30000**

ज. परिवार की मासिक आय

I. <20,000

II. >20,000-30,000

III. >30000

SECTION-B

VISUAL ANALOGUE SCALE

दृश्य एनालॉग का पैमाना

0	1	2	3	4	5	6	7	8	9	10

NO PAIN	ANNOYING	UNCOMFORTABLE (MODERATE)	HORRIBLE (SEVERE)	WORST
कोई दर्द नहीं	झुंझला देना	असुविधाजनक (मध्यम दर्द)	भयानक (तीव्र दर्द)	अत्यंत बुरा

METHOD OF ADMINISTRATION: At the transition phase of labour remark was done by the primigravidae parturient mothers by self-reporting at this phase.

VAS is a 10 cm long horizontal line that indicates the subjective assessment of pain severity. It contains a 0-10 point numerical scale, the first part (0) indicates no pain (1-3) represents mild pain, (4-6) indicates moderate pain, (7-9) shows severe pain and 10 shows worst pain

MATERNAL OUTCOME BY USING PARTOGRAPH

THE SIMPLIFIED PARTOGRAPH

IDENTIFICATION DATA

Name: W/o: Age: Parity: Reg. No:

Date & Time of Admission: Date & Time of ROM:

A) Foetal Condition

Foetal heart rate — scale: 200, 190, 180, 160, 150, 140, 130, 120, 110, 100, 90, 80

Amniotic fluid

B) Labour

Legend:
- <20 Sec
- 20 - 40 Sec
- >40 Sec

Cervix (cm) [Plot X] — scale: 10, 9, 8, 7, 6, 5, 4

Alert   Action

Hours Time: 1 2 3 4 5 6 7 8 9 10 11 12

Contraction per 10 min — scale: 5, 4, 3, 2, 1
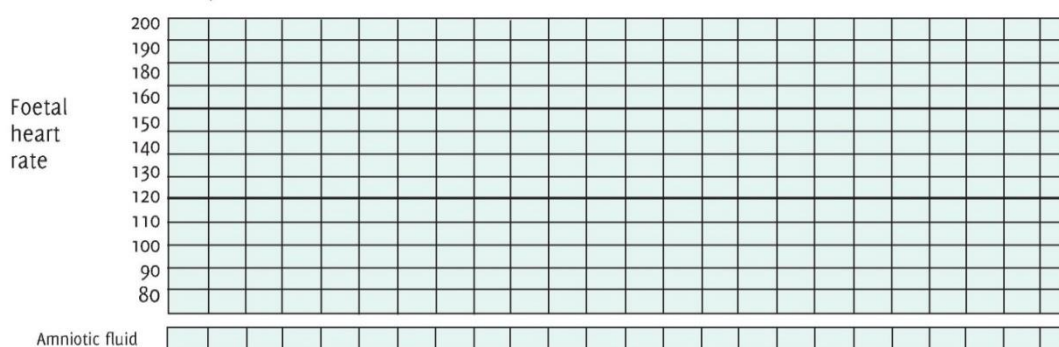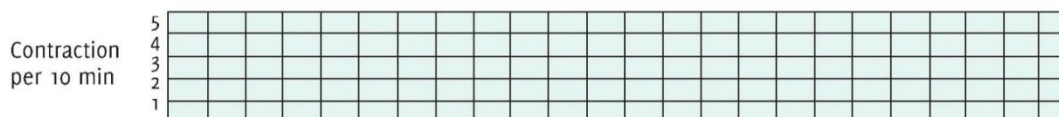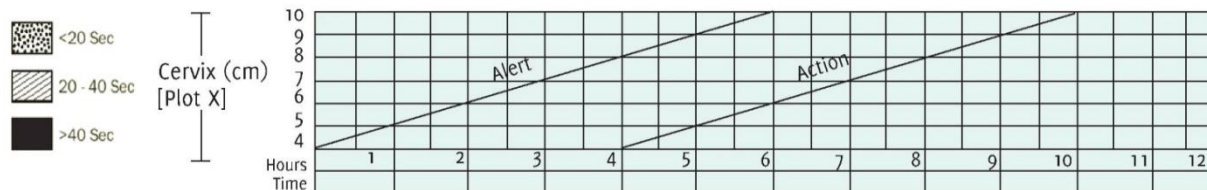
C) Interventions

Drugs and IV fluids given

D) Maternal Condition

Pulse and BP — scale: 180, 160, 150, 140, 130, 120, 110, 100, 90, 80, 70, 60

Temp (°C)
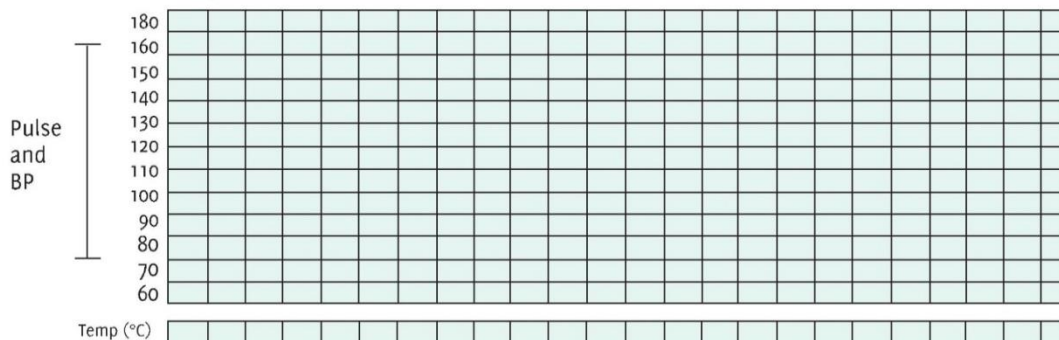
MATERNAL OUTCOME BY USING PARTOGRAPH

S.NO	MATERNAL OUTCOME	PRIMIGRAVIDAE MOTHERS
1	Duration of labour(hrs) 8-12 12-16 16-20 20-24	
2.	Rate of cervical dilatation <1cm/hr 1cm/hr >1cm/hr	
3.	Rupture of membrane Spontaneous Artificial PROM	
4	Augmentation/ induction of labour Not done Done with oxytocin Done with CP gel	
5.	Analgesics during labour Given Not given If any special medication	
6.	Maternal vitals during labour Stable Unstable	
7.	Mode of delivery Normal vaginal delivery with episiotomy Forceps vaginal delivery Vacuum vaginal delivery Caesarean section	

Apgar score

	Score 2	Score 1	Score 0
Appearance	Pink	Extremities blue	Pale or blue
Pulse	> 100 bpm	< 100 bpm	No pulse
Grimace	Cries and pulls away	Grimaces or weak cry	No response to stimulation
Activity	Active movement	Arms, legs flexed	No movement
Respiration	Strong cry	Slow, irregular	No breathing

Interpretation :-

- Severely depressed:- 0-3
- Moderately depressed:- 4-6
- Excellent condition:- 7-10

NEONATAL OUTCOME BY USING APGAR SCORE

S.NO.	NEONATAL OUTCOME	Baby of primigravidae mothers.
1.	APGAR score	
	7-10	
	4-6	
	0-3	
2.	cried immediately after birth	
	Yes	
	No	
3.	Admission to NICU	
	Yes	
	No	

ANNEXURE IV

Participant information sheet

Part-1

1. **Purpose of the study**: The aim of the study is to assess the effect of birthing ball exercises on the labour pain and labour outcome during the first stage of labour among primigravidae parturient mothers at AIIMS, JODHPUR.
2. **Study procedures to be followed**: primigravidae parturient mothers will be encouraged for doing birthing ball exercise for 20 minutes at subsequent gap of 1 hour. There will be only two sessions.
3. **Benefits from the study**: The using of birthing ball as a non-pharmacological method for reducing labour pain as well as having better labour outcome.
4. **Risks of the study**: None
5. **Complications of the study**: None
6. **Confidentiality:** Data collected from the participants shall not be shared with anyone except the study investigators.
7. **Rights of participants**: Participants would have the freedom to share their data and to continue or leave the study if they desire so.

Participant Signature:

Participant Name:

Date:

Part-2

Investigator's word

I have explained the purpose, procedures, benefits and harms of the study in detail to the participant. All information regarding the study has been disclosed and enough opportunity for asking questions regarding the study was given to the study participant.

Principal investigator signature: Witness signature:

Name: Name:

Date: Date

प्रतिभागी जानकारी

भाग-1

1. अध्ययन का उद्देश्य :- एम्स, जोधपुर में प्रथम गर्भा प्रसवोन्मुखी महिलाओं में प्रसव पीड़ा और प्रसव के परिणाम पर बर्थिंग बॉल एक्सरसाइज के प्रभाव देखने के लिए अध्धयन

2. अध्ययन प्रक्रिया: : 1 घंटे के बाद के अंतराल पर 20 मिनट के लिए बिरथिंग बॉल एक्सरसाइज करने के लिए प्रथम गर्भा प्रसवोन्मुखी महिलाओं को प्रोत्साहित किया जाएगा। केवल दो सत्र होंगे।

3. अध्ययन से लाभ : श्रम पीड़ा को कम करने के साथ-साथ बेहतर श्रम परिणाम होने के लिए गैर-औषधीय विधि के रूप में बर्थिंग बॉल का उपयोग।

4. अध्ययन का खतरा: कोई नहीं

5. अध्ययन की जटिलता : कोई नहीं

6. गोपनीयता : प्रतिभागी से एकत्र किये गये आंकड़ों का अध्ययन अन्वेषक को छोड़कर किसी के साथ साझा नहीं किया

7. प्रतिभागी के अधिकार : प्रतिभागियों को अपने आंकड़ों को साझा करने ,जारी रखने या अध्ययन छोड़ने के लिए किसी भी समय के किसी भी बिंदु पर स्वतंत्र होंगे

प्रतिभागी हस्ताक्षर :

प्रतिभागी नाम :

दिनांक :

भाग 2:

अन्वेषक के शब्द :

मानिने प्रतिभागियों को अध्ययन के उद्देश्य ,प्रक्रिया ,लाभ और नुक्सान के बारे में विस्तार से बताया है। अध्ययन के बारे में समस्त जानकारी का खुलासा किया गया है और अध्ययन के बारे में प्रश्न पूछने के लिए पर्याप्त अवसर अध्ययन प्रतिभागी को दिया गया था।

प्रधान अन्वेषक हस्ताक्षर   गवाह हस्ताक्षर

नाम :   नाम :

तिथि:   तिथि:

ANNEXURE V

LETTER REQUESTING EXPERTS OPINION AND SUGGESTION FOR CONTENT VALIDITY OF TOOL

To,

……………………..

Subject: Requesting the opinion and suggestions by experts for establishing content validity of research tool.

Respected Sir/Madam,

With due respect and humble submission, I Sujata Jha student of M.Sc. Nursing,(Batch 2019-2021) College of Nursing, AIIMS, Jodhpur (Rajasthan) have to undertake a research project for my M.Sc. Nursing course requirement. The title of my project is "**Effect of birthing ball exercises on labour pain and labour outcome among primigravidae parturient mothers at AIIMS, Jodhpur**", under the supervision of Mr. Himanshu Vyas, Associate Professor, College of Nursing, AIIMS Jodhpur and co-supervison of Mrs. Mamta Rajput, Associate Professor, College of Nursing, AIIMS Jodhpur and Dr. Pratibha Singh, Professor and Head, Department of Obs & Gynae, AIIMS, Jodhpur.

Objectives are:-

- To assess and compare the labour pain in primigravidae parturient mothers in experimental and control group.
- To assess and compare the labour outcome in primimgravidae parturient mothers in experimental and control group
- To determine the association of labour pain and labour outcome with selected personal variables.

I have prepared as well as using standardised tool for the purpose of data collection and you are requested to go through the content of the following tool for relevancy and appropriateness.

1. *Socio demographic data:* Base line data about mothers.
2. *Visual analogue scale:* To assess the labour pain of the mother at transition phase.
3. *Partograph:* To assess the maternal outcome.
4. *Apgar score:* To assess the neonatal outcome.

Please find attached herewith, a copy of statement of the problem, objectives, operational definition, methodology and the research tools of the study. Kindly give your expert opinion about the tool using the evaluation criteria. I also request you to sign the certificate stating that you have validated the tool. Your kind cooperation and experts comments will be very much appreciated.

Thanking You

Sujata Jha
M.Sc. Nursing
College of Nursing
AIIMS, Jodhpur.

Enclosures:

1. Research statement, objectives, operational definition and methodology
2. Research Tools

ANNEXURE-VI

COLLEGE OF NURSING

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, JODHPUR

RESEARCH PROJECT

CERTIFICATE OF CONTENT VALIDITY

I, Dr. / Mr./ Mrs. ……………………………………………………………………. hereby certify that the tool for data collection of the research project titled **"Effect of birthing ball exercise on labour pain and labour outcomes among primigravidae mothers at AIIMS, Jodhpur."** prepared by ………………………… is found to be valid and up to date.

Place:

Date:

Signature & Seal of Validator

ANNEXURE VII

Experts for content validity of tool

1. Dr. Shashank Shekhar
Professor
Department of obstetrics and gynaecology, AIIMS, Jodhpur

2. Dr. Meenakshi Gothwal
Associate Professor, Department of obstetrics and gynaecology, AIIMS, Jodhpur

3. Dr. Manisha Jhirwal
Associate Professor,
Department of obstetrics and gynaecology,
AIIMS, Jodhpur

4. Dr. Manu Goyal
Associate Professor, Department of obstetrics and gynaecology, AIIMS, Jodhpur

5. Mrs. Prabha Kumari
Associate Professor,
College of Nursing, RML, Delhi

6. Mrs. D Kanitha
Lecturer,
College of Nursing,
NIMHANS

7. Mrs. Prasuna Jelly
Assistant Professor,
College of Nursing,
AIIMS, Rishikesh

ANNEXURE-VIII

COLLEGE OF NURSING

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, JODHPUR

RESEARCH PROJECT

CERTIFICATE OF LANGUAGE VALIDITY OF THESIS(ENGLISH)

I, Dr. / Mr./Mrs. .... Sayur .... hereby certify that the thesis titled "**Effect of birthing ball exercise on labour pain and labour outcome among primigravidae parturient mothers at AIIMS, Jodhpur**" prepared by Sujata Jha is found to be valid and up to date.

Place:

Date:

Signature & Seal of Validator
H.O.S./V.Principal
Govt. S.K.V. Mundka
ID Code - 1617014
New Delhi-110041

ANNEXURE IX

S. No.	Categories	Range	Coding
1.	Age(in years):		
		18-24 years	1
		25-30 years	2
		31-35 years	3
2.	Gestational age(in weeks):		
		37-39wks	1
		39.1-41weeks	2
		41.1-42weeks	3
3.	Education:		
		No formal education	1
		Primary	2
		Secondary	3
		Higher Secondary	4
		Graduation and above	5
4.	Occupation:		
		Homemaker	1
		Private job/self-employed	2
		Government job	3
		Others	4
5.	Religion:		
		Hindu	1
		Muslim	2
		Christian	3
		Any others	4
6.	Duration of marriage		
		<1 years	1
		1-3 years	2
		>3 years	3
7.	Type of family:		
		Nuclear	1
		Joint	2
		Extended	3
8.	Monthly income of family:		
		<20,000	1
		20,000-30,000	2
		>30,000	3
9.	VAS Score:		
		No pain(0)	1
		Mild pain(1-3)	2
		Moderate pain(4-6)	3
		Severe pain(7-9)	4
		Worst pain(10)	5

10.	**Duration of labour:**		
		8-12 hours	1
		12-16 hours	2
		16-20 hours	3
		20-24hours	4
11.	**Rate of cervical dilatation:**		
		<1cm/hr	1
		1cm/hr	2
		>1cm/hr	
12.	**Rupture of membrane:**		
		Spontaneous	1
		Artificial	2
		PROM	
13.	**Augmentation/induction of labour:**		
		Not done	1
		Done with oxytocin	2
		Done with CP gel	3
14.	**Analgesics given during labour:**		
		Given	1
		Not given	2
		If any special medication	
15.	**Maternal vitals during labour**		
		Stable	1
		Unstable	2
16.	**Mode of delivery**		
		Normal vaginal delivery with episiotomy	1
		Forceps vaginal delivery	2
		Vacuum vaginal delivery	3
		Caesarean section	4
17.	**APGAR Score**		
		7-10	1
		4-6	2
		0-3	3
18.	**Baby cried immediately after birth**		
		Yes	1
		No	2
19.	**Admission to NICU**		
		Yes	1
		No	2

MASTER SHEET OF EXPERIMENT GROUP

	age	gestation w	educa.	occupatio	religion	dur. Of marrig	type of family	monthly i	VAS	dur. Of lat	rate of CD	ROM	AUG. OF LAE	Analgesic	Mat. V/S	MOD	APGAR	BRIAF	Adm to NI
1	1	2	2	2	1	2	2	2	4	4	1	2	2	3	1	1	1	1	2
2	2	1	4	1	1	1	3	3	1	3	3	2	2	2	1	1	1	1	2
3	2	1	4	1	1	1	2	3	2	3	2	2	1	2	1	1	1	1	2
4	3	3	3	1	1	3	3	2	2	3	2	1	1	2	1	1	1	1	2
5	2	1	2	1	2	2	3	1	3	3	3	2	1	2	1	1	1	1	2
6	2	1	4	2	1	2	2	3	2	3	2	1	1	2	1	1	1	1	2
7	1	2	3	1	1	1	2	1	1	3	3	1	2	2	1	1	1	1	2
8	3	1	4	2	1	2	1	3	2	3	2	1	1	2	1	1	1	1	2
9	2	3	4	4	4	2	2	2	3	4	1	2	2	3	1	4	1	1	2
10	2	2	4	1	1	3	2	3	1	3	3	2	2	2	1	1	1	1	2
11	2	2	3	1	1	1	2	2	3	3	3	1	2	2	1	1	1	1	2
12	1	2	2	1	1	2	2	2	1	3	2	1	2	2	1	1	1	1	2
13	1	3	2	1	1	2	2	2	2	3	2	2	2	2	1	1	1	1	2
14	1	1	3	1	1	2	2	2	1	3	3	2	1	3	1	1	1	1	2
15	2	2	4	1	1	2	2	3	3	4	3	2	3	3	1	1	1	1	2
16	2	2	4	1	1	3	2	3	2	3	2	1	2	2	1	1	1	1	2
17	2	3	4	2	1	3	3	3	2	3	3	1	2	2	1	1	1	1	2
18	2	1	4	1	1	2	2	3	1	4	3	2	2	2	1	1	1	1	2
19	2	2	4	1	1	3	2	3	1	3	3	2	2	2	1	1	1	1	2
20	1	2	2	2	2	2	3	2	1	3	2	2	1	1	1	1	1	1	2
21	2	2	3	1	1	2	2	3	2	3	3	1	2	2	1	1	1	1	2
22	1	2	4	1	1	2	3	2	1	3	2	2	1	1	1	1	1	1	2
23	2	2	4	2	2	3	2	3	2	3	3	2	2	2	1	1	1	1	2
24	1	2	4	1	1	2	2	3	3	3	3	2	2	3	1	1	1	1	2
25	1	2	4	1	1	2	1	3	3	3	1	2	2	3	1	1	1	1	2
26	1	2	3	1	1	2	2	2	4	3	1	2	2	3	1	1	1	2	1
27	2	2	4	1	1	2	2	3	4	4	1	2	2	1	1	4	3	1	2
28	2	1	4	1	1	3	2	3	2	3	2	1	3	3	1	1	1	1	2
29	1	2	2	1	1	2	1	1	3	3	3	1	2	2	1	1	1	1	2
30	2	2	3	1	1	1	2	3	2	3	2	1	2	2	1	1	1	1	2

MASTER SHEET OF CONTROL GROUP

S.NO	age	gestation	educa.	occupatio	religion	dur. Of m	type of fa	monthly i	VAS	dur. Of lat	rate of CD	ROM	AUG. OF L	Analgesic	Mat. V/S	MOD	APGAR	BRIAF	Adm to NI
1	1	3	4	1	1	2	2	2	4	3	1	2	2	2	1	1	1	1	2
2	2	2	2	1	1	2	2	1	4	4	1	2	3	1	1	4	4	2	2
3	1	1	3	1	1	2	2	1	4	4	1	2	2	2	2	4	4	3	1
4	2	2	2	1	1	2	3	3	4	4	1	2	3	3	1	1	1	1	2
5	3	2	4	1	1	2	2	3	3	3	2	2	2	3	1	1	1	1	2
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30	1	2	2	1	1	2	2	1	3	2	2	2	2	3	1	1	1	1	2