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Effect of back massage on pain perception during first stage of labor among primi mothers in a teaching hospital

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Abstract

Introduction: Labor pain is experienced and endured by every childbearing woman, and pain relief measures are often neglected. Thus, this study aimed to identify the effect of back massage on pain perception during the first stage of labor among primi mothers at Patan Hospital.

Method: A quasi experimental study was conducted among 56 primi mothers (28 experimental and 28 control groups) selected purposively in the active room of the maternity ward. Mothers who met the inclusion criteria were assigned non-randomly into experimental (received usual labor care and mustard oil back massage) and control groups (received usual labor care). The Visual Analogue Scale (VAS) was used to assess labor pain before and after 15 minutes of intervention in both groups, and the data was analyzed by descriptive and inferential statistics using SPSS version 16 software.

Result: The mean score of pain perceived by mothers before intervention in the experimental group was 68.21 mm, and the control group was 69.39 mm. There was a significant difference in pain perception before and after back massage in the experimental group ($p < 0.001$). Similarly, a significant difference was found after intervention in the experimental and control groups ($p < 0.001$).

Conclusion: Back massage was effective in reducing labor pain. The findings of the study might be helpful to those planning to include labor pain relief measures in maternity wards.

Keywords: Back massage, labor pain, primi mothers, visual analogue scale

Introduction

Labor is a series of events to expel the product of conception out of the womb through the vagina.¹ Labor pain is reportedly the most severe and indescribable painful experience for a woman.² Pain is located over the lower abdomen and radiates to the lumbar back and thigh.³

A study in Egypt shows that 44.9% of women use non-pharmacological methods whereas 36.8% used neither pharmacological nor non-pharmacological methods in the first stage of labor.⁴ Massage is recommended by World Health Organization (WHO) for healthy pregnant women during labor, depending on woman's preferences.⁵ As per the essential competencies for midwifery practice, midwives need to have the competence on skill to use massage for coping with labor pain to promote physiologic labor and birth.⁶

However, despite the effectiveness of back massage for labor pain, there is limited data available locally. This study aims to identify the effect of back massage on pain perception during the first stage of labor among primigravida mothers which could be a platform for future studies.

Method

This Quasi-experimental study was conducted from Jan 2019 to Feb 2020 in the active labor room of the Maternity ward in Patan Hospital, Patan Academy of Health Sciences, Lalitpur Kathmandu, Nepal for the effect of back massage on pain perception during the first stage of labor among primigravida mothers. Ethical approval of the study was obtained from the IRC of PAHS (PNW1907301276).

Full-term (37-42 w of gestation) primigravida mother of 20-35 y, carrying a live single fetus in a cephalic presentation in the active phase of the first stage of labor (>4cm cervical dilatation) and willing to participate in the study were included in the study. Informed

written consent (generic PAHS format in Nepali) was taken from all the participants of the study. Participants were explained about the type and purpose of the study, issues of confidentiality, voluntary participation, significance, benefits and harms, intervention process, and free will of withdrawal from the study. The rights and confidentiality of the respondents were respected in all phases of the study. Confidentiality was maintained by keeping the collected information separately and using the findings for the study purpose only. The sample size was determined by using power analysis.⁷ The sample size was 28 in each experimental and control group which makes a total sample size of 56 in the study.

Pregnant women who met the inclusion criteria were assigned non-randomly into the Experimental group (receives usual labor care and mustard oil back massage) and Control group (receives usual labor care) as a sample for the study. In the active room of the maternity ward, a total of 10 beds were available (bed number 147 to 156) for women undergoing labor. The women who met the inclusion criteria and with the lowest bed numbers were selected for the experimental group and the highest bed numbers were selected for the control group.

Socio-demographic characteristics including age, have seen birth, listened to birth experiences were collected by face to face interview technique. Then, pain perception was assessed before usual labor care and mustard oil back massage by using the Visual Analog Scale (VAS) at the end of a contraction. Mothers were asked to mark a line perpendicular to the VAS line (0-100) at the point that represented her pain perception at her current state. Immediately after 15 m of intervention, at the end of a contraction, pain perception was assessed by using VAS.

Mothers in the control group received usual labor care included monitoring vital signs, Fetal Heart Sound, uterine contraction, administering and regulating the flow of Oxytocin drip as per Dr's order, instructing mothers to lie on left lateral position, emptying

bladder frequently, frequent intake of glucose water and not to bear down until instructed for 15 minutes as intervention. Mothers in the experimental group, on top of the usual labor care, the researcher provided mustard oil back massage for 15 min. The mother's caregiver or accompanying person was not restricted in any way from offering comfort and support to women during the 15 m period (holding hands, rubbing hands, caregivers communicating with mother, cooling mothers by applying hand fan).

The collected data were analyzed using statistical software SPSS. The descriptive statistics were used to calculate the frequency, mean and standard deviation of the socio-demographic characteristics and pain perception. For hypothesis testing, 't test' was used. Pretesting of the data was done using both graphical presentation (Histogram) and statistics (Kurtosis and Skewness). Data were checked for normality using kurtosis and skewness. The calculated kurtosis coefficient and skewness coefficient on the pain perception in the experimental group before the back massage was 0.12 and -1.49; after the back massage was 1.50 and -1.03; in the control group before usual labor care was 1.85 and 0.08 and after usual labor care was 1.44 and 0.92; which showed that the value falls between -1.96 to +1.96 and data were normally distributed, thus t-test was used. Paired t-test was used to assess the difference in pain perception before and after back massage in the experimental group. An independent t-test was used to assess the difference in pain perception after back massage and usual labor care of the experimental and control group.

Fischer's exact test was used to find out the significant difference between experimental and control groups for socio-demographic characteristics.

Result

Out of 56 mothers, there were 28 in the experimental and control group each. In the experimental group, 23(82.14%) belonged to 20-27 y of age and in the control group, 18(64.29%) belonged to the same age group. Likewise, most of the mothers, 22(78.57%) in the experimental group and (96.43%) in the control group, had not seen birth. Similarly, 17(60.71%) in the experimental group and 20(71.43%) in the control group had listened to birth experiences from others. There were no statistically significant differences between the experimental and control group for age, who have seen birth and listened to birth experiences, Table 1.

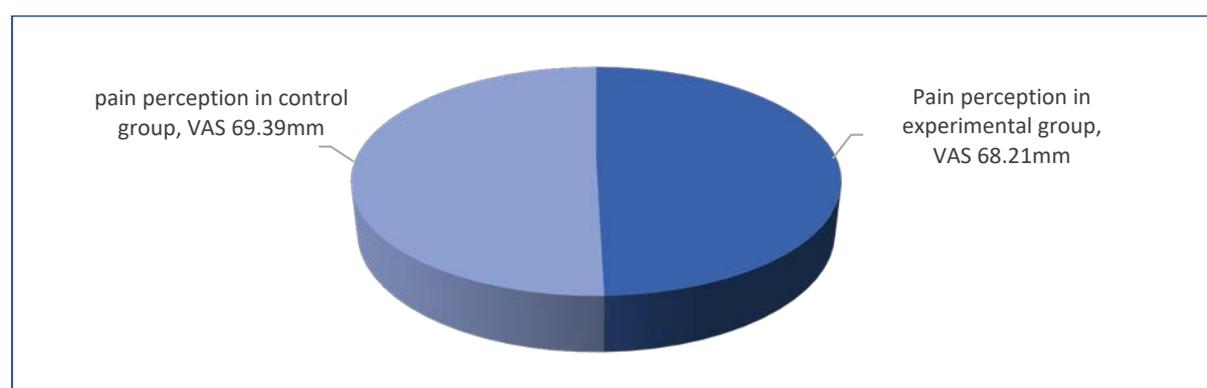
The mean VAS score of pain perceived by the experimental group before the back massage was 68.21 mm and by the control group before usual labor care was 69.39 mm, Figure 1.

The pain perception after back massage (mean 59.64, $SD\pm 11.12$) was less than before back massage (mean 68.21, $SD\pm 10.22$), $t(27)=6.61$ at 0.05 level of significance with $p<0.001$, Table 2. The pain perception before intervention in the experimental group (mean 68.21, $SD\pm 10.22$) was slightly less than the pain perception before usual labor care in the control group (mean 69.39, $SD\pm 10.76$), $t(54) = -0.42$ at 0.05 level of significance with $p=0.67$.

The pain perception after intervention in the experimental group (mean 59.64, $SD\pm 11.12$) was less than the pain perception after usual labor care in the control group (mean 77.07, $SD\pm 10.44$), $t(54)=-6.04$ at 0.05 level of significance with $p<0.001$, Table 3.

Table 1. Socio-demographic characteristics of primi mothers perception on the effect of pain after back massage during the first stage of labor between Experimental (N=28) and Control Group (N=28)

Variables	Experimental group, N=28	Control group, N=28	p-value
	N(%)	N(%)	
Age (y)			
20-27	23(82.14)	18(64.29)	0.626
28-35	5(17.86)	10(35.71)	
Mean±SD	24.32±2.79	25.07±3.46	
Have Seen birth			
Yes	6(21.43)	1(3.57)	1.000
No	22(78.57)	27(96.43)	
Listened to birth experiences			
Yes	17(60.71)	20(71.43)	0.419
No	11(39.29)	8(28.57)	

**Figure 1. Mothers' pain perception before back massage and usual labor care during the first stage of labor****Table 2. The difference in pain perception before and after back massage (experimental group) during the first stage of labor, N=28**

Experimental group	Mean	S. D	Paired Differences		t	Df	p-value
			Mean	Std. Deviation			
Before back massage	68.21	10.22	8.57	6.86	6.61	27	0.000
After back massage	59.64	11.12					

Table 3. The difference in pain perception before and after back massage during the first stage of labor between Experimental (N=28) and Control Group (N=28)

Group		Mean	S.D	Std. Error Mean	t	Df	p-value
Before back massage	Experimental group	68.21	10.22	1.93	-0.42	54	0.67
	Control group	69.39	10.76	2.03			
After back massage	Experimental group	59.64	11.12	2.10	-6.04	54	0.000
	Control group	77.07	10.44	1.97			

Discussion

The present study revealed that the mean score of pain perceived by a pregnant woman in the experimental group before mustard oil back massage was 68.21 mm and the control

group before usual labor care during the first stage of labor was 69.39 mm. In a study conducted in Brazil, pain severity was 69 mm in both experimental and control groups.⁹ Likewise another study in Norway has shown that the mean labor pain perception was 81.7

mm.¹⁰ Similarly, a study in Nigeria revealed that the mean pain perception was 70 mm.¹¹ Another mean pain score of primigravida mothers in Iran, was 83.1 mm.²⁶ In addition, a similar study in New Delhi, India revealed that the mean pain score of the experimental group (back massage) was 80.3 mm.¹² Similarly, a study in New Delhi, India, showed that the pain score of the experimental group was 77 mm and control group was 79.3 mm.⁸ Furthermore, a study conducted in Mangalore, India revealed that mean pain severity of experimental group was 53.5 mm and control group was 52.0 mm.¹³ Likewise, another study in Bangalore, India revealed that the mean score on labor pain before jasmine oil back massage was 74.0 mm and coconut oil back massage group was 65.6 mm.¹⁴ the perception of recalled labor pain in Paropakar Maternity and Women's Hospital, Nepal was 88.4 mm.¹⁵ The findings highlight the need for non-pharmacological measures to minimize pain during labor.

The result of the study showed that the pain perception after back massage (mean=59.64, SD=11.12) was less than before back massage (mean=68.21, SD=10.22), $t(27)=6.61$ at 0.05 level of significance with $p<0.001$, showing the improvement by 8.57 mm. Hence, the alternate hypothesis was accepted which showed that there was a significant reduction in pain perception after back massage in mothers. Thus, back massage was effective in reducing pain perception during labor.

Most of the studies have shown a significant difference in pain perception after back massage. The findings of the study are supported by the study conducted in Brazil, which has shown a significant difference in pain severity in the experimental group, where, mean VAS score before the massage was 69 mm and after the massage was 52 mm, and the group improved by a mean of 17 mm.⁹ Furthermore, the study conducted in Bangalore, India has shown a significant difference in pain perception within the group of jasmine oil back massage with p-value 0.001 and coconut oil back massage with p-value 0.001.¹⁴ Another study in New Delhi, India

showed that there was a significant difference in pain score of mothers in the experimental group (olive oil back massage) with p-value 0.0001.⁸ Similarly, another study in Punjab, India has shown that the difference between pre-test and the post-test mean score was significant with $p<0.01$.¹⁶ Likewise, a study done in India has shown that in the experimental group, there was a significant difference in score of labor pain with p-value 0.001.¹³

The current study showed that the pain perception before back massage and usual labor care in the experimental group (mean=68.21, SD=10.22) was slightly less than the pain perception before usual labor care in the control group (mean=69.39, SD=10.76), $t(54)=-0.42$ at 0.05 level of significance with p-value 0.67. Whereas, the pain perception after back massage and usual labor care in the experimental group (mean=59.64, SD=11.12) was less than the pain perception after usual labor care in the control group (mean=77.07, SD=10.44), $t(54)= -6.04$ at 0.05 level of significance with $p<0.001$. Hence, the alternate hypothesis was accepted which showed that there was a significant difference in pain perception after back massage and usual labor care during the first stage of labor. Thus, back massage is effective than usual labor care in reducing pain perception during labor.

In accordance with the findings of the study, a study in India has shown that there was no any significant difference in the experimental and control group before olive oil massage with p-value 0.26.⁸ Similarly, another study in India has shown no any significant difference in experimental and control group before jasmine oil massage with p-value 0.72.¹³ In accordance with the findings of the study, a study in Turkey has shown that there were statistically significant differences in message and control group after massage with p-value 0.000.¹⁷ Furthermore, study conducted in Brazil has shown that there was significant difference in pain severity among experimental and control group in which the pain score after massage in experimental group was 52 mm and routine maternity ward

care in control group was 72 mm.⁹ Similarly, the next study in Iraq has shown the significant mean rank difference in pain score between the massage and control group after intervention with p-value 0.001 (Mann-Whitney U Test).²⁰ Another study in India showed that there was a significant difference in pain score of mothers after intervention in the experimental and control group with a p-value of 0.001.¹³ Another study in India has shown that there was a significant difference in labor pain in the experimental and control group with p=0.001.¹⁴

The study result contradicts the study findings of Canada in which the total scores on the Short Form McGill Pain Questionnaire were lower in the massage group (13.3) than usual care (15.8) but these differences were not statistically significant.¹⁹ This probably might be because the score difference between massage and control group might not be enough to cause difference significant, as well the study has used Short Form McGill Pain Questionnaire and researcher in the present study has used VAS to assess the pain score.

There was the following limitation in this study: Quasi-experimental design was used to assess the effect of back massage on pain perception and mothers were assigned to experimental and control groups non-randomly in which the confounding variables might have influenced the result. The study was limited to primi mothers in the maternity ward of Patan Hospital and it was conducted by a purposive sampling technique so the findings of the study could not be generalized to the entire population.

Further study can be conducted by adding variables like cervical dilatation that might influence the level of pain perceived by mothers. The outcome and duration of labor after the back massage can also be assessed. Similarly, a qualitative study can be done to understand in-depth the pain perceived by mothers and the effect of massage. A similar study can be conducted in different Hospitals in a large population so that the findings can be generalized.

Conclusion

There was a significant difference in pain perception and back massage was found to be effective in reducing pain perception during the first stage of labor.

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Conflict of Interest

None

Funding

None

Author Contribution

This research was a requirement for the thesis of the Masters of Nursing program, and the author is accountable for the concept, design, literature review, data collection, data analysis, draft manuscript, revision of the draft manuscript, and final manuscript.

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Supplement

The questionnaire used in the study

Section 1: Socio-demographic characteristics

SN	Questions	Response
1.	Age completed in years	
2.	Have you seen giving birth? a) Yes b) No	
3.	Have you listened to birth experiences? a) Yes b) No	

Section 2: Visual Analogue Scale (VAS)

Direction: Respondents will be asked to mark at the VAS line to the point that represents her pain perception. The patient's mark on the line will represent pain perception at her current state.

For Experimental group:

1. Before usual labor care and Mustard oil back massage

No pain 0 _____ 100 Worst imaginable pain

2. After usual labor care and Mustard oil back massage

No pain 0 _____ 100 Worst imaginable pain

For Control group:

1. Before usual labor care

No pain 0 _____ 100 Worst imaginable pain

2. After usual labor care

No pain 0 _____ 100 Worst imaginable pain