RESULTS

The aim of this study is to evaluate the effects of natural pain relieve measures on maternal, fetal and labor out comes. This study has included group of 100 parturient mothers. The intervention group was divided into two equal groups: one receiving heat application, and the other, back massage. The results of this study will be presented in the following sequence.

Part I: General characteristics of the study sample**.**

- Socio-demographic characteristics of mothers concerning age, education, and occupation Table (1) & figure (1,2).

Part II:

- Assessment of pain symptoms among mothers during first stage of labor and the effect of the intervention on this symptom Table (2-8)

Part III:

- Assessment of the progress of labor and its affection by the study intervention Table (9-12)

Part IV:

- Description of the effect of the intervention on the new-born Table (13-16)

Part V:

- Evaluation of mother's satisfaction about non-pharmacological intervention. Figures (3-4).

Part I: General characteristics of the study sample.

Table (1): Socio-demographic characteristics of the back massage group and heat application group of parturient mothers in the study sample.

Items	Back massage Group (n = 50)		Heat application group (n = 50)		Total		Significant test	
	No	%	No	%	No	%	X^2	*P*
Age in years:								
20-	23	46.0	42	84.0	65	65.0		
25-	23	46.0	8	16.0	31	31.0	16.81	0.0002**
30+	4	8.0	0	0.0	4	4.0		
Mean ± SD	23.96 ± 4.58		21.94 ± 4.142		100	100.0		
Education:								
Illiterate	0	0.0	8	16.0	8	8.0		
Read and write	7	14.0	4	8.0	11	11.0		
Primary school	11	22.0	12	24.0	23	23.0	9.6	0.04769*
Secondary school	17	34.0	15	30.0	32	32.0		
University	15	30.0	11	22.0	26	26.0		
Total	50	100.0	50	100.0	100	100.0		
Occupation:								
Working	43	86.0	50	100.0	93	93.0	5.53	0.01806*
House wife	7	14.0	0	0.0	7	7.0		
Total	50	100.0	50	100.0	100	100.0		
Area of residence:								
Rural area	28	56.0	32	64.0	60	60.0	0.67	0.414216
Urban area	22	44.0	18	36.0	40	40.0		
Total	50	100.0	50	100.0	100	100.0		

*statistical significant difference (P ≤ 0.05) **highly statistical significant difference (P ≤ 0.001)

Table (1): This table describes the socio demographic characteristics of women among groups. It can be observed that the two groups were similar in age, education and occupation with no statistically significant differences (P>0.05). The majority (46% & 84%) of the back massage group and heat application group respectively were in the age 20 to less than 30 years. As regards education: secondary school was the most frequent category, followed by higher education but a few mother in the back massage group (14%), and in the heat application group (8%) had read and write. As regards occupation, the majority of parturient mothers were working (86% & 100%) of the back massage and heat application groups respectively. In addition, about two thirds of the parturient mothers were resident of rural areas.

Figure (1): Distribution of heat application intervention

group regarding their age group.

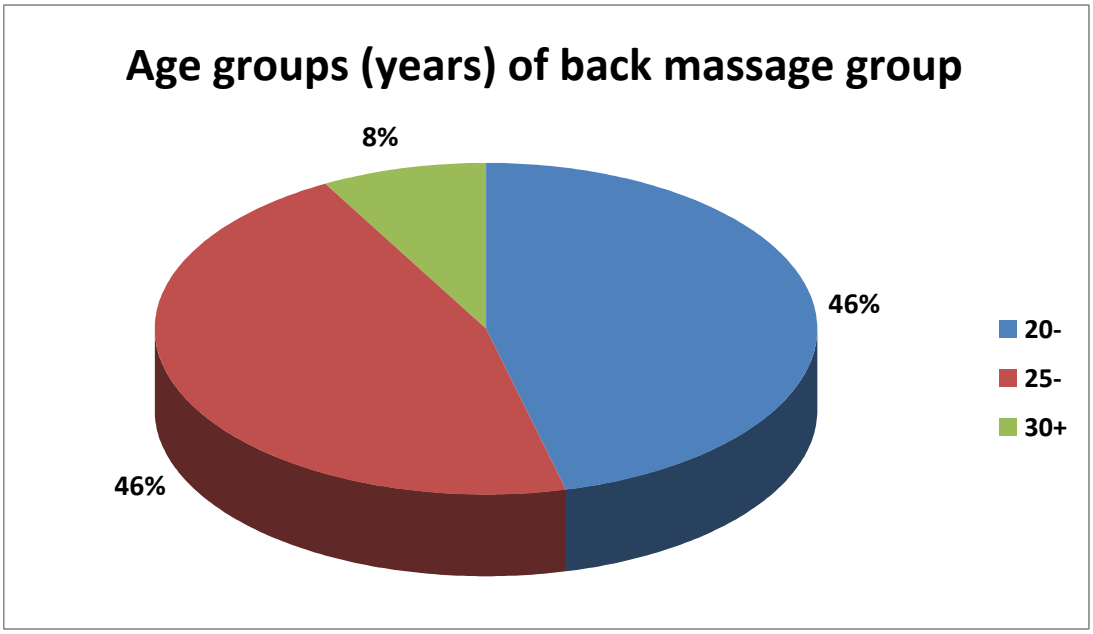
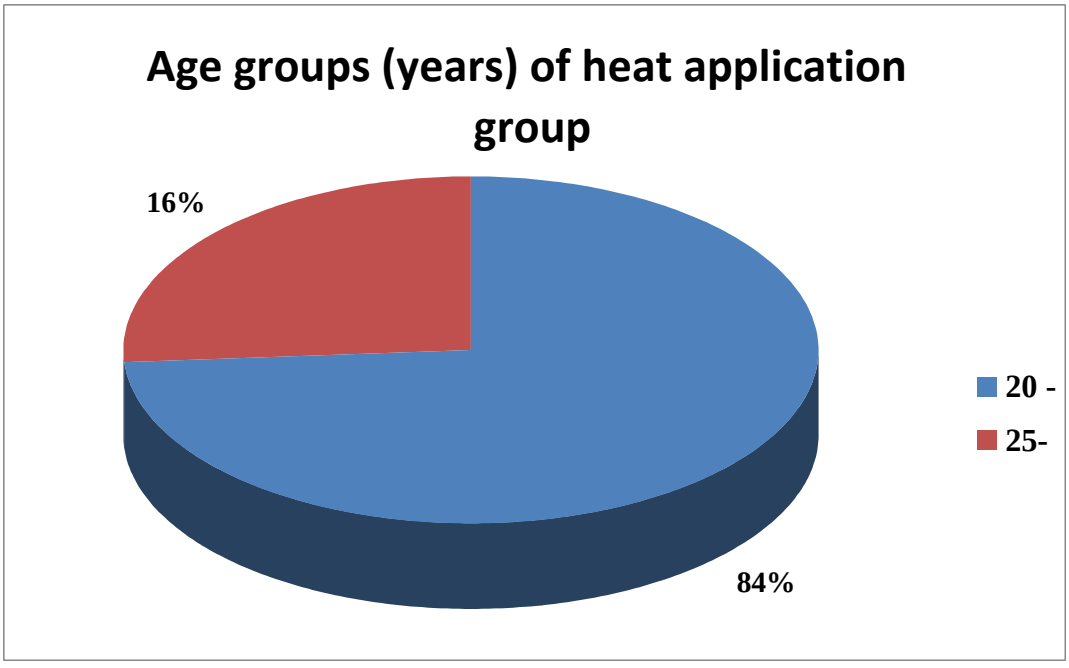


Figure (2): Distribution of back massage intervention group regarding their age group.



Part II.Assessment of pain, and its affection inrelation to the intervention

Table (2): Mother's self reported reasons of fear concerning labor before and after using non–pharmacological methods (n=100)

Items	Intervention group (n = 100)						Significant test	
	Pre (Cervix3-4)		Post (cervix5-6)		Post (cervix7-8)		X^2	*P*
	No	%	No	%	No	%		
Fear from labor								
* Absent	6	6.0	60	60	60	60	79.8	0.0000**
* Present	94	94.0	40	40	40	40		
Reasons of fear								
*Fear from labor pain.	42	44.7	15	37.5	15	37.5		
*Concern about the baby.	10	10.7	4	10.0	4	10.0		
*fear from of death.	5	5.3	3	7.5	3	7.5	5.62	0.8458
*fear from of examination.	16	17.0	7	17.5	7	17.5		
*Fear from unknown.	16	17.0	5	12.5	5	12.5		
*Combination of above.	5	5.3	6	15.0	6	15.0		

*statistical significant difference (P ≤ 0.05) **highly statistical significant difference (P ≤ 0.001)

Table(2): shows that the majority of mothers had fears from labor pain pre-intervention, compared by less than half of them post intervention, the difference is highly statistical significant at p value <0.001. The most common source of fear was from labor pain pre and post intervention.

Table (3): Comparison of qualitative pain assessment among parturient mothers before and after using Heat Application intervention (n=50)

Items	Heat application						Significant test	
	Pre (Cervix 3-4)		Post (cervix5-6)		Post (cervix7-8)			
	No	%	No	%	No	%	x^2	*P*
1-Vocalization								
- No vocalization	8	16.0	3	6.0	0	0.0		
- Crying	26	52.0	26	52.0	45	90.0	25.51	0.00027**
- Screaming	23	46.0	23	46.0	41	82.0		
- Grunting	13	26.0	40	80.0	46	92.0		
2-Facial expression								
- No facial expression	5	10.0	3	6.0	1	2.0		
- Clenched teeth	20	40.0	24	48.0	45	90.0		
- Wrinkled forehead	12	24.0	28	56.0	40	80.0	16.34	0.037763*
- Tightly closed\ open eyes\mouth	28	56.0	40	80.0	36	72.0		
- Lip biting	14	28.0	30	60.0	32	64.0		
3-Body movement								
- Muscle tension	28	56.0	18	36.0	43	86.0		
- Increased hand\finger movement	30	60.0	30	60.0	37	74.0		
- Changing position in bed	25	50.0	22	44.0	30	60.0	23.44	0.00066**
- Walking around bed	28	56.0	23	46.0	6	12.0		

*statistical significant difference (P ≤ 0.05) **highly statistical significant difference (P ≤ 0.001)

In table (3) shows, the parturient mothers (who expressed these) indicators of pain (were compared) before and after heat application there was no statistical significant difference in vocalization causes, but on the other hand there was a highly statistical significant difference in facial and body movement causes.

Table (4): Comparison of qualitative pain assessment among parturient mothers before and after using Back Massage application intervention (n=50)

Items	Back massage application						Significant test	
	Pre (Cervix 3-4)		Post (cervix5-6)		Post (cervix7-8)		x^2	*P*
	No	%	No	%	No	%		
1-Vocalization								
- No vocalization	2	4.0	0	0.0	2	4.0	7.85	0.24914
- Crying	24	48.0	18	36.0	30	60.0		
- Screaming	10	20.0	10	20.0	25	50.0		
- Grunting	30	60.0	35	70.0	37	74.0		
2-Facial expression								
- No facial expression	5	10.0	1	2.0	2	4.0	13.74	0.08876
- Clenched teeth	18	36.0	18	36.0	29	58.0		
- Wrinkled forehead	17	34.0	17	34.0	22	44.0		
- Tightly closed\ open eyes\mouth	7	14.0	19	38.0	24	48.0		
- Lip biting	10	20.0	21	42.0	16	32.0		
3-Body movement								
- Muscle tension	30	60.0	14	28.0	17	34.0	4.47	0.61310
- Increased hand\finger movement	38	76.0	16	32.0	18	36.0		
- Changing position in bed	30	60.0	20	40.0	17	34.0		
- Walking around bed	21	42.0	12	24.0	5	10.0		

*statistical significant difference (P ≤ 0.05) **highly statistical significant difference (P ≤ 0.001)

In table (4) shows, the parturient mothers who expressed these indicators of pain were compared before and after hot application there was no statistical significant difference in the three items of pain (Vocalization, Facial expression and Body movement). p value more than 0.05.

Table (5): Assessment of amniotic fluid's condition among

the two groups of parturient mothers

Condition of amniotic fluids	Heat Application (n= 50)		Back application (n=50)		Significant test	
	No.	**%**	**No.**	**%**	x^2	***P***
-Clear fluid	47	94.0	48	96.0		
-Bloody fluid	0	0.0	0	0.0		
- Meconium	3	6.0	2	4.0	0.289	1.000*
Total	50	100.0	50	100.0		

*statistical insignificant difference (P > 0.05)

Table (5): This table describes the distribution of amniotic fluid's condition among the two intervention groups. It shows that there was not bloody fluid detected in the amniotic fluids in both groups and there is no significant difference between the tow groups, p value more than 0.05.

Table (6): Comparison of quantitative pain assessment among parturient

mothers before and after using non-pharmacological intervention

Items	Massage Intervention group n = 50						Significant test	
	Pre (Cervix 3-4)		Post (Cervix5-6)		Post (Cervix7-8)			
	No	%	No	%	No	%	X^2	*P*
Pain Grades								
1-Mild Pain	10	20.0	8	16.0	0	0.0	22.21	0.000182**
2- Moderate Pain	18	36.0	33	66.0	24	48.0		
3- Server Pain	22	44.0	9	18.0	26	52.0		
Items	**Heat Intervention group n = 50**						X^2	*P*
	Pre (Cervix 3-4)		Post (Cervix5-6)		Post (Cervix7-8)			
	No	%	No	%	No	%		
Pain Grades								
1-Mild Pain	6	12.0	7	14.0	2	5.0	4.26	0.37194
2- Moderate Pain	20	40.0	25	50.0	23	57.5		
3- Server Pain	24	48.0	18	36.0	15	37.5		

*statistical significant difference (P ≤ 0.05) **highly statistical significant difference (P ≤ 0.001)

Table (6): shows quantitative pain assessment, using a Visual Analogue Scale. The table demonstrates that there was a highly statistical (P ≤ 0.001) significant difference in pain grades assessment between pre intervention and after application of back massage and heat application (P ≤ 0.05).

Table (7): **Comparison of maternal vital signs among parturient mothers before**

and after using non-pharmacological intervention

Items	Heat intervention group n = 50				Significant test	
	Pre (Cervix 3-4)		Post (Cervix5-6)			
	No	**%**	**No**	**%**	X^2	***P***
Bp/mmHg:						
-100/60	5	10.0	3	6.0		
-110/70	13	26.0	10	20.0	2.63	0.452228
-120/80	26	52.0	27	54.0		
-130/90	6	12.0	10	20.0		
Pulse (b/m):						
-70	10	20.0	0	0.0		
-80	32	64.0	36	72.0	11.87	0.00264**
-90 – 100	8	16.0	14	28.0		

Items	Massage intervention group n = 50				X^2	***P***
	Pre (Cervix 3-4)		Post (Cervix5-6)			
	No	**%**	**No**	**%**		
Bp/mmHg						
-100/60	0	0.0	0	0.0		
-110/70	27	54.0	9	18.0	17.75	0.000140**
-120/80	14	28.0	33	66.0		
-130/90	9	18.0	5	10.0		
Pulse (b/m):						
-70	3	6.0	6	12.0		
-80	28	56.0	35	70.0	5.35	0.06893
-90 – 100	19	38.0	9	18.0		

***statistical significant difference (P ≤ 0.05)** ****highly statistical significant difference (P ≤ 0.001)**

Table (7) displays the results of the measurement of vital signs in the two groups before and after the intervention. As regards blood pressure demonstrated no statistically significant differences between pre and post heat application, but it shows highly statistically significance difference between pre and post back massage application. Concerning the pulse rate, mothers in the heat application group had statistical significant difference between before and after the intervention.

Table (8): Comparison of fetal heart rate among parturient

mothers before and after using non-pharmacological intervention

Items	Heat intervention group n = 50						Significant test	
	Pre (Cervix3-4)		Post (cervix5-6)		Post (cervix7-8)			
	No	%	No	%	No	%	x^2	*P*
Fetal condition:								
1-Normal	44	88	48	96	47	94	4.83	0.305199*
2-Bradycardia	3	6	1	2	3	6		
3- Tachycardia	3	6	1	2	0	0		
Items	**Massage intervention group n = 50**						x^2	*P*
	Pre (Cervix3-4)		Post (Cervix5-6)		Post (Cervix7-8)			
	No	%	No	%	No	%		
Fetal condition:								
1-Normal	47	94	49	98	49	98	3.55	0.169893*
2-Bradycardia	0	0	0	0	1	2		
3- Tachycardia	3	6	1	2	0	0		

*statistical insignificant difference (P >0.05)

Concerning fetal heart rates, **table (8)** shows that no statistically significant difference was observed between the two groups before and after using non-pharmacological intervention.

Part III. Assessment of labor and its affection by the intervention.

Table (9): **Comparison of labor progress and duration of the stages between the two groups of parturient mothers**

Progress of labor	Intervention Groups				Significant test	
	Heat application(n=50)		Back massage (n = 50)			
	No	%	No	%	X^2	*P*
- **Normal progress:**	47	94.0	48	96.0	1.92	> 0.05
- Abnormal progress:						
- primary dysfunction	2	4.0	2	4.0		
- Secondary arrest	1	2.0	0	0.0		

*statistical insignificant difference (P >0.05)

Table (9) explains the progress of labor among the tow intervention groups. It was normal progress of labor in the majority of mothers among heat application group, and back massage group, the difference statistically insignificant (p>0.05). As regards the abnormal progress of labor, the table shows that two mothers in both groups had primary dysfunction progress, and one mother in the heat application group had secondary arrest.

Table (10): Comparison between the mean duration of the labor stages in both intervention groups. (Mean± SD)

Labor stages	Heat Application Group	Back Massage Group	Significant test	
			F	*P
First Stage (hr)	8.92±0.340	8.98 ± 1.22	0.11	0.737
Second Stage(min)	44.8 ±1.41	42.00 ±6.061	10.39	0.0017 **
Third Stage (min)	10.8 ± 3.90	14.5 ± 4.87	21.21	0.0001 **

***statistical significant difference (P ≤ 0.05)** ****highly statistical significant difference (P ≤ 0.001)**

Table (10) illustrates the mean duration of labor stages in both groups. As regards the duration of first stage of labor, mothers in both heat application and back massage groups had nearly the same mean duration therefore the difference was not statistically significant (P>0.737). However, the differences were highly statistically significant between the two groups in either the second or the third stage of labor (p=0.0017 and 0.0001 respectively).

Table (11): Comparison of the outcome of labor between

the two groups of parturient mothers in the study sample

Items	Intervention N=100				Significant test	
	Heat n = 50		Back n = 50			
	No.	%	No.	%	X^2	*P*
Mode of delivery:						
*Normal vaginal delivery	46	92.0	48	96.0	3.123	> 0.05
* Instrumental	4	8.0	2	4.0		
* Cesarean section	0	0.0	0	0.0		
Delivery of placenta						
*spontaneous	48	96.0	49	98.0	3.01	> 0.05
*Manual	2	4.0	1	2.0		

*statistical insignificant difference (P >0.05)

Table (11) describes the outcomes of labor between the two groups of parturient mothers. The majority of mothers in the two groups had normal labor with or without episiotomy. Instrumental labor, either ventouse or forceps, was observed in four mothers in the hot application group and two mothers in the back massage group. There was no caesarean section in both groups. As regards the delivery of the placenta, it was spontaneous in the great majority of mothers.

Table (12): Comparison of maternal labor complications between the

two groups of parturient mothers in the study sample

Items	Intervention N=100				Significant test	
	Heat n =50		Back n = 50			
	No.	%	No.	%	X^2	*P*
Retained placenta:						
*Yes	2	4.0	1	2.0	2.01	> 0.05
* No	48	96.0	49	98.0		
Immediate haemorrhage:						
*Yes	0	0.0	0	0.0	-------	----
*No	50	100.0	50	100.0		
Perineal laceration:						
*Absent:	45	90.0	46	92.0	0.66	> 0.05
*Present:						
1st degree	4	8.0	4	8.0		
2nd degree	1	2.0	0	0.0		

Table (12) shows that very few complications observed in the two intervention groups of parturient mothers, only two mothers in the heat application group and one in the back massage group had retained placenta. In addition, the majority of mothers in the heat application and back massage groups had no perineal lacerations. The few cases of perineal lacerations that occurred were of first-degree laceration. The table shows that there is no significant difference between both groups, p>0.05.

Part IV. Assessment of neonatal condition.

Table (13): Comparison of percentage of APGAR score at first and ten minutes after delivery among the neonate in the study sample.

APGAR score	Heat (n=50)		Massage (n=50)		Significant test	
	No.	%	No.	%	F	P
APGAR score (1 min):						
0 - 4	3	6	4	8	--	--
5 - 7	32	64	25	50		
8 -10	15	30	21	42		
Mean ± SD	7.28± 2.0		7.86±2.02		1.91	0.170
APGAR score (10 min):						
0 – 4	0	0.0	0.0	0.0	--	--
5 – 7	1	2.0	2	4.0		
8 – 10	49	98.0	48	96.0		
Mean ± SD	8.72±1.52		9.68±0.81		15.37	0.00016**

*statistical significant difference (P ≤ 0.05) **highly statistical significant difference (P ≤ 0.001)

Table (13): This table illustrates the comparison of percentages and means of neonatal APGAR score at first and ten minutes after delivery between the two intervention groups. The majority of newborns in both groups had a score of six or more at one minute, nevertheless, the mean difference was insignificant. On the other hand, APGAR score at ten minutes showed only one newborn in the heat application group and two in the back massage group had score of less than eight. However, the difference was highly statistically significant at p value <0.001.

Table (14): relation between socio-demographic data and mother's fear in the massage group on admission.

Variables	Mother's fear				Significant test	
	Pre		Post			
	Yes	No	Yes	No	X^2	P*
Age group						
20-	14	9	8	15	3.14	0.0765
25-	5	18	4	19	0.00	1.0000
30+	4	0	3	1		
Total	23	27	15	35	2.72	0.9934
Education						
Illiterate	1	1	0	2		
Read & write	0	6	0	6		
Primary school	9	2	6	5	0.84	0.3599
Secondary school	7	8	5	10	0.56	0.4560
University	6	10	4	12	0.58	0.4456
Total	23	27	15	35	2.72	0.9934
Occupation						
Housewives	5	6	3	8	0.20	0.6576
Working	18	21	12	27	1.95	0.1625
Total	23	27	15	35	2.72	0.9934
Residence						
Rural	10	15	5	20	2.38	0.1228
Urban	13	12	10	15	0.72	0.3946
Total	23	27	15	35	2.72	0.9934

***statistical significant difference (P ≤ 0.05)**

Table (14): shows no statistical significant relation between mother's age, educational level, and occupation and maternal fear (P > 0.05).

Table (15): relation between socio-demographic data and mother's fear in the heat application group on admission.

Variables	Mother's fear				Significant test	
	Pre		Post			
	yes	No	Yes	No	X^2	P*
Age group						
20-	10	27	0	19	3.14	0.0765
25-	9	4	0	31	0.00	1.0000
Total	19	31	0	50	2.72	0.9934
Education						
Illiterate	2	6	0	8		
Read & write	0	4	0	4		
Primary school	2	10	0	12	0.84	0.3599
Secondary school	6	9	0	15	0.56	0.4560
University	9	2	0	11	0.58	0.4456
Total	19	31	0	50	2.72	0.9934
Occupation						
Working	19	31	0	50	1.95	0.1625
Total	19	31	0	50	2.72	0.9934
Residence						
Rural	10	15	0	32	2.38	0.1228
Urban	13	12	0	18	0.72	0.3946
Total	23	27	0	50	2.72	0.9934

***statistical significant difference (P ≤ 0.05)** ****highly statistical significant difference (P ≤ 0.001)**

Table (15): shows no statistical significant relation between mother's age educational level, and occupation and maternal fear (P > 0.05).

Table (16): Correlation association between mother's age and fetal / newborn heart rate

Variables	FHR		APGAR at 1 min		APGAR at 10 min	
	R	Sig. 2 tailed	R	Sig. 2 tailed	R	Sig. 2 tailed
Age	0.271**	0.006	0.224*	0.025	0.126	0.211

*statistical significant difference (P ≤ 0.05) **highly statistical significant difference (P ≤ 0.001)

Table (16): illustrates the pattern of the correlation association between mother's age and vital signs of both fetal and neonatal heart rates. It is clearly that there was highly positive correlation at p value <0.01 between mother's age and fetal heart rate. In addition, there was significant positive correlation between mother's age and APGAR score at 1 minute at p value <0.05. Contrary, the correlation between mother's age and APGAR score at 10 minutes shows insignificant positive correlation association (p value = 0.211).

Part V: Evaluation of mother's satisfaction about non-pharmacological interventions between both groups.

Figure (3): Mother's satisfaction about heat application intervention.

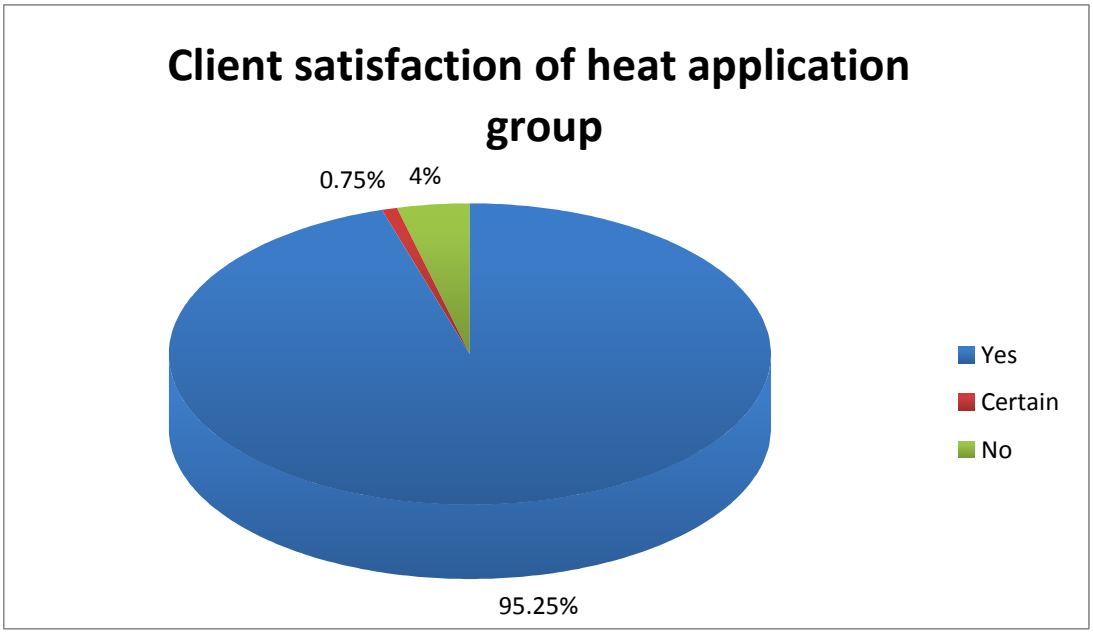
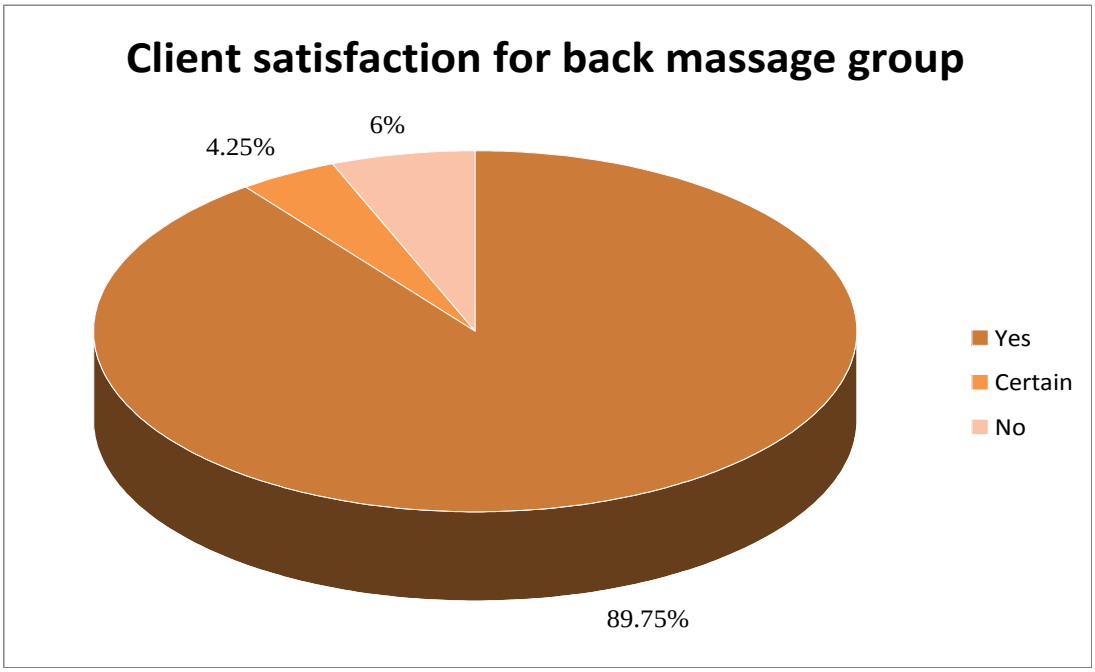


Figure (4): Mother's satisfaction about back massage intervention.



Regarding the mother's acceptance of non-pharmacological interventions to be used in the future deliveries, results in figures (3&4) show that the majority of mothers had expressed their willingness to use the non-pharmacological interventions in their future deliveries. The few numbers of mothers who refused the natural methods were referred their refusal to the lack of effectiveness and discomfort of the non-pharmacological interventions.