Journal of Chemical Health Risks

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JCHR (2026) 16(2), 2666-2682 | ISSN:2251-6727

Effect of Massage Therapy on Neonates with Unconjugated Hyperbilirubinemia Undergoing Phototherapy- A Pilot Study

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(Received: 28 January 2026 Revised: 16 March 2026 Accepted: 09 April 2026)

KEYWORDS

Effect, Massage Therapy, Neonates, Unconjugated Hyperbilirubinemia, Phototherapy

ABSTRACT:

This pilot study evaluated the effect of massage therapy on neonates with unconjugated hyperbilirubinemia undergoing phototherapy. A quantitative evaluative approach with a pre-test and post-test control group design was used. A total of 20 neonates were selected using purposive sampling, with 10 in the experimental group and 10 in the control group. Data were collected through observation, maternal interviews, and standardized tools including breastfeeding assessment and Kramer's criteria. The findings showed a reduction in serum bilirubin levels in both groups after intervention. The experimental group demonstrated a significant decrease in bilirubin levels from pre-test to post-test ($t=7.93$, $p<0.05$). However, comparison between experimental and control groups showed no statistically significant difference. Improvements were observed in feeding patterns, weight gain, and sleep, particularly in the experimental group. Night-time sleep patterns showed some statistical significance. The study suggests that massage therapy may support neonatal recovery alongside phototherapy. Further research with larger samples and randomized design is recommended.

INTRODUCTION

The history of baby massage goes back thousands of years in all civilizations. Benefits of Infant Massage have been known over thousands of years in different civilizations like Indian, Egyptian, African etc. Infant massage is the most risk free and economical way of improving the baby's health has many benefits. It has been established that massage therapy can improve the weight, sleep patterns, growth and development, reduction of colic and improves Jaundice too. Massage relaxes and clams the baby, stimulates milk production in the mother and develops a stronger attachment and bonding with the mother or primary caregiver. (Zhang et al., 2019.)

Jaundice refers to the yellow staining of the skin and sclera due to the increase in the serum bilirubin levels. 60% of healthy neonates are affected by jaundice and it is responsible for 75% of hospitalizations. Incidence of neonatal jaundice was 29.3 per 1000 live births in 2003. Prevalence of neonatal jaundice in term babies is 38.32% in 2020. (A.U Bregmann and T. Thorkelsson, 2020.)

According to the study published in the Italian Journal of Paediatrics by Chien- Heng Lin et.al, massage therapy in neonates with unconjugated hyperbilirubinemia have reported significantly lower bilirubin levels. (C.H.Linn, H.C.Yang , C.S Cheng, and C.E. Yen, 2015.) According to a Meta-analysis in Iran, the effect of massage on neonatal jaundice to promote the growth and health care is well established. It has been stated that massage can be effective in changes in body weight, the patterns and frequency of urination and defecation due to better breast feeding patterns. Thus, reducing the serum bilirubin levels in the neonates.(Homa Babaei, Mazyar Vakiliamini, 2018.)

METHODOLOGY

A Pilot study was conducted using a Quantitative Evaluative research approach to assess the effect of massage therapy on neonates with unconjugated hyperbilirubinemia undergoing Phototherapy in a selected hospital in Jalna. The research design was pre-test and post-test design with control group and a purposive sampling technique was used to choose 10 neonates from each group i.e.,

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experimental and control groups respectively. A total number of 20 neaonates from both the groups with unconjugated hyperbilirubinemia undergoing Phototherapy was selected for the study. Data collection was done using a combination of observations of the skin of the baby and informal interviews with mothers related to the feeding and defecation patterns of the baby. Standardized tools were used to assess the levels of bilirubin, patterns of breast feeding and defecation in the neonates receiving Phototherapy.

The Standardized Tools included the Breastfeeding Assessment Tools and Visual Assessment by Kramer's Criteria to assess the levels of bilirubin in the neonates. Statistical analysis helped to assess the distribution of neonates with regards to demographic variables like, age, sex, place of delivery, birth weight, type of delivery, type of feed, APGAR at birth. The effectiveness of massage therapy and comparison between both experimental and control group was done by descriptive statistics with helped to summarize and systematically state the data.

The ethical concerns were thoroughly considered so that the privacy of the samples and relations were protected and kept confidential throughout the study.

RESULTS

The data obtained to describe the sample characteristics including demographic variables, clinical variables, biophysical parameters including frequency of feeding, assessment of bilirubin level and assessment of sleep pattern respectively.

Table no.1

Percentage wise distribution of Neonates according to their demographic characteristics.

N=20

Demographic Variables	Experimental Group(n=10)	Control Group(n=10)
Age(yrs)		
1-3 days	5(50%)	4(40%)
4-6 days	4(40%)	5(50%)
7-9 days	1(10%)	1(10%)
Gender		
Male	7(70%)	4(40%)
Female	3(30%)	6(60%)
Place of delivery		
Institutional	0(0%)	0(0%)
Hospital	10(100%)	10(100%)

50% of neonates in experimental group and 40% in control group were in the age group of 1-3 days, 40% in experimental group and 50% in control group were in the age group of 4-6 days and each 10% of the neonates in both the groups were in the age group of 7-9 days.

70% of neonates in experimental group and 40% in control group were males and 30% of the neonates in experimental group and 60% in control group were females. All(100%) of neonates in experimental group and in control group were delivered by hospital deliveries.

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Table no.2

Percentage wise distribution of Neonates according to their Clinical Variables.

(n=20)

Clinical Variables	Experimental Group(n=10)	Control Group(n=10)
Birth Weight(kg)		
2-2.5 kg	1(10%)	4(40%)
2.6-3 kg	5(50%)	6(60%)
>3 kg	4(40%)	0(0%)
Weight on admission		
2.5-3 kg	0(0%)	9(90%)
3.1-3.5 kg	7(70%)	1(10%)
≥3.6 kg	3(30%)	0(0%)
Type of delivery		
Vaginal Delivery	4(40%)	6(60%)
Caesarean Delivery	6(60%)	4(40%)
Full Term		
Yes	10(100%)	10(100%)
No	0(0%)	0(0%)
Receiving Phototherapy		
Yes	10(100%)	10(100%)
No	0(0%)	0(0%)
APGAR score at birth		
7 to 10	9(90%)	10(100%)
4 to 6	1(10%)	0(0%)

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≤3	0(0%)	0(0%)
Kind of feeding		
Breast fed	7(70%)	7(70%)
Infant formula	0(0%)	3(30%)
Mixed	3(30%)	0(0%)
Serum bilirubin level on admission		
>10 mg/dl	8(80%)	6(60%)
>15 mg/dl	2(20%)	3(30%)
>18 mg/dl	0(0%)	1(10%)
>20 mg/dl	0(0%)	0(0%)

The distribution of neonatal characteristics showed that 10% of neonates in the experimental group and 40% in the control group had a birth weight of 2–2.5 kg. Additionally, 50% of neonates in the experimental group and 60% in the control group had a birth weight of 2.6–3 kg, while 40% of neonates in the experimental group had a birth weight of more than 3 kg.

Regarding weight on admission, 90% of neonates in the control group had a weight between 2.5–3 kg. In comparison, 70% of neonates in the experimental group and 10% in the control group had a weight between 3.1–3.5 kg, while 30% of neonates in the experimental group had a weight above 3.6 kg.

With respect to the mode of delivery, 40% of neonates in the experimental group and 60% in the control group were delivered vaginally, whereas 60% in the experimental group and 40% in the control group were delivered by caesarean section.

All (100%) neonates in both the experimental and control groups were full-term and had received phototherapy.

In terms of Apgar scores, 92% of neonates in the experimental group and 100% in the control group had scores between 7–10, while 10% of neonates in the experimental group had Apgar scores between 4–6.

Feeding patterns revealed that 70% of neonates in both groups were breastfed, while the remaining 30% in both experimental and control groups received either infant formula or mixed feeding.

Regarding serum bilirubin levels, 80% of neonates in the experimental group and 60% in the control group had levels greater than 10 mg/dl. Furthermore, 20% in the experimental group and 30% in the control group had bilirubin levels above 15 mg/dl, while 10% of neonates in the control group had levels exceeding 18 mg/dl.

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Table no.3

Assessment with level of frequency of feeding in Experimental group

(n=10)

What to look for/ask about	Day 1	Day 2	Day 3	Day 4	Day 5
Your baby: Is not interested, when offered breast, sleepy	9(90%)	5(50%)	3(30%)	0(0%)	0(0%)
Is showing feeding cues but not attaching	6(60%)	4(40%)	3(30%)	0(0%)	0(0%)
Attaches at the breast but quickly falls asleep	6(60%)	8(80%)	6(60%)	4(40%)	0(0%)
Attaches for short bursts with long pauses	3(30%)	4(40%)	7(70%)	6(60%)	2(20%)
Attaches well with long rhythmical sucking and swallowing for a short feed (requiring stimulation)	0(0%)	4(40%)	6(60%)	7(70%)	5(50%)
Attaches well for a sustained period with long rhythmical sucking and swallowing	0(0%)	1(10%)	5(50%)	7(70%)	10(100%)
Normal skin colour and tone	1(10%)	1(10%)	4(40%)	8(80%)	9(90%)
Gaining weight appropriately	0(0%)	3(30%)	6(60%)	10(100%)	10(100%)
Your baby's nappies:					
At least 5-6 heavy, wet nappies in 24 hours	4(40%)	6(60%)	9(90%)	10(100%)	10(100%)
At least 2 dirty nappies in 24hrs, at least 2 rupees coin size, yellow and runny	4(40%)	5(50%)	10(100%)	10(100%)	10(100%)
Your breasts:					
Breasts and nipples are comfortable	1(10%)	4(40%)	6(60%)	9(90%)	10(100%)
Nipples are the same shape at the end of the feed as at the start	0(0%)	4(40%)	5(50%)	7(70%)	10(100%)

90% of the neonates at day 1, 50% at day 2 and 30% of neonates at day 3 were not interested when offered breast, sleepy.

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Table no.4

Assessment with level of frequency of feeding in Control group

(n=10)

What to look for/ask about	Day 1	Day 2	Day 3	Day 4	Day 5
Your baby: Is not interested, when offered breast, sleepy	4(40%)	4(40%)	1(10%)	0(0%)	0(0%)
Is showing feeding cues but not attaching	4(40%)	5(50%)	0(0%)	0(0%)	0(0%)
Attaches at the breast but quickly falls asleep	1(10%)	7(70%)	4(40%)	0(0%)	0(0%)
Attaches for short bursts with long pauses	2(20%)	6(60%)	7(70%)	1(10%)	0(0%)
Attaches well with long rhythmical sucking and swallowing for a short feed (requiring stimulation)	1(10%)	2(20%)	6(60%)	7(70%)	3(30%)
Attaches well for a sustained period with long rhythmical sucking and swallowing	0(0%)	1(10%)	6(60%)	8(80%)	10(100%)
Normal skin colour and tone	0(0%)	0(0%)	4(40%)	7(70%)	10(100%)
Gaining weight appropriately	1(10%)	3(30%)	9(90%)	10(100%)	10(100%)
Your baby's nappies:					
At least 5-6 heavy, wet nappies in 24 hours	3(30%)	6(60%)	10(100%)	10(100%)	10(100%)
At least 2 dirty nappies in 24hrs, at least 2 rupees coin size, yellow and runny	3(30%)	6(60%)	10(100%)	10(100%)	10(100%)
Your breasts:					
Breasts and nipples are comfortable	1(10%)	4(40%)	6(60%)	9(90%)	10(100%)
Nipples are the same shape at the end of the feed as at the start	1(10%)	3(30%)	6(60%)	9(90%)	10(100%)

Each 40% of the neonates at day 1 and day 2 and 10% of neonates at day 3 were not interested when offered breast, sleepy.

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Table no.5

Assessment with level of Visual Assessment by Kramer's Criteria in Experimental Group

(N=10)

	Day 1	Day 2	Day 3	Day 4	Day 5
1. Face (4-8 mg/dl)	10(100%)	10(100%)	10(100%)	10(100%)	9(90%)
2. Upper Trunk (5-12 mg/dl)	9(90%)	10(100%)	10(100%)	8(80%)	5(50%)
3. Lower Trunk and Thighs (8-16mg/dl)	7(70%)	7(70%)	6(60%)	2(20%)	0(0%)
4. Arms and Lower Legs (11-18mg/dl)	7(70%)	6(60%)	3(30%)	1(10%)	0(0%)
5. Palms and Soles (>15 mg/dl)	3(30%)	2(20%)	1(10%)	0(0%)	0(0%)

Table no.6

Assessment with level of Visual Assessment by Kramer's Criteria in Control Group

(n=10)

	Day 1	Day 2	Day 3	Day 4	Day 5
1. Face (4-8 mg/dl)	10(100%)	10(100%)	9(90%)	8(80%)	8(80%)
2. Upper Trunk (5-12 mg/dl)	10(100%)	10(100%)	8(80%)	6(60%)	6(60%)
3. Lower Trunk and Thighs (8-16mg/dl)	10(100%)	8(80%)	6(60%)	4(40%)	1(10%)
4. Arms and Lower Legs (11-18mg/dl)	8(80%)	6(60%)	4(40%)	3(30%)	1(10%)
5. Palms and Soles (>15 mg/dl)	5(50%)	3(30%)	3(30%)	0(0%)	0(0%)

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Table no.7

Assessment with level of Serum bilirubin level

(n=20)

Group	Score Range	Level of Serum Bilirubin Level	
		Pre Test	Post Test
Experimental Group	Pre Test: 7.40-19.20 Post Test: 4.30-14.20	13.33±3.88	8.12±3.79
Control Group	Pre Test: 10-18.70 Post Test: 3.80-11.50	13.56±2.94	7.51±2.69

The above table shows that mean serum bilirubin level in experimental group at pre test was 13.33±3.88 and at post test it was 8.12±3.79 and in control group mean serum bilirubin level at pre test was 13.56±2.94 and at post test it was 7.51±2.69.

Table no.8

Assessment with Birth Weight(kg)

(n=20)

Day	Group	
	Experimental Group	Control Group
Day 1	2.84±0.20	2.59±0.16
Day 2	2.89±0.24	2.64±0.18
Day 3	2.93±0.23	2.70±0.16
Day 4	2.97±0.27	2.77±0.16
Day 5	3.03±0.28	2.79±0.16

The above table shows that mean birth weight at day 1 in experimental group was 2.84±0.20 and in control group it was 2.59±0.16, at day 2 in experimental group it was 2.89±0.24 and in control group it was 2.64±0.18, at day 3 in experimental group it was 2.93±0.23 and in control group it was 2.70±0.16, at day 4 in experimental group it was 2.97±0.27 and in control group it was 2.77±0.16 and at day 5 in experimental group it was 3.03±0.28 and in control group it was 2.79±0.16.

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Table no 9

Assessment with Sleep Patterns in Experimental Group

(n=10)

Sleep Pattern	Pre Test	Post Test
Daytime sleeping pattern		
6-7 hrs	1(10%)	0(0%)
7-8 hrs	4(40%)	3(30%)
8-9 hrs	4(40%)	7(70%)
>9 hrs	1(10%)	0(0%)
Nighttime sleeping pattern		
6-7 hrs	1(10%)	0(0%)
7-8 hrs	2(20%)	3(30%)
8-9 hrs	5(50%)	7(70%)
>9 hrs	2(20%)	0(0%)
Number of feeds at night		
1 to 2	0(0%)	0(0%)
3 to 4	6(60%)	4(40%)
5 to 6	4(40%)	6(60%)

Day time sleeping pattern among neonates was 6-7 in pre test was 10% and, it was 7-8 in 40% of neonates in pretest and 30% in post test and it was 8-9 in 40% of neonates at pre test and 70% in post test.

Night time sleeping pattern among neonates was 6-7 in pre test was 10% and, it was 7-8 in 20% of neonates in pretest and 30% in post test and it was 8-9 in 50% of neonates at pre test and 70% in post test.

Number of feeds at night among neonates in pre test was 3-4 in 60% of neonates in pretest and 40% in post test and it was 5-6 in 40% of neonates at pre test and 60% in post test.

Table no.10

Assessment with Sleep Patterns in Control Group

(n=10)

Sleep Pattern	Pre Test	Post Test
Daytime sleeping pattern		
6-7 hrs	3(30%)	1(10%)
7-8 hrs	4(40%)	6(60%)

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8-9 hrs	3(30%)	3(30%)
>9 hrs	0(0%)	0(0%)
Nighttime sleeping pattern		
6-7 hrs	1(10%)	0(0%)
7-8 hrs	2(20%)	2(20%)
8-9 hrs	7(70%)	3(30%)
>9 hrs	0(0%)	5(50%)
Number of feeds at night		
1 to 2	0(0%)	0(0%)
3 to 4	8(80%)	6(60%)
5 to 6	2(20%)	4(40%)

Day time sleeping pattern among neonates was 6-7 in pre test was 10% and, it was 7-8 in 40% of neonates in pretest and 60% in post test and it was 8-9 in 30% of neonates at pre test and 30% in post test.

Night time sleeping pattern among neonates was 6-7 in pre test was 10% and, it was 7-8 in 20% of neonates in pretest and 30% in post test and it was 8-9 in 70% of neonates at pre test and 30% in post test.

Number of feeds at night among neonates in pre test was 3-4 in 80% of neonates in pretest and 60% in post test and it was 5-6 in 20% of neonates at pre test and 40% in post test.

Table no.11

Significance of difference between Serum Bilirubin Score in pre and post test of Neonates in Experimental Group

(n=10)

Overall	Mean	SD	Mean Difference	t-value	p-value
Pre Test	13.33	3.88	5.21±2.07	7.93	0.0001 S,p<0.05
Post Test	8.12	3.79			

This table shows the comparison of pretest and post test Serum Bilirubin score among neonates from selected hospital. Mean, standard deviation and mean difference values are compared and student's paired 't' test is applied at 5% level of significance. The tabulated value for n=10-1 i.e. 9 degrees of freedom was 2.23. The calculated 't' value i.e. 7.93 are much higher than the tabulated value at 5% level of significance which is statistically acceptable level of significance. Hence it is statistically interpreted that Massage Therapy on Serum Bilirubin Score among neonates from selected hospital was effective. Thus the H_1 is accepted.

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Table no.12

Significance of difference between Serum Bilirubin Score in pre and post test of Neonates in Control Group

(n=10)

Overall	Mean	SD	Mean Difference	t-value	p-value
Pre Test	13.56	2.94	6.05±0.96	19.91	0.0001 S,p<0.05
Post Test	7.51	2.69			

This table shows the comparison of pretest and post test Serum Bilirubin score among neonates from selected hospital. Mean, standard deviation and mean difference values are compared and student's paired 't' test is applied at 5% level of significance. The tabulated value for n=10-1 i.e. 9 degrees of freedom was 2.23. The calculated 't' value i.e. 19.91 are much higher than the tabulated value at 5% level of significance which is statistically acceptable. Hence it is statistically interpreted that Massage Therapy on Serum Bilirubin Score among neonates from selected hospital was effective. Thus the H_1 is accepted.

Table no.13

Assessment with Sleep Patterns in Experimental Group

(n=10)

Sleep Pattern	Pre Test	Post Test	χ2-value
Daytime sleeping pattern			
6-7 hrs	1(10%)	0(0%)	2.96 P=0.23,NS
7-8 hrs	4(40%)	3(30%)	
8-9 hrs	4(40%)	7(70%)	
>9 hrs	1(10%)	0(0%)	
Nighttime sleeping pattern			
6-7 hrs	1(10%)	0(0%)	3.53 P=0.31,NS
7-8 hrs	2(20%)	3(30%)	
8-9 hrs	5(50%)	7(70%)	
>9 hrs	2(20%)	0(0%)	
Number of feeds at night			
1 to 2	0(0%)	0(0%)	0.80 P=0.37,NS
3 to 4	6(60%)	4(40%)	
5 to 6	4(40%)	6(60%)	

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Day time sleeping pattern among neonates was 6-7 in pre test was 10% and, it was 7-8 in 40% of neonates in pretest and 30% in post test and it was 8-9 in 40% of neonates at pre test and 70% in post test. By using Chisquare test statistically no significant difference was found in day time sleeping pattern among neonates in pre test and post test(χ2-value=2.96,p=0.23).

Night time sleeping pattern among neonates was 6-7 in pre test was 10% and, it was 7-8 in 20% of neonates in pretest and 30% in post test and it was 8-9 in 50% of neonates at pre test and 70% in post test. By using Chisquare test statistically no significant difference was found in night time sleeping pattern among neonates in pre test and post test(χ2-value=3.53,p=0.31).

Number of feeds at night among neonates in pre test was 3-4 in 60% of neonates in pretest and 40% in post test and it was 5-6 in 40% of neonates at pre test and 60% in post test. By using Chisquare test statistically no significant difference was found in number of feeds among neonates in pre test and post test(χ2-value=0.80,p=0.37).

Table no.14

Assessment with Sleep Patterns in Control Group

(n=10)

Sleep Pattern	Pre Test	Post Test	χ2-value
Daytime sleeping pattern			
6-7 hrs	3(30%)	1(10%)	1.40 P=0.49,NS
7-8 hrs	4(40%)	6(60%)	
8-9 hrs	3(30%)	3(30%)	
>9 hrs	0(0%)	0(0%)	
Nighttime sleeping pattern			
6-7 hrs	1(10%)	0(0%)	7.60 P=0.05,NS
7-8 hrs	2(20%)	2(20%)	
8-9 hrs	7(70%)	3(30%)	
>9 hrs	0(0%)	5(50%)	
Number of feeds at night			
1 to 2	0(0%)	0(0%)	0.95 P=0.32,NS
3 to 4	8(80%)	6(60%)	
5 to 6	2(20%)	4(40%)	

Day time sleeping pattern among neonates was 6-7 in pre test was 10% and, it was 7-8 in 40% of neonates in pretest and 60% in post test and it was 8-9 in 30% of neonates at pre test and 30% in post test. By using Chisquare test statistically no significant difference was found in day time sleeping pattern among neonates in pre test and post test(χ2-value=1.40,p=0.49).

Night time sleeping pattern among neonates was 6-7 in pre test was 10% and, it was 7-8 in 20% of

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neonates in pretest and 30% in post test and it was 8-9 in 70% of neonates at pre test and 30% in post test. By using Chisquare test statistically no significant difference was found in night time sleeping pattern among neonates in pre test and post test(χ2-value=1.40,p=0.49)

Number of feeds at night among neonates in pre test was 3-4 in 80% of neonates in pretest and 60% in post test and it was 5-6 in 20% of neonates at pre test and 40% in post test. By using Chisquare test statistically no significant difference was found in number of feeds at night among neonates in pre test and post test(χ2-value=0.95,p=0.32).

Table no.15

Comparison of mean difference Serum Bilirubin Score of Neonates in Experimental Group

(n=20)

Group	Mean	SD	t-value	p-value
Experimental Group	5.21	2.07	1.16	0.26 NS,p>0.05
Control Group	6.05	0.96		

This table shows the comparison of mean difference in Serum Bilirubin score among neonates from selected hospital in experimental and control group. Mean difference and standard deviation are compared and student's unpaired 't' test is applied at 5% level of significance. The tabulated value for n=10+10-2 i.e. 18 degrees of freedom was 2.10. The calculated 't' value i.e. 1.16 are much less than the tabulated value at 5% level of significance for overall serum bilirubin score of Neonates which is statistically not acceptable level of significance. Hence it is statistically interpreted that Massage Therapy on Serum Bilirubin Score among neonates from selected hospital was not effective. Thus the H_0 is accepted.

Table no. 13:

Assessment with Sleep Patterns in Experimental and Control Group

(n=10)

Sleep Pattern	Experimental Group	Control Group	χ2-value
Daytime sleeping pattern			
6-7 hrs	0(0%)	1(10%)	3.60 P=0.16,noNS
7-8 hrs	3(30%)	6(60%)	
8-9 hrs	7(70%)	3(30%)	
>9 hrs	0(0%)	0(0%)	
Nighttime sleeping pattern			
6-7 hrs	0(0%)	0(0%)	6.80 P=0.033,S
7-8 hrs	3(30%)	2(20%)	
8-9 hrs	7(70%)	3(30%)	

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>9 hrs	0(0%)	5(50%)	
Number of feeds at night			
1 to 2	0(0%)	0(0%)	0.80 P=0.37,NS
3 to 4	4(40%)	6(60%)	
5 to 6	6(60%)	4(40%)	

Day time sleeping pattern among neonates was 6-7 in control group t was 10%, it was 7-8 in 30% of neonates in experimental group and 60% in control group and it was 8-9 in 70% of neonates in experimental group and 30% in control group. By using Chisquare test statistically no significant difference was found in day time sleeping pattern among neonates in experimental and control group(ϰ2-value=3.60,p=0.16).

Night time sleeping pattern among neonates was 7-8 in 30% of neonates in experimental group and 20% in control group and it was 8-9 in 70% of neonates in experimental group and 30% in control group. By using Chisquare test statistically significant difference was found in night time sleeping pattern among neonates in experimental and control group(ϰ2-value=6.80,p=0.033).

Number of feeds at night among neonates in pre test was 3-4 in 40% of neonates in experimental group and 60% in control group and it was 5-6 in 60% of neonates in experimental group and 40% in control group. By using Chisquare test statistically no significant difference was found in number of feeds among neonates in experimental and control group(ϰ2-value=0.80,p=0.37).

Table no.14

Assessment with level of frequency of feeding in Experimental and control group

(n=20)

What to look for/ask about	Day 5		Chisquare Test	
	Experimental Group	Control Group	ϰ2-value	p-value
Your baby: Is not interested, when offered breast, sleepy	0(0%)	0(0%)	-	-
Is showing feeding cues but not attaching	0(0%)	0(0%)	-	-
Attaches at the breast but quickly falls asleep	0(0%)	0(0%)	-	-
Attaches for short bursts with long pauses	2(20%)	0(0%)	2.22	0.13,NS
Attaches well with long rhythmical sucking and swallowing for a short feed (requiring stimulation)	5(50%)	3(30%)	0.83	0.36,NS
Attaches well for a sustained period with long rhythmical sucking and swallowing	10(100%)	10(100%)	-	-

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Normal skin colour and tone	9(90%)	10(100%)	1.05	0.30,NS
Gaining weight appropriately	10(100%)	10(100%)	-	-
Your baby's nappies:				
At least 5-6 heavy, wet nappies in 24 hours	10(100%)	10(100%)	-	-
At least 2 dirty nappies in 24hrs, at least 2 rupees coin size, yellow and runny	10(100%)	10(100%)	-	-
Your breasts:				
Breasts and nipples are comfortable	10(100%)	10(100%)	-	-
Nipples are the same shape at the end of the feed as at the start	10(100%)	10(100%)	-	-

Neonates attaches for short bursts with long pauses in 20% of experimental group which is statistically not significant by using Chisquare test (χ2-value=2.22,p=0.13).

Neonates attaches well with long rhythmical sucking and swallowing for a short feed in 50% of experimental group and 30% of control group which is statistically not significant by using Chisquare test (χ2-value=0.83,p=0.36).

Normal skin colour and tone in 90% of experimental group and 100% of control group which is statistically not significant by using Chisquare test (χ2-value=1.05,p=0.30).

Table no.15

Assessment with Visual Assessment by Kramer's Criteria in Experimental and control group

(n=20)

Visual Assessment	Day 5		Chisquare Test	
	Experimental Group	Control Group	χ2-value	p-value
Face (4-8 mg/dl)	9(90%)	8(80%)	0.39	0.53,NS
Upper Trunk (5-12 mg/dl)	5(50%)	6(60%)	0.20	0.65,NS
Lower Trunk and Thighs (8-16mg/dl)	0(0%)	1(10%)	1.05	0.30,NS
Arms and Lower Legs (11-18mg/dl)	0(0%)	1(10%)	1.05	0.30,NS
Palms and Soles (>15 mg/dl)	0(0%)	0(0%)	-	-

Journal of Chemical Health Risks

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JCHR (2026) 16(2), 2666-2682 | ISSN:2251-6727

Face was found in 90% of neonates in experimental group and 80% of control group which is statistically not significant by using Chisquare test (χ2-value=0.39,p=0.53). Upper Trunk was found in 50% of neonates in experimental group and 60% of control group which is statistically not significant by using Chisquare test (χ2-value=0.20,p=0.65). Lower Trunk and Thighs was found in 10% of neonates in control group which is statistically not significant by using Chisquare test (χ2-value=1.05,p=0.30). Arms and lower legs was found in 10% of neonates in control group which is statistically not significant by using Chisquare test (χ2-value=1.05,p=0.30).

Table no. 16

Comparison of Birth Weight(kg) at day 5 in experimental and control group

Student's Unpaired t test

N=20

Group	N	Mean	Std. Deviation	Std. Error Mean	t-value
Experimental Group	10	3.03	0.28	0.08	2.30 P=0.030,S
Control Group	10	2.79	0.16	0.05	

Mean birth weight (kg) among neonates of experimental group was 3.03±0.28 and in control group it was 2.79±0.16. By using Student's unpaired t test statistically significant difference was found in birth weight among neonates of two groups (t=2.30,p=0.030).

DISCUSSION

This Pilot study was based on the effect of massage therapy given to neonates with unconjugated hyperbilirubinemia for five consecutive day for 15-20 mins using coconut oil. Here the emphasis is given to the patterns of breastfeeding, urination, defecation and sleep to assess the impact of massage therapy to eliminate bilirubin faster from the body. This study is similar to a study which used massage therapy to reduce the serum bilirubin levels in neonates receiving Phototherapy. (Nuthcharin Intanai, Tipawan Daramas, 2024)

The study shows a thorough analysis of the demographic data as well as clinical variables, among which 100% are institutional deliveries, 100% are full term babies, 70% of neonates are breast fed, 90% of neonates have an APGAR score between 7-10 and 60-80% of neonates have serum Bilirubin levels more than 10 mg/dl. The findings showed decrease in bilirubin levels in both experimental and control group as a result of low sample size. The study also showed significant difference between the effect of massage therapy on serum bilirubin scores in pre-test and post-test of neonates in experimental group with a t-value of 7.93 and a p-value of 0.0001 indicating a demarcating level of significance. It also showed some level of significance in the night time sleeping pattern of the neonates. The biophysical parameters of weight gain show significant difference between the experimental and control group.

CONCLUSION

Infant massage after birth has numerous amounts of benefits and this therapy should be practiced by mothers to promote not only growth and development but also to prevent increasing serum bilirubin levels causing neonatal jaundice. Massage can also be used as a routine therapy in hospitals for better outcomes and reduced hospitalization in neonates. However, this study was a Pilot study, hence the low sample size, limited duration of massage therapy and techniques can be considered for further studies to

Journal of Chemical Health Risks

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JCHR (2026) 16(2), 2666-2682 | ISSN:2251-6727

improve the efficiency of reduction of serum bilirubin levels in neonatal jaundice. The samples can also be randomized for both the groups to prevent experimental bias and increase experiment reliability.

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