UNIVERSITAS GALUH
FAKULTAS ILMU KESEHATAN
TERAKREDITASI "B" OLEH : LAM-PTKes
Jl. R.E. Martadinata No. 150 Tlp. (0265) 774435 Ciamis 46274
Website : fikes.unigal.ac.id, email : fikesunigalciamis@gmail.com

SURAT KEPUTUSAN
DEKAN FAKULTAS ILMU KESEHATAN UNIVERSITAS GALUH
NOMOR : 006/401/SK/AK/D/II/2024
Tentang
PENGANGKATAN PEMBIMBING KARYA ILMIAH AKHIR NERS (KIAN)
PROGRAM PENDIDIKAN PROFESI NERS TAHUN AKADEMIK 2023-2024

DEKAN FAKULTAS ILMU KESEHATAN UNIVERSITAS GALUH CIAMIS

MENIMBANG : 1. Bahwa untuk kelancaran dan kesesuaian penulisan Karya Ilmiah Akhir Ners (KIAN) perlu diangkat Dosen Pembimbing;
2. Bahwa untuk legalitas pembimbing dalam melakukan kegiatan bimbingan penulisan Karya Ilmiah Akhir Ners (KIAN) perlu di terbitkan Surat Keputusan Dekan.

MENGINGAT : 1. Undang-undang Nomor 12 Tahun 2012 tentang Sistem Pendidikan Nasional;
1. Peraturan Pemerintah Nomor 4 Tahun 2014 tentang Penyelenggaraan Pendidikan Tinggi dan Pengelolaan Pendidikan Tinggi;
2. Keputusan Menteri Pendidikan Nasional Nomor 184/U/2001 tentang Pedoman Pengawasan, Pengendalian dan Pembinaan Program Diploma, Sarjana dan Pascasarjana di Perguruan Tinggi;
3. Surat Keputusan Yayasan Pendidikan Galuh Ciamis Nomor 1 Tahun 2017 tanggal 18 Juli 2017 tentang Statuta Universitas Galuh;
4. Keputusan Rektor Universitas Galuh Nomor 037A/4123/SK/AK/R/II/2017 tentang Pemberlakuan Pedoman Akademik Universitas Galuh;
5. Surat Keputusan Rektor Universitas Galuh Nomor : 262/4123/SK/G/VIII/2023 Tanggal 26 Agustus 2023 tentang Pemberhentian dan Pengangkatan Dekan Fakultas Ilmu Kesehatan Universitas Galuh Masa Jabatan 2023-2027;

MEMPERHATIKAN : Surat Ajuan dari Ketua Pendidikan Profesi Ners Fakultas Ilmu Kesehatan Universitas Galuh Nomor 005/401/SM/AK/Ka_Kep/I/2024 perihal Permohonan SK Pembimbing KIAN Program Profesi Ners T.A. 2023/2024

MEMUTUSKAN

MENETAPKAN :

PERTAMA : Nama : **Ayu Novia Rahmawati Pratama**
Nomor Pokok : **1490123075**
Program Studi : Pendidikan Profesi Ners

KEDUA : Mengangkat Pembimbing Karya Ilmiah Akhir Ners mahasiswa seperti yang tertulis pada diktum pertama sebagai berikut:
Pembimbing I : **Daniel Akbar Wibowo,S.Kep.,Ners., M.M., Mkep**
Pembimbing II : **Dedeng Nurkholik Sidik P., S.KM., S.Kep.,Ners., M.M., M.Kep**

KETIGA : Pembimbing Karya Ilmiah Akhir Ners mempunyai tugas membimbing dan membantu mahasiswa dalam menyelesaikan penyusunan Karya Ilmiah Akhir Ners.

KEEMPAT : Surat Keputusan ini berlaku sejak tanggal ditetapkan, dan apabila di kemudian hari ternyata terdapat kekeliruan dalam Surat Keputusan ini, akan dilakukan perbaikan sebagaimana mestinya.
Surat Keputusan ini disampaikan kepada yang bersangkutan untuk diketahui dan dipergunakan sebagaimana mestinya

Ditetapkan : Ciamis
Pada Tanggal : 10 Januari 2024
Dekan,

Tita Ronita, S.Kep., Ners., MM., M.Kep
NIK. 11.3112770275

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JBI Critical Checklist for Quasy Experimental Studies
(non-randomized experimental studies)

Reviewer : Ayu Novia Rahmawati Pratama Date : 05 Mei 2024

Author : Li-Chin Lu, et.al Year : 2020 Record Number

	Yes	No	Unclear	Not applicable
1. Is it clear in the study what is the 'cause' and what is the 'effect' (i.e. there is no confusion about which variable comes first)?	✓			
2. Were the participants included in any comparisons similar?	✓			
3. Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or interventionof interest?	✓			
4. Was there a control group?		✓		
5. Were there multiple measurements of the outcome both pre and post the intervention/exposure?	✓			
6. Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?	✓			
7. Were the outcomes of participants included in any comparisons measured in the same way?	✓			
8. Were outcomes measured in a reliable way?	✓			
9. Was appropriate statistical analysis used?	✓			

Overall appraisal: Include ✓☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

Layak dilakukan review : 88%

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Reviewer : Ayu Novia Rahmawati Pratama Date : 05 Mei 2024

Author _ : Zahra Akbarian Rad, et.al Year : 2015 Record Number

	Yes	No	Unclear	Not applicable
1. Is it clear in the study what is the 'cause' and what is the 'effect' (i.e. there is no confusion about which variable comes first)?	✓			
2. Were the participants included in any comparisons similar?	✓			
3. Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or interventionof interest?	✓			
4. Was there a control group?	✓			
5. Were there multiple measurements of the outcome both pre and post the intervention/exposure?	✓			
6. Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?	✓			
7. Were the outcomes of participants included in any comparisons measured in the same way?	✓			
8. Were outcomes measured in a reliable way?	✓			
9. Was appropriate statistical analysis used?	✓			

Overall appraisal: Include ✓☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

Layak dilakukan review : 100%

THE JOANNA BRIGGS INSTITUTE

Reviewer : Ayu Novia Rahmawati Pratama Date : 05 Mei 2024

Author _ : Jose Maria, et.al Year : 2019 Record Number

	Yes	No	Unclear	Not applicable
1. Is it clear in the study what is the 'cause' and what is the 'effect' (i.e. there is no confusion about which variable comes first)?	✓			
2. Were the participants included in any comparisons similar?	✓			
3. Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or interventionof interest?	✓			
4. Was there a control group?	✓			
5. Were there multiple measurements of the outcome both pre and post the intervention/exposure?	✓			
6. Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?	✓			
7. Were the outcomes of participants included in any comparisons measured in the same way?	✓			
8. Were outcomes measured in a reliable way?	✓			
9. Was appropriate statistical analysis used?	✓			

Overall appraisal: Include ✓☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

Layak dilakukan review : 100%

THE JOANNA BRIGGS INSTITUTE

Reviewer : Ayu Novia Rahmawati Pratama Date : 05 Mei 2024

Author _ : Lusia, et.al Year : 2023 Record Number

	Yes	No	Unclear	Not applicable
1. Is it clear in the study what is the 'cause' and what is the 'effect' (i.e. there is no confusion about which variable comes first)?	✓			
2. Were the participants included in any comparisons similar?	✓			
3. Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or interventionof interest?	✓			
4. Was there a control group?	✓			
5. Were there multiple measurements of the outcome both pre and post the intervention/exposure?	✓			
6. Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?	✓			
7. Were the outcomes of participants included in any comparisons measured in the same way?	✓			
8. Were outcomes measured in a reliable way?	✓			
9. Was appropriate statistical analysis used?	✓			

Overall appraisal: Include✓ ☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

Layak dilakukan review : 100%

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Reviewer : Ayu Novia Rahmawati Pratama Date : 05 Mei 2024

Author _ : Umi Kalsum Year: 2014 Record Number

	Yes	No	Unclear	Not applicable
1. Is it clear in the study what is the 'cause' and what is the 'effect' (i.e. there is no confusion about which variable comes first)?	✓			
2. Were the participants included in any comparisons similar?	✓			
3. Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or interventionof interest?	✓			
4. Was there a control group?		✓		
5. Were there multiple measurements of the outcome both pre and post the intervention/exposure?	✓			
6. Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?	✓			
7. Were the outcomes of participants included in any comparisons measured in the same way?	✓			
8. Were outcomes measured in a reliable way?	✓			
9. Was appropriate statistical analysis used?	✓			

Overall appraisal: Include ✓ ☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

Layak dilakukan review : 88%

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Reviewer : Ayu Novia Rahmawati Pratama Date : 05 Mei 2024

Author _ : Ida Susila Year : 2017 Record Number

	Yes	No	Unclear	Not applicable
1. Is it clear in the study what is the 'cause' and what is the 'effect' (i.e. there is no confusion about which variable comes first)?	✓			
2. Were the participants included in any comparisons similar?	✓			
3. Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or interventionof interest?	✓			
4. Was there a control group?		✓		
5. Were there multiple measurements of the outcome both pre and post the intervention/exposure?	✓			
6. Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?	✓			
7. Were the outcomes of participants included in any comparisons measured in the same way?	✓			
8. Were outcomes measured in a reliable way?	✓			
9. Was appropriate statistical analysis used?	✓			

Overall appraisal: Include ✓ ☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

Layak dilakukan review : 88%

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Reviewer : Ayu Novia Rahmawati Pratama Date : 05 Mei 2024

Author _ : Sharifa Mohammed Ali Al Balushi, et.al Year 2019 Record Number

	Yes	No	Unclear	Not applicable
1. Is it clear in the study what is the 'cause' and what is the 'effect' (i.e. there is no confusion about which variable comes first)?	✓			
2. Were the participants included in any comparisons similar?	✓			
3. Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or interventionof interest?	✓			
4. Was there a control group?	✓			
5. Were there multiple measurements of the outcome both pre and post the intervention/exposure?	✓			
6. Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?	✓			
7. Were the outcomes of participants included in any comparisons measured in the same way?	✓			
8. Were outcomes measured in a reliable way?	✓			
9. Was appropriate statistical analysis used?	✓			

Overall appraisal: Include ✓☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

Layak dilakukan review : 100%

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Reviewer : Ayu Novia Rahmawati Pratama Date : 05 Mei 2024

Author _ : Vitrianingsih et.al Year : 2019 Record Number

	Yes	No	Unclear	Not applicable
1. Is it clear in the study what is the 'cause' and what is the 'effect' (i.e. there is no confusion about which variable comes first)?	✓			
2. Were the participants included in any comparisons similar?	✓			
3. Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or interventionof interest?	✓			
4. Was there a control group?	✓			
5. Were there multiple measurements of the outcome both pre and post the intervention/exposure?	✓			
6. Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?	✓			
7. Were the outcomes of participants included in any comparisons measured in the same way?	✓			
8. Were outcomes measured in a reliable way?	✓			
9. Was appropriate statistical analysis used?	✓			

Overall appraisal: Include ✓☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

Layak dilakukan review : 100%

THE JOANNA BRIGGS INSTITUTE

Reviewer : Ayu Novia Rahmawati Pratama Date : 05 Mei 2024

Author _ : Susi Hartati et.al Year : 2020 Record Number

	Yes	No	Unclear	Not applicable
1. Is it clear in the study what is the 'cause' and what is the 'effect' (i.e. there is no confusion about which variable comes first)?	✓			
2. Were the participants included in any comparisons similar?	✓			
3. Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or interventionof interest?	✓			
4. Was there a control group?	✓			
5. Were there multiple measurements of the outcome both pre and post the intervention/exposure?	✓			
6. Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?	✓			
7. Were the outcomes of participants included in any comparisons measured in the same way?	✓			
8. Were outcomes measured in a reliable way?	✓			
9. Was appropriate statistical analysis used?	✓			

Overall appraisal: Include ✓ ☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

Layak dilakukan review : 100%

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Massage therapy for weight gain in preterm neonates: A systematic review and meta-analysis of randomized controlled trials

Li-Chin Lu [a,b], Shao-Huan Lan [c], Yen-Ping Hsieh [d], Long-Yau Lin [e], Jong-Chen Chen [a], Shou-Jen Lan [f,*]

[a] Department of Information Management, National Yunlin University of Science and Technology, Taiwan
[b] School of Management, Putian University, China
[c] School of Pharmaceutical Sciences and Medical Technology, Putian University, China
[d] Department of Long Term Care, National Quemoy University, Taiwan
[e] Department of Obstetrics and Gynecology, Chung-Shan Medical University Hospital, Taiwan
[f] Department of Post-Baccalaureate Veterinary Medicine, Asia University, Taiwan

ARTICLEINFO

Keywords:
Preterm neonates
Low birth weight
Massage therapy
Weight gain

ABSTRACT

Objectives: Weight gain is the main criterion for hospital discharge. This study measured the effectiveness of treating preterm neonates with massage therapy.
Design: Systematic review and meta-analysis of randomized controlled trials.
Data sources: Web of Science, Ovid-Medline, CINAHL, ProQuest, and PubMed (up to July 24, 2018).
Study selection: Randomized controlled trials involving preterm infants with very-low-birth weight or low-birth-weight that examined the effect of massage therapy, and at least one outcome assessing infants' weight change or weight gain.
Results: Pooled effect estimate from 15 trials with 697 participants showed that massage therapy improved daily weight gain by 5.07 g/day (95% CI 2.19–7.94, p ¼ 0.0005). More benefits were observed when preterm neonates received moderate pressure massage (5.60 g/day, 95% CI 2.64–8.56, p ¼ 0.0002) than when receiving light- pressure therapy (1.08 g/day, 95% CI 0.29–7.96, p 0.0006). ¼
Conclusions: Massage therapy is beneficial for preterm infant weight gain.

1. Introduction

Massage has been reported by nursing staff and mothers to promote weight gain in preterm neonates [1–5]. Studies have suggested that massage therapy stimulates vagal activity, which is related to weight gain and sleep–wake state behavior maturation [6], through increased gastric motility and insulin-like growth factor-1 (IGF-1) [7,8].

A review article discussed supplemental stimulation approaches that had positive effects on preterm infants [1]. In 1987, a systematic review of 19 studies suggested that infants receiving tactile stimulation were healthier than those in control groups [9]. Another review demonstrated that massage therapy (MT) for preterm neonates with low birth weight increased weight and reduced hospitalization time [10].

The massage protocol for preterm neonates involves administering tactile and kinesthetic stimulation for 15 min divided equally into three phases [2]. In the first and third phases, the neonate receives moderate pressure stroking (moving the skin). The second phase is comprised of kinesthetic stimulation, during which the infant lays on its back and its limbs are passively moved into flexion and extension [2]. Studies have demonstrated the benefit of massage on weight gain in preterm infants.

Body weight is the most common metric used to assess the health of preterm neonates. This study pooled randomized controlled trial (RCT) data from relevant studies and conducted a meta-analysis to assess the effects of massage therapy on preterm neonates.

2. Material and method

This study followed the PRISMA guidelines for meta-analysis of randomized controlled trials [11]. The flow diagram of research is displayed in Fig. 1. The study adhered to the PICO (population,

* Corresponding author. No. 500, Lioufeng Rd., Wufeng District, Taichung City, 41354, Taiwan.
E-mail addresses: jane90467@gmail.com (L.-C. Lu), shawnlan0713@gmail.com (S.-H. Lan), yenping2010@gmail.com (Y.-P. Hsieh), xillin681113@gmail.com(L.-Y. Lin), jcchen@yuntech.edu.tw (J.-C. Chen), shoujenlan@gmail.com (S.-J. Lan).

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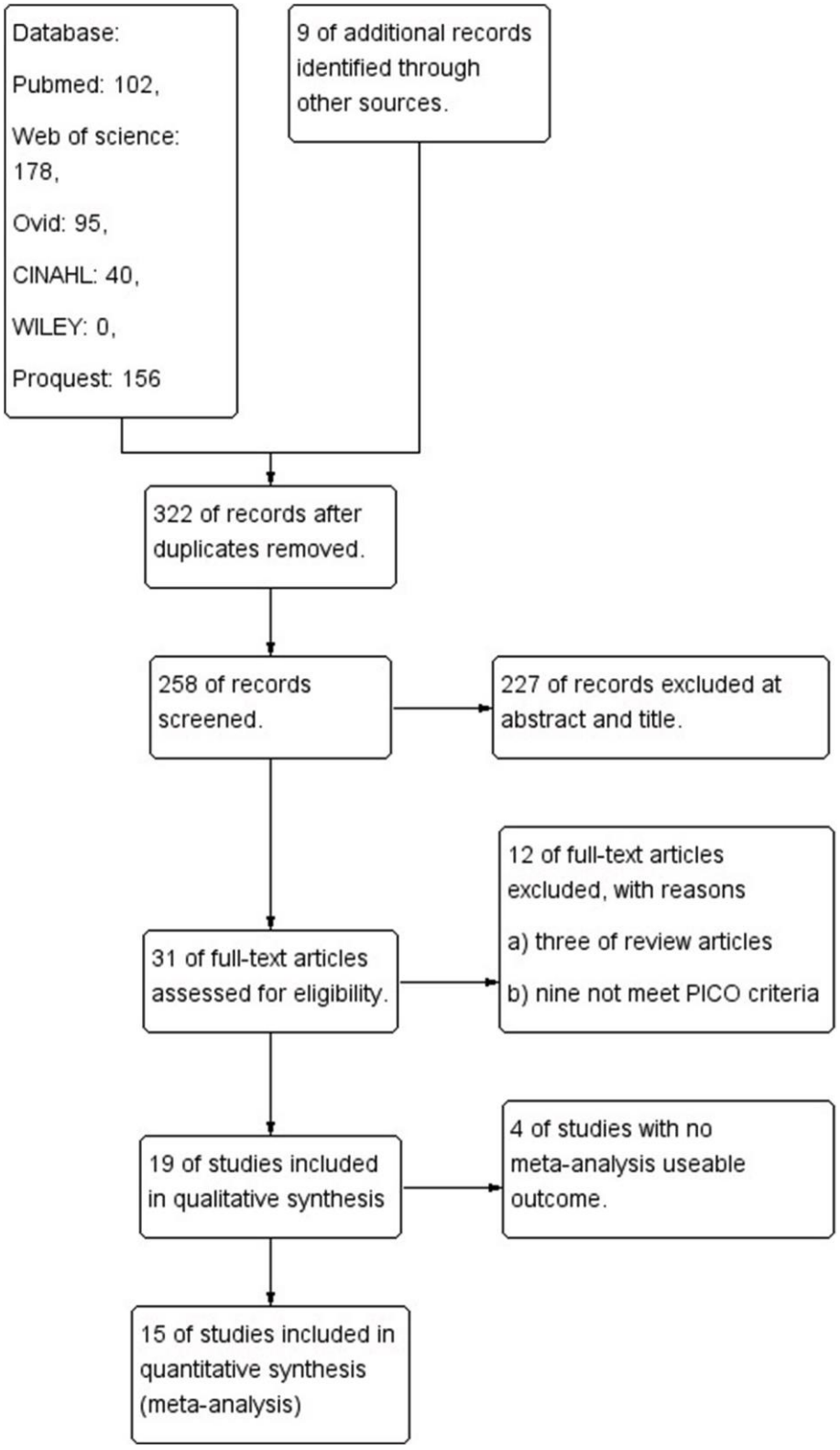

Fig. 1. Flowchart of search results and article retrieval. In total, 580 aritcles were identified; 19 full texts articles were included in the final review, and 15 of these studies were included in the meta-analysis.

intervention, comparison, and outcome) method (Table 1).

2.1. Search strategy

Review of the existing literature was conducted across English-speaking databases. Databases included Web of Science, Ovid- Medline, CINAHL, ProQuest, and PubMed. Searches were performed to find articles with keywords in their content. Case studies without control groups were excluded.

Searches included the following terms: “Small for gestational age” or

Table 1
Question (using PICO).

PICO	PICO description
Participant/problem	Preterm, Low birth weight, Premature
Intervention/EXposure	Touch, Tactile, Sham, Acupressure
Comparison	Standard care
Outcome	body weight or weight gain

"Light for gestational age" or "Low birth weight", combined with "Touch" or "Massage" or "Acupressure" or "Tactile" or "Sham." This search approach retrieved 580 references. Search strategies, such as specific keywords and program syntax, applied in the five databases in this study are featured in supplement 1–2.

Table 2
Study characteristics.

Very Low-Birth Weight Author	Year	Country	Design	Intervention; Number of cases	Baseline Gestational	Birth Weight	Measures
Arora [25]	2005	India	RCT	Oil massage:23	33.9 ± 1.7	1280.2 ± 170.7	Weight, length
				Massage:23	34.6 ± 1.1	1298.6 ± 175.4	Head circumference
				No massage.:23	34.7 ± 1.5	1327.1 ± 125.1	Skin thickness
Diego [7]	2005	USA	RCT	Massage:16 sham:16	29.8 ± 3.4	1091 ± 193	Weight gain
				Control:16	30.3 ± 1.7	1184 ± 205	Caloric intake
					29.6 ± 2.7	1265 ± 333	Vagal activity
							Gastric Motility
							Days to discharge
Diego [26]	2014	USA	RCT	kinesthetic:15	29.8 ± 3.4	1156.53 ± 180.55	Weight gain
				tactile:15	30.3 ± 1.7	1232.67 ± 186.57	Caloric intake
Dieter [27]	2003	USA	RCT	Massage:16	30.1 ± 2.5	1359.3 ± 140.1	Weight gain sleep/wake behavior
				Control:16	31.1 ± 2.8	1421.5 ± 91.9	
Field [4]	1986	USA	RCT	kS/tactile:20	31 ± 2.2	1280 ± 249	Weight gain
				Control:20	31 ± 2.8	1268 ± 199	Height
							Caloric intake
							Days in NICU
							Brazelton scale
Gonzalez [28]	2009	Mexico	RCT	Massage:30	31.4 ± 2.0	1235 ± 243	Weight gain
				Control:30	31.7 ± 1.8	1220 ± 192	Caloric intake
							Hospital stay
Ho [29]	2010	Hong Kong	RCT	Massage:10	30.2 ± 2.0	1104.5 ± 208.5	TIMP score
				Control:10	29.6 ± 2.3	1093.0 ± 224.7	Weight gain
							Caloric intake
Massaro [30]	2009	USA	RCT	Massage:19	29 ± 0.46	1097 ± 68	Weight gain
				M/KS:20	29 ± 0.55	1124 ± 75	Length of stay
				Control:20	27 ± 0.45	959 ± 44	Head circumference
Wheeden [31]	1993	USA	RCT	Massage:15	29.7 ± 1.9	1158.3 ± 155.1	Weight gain
				Control:15	30.8 ± 2.1	1265.4 ± 206.6	Caloric intake
							Respiration rate
							Heart rate
							Brazelton scale
Low-Birth Weight							
Abdallah [16]	2013	Lebanon	RCT	Massage:27	32.2 ± 1.9	1747 ± 389	Weight gain
				Control:23	32.6 ± 2.6	1684 ± 446	Length of stay
							Apgar Score
							Mental scores
							Motor scores
Akhavan Karbasi [17]	2013	Iran	RCT	Massage:20	34.5 ± 1.26	1721 ± 123	Weight
				Control:20	34.6 ± 1.35	1539 ± 513	Height
							Head circumference
Aliabadi [18]	2013	Iran	RCT	Tactile:20	33.64 ± 2.06	1978.50 ± 317.46	Weight
				Control:20	33.67 ± 1.91	2051.50 ± 305.96	Brazelton scale
							NBAS
Ferber [19]	2002	Israel	RCT	Mothers:21	30.90 ± 1.94	1318 ± 333.81	Weight gain
				Staff:17	31.88 ± 1.93	1527 ± 34.63	Caloric intake
				Control:19	31.52 ± 2.22	1375 ± 370.66	
Field [6]	2006	USA	RCT	moderate:	Mean	Mean	Weight gain
				light pressure:	GA ¼ 30	BWT ¼ 1292 g	Heart rate
							Deep sleep
							Movement
Kumar [20]	2013	India	RCT	Oil Massage:25	32.9 ± 1.4	1466.4 ± 226.8	Weight gain
				Control:23	32.6 ± 1.4	1416.6 ± 229.9	Height
							Head circumference

Lahat [21]	2007	ISRAEL	RCT Cross-over	Massage:5 Control:5	32 ± 1.7	1384 ± 441	weight gain Energy expenditure
Rangey [22]	2014	India	Quasi-experiment	Massage:15 Control:15	<37		Weight Length of stay
Saeadi [23]	2015	Iran	RCT	oil massage:40 massage:40 control:41	30.8 ± 2.4 yrs 31.6 ± 2.7		weight gain
Salam [24]	2015	Pakistan	RCT	Intervention n ¼ 128 Control n ¼ 130	33.9 ± 2.4 34.4 ± 2.6	2114.1 ± 499.7 2249.5 ± 569.0	Weight gain Skin condition Mortality

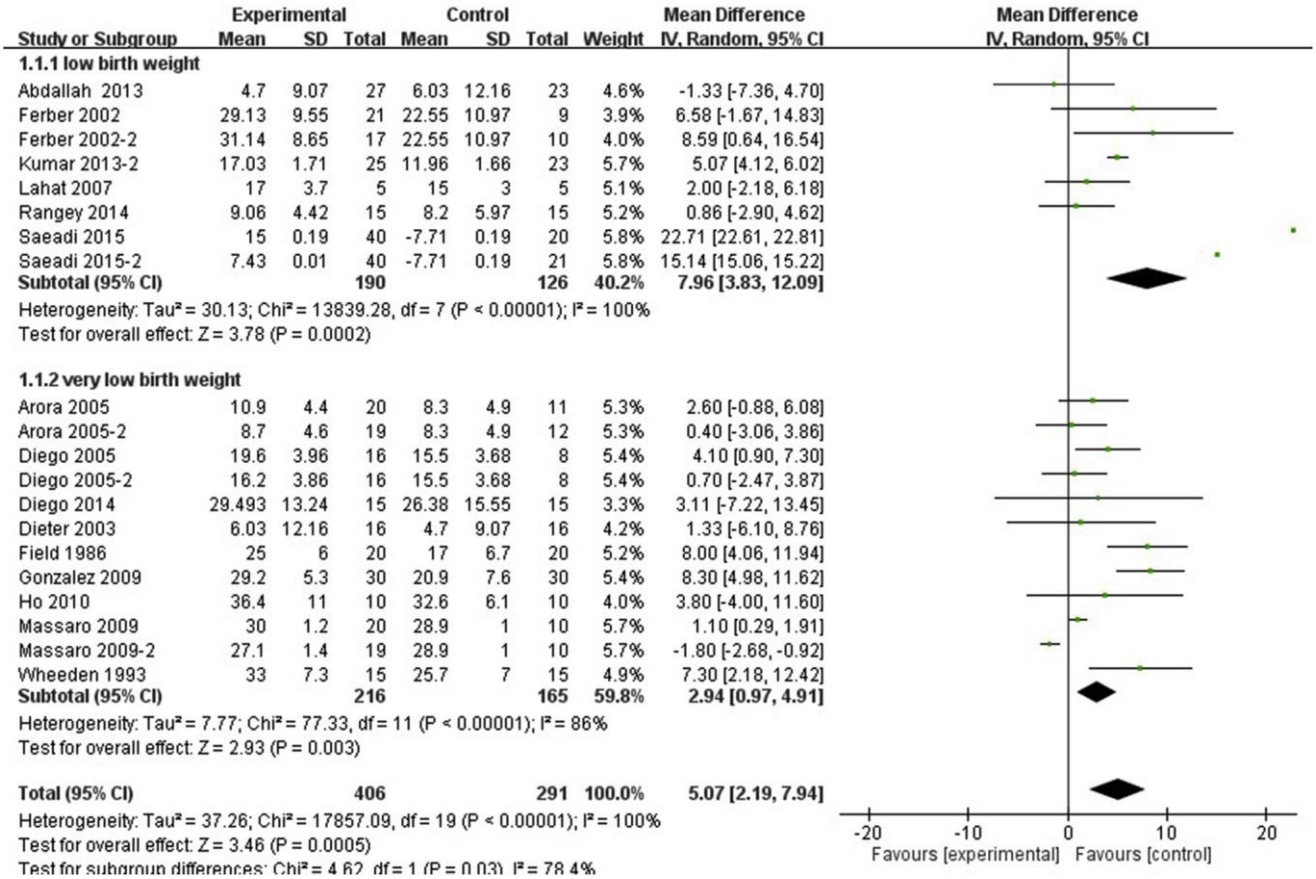

Fig. 2. Forest plot of difference in weight change. The weight of preterm neonates who received massage intervention increased their weight daily by an average of 5.07 g, a significant increase (95% CI: 2.19–7.94, p ¼ 0.0005). These effects were observed in both the low-birth-weight group and the very-low-birth-weight group: 7.96 g/day (95% CI 3.83–12.09, p ¼ 0.0002) and 2.94 g/day (95% CI 0.97–4.91, p ¼ 0.003).

2.2. Study selection

Studies were included for analysis based on the following criteria: (a) study design must be that of a randomized controlled trial or quasi-experimental design; (b) preterm neonates with low birth weight between 1500 and 2500 g; (c) preterm neonates with very low birth weight between 500 and 1500 g. The exclusion criteria were as follows: (a) non-peer reviewed research; (b) study participants were not preterm infants categorized as very low birth weight or low birth weight; (c) study outcomes did not involve adequate weight information, such as the mean and standard deviation; (d) non-full-text articles; and (e) articles published in languages other than English.

2.3. Data extraction

The following data were extracted from the selected studies: demographic information, massage procedures, and effect sizes for each study. Two investigators independently reviewed the title and abstract of each article retrieved from the literature review to identify potentially relevant studies. The selected articles were reviewed to ensure they fulfilled the inclusion criteria for data extraction. If there was disagreement in the study selection, the final decision on inclusion was made by the third investigator.

Information was extracted from the selected studies by using a standardized data extraction form, which included information on the year of publication, country, study design, demographic variables, sample size, and mean and standard deviation. The quality of each study was evaluated using guidelines developed by Higgins et al. [12]. The sources of bias in this methodology scale include selection bias, performance bias, attrition bias, and detection bias [12].

2.4. Statistical analysis

The effect measure for each comparison was weighted mean difference (WMD) and a 95% confidence interval (CI). Between-study heterogeneity was tested using Cochran's Q test and I^2 metric. If the p-value was less than 0.05 in the Q-test or if the I^2 index was higher than 50%, the pooled analysis was considered significantly heterogeneous; fixed- or random-effects model was chosen based on statistical evidence of heterogeneity [13–15]. Forest plots were generated using RevMan 5.3 software. Publication bias was ascertained through visual inspection of the funnel plot and Egger's test using Comprehensive Meta-Analysis Software 2.0.

3. Results

3.1. Description of included studies

The flow chart of selected studies, with detailed information, is presented in Fig. 1 580 references were retrieved. First, retrieved references were screened to remove trials that failed to meet inclusion criteria; 3 reviews and 270 studies that focused on other interventions and not on massage were excluded. Case-based studies, books, duplicate papers, and editorials or comments were also excluded. 19 eligible studies were included in the analysis. Of the 19 trials included [2,6,7, 16–31], all were randomized controlled trials (RCTs), 9 on very low birth weight neonates [2,7,16,18,19,21–23,28], and 10 on low birth weight neonates [6,17,20,24–27,29–31]. Table 2 (very low-birth weight

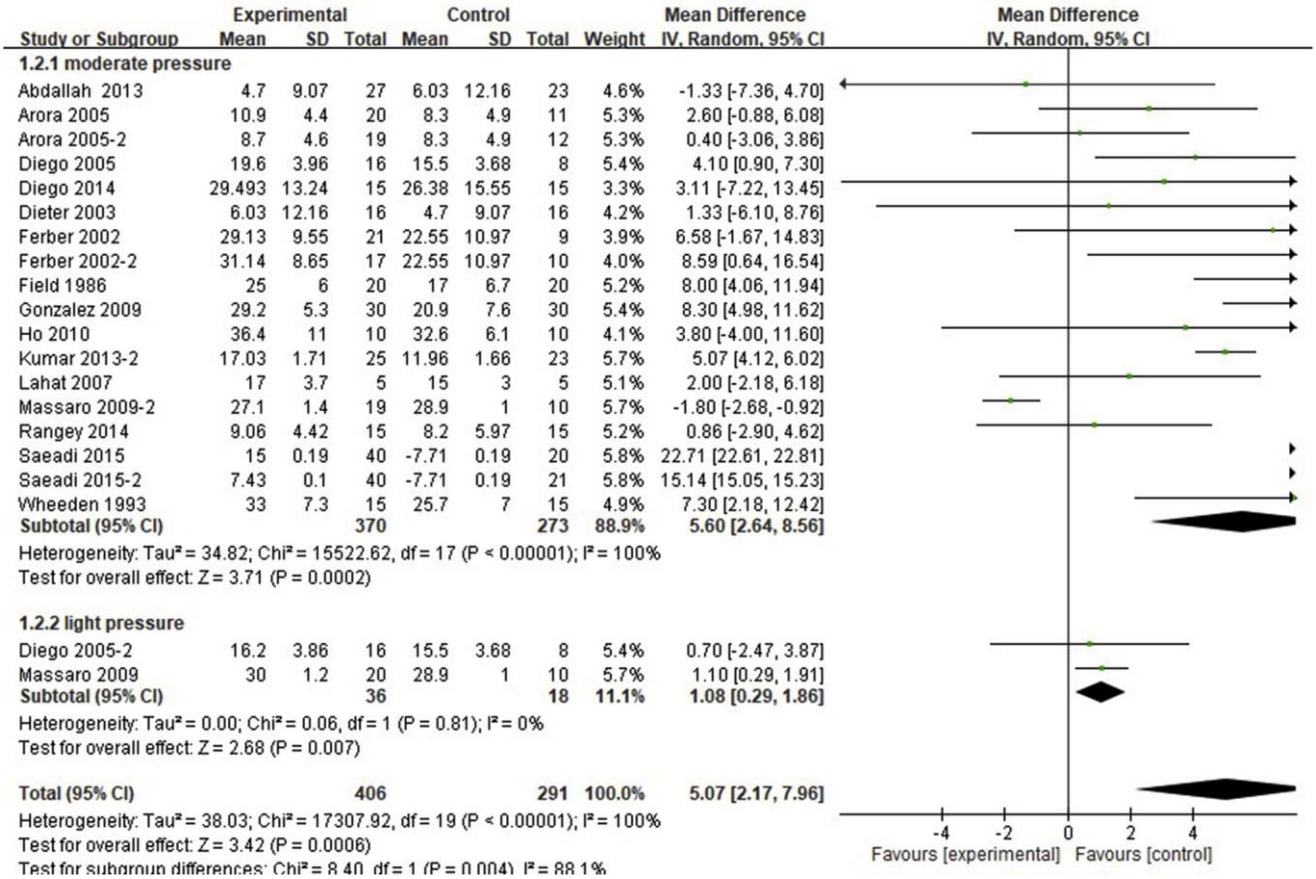

Fig. 3. Forest plot of difference in massage pressure force. Preterm neonates who received massages with greater pressure gained more weight daily compared with the control group (5.55 g/day, 95% CI 2.44–8.66, p ¼ 0.0005). Although preterm neonates who received sham or touch exhibited improvement in body weight, this increase was not statistically significant (2.87 g/day, 95% CI −0.38–6.12, p ¼ 0.08).

and low-birth weight) exhibits each study included in the quantitative analysis. The included studies had a low to moderate risk of bias.

In the 19 selected studies, preterm neonates were 28–37 weeks gestational age and in stable condition. Those with congenital heart disease, gastrointestinal disease, central nervous system dysfunction, or morbidity were excluded, as were those receiving emergency care, such as ventilation. Clinical results of nursing interventions were recorded. Weight gain and body weight were used to assess the effects of massage therapy.

3.2. Weight gain

Individual analyses were performed for subgroups of neonates with low and very low birth weights. In total, 697 preterm neonates were included in the 15 trials [2,7,16–24,27–30] that investigated daily weight gain of a massage group and control group. The daily weight gain of preterm neonates receiving massage averaged 5.07 g (95% CI 2.19–7.94, p 0.0005; Fig. 2). Daily weight gain in the massage group and control group was recorded in 316 participants in the low-birth-weight subgroup from the 6 trials [17,20,24,27,29,30]. The weight of the low birth weight preterm neonates receiving massage increased daily by 7.96 g/day (95% CI 3.83–12.09, p 0.0002; Fig. 2). The very-low-birth weight subgroup had 381 participants (in 9 trials) [2,7,16,18,19,21–23,28] in the massage group and control group. The weight of the very low birth weight preterm neonates who received massage increased by 2.94 g/day (95% CI 0.97–4.91, p ¼ 0.003; Fig. 2).

3.3. Varying massage pressure

To investigate the effect of massage pressure on neonates, we classified the collected trials into two groups: light-pressure (touch, tactile, and sham massage) and moderate-pressure stimulation, such as massage. We then conducted subgroup meta-analysis. Preterm neonates who received moderate pressure [2,16–21,23,24,27–30]and light pressure [7,22] massages which both compare with control group exhibited daily weight gain (5.60 g/day, 95% CI 2.64–8.56, p ¼ 0.0002; 1.08 g/day, 95% CI 0.29–1.86, p ¼0.007; Fig. 3). However, preterm neonates who received moderate pressure gained more weight daily than preterm neonates who received sham or touch massage (p ¼ 0.004).

3.4. Body weight

Neonates in the low birthweight massage group had greater body weight compared with the control group. This difference was statistically significant, with a mean difference of 140.99 g (95% CI:2.56–−284.54, p ¼ 0.05). However, the body weight of the very-low-birth-weight massage and control groups did not differ: 47.29 g (95% CI: −20.91–115.50, p ¼ 0.17) or overall group 113.51 g (95% CI: −8.40–235.43, p ¼ 0.07; Suppl. 3). A potential explanatory factor could be the large differences in birth weights across the two groups.

4. Discussion

The results of this meta-analysis demonstrate that massage therapy significantly increases daily weight gain in preterm neonates, including low birth weight neonates and very low birth weight neonates. In

addition, moderate pressure massage therapy versus light pressure massage therapy is found to greater daily weight gain in preterm neonates.

As others have noted massage therapy leads to increased vagal activity, gastric motility, insulin, and IGF-1 in preterm neonates [8,10,32]. Massage also releases motilin and gastrin, which improve peristalsis and defecation [33,34]. Massage reduces neonatal jaundice [35]. Abdominal massage can prevent poor feeding and enhance digestive and central nervous system function [36,37]. The benefits of preterm neonatal massage include reduced hospital stay and associated decreased costs [2].

A previous meta-analysis has shown that massage is an effective way to increase weight gain and shorten hospital stays for neonates born at 25–37 weeks gestation [38]. In a literature review of preterm neonate massage, neonates with 5–10 days massage had an average of 21%–48% greater weight gain than the control group [10]. Days in hospital were also reduced by 3–6 days on average. Another literature review has recommended the application of comforting touch to very premature neonates born before gestational age of 30 weeks [39].

Regarding emollient therapy, evidence suggests that providing massage with coconut oil two times a day for 28 days assists in maintaining skin integrity and in reducing the risk of infection in preterm infants [31]. Massage with medium-chain triglycerides (MCT) increases the body weight of preterm neonates [30]. Massage is a useful method of promoting the growth and development of preterm and low birth weight neonates in current clinical practice [5].

Future research should also include long-term follow up of infants in order to determine the effects of massage over time. Moreover, future analysis should consider potential confound variables including gestational age, weight, physical condition, and length of hospital stay.

5. Study limitations

The studies included in this meta-analysis had different massage protocols and data collection methods. In some studies, other critical variables, such as gestational age and length of hospital stay, were not controlled. The results of the meta-analysis suggest that moderate pressure massage contributed to greater daily weight gain in preterm neonates with low and very low birth weights.

Declaration of competing interest

The authors disclose no conflicts of interest.

CRediT authorship contribution statement

Li-Chin Lu: Formal analysis, Writing - original draft. **Shao-Huan Lan:** Formal analysis, Writing - original draft. **Yen-Ping Hsieh:** Data curation, Writing - original draft. **Long-Yau Lin:** Data curation, Writing - original draft. **Jong-Chen Chen:** Writing - original draft. **Shou-Jen Lan:** Data curation, Writing - original draft.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ctcp.2020.101168.

References

[1] T. Field, Supplemental stimulation of preterm neonates, Early Hum. Dev. 4 (3) (1980) 301–314.
[2] T.M. Field, et al., Tactile/kinesthetic stimulation effects on preterm neonates, Pediatrics 77 (5) (1986) 654–658.
[3] F.A. Scafidi, T. Field, S.M. Schanberg, Factors that predict which preterm infants benefit most from massage therapy, J. Dev. Behav. Pediatr. 14 (3) (1993) 176–180.
[4] S. Mathai, et al., Effects of tactile-kinesthetic stimulation in preterms: a controlled trial, Indian Pediatr. 38 (10) (2001) 1091–1098.
[5] A. Vickers, et al., Massage for promoting growth and development of preterm and/or low birth-weight infants, Cochrane Database Syst. Rev. (2) (2004), Cd000390.
[6] T. Field, et al., Moderate versus light pressure massage therapy leads to greater weight gain in preterm infants, Infant Behav. Dev. 29 (4) (2006) 574–578.
[7] M.A. Diego, T. Field, M. Hernandez-Reif, Vagal activity, gastric motility, and weight gain in massaged preterm neonates, J. Pediatr. 147 (1) (2005) 50–55.
[8] T. Field, et al., Insulin and insulin-like growth factor-1 increased in preterm neonates following massage therapy, J. Dev. Behav. Pediatr. 29 (6) (2008) 463–466.
[9] K.J. Ottenbacher, et al., The effectiveness of tactile stimulation as a form of early intervention: a quantitative evaluation, J. Dev. Behav. Pediatr. 8 (2) (1987) 68–76.
[10] T. Field, M. Diego, M. Hernandez-Reif, Preterm infant massage therapy research: a review, Infant Behav. Dev. 33 (2) (2010) 115–124.
[11] D. Moher, et al., Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement, Ann. Intern. Med. 151 (4) (2009) 264–269. W64.
[12] J.P. Higgins, et al., The Cochrane Collaboration's tool for assessing risk of bias in randomised trials, BMJ 343 (2011) d5928.
[13] J. Higgins, S.G. Thompson, Quantifying heterogeneity in a meta-analysis, Stat. Med. 21 (11) (2002) 1539–1558.
[14] J.P. Higgins, et al., Measuring inconsistency in meta-analyses, Br. Med. J. 327 (7414) (2003) 557–560.
[15] J. Lau, J.P. Ioannidis, C.H. Schmid, Quantitative synthesis in systematic reviews, Ann. Intern. Med. 127 (9) (1997) 820–826.
[16] A. Wheeden, et al., Massage effects on cocaine-exposed preterm neonates, J. Dev. Behav. Pediatr. 14 (5) (1993) 318–322.
[17] S.G. Ferber, et al., Massage therapy by mothers and trained professionals enhances weight gain in preterm infants, Early Hum. Dev. 67 (1–2) (2002) 37–45.
[18] J.N. Dieter, et al., Stable preterm infants gain more weight and sleep less after five days of massage therapy, J. Pediatr. Psychol. 28 (6) (2003) 403–411.
[19] J. Arora, A. Kumar, S. Ramji, Effect of oil massage on growth and neurobehavior in very low birth weight preterm neonates, Indian Pediatr. 42 (11) (2005) 1092–1100.
[20] S. Lahat, et al., Energy expenditure in growing preterm infants receiving massage therapy, J. Am. Coll. Nutr. 26 (4) (2007) 356–359.
[21] A.P. Gonzalez, et al., Weight gain in preterm infants following parent-administered Vimala massage: a randomized controlled trial, Am. J. Perinatol. 26 (4) (2009) 247–252.
[22] A.N. Massaro, et al., Massage with kinesthetic stimulation improves weight gain in preterm infants, J. Perinatol. 29 (5) (2009) 352–357.
[23] Y.B. Ho, et al., Impact of massage therapy on motor outcomes in very low-birthweight infants: randomized controlled pilot study, Pediatr. Int. 52 (3) (2010) 378–385.
[24] B. Abdallah, L.K. Badr, M. Hawwari, The efficacy of massage on short and long term outcomes in preterm infants, Infant Behav. Dev. 36 (4) (2013) 662–669.
[25] S. Akhavan Karbasi, et al., Effect of body massage on increase of low birth weight neonates growth parameters: a randomized clinical trial, Iran. J. Reproductive Med. 11 (7) (2013) 583–588.
[26] F. Aliabadi, R.K. Askary, Effects of tactile-kinesthetic stimulation on low birth weight neonates, Iran J Pediatr 23 (3) (2013) 289–294.
[27] J. Kumar, et al., Effect of oil massage on growth in preterm neonates less than 1800 g: a randomized control trial, Indian J. Pediatr. 80 (6) (2013) 465–469.
[28] M.A. Diego, T. Field, M. Hernandez-Reif, Preterm infant weight gain is increased by massage therapy and exercise via different underlying mechanisms, Early Hum. Dev. 90 (3) (2014) 137–140.
[29] P.S. Rangey, M. Sheth, Comparative effect of massage therapy versus kangaroo mother care on body weight and length of hospital stay in low birth weight preterm infants, Int. J. Pediatr. 2014 (2014) 434060.
[30] R. Saeadi, Z. Ghorbani, A. Shapouri Moghaddam, The effect of massage with medium-chain triglyceride oil on weight gain in premature neonates, Acta Med. Iran. 53 (2) (2015) 134–138.
[31] R.A. Salam, G.L. Darmstadt, Z.A. Bhutta, Effect of emollient therapy on clinical outcomes in preterm neonates in Pakistan: a randomised controlled trial, Arch. Dis. Child. Fetal Neonatal Ed. 100 (3) (2015) F210–F215.
[32] M.A. Diego, et al., Preterm infant massage elicits consistent increases in vagal activity and gastric motility that are associated with greater weight gain, Acta Paediatr. 96 (11) (2007) 1588–1591.
[33] Z. Liu, et al., Mechanism of abdominal massage for difficult defecation in a patient with myelopathy (HAM/TSP), J. Neurol. 252 (10) (2005) 1280–1282.
[34] K.L. Harrington, E.M. Haskvitz, Managing a patient's constipation with physical therapy, Phys. Ther. 86 (11) (2006) 1511–1519.
[35] M. Basiri-Moghadam, et al., The effect of massage on neonatal jaundice in stable preterm newborn infants: a randomized controlled trial, J. Pakistan Med. Assoc. 65 (6) (2015) 602–606.
[36] K.S. Tekgunduz, et al., Effect of abdomen massage for prevention of feeding intolerance in preterm infants, Ital. J. Pediatr. 40 (2014) 89.

[37] H. Choi, et al., The effects of massage therapy on physical growth and gastrointestinal function in premature infants: a pilot study, J. Child Health Care 20 (3) (2016) 394–404.
[38] L. Wang, J.L. He, X.H. Zhang, The efficacy of massage on preterm infants: a meta-analysis, Am. J. Perinatol. 30 (9) (2013) 731–738.
[39] J.R. Smith, Comforting touch in the very preterm hospitalized infant: an integrative review, Adv. Neonatal Care 12 (6) (2012) 349–365.

The Effect of Massage on Weight Gain of Low-Weight Hospitalized Infants: A Randomized Clinical Trial

Sahar Johari[1], Hojjat Allah Haghgou[1], Mostafa Daemi[2], Tahereh Rezaeiyan[3], Zahra Mosala Nejad[3*]

1. Department of Occupational Therapy, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.
2. Department of Speech Therapy, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.
3. Department of Physical Therapy, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.

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ABSTRACT

Purpose: Low birth weight (LBW) is one of the most serious health problems in infants. Many studies indicate that LBW infants, who survive, may suffer from long- and short-term physical, mental, and social problems. This study aimed to determine the effect of massage therapy on weight gain of LBW neonates.

Methods: This study was a randomized clinical trial. A total of 45 LBW neonates were randomly allocated into experiment and control group. Three 15-minute period massages per day were administered in 5 days for the experiment group. Infants' weights were measured in both groups in 5 all days.

Results: Based on the results, weight gain in the experiment group was significantly higher than the control group.

Conclusion: Massage through tactile-kinetic stimulation result in weight gain of LBW neonates. Massage therapy can be recommended as the special and complementary care for LBW neonates. It can also be effective in prevention of neurologic and developmental problems in infants.

1. Introduction

Low birth weight (LBW) is one of the most serious health problems in today's world. Although LBW neonates comprise 6% to 7% of the total births, 75% of the death rate in neonates is implicated on it. Every year, 19% of neonates in the world are born with LBW which is the major cause of the infants' mortalities and morbidities. The premature birth rate and LBW in Iran is not exactly clear, but some sources in Iran have estimated the rate of LBW as 12% [3]. LBW babies (who survive) suffer 2 or 3 times more than normal children of disabilities and health problems as well as long-term and short-term psychological and social problems [4]. The growth and development of premature infants are of particular importance and weight is the most important factor in this regard [5].

Since infants actually receive very little nutrients in their first 3 to 4 days of lives (until the flow of the breast

*** Corresponding Author:**
Zahra Mosala Nejad, PhD
Address: *Department of Physical Therapy, University of Social Welfare and Rehabilitation Sciences, Kodakyar Ave., Daneshjo Blvd., Evin, Tehran, Iran.*
Phone: *+98 (935) 3977654*
E-mail: *zmosallanezhad@yahoo.com*

milk or other feeding methods be established), a progressive reduction in their body weights occurs. The premature infants lose more weight and regain the normal birth weight at a lower speed compared to the normal weight ones [6]. Gestational age and consequently the neonates' weight can affect the future weight gain in them, i.e. the lower the birth weight, the more weight loss in infants than the normal ones during the first 2 weeks of life [7]. Also, the lower the birth weight, the more the risk of the neurological complications and mental retardation in newborn babies. As much as 50% of the neonates with the birth weight of 500-750 g are at high risk of developing severe nervous system disabilities such as blindness, deafness, mental retardation, and cerebral palsy. The overall rate of neurodevelopmental disorders such as cerebral palsy, visual and audio impairments and learning disabilities in babies with LBW varies from 10% to 20% [8]. In addition to the effects on the infants' health, LBW can affect the family's mental state so that these parents experience a high level of anxiety about their children's long-term complications and their failure in reaching a normal growth and development [9].

One of the major problems in premature infants and their hospitalizations is their low weights. In many cases, insufficient weight gain is the main and important reason in prolongation of the infants' hospitalization, its high costs, and related problems [10]. Given that with the weight gain, the risk of anomalies in low weight neonates decreases, the effectiveness of various therapeutic methods to gain weight in LBW neonates is of significant importance. Massage or tactile-kinetic stimulation is one of the developmental interventions. Massaging with or without using oil is one of the ways in the premature neonates' weight gain [10]. It not only contributes to the infants' growth and development, but also have many benefits for the infant and his or her parents which leads to high regards in researchers to pay attention to [11]. New studies suggest that child' massage after birth and during the first months of life contributes to the child's growth and development [12] as well as the improvement of the weight gain and sleep patterns in these infants [13,14]. It can also lead to the better mineralization of bones, early discharge from the hospital and more efficient kinetic-behavioral responses [15, 16].

Several studies have been conducted on the effects of the massage therapy on the growth and the development of the various physical and even the behavioral aspects of infants. However, most of these studies had been conducted when the medical intervention and therapy needed for the infants were finished and they were discharged from ICU to the other care units. On the other hand, there is still no consensus on how to administer the massage and its processes, so we need more accurate and detailed studies in this area. Therefore, considering the high rate of LBW babies, the risk of the developmental delays and problems in these infants, and the golden time limit for the help and the well-timed treatment, this study aimed to examine the effects of massage and tactile-kinetic stimulation on the infants' weight gain in neonatal intensive care units (NICUs).

2. Materials and Methods

The present study was a double-blind clinical trial (Clinical Trail Code: IRCT201411189014N47). The sample size was determined based on the previous studies and relevant formulas with 95% power to assess the effect of the massage. In this regard, each group should possess at least 16 participants [17]. However, in this study, to prevent the effect of participants' dropout, a total of 45 hospitalized premature infants in Hamadan Fatemieh Hospital were recruited. The sampling was conducted consecutively from spring to summer 2015 by purposeful method and the participants, after being qualified for the study, were randomly assigned into experiment (n=23) and control groups (n=22). The study inclusion criteria were as follows:

- Birth weight less than 2400 g;
- Gestational age between 25 to 34 weeks;
- Stable medical conditions based on the pediatrician's diagnosis;
- Oral intake start;
- Being a 5-day neonate at the beginning of the study.

Also, the exclusion criteria were as follows:

- Having genetic disorders, congenital heart problems, central nervous system, and intraventricular hemorrhage;
- A history of drug abuse in mothers;
- Positive HIV test in children;
- Children's need for surgery;
- The beginning of breast feeding.

After informing the parents of the purpose, process, and potential benefits of the treatment used, as well as its safety for the infants and assuring them of the confidentiality of their information in the research, the consent

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forms were distributed among the parents and the infants' medical and demographic data were entered in a medical questionnaire using the mother and infant's medical records. All infants were weighed by a person other than the therapist and then, the experiment group received the treatment by Tiffany method [17] 3 times a day for 5 days, each time for 15 minutes of tactile stimulation in accordance with the following schedule which included 3 phases. Each 15-minute period included three 5 minute phases that in the first and last phases, the infant was lying on the stomach and was touched very gently with the soft parts of fingers of both hands. In these two phases, each of the following areas was consecutively touched for 1 minute:

First phase: mobile touching of the following areas in the prone positions:

- From the top of the head to the neck;
- From the neck to the shoulders;
- From the top of the back to waist;
- From the hips and then in the backward direction on both feet;
- From shoulders to the hands and then to return to the areas listed in both hands, 12 movements each one 5 seconds.

Second phase (middle phase): the infant was lying on his back and with the smooth and passive range of motions, the flexion and extension order were given to these 5 areas:

Right arm, left arm, right leg, left leg, both legs together in 5 one-minute steps that each step included 6 ten-second movements.

Third phase (the last phase) was the same as the first phase.

Five days later, the same experimenter who was blind to sampling the infants measured the infants' weights with the same first-used scale. This study was approved by the Ethics Committee of the University of Medical Sciences and the researchers tried their best to maintain all the ethical principles in all phases of the study. After data collection and reviewing their normal distribution, parametric tests, including independent t test and dependent t test, Chi-square, and ANCOVA were performed. In ANCOVA test, the first day variable was considered as covariate and the ANCOVA test was used for comparing the values between the two groups after the treatment considering the first-day weight added the covariate. For their analysis, SPSS version 16 was used.

3. Results

At the first of the study, the two groups were homogenous in terms of qualitative treatment variables including gender, recovery, oxygen therapy, receiving phototherapy, fluid therapy, and antibiotics and also, in terms of a-bit-treatment variables, including head circumference, height and weight at birth, duration of the pregnancy, 1-minute and 5-minute Apgar and the weight before treatment ($P>0.05$) (Tables 1&2).

Finally, to compare the two groups regarding the effects of the treatment on infants' weight gain with respect to the normal distribution of data, variance homogeneity, the distance between the measurements, insignificant correlation between the covariate variables (first-day weight) and the independent variable ($P>0.05$), the analysis of covariance was used. Its results showed that the weight gain in the experiment group has a significant difference from the control group ($P=0.003$). Table 3 includes these statistical tests.

4. Discussion

This study aimed to analyze the effects of massage on the weight gain of hospitalized low-weight infants in NICUs of Hamedan City hospitals. According to the results of this study, it was recognized that massage therapy increases the weight in LBW infants. The results of this study agree to Khoshrouzeh et al. results, which investigated the effects of massage by mothers on LBW infants' physical growth (48 infants in two groups). They showed that massage therapy affected the LBW infants' physical growth and increased their weight and height [1].

Of course, one of the differences which can be cited between Khoshrouzeh study and this study is the administration of massaging by mothers. Badie et al. examined the effects of massage by mothers and nurses on the weight gain of 28- to 34-week premature infants. The results of this study supported the effects of the massage therapy on LBW infants' weight gain [18]. However, Badie et al. included the infants in their study after their entering to the post NICU. Also, in another study by Golchin et al. the effects of deep massage therapy on weight gain of LBW infants were studied in two groups (n=20) of LBW infants. The results of this study showed that deep massage therapy increased the LBW infants' weight [19]. Likewise, in Scafidi study, 93 premature

Table 1. Comparison between the control and experiment groups with regard to nominal variables before the intervention.

Variable		Experiment Group		Control Group		Chi-Square Test/Fisher's Exact Test		
		No.	%	No.	%	Statistics	df	Probability
Gender	Male	11	47.8	14	60.9	0.203	1	0.674
	Female	12	52.2	9	39.1			
Delivery type	Normal delivery	3	13.0	6	27.3	-	-	0.284
	Cesarean	20	87.0	16	72.7			
Recovery	Received	16	80.0	20	87.0	-	-	0.816
	Not received	4	20.0	3	13			
Oxygen	Received	19	82.6	19	86.4	-	-	0.999
	Not received	4	17.4	3	13.6			
Phototherapy	Received	15	65.2	14	60.9	0.180	1	0.909
	Not received	8	34.8	9	39.1			
Fluid therapy	Received	14	60.9	10	43.5	0.711	1	0.399
	Not received	9	39.1	13	56.5			
Antibiotics	Received	11	47.8	12	52.2	1.13	1	0.548
	Not received	12	52.2	11	47.8			

* Those variables that their statistics and the degree of freedom are not reported have been analyzed with the Exact Fischer test because the frequency in more than 20% of the expected cells was less than 5.

Table 2. Comparison between the control and experimental groups with regard to quantitative variables at the beginning of the study.

Variable	Experiment Group			Control Group			Independent T Test		
	No.	Mean	SD	No.	Mean	SD	Statistics	df	Probability
Birth weight (g)	23	1545.60	417.47	22	1737.50	39.745	-1.54	43	0.131
Pregnancy (wk)	23	31.95	2.38	20	32.20	1.70	-0.380	41	0.706
Height at the beginning of the study (cm)	19	40.89	4.66	19	42.42	4.71	-1.01	36	0.323
Head circumference (cm)	19	29.55	1.89	19	30.31	2.23	-1.13	36	0.264
Apgar at 1st minute	20	5.85	1.66	22	5.86	1.58	-0.027	40	0.978
Apgar at 5th minute	18	7.77	1.66	22	7.45	1.29	0.690	38	0.494

Table 3. The analysis of weight variable of the infants after treatment.

Variable	Experiment (SD)Mean	Control (SD)Mean	df	*t **f	Probability
Weight before treatment (g)	1448.47(403.05)	1664.77(399.49)	43	-1.89	0.065
Weight after treatment (g)	1520.65(376.85)	1600.22(336.2)	2	6.50	0.003

*t for independent t test.

**f for ANCOVA test.

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neonates with average gestational age of 30 weeks were randomly divided into massage therapy and control groups. After receiving massage, the obtained results showed that there was a gain weight in massage therapy group compared to the control group [20]. The difference of the present study with the Scafidi study was that many infants entered in this study had a gestational pregnancy age of 28 weeks.

Based on the results of this study and other studies, the physiological effects of massage on the body can be inferred. Massage can release endorphins, which cause relaxation, reduce muscle tensions, and help the disposal of waste materials. Regular rhythmic tactile stimulations reduces stress and secretion of cortisol as well as controlling temperature and infections in neonates [8]. Massage also improves blood circulation, strengthens the immune system through circulating the lymph fluid throughout the body and disposing the harmful substances. In addition, massage therapy strengthens the preterm infants against stress through its effects on hypothalamic-pituitary-adrenal axis [15, 21]. It can also be noted that massage therapy can, with the increase in the activity of vagus nerve, release the effective hormones involved in food intake, increase the gastric motility, and increase the insulin level, insulin-like growth factor, and oxytocin [4].

On the other hand, massage helps the infant's growth by increasing the levels of epinephrine and norepinephrine which cause an increase in catecholamine [4]. However, there are some research in this area such as Li et al. (2006) with opposite results. In this study, fifty-two 2- to 6-month-old healthy infants with no premature backgrounds were randomly assigned into two groups (n=26) and received massage. Unlike the previous studies, the results of this study did now show any significant difference in improving the physical growth and weight gain [22]. To explain the discrepancy in results, it can be mentioned that in Li study, the healthy infants with no prematurity and LBW were studied. However, in this study and other similar studies, low weight and infants' prematurity were the essential criteria to enter to the study. In addition, in most similar studies, infant's age was very low so that the research was conducted on them before their leaving the hospital while in Li study all studied infants were reported to be 2 to 6 months old. Another study was done by Asgari et al. In this study which aimed to investigate the effects of tactile-kinetic stimulation on weight gain of LBW infants, 40 qualified infants were randomly chosen and divided into two groups of experiment and control. The experiment group received the tactile-kinetic stimulation for 10 days immediately after birth, 3 times a day, and each time for 15 minute. The stimulation started with the moderate occipital pressure and finally ended with legs.

The results of this study showed that the tactile-kinetic stimulation did not have any effect in weight gain of infants, which was not consistent with the results of the present study [23]. In Asgari research, also, low weight infants received tactile-kinetic stimulation immediately after birth. Whereas in the first days of life, infants naturally lose weight [23]; therefore, the tactile-kinetic stimulations must be applied at least 5 days after birth as it was applied in this study. Among the limitations of this study, we can refer to the early infants' discharge from the hospital because of the shortages in the number of the NICU beds. Our study results indicate that massage therapy affects weight gain of the LBW infants.

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Conflict of Interest

The authors declared no conflict of interests.

References

[1] Hoseinzadeh Kh, Azima S, Keshavarz T, KaramizadeT, Zaree N. [The effect of Massage on physical growth of low birth weight infants in maternity wards (Persian)]. Journal of Isfahan Medical School. 2012; 29(165):2175-169.

[2] Hadi N. [Maternal and child health (Persian)]. Shiraz: Shiraz University of Medical Sciences Publication; 2006.

[3] Naseri M. [Care of very low birth weight neonate (Persian)]. Tehran: Scientific society of fertility & infertility scientists. 2005.

[4] Javadifar N, Faal Siahkal Sh, Tadayon M, Dehdashtian M, Latifi SM. [The effect of massage with coconut oil on weight gain in preterm neonate (Persian)]. Jundishapur Scientific Medical Journal. 2009; 8(2):247-54.

[5] Behrman RE, Kliegman RM, Jenson HB. Nelson textbook of pediatrics. 17th ed. Philadelphia: Sanders Company; 2003.

[6] Cunningham FG, Leveno KJ, Bloom SL, Hauth J, Gilstrap L, Wenstrom K. Williams obstetrics. 22nd ed. New York: McGraw-Hill Companies, Inc; 2005.

[7] Fernandez A, Patkar S, Chawla C, Taskar T, Prabhu SV. Oil application in preterm babies. A source of warmth and nutrition. Indian Pediatrics. 1987; 24(12):1111-116.

ala Nejad Z, et al. The Effect of Massage on Weight Gain of Low-Weight Hospitalized Infants: A Randomized Clinical Trial. Physical Treatments. 2016; 5(4):205-210.

[8] Roozbehani N, Narenji F. [The effect of massage with Sesame oil on infant anthropometric measurements and their sleep pattern (Persian)]. Journal of Shahrekord University of Medical Sciences. 2009; 11(3):34-39.

[9] Arifeen SE, Black RE, Caulfield LE, Antelman G, Baqui AH, Nahar Q, et al. Infant growth patterns in the slums of Dhaka in relation to birth weight, intrauterine growth retardation, and prematurity. American Journal of Clinical Nutrition. 2000; 72(4):1010-017. PMID:11010945

[10] Saeidi R, Partovi S, Kianifar HR, Gholami Robatsangi M, Ghorbani M. [Evaluation of massage with oil containing medium chain triglyceride on weight gaining in preterm (Persian)]. Journal of Semnan University of Medical Sciences (Koomesh). 2009; 11(1):1-6.

[11] Sankaranarayanan K, Mondkar JA, Chauhan MM, Mascarenhas BM, Mainkar AR, Salvi RY. Oil massage in neonates: an open randomized controlled study of coconut versus mineral oil. Indian Pediatrics. 2005; 42(9):877. PMID:16208048

[12] Vickers A, Ohlsson A, Lacy JB, Horsley A. Massage for promoting growth and development of preterm and/or low birth-weight infants. Cochrane Database of Systematic Reviews. 2000; 2:CD000390. doi: 10.1002/14651858.CD000390.pub2

[13] Agarwal KN, Gupta A, Pushkarna R, Bhargava SK, Faridi MM, Prabhu MK. Effects of massage & use of oil on growth, blood flow & sleep pattern in infants. Indian Journal of Medical Research. 2000; 112:212-17. PMID: 11247199

[14] Ferber SG, Kuint J, Weller A, Feldman R, Dollberg S, Arbel E, Kohelet D. Massage therapy by mothers and trained professionals enhances weight gain in preterm infants. Early Human Development. 2002; 67(1-2):37-45. PMID: 11893434

[15] Acolet D, Modi N, Giannakoulopoulos X, Bond C, Weg W, Clow A, Glover V. Changes in plasma cortisol and catecholamine concentrations in response to massage in preterm infants. Archives of Disease in Childhood. 1993; 68(1):29-31. doi: 10.1136/adc.68.1_spec_no.29

[16] Hack M, Flannery DJ, Schluchter M, Cartar L, Borawski E, Klein N. Outcomes in young adulthood for very-low-birth-weight infants. New England Journal of Medicine. 2002; 346(3):149-57. doi: 10.1056/nejmoa010856

[17] Field TM, Schanberg SM, Scafidi F, Bauer CR, Vega-Lahr N, Garcia R, et al. Tactile/kinesthetic stimulation effects on preterm neonates. Pediatrics. 1986; 77(5):654-58. PMID: 3754633

[18] Badiee Z, Sasamshariati S, Pourmorshed P. [Massage therapy by mother or nurse: effect on weight gain in premature infants (Persian)]. Journal of Isfahan Medical School. 2011; 29(114):804-11.

[19] Golchin M, Rafati P, Taheri P, Nahavandinjad S. [Effect of deep massage on increasing body weight in low birth weight infants (Persian)]. Journal of Kashan University of Medical Sciences. 2010; 14(1):46-50.

[20] Scafidi FA, Field TM, Wheeden A, Schanberg S, Kuhn C, Symanski R, et al. Cocaine-exposed preterm neonates show behavioral and hormonal differences. Pediatrics. 1996; 97(6):851-85. PMID: 8657526

[21] Hernandez-Reif M, Diego M, Field T. Preterm infants show reduced stress behaviors and activity after 5 days of massage therapy. Infant Behavior and Development. 2007; 30(4):557-61. doi: 10.1016/j.infbeh.2007.04.002

[22] Lee HK. The effect of infant massage on weight gain, physiological and behavioral responses in premature infants. Journal of Korean Academy of Nursing. 2005; 35(8):1451-460. PMID:16415626

[23] Aliabadi F, Askari R, Taghizadeh G. [Effect of tactile-kinesthetic stimulation on weight gaining of low birth weight neonates (Persian)]. Journal of Modern Rehabilitation. 2010; 4(3-4):29-34.

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PROTOCOL

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Effectiveness of the application of massage therapy and kinesitherapy by parents on premature neonates: A research protocol

María José Álvarez-Álvarez PhD, Associate Professor[1] | Daniel Fernández-García PhD, Healthcare Nurse[2] | Juan Gómez-Salgado PhD, Assistant Professor[3,4] | Beatriz Ordás PhD, Healthcare Nurse[2] | María Dolores Rodríguez-González RN, Healthcare Nurse[5] | Santiago Martínez-Isasi PhD, Assistant Professor[6]

[1]Department of Nursing and Physiotherapy, University of León, León, Spain

[2]Division of Nursing, University Hospital of León, León, Spain

[3]Department of Sociology, Social Work and Public Health, University of Huelva, Huelva, Spain

[4]Espíritu Santo University, Guayaquil, Republic of Ecuador

[5]Premature Unit, University Hospital of León, León, Spain

[6]Health and Podiatry Unit, Department of Heatlh Sciences, Faculty of Nursing and Podiatry, University of A Coruña, Campus of Esteiro, Ferrol, Spain

Correspondence
Daniel Fernández-García, Division of Nursing, University Hospital of León, León, Spain.
Email: dfernandezg@saludcastillayleon.es

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Abstract

Aim: The study aims to analyse the efficacy of massage therapy and kinesitherapy applied by parents of premature infants admitted to hospital.

Background: Premature newborns suffer early somatic deprivation that has adverse effects on their growth and development and that also has a negative impact on the emotional state of their parents. Massage therapy and kinesitherapy is beneficial in alleviating somatic deficit and facilitates the bond between parents and newborns.

Design: A quasi-experimental community intervention trial will be conducted in a neonatology unit.

Methods: This study will compare the benefits of a 15-min massage protocol applied by parents with the usual medical and nursing care given by neonatal units for premature babies. The evaluation of neuromotor development will take place through the Spanish Premie-Neuro scale. The determination of weight, size, and head circumference will be based on the unit's usual procedures.

Discussion: If the implementation of a massage therapy and kinesitherapy protocol is effective in promoting the growth and development of hospitalized premature infants, the results of this study could give an impetus for the inclusion of somatic stimulation in the usual nursing care given for preterm infants.

Impact: Prematurity and its associated morbidity pose a major global public health problem. Somatic and kinaesthetic stimulation has beneficial effects on anthropometric and neuromotor development in preterm infants. The results will have a positive impact on premature neonates and their families, both during the hospitalization, and a positive socio-economic effect throughout their lives (education, work, disability).

Trial registration: NCT03704012.

KEYWORDS
education, kinesitherapy, massage, neonate, newborn, nurse, nursing, parents, premature, preterm

1 | INTRODUCTION

Prematurity is one of the world's most important health problems. Today, it is the second leading cause of death in children under 5 years of age and it stands out as the single most important cause of death during the critical period of the first month of life (Blencowe et al., 2012; Liu et al., 2012). Being born premature, with a very low weight, increases the risk of complications such as respiratory distress, retinopathy of prematurity, patent ductus arteriosus, bronchopulmonary dysplasia, late onset sepsis and necrotizing enterocolitis (Stoll, Hansen, & Bell, 2010). According to a report from the World Health Organization (WHO; March of Dimes et al., 2012), one in ten newborns around the world are premature and one million of them die from complications each year. The prematurity rate varies widely by country. In most European countries, preterm birth rates have risen. However, the extent of these increases is varied among the different countries and about the type of pregnancy (Zeitlin et al., 2013).

The main challenges that neonatal nurses face in neonatal intensive care units (NICUs) do not only imply ensuring survival, but also contributing to the optimal growth and development of preterm infants and performing actions aimed at supporting this achievement, adapting this approach to the children's degree of neurological maturity. Consequently, an urgent need for early interventions towards improving preterm infants' growth and development is evidenced (Fucile & Gisel, 2010) Neonatal nurses are the main caregivers in the NICU. Therefore, they have a key role in influencing the developing neonates' environment, and the therapeutic interventions aimed at ensuring their optimal development (Altimier, Kenner, & Damus, 2015).

It is also very important to involve families, since there is evidence about the important role of parents in the proper development of preterm newborns (Davis, Mohay, & Edwards, 2003). As a result of their work in direct contact with families, nurses have an opportunity to promote positive interactions between preterm neonates and their parents (Magill-Evans, Harrison, Rempel, & Slater, 2006).

2 | BACKGROUND

2.1 | Somatic stimulation of the hospitalized preterm newborn

In addition to suffering the immaturity inherent in prematurity, preterm newborns are deprived, at an early stage, of the somatic stimulation given by the contact between their skin and the amniotic fluid and uterine walls that takes place during the child's development in the womb. This contact has proven to influence the child's proper growth and neurodevelopment (Im & Kim, 2009; Mathai, Fernández, Mondkar, & Kanbur, 2001).

In addition and as a factor associated with this early sensory deprivation, the need for preterm infants to stay in the NICU or in an incubator prevents them from the necessary continued contact with their parents. This has proven to negatively affect both the psychobiological development of the child and the emotional status of the parents (Brett, Staniszewska, Newburn, Jones, & Taylor, 2011; Ionio et al., 2016; Pace et al., 2016).

Our understanding of all these factors has meant that, over recent years, many hospitalization units for premature infants have begun to carry out a series of care procedures focused on cutaneous, kinaesthetic and sensory stimulation, with the aim of promoting an enrichment of the hospital environment and facilitating a suit- able psychomotor development of premature infants (Field, Diego, & Hernández-Reif, 2006, 2010; Pallás & Arriaga, 2008).

These interventions are consistent with care focused on development, as they make it possible to create a similar environment to the intrauterine one and adapt the stimuli that preterm infants receive to their degree of brain maturation. Furthermore, it has been shown that if parents are encouraged to apply this stimula- tion, there are beneficial improvements in the well-being of par- ents and improvements in the bonds between mother and child (Damato, 2004; Muller-Nix et al., 2004; Stefana, Padovani, Biban, & Lavelli, 2018).

One of the interventions most frequently deployed to give somatic stimulation to newly hospitalized premature infants is massage therapy. Many physical therapy programs applied to preterm infants combine stimulation through movement with somatic stimulation, giving rise to massage therapy and kinesitherapy protocols specifically designed for this population (Asadollahi, Jabraeili, Mahallei, Asgari-Jafarabadi, & Ebrahimi, 2016; Diego, Field, Hernandez-Reif 2005; Field et al., 1986, 2008; Ho, Lee, Chow, & Pang, 2010).

2.2 | Benefits of massage therapy and kinesitherapy protocols in hospitalized premature infants

Most research on somatic and kinaesthetic stimulation for hospitalized preterm neonates agrees in its pointing out a benefit in relation to factors linked to the growth of preterm infants (Diego et al., 2007; Field et al., 2008; Gonzalez et al., 2009; Jabraeile, Rasooly, Farshi, & Malakouti, 2016; Kumar et al., 2013; Massaro, Hammad, Jazzo, & Aly, 2009; Niemi, 2017; Saeadi, Ghorbani, Moghaddam 2015). In some cases, a weight increase has been found by the end of the implementation of the massage protocol and/or at the time of discharge (Diego et al., 2007; Guzzetta et al., 2009; Jabraeile et al., 2016; Massaro et al., 2009) and in other cases benefits have been found at 1 or 2 months of age (Akhavan, Golestan, Fallah, Golshan, & Dehghan, 2013; Arora, Kumar, & Ramji, 2005; Fallah, Karbasi, Golestan, & Fromandi, 2013).

When applied to premature infants, massage therapy has shown verified benefits for a better neurodevelopment of the child. A study conducted by Ferreira and Bergamasco (2010) observed this effect in children receiving tactile and kinaesthetic stimulation, as the study preterms showed an improvement in motor skills and in behavioural and weight outcomes, and a tendency towards shorter hospitalstays. In addition, Fucile and Gisel (2010), and Ho et al. (2010) foundsuperior motor development in preterm infants who had received somatic and kinaesthetic stimulation. In 2010, Procianoy et al. pub- lished a study where these benefits were observed at 24 months

(corrected age). In 2016, the results of an investigation which also showed that massage had beneficial effects on development, both at the time of discharge and when the babies were assessed at corrected ages of 12 and 24 months, were published (Lai et al., 2016).

The influence of massage therapy on the brain development of the preterm newborn is demonstrated in two studies led by Andrea Guzzeta (Guzzetta et al., 2009, 2011). When a somatic stimulation protocol is applied, extrauterine brain maturation in low-risk premature infants is similar to the process of brain maturation that they would have had if they had continued their development in the mother's uterus. Other benefits of massage applied to hospitalized newborn infants are a decreased risk of neonatal sepsis (Mendes & Procianoy, 2008), the lowest number of days of hospitalization (Ho et al., 2010; Mendes & Procianoy, 2008) and reduced stress levels in the newborn (Smith, Haley, Slater, & Moyer-Mileur, 2013a; Smith, Lux, et al., 2013b).

3 | THE STUDY

3.1 | Aims

The study will aim to analyse the efficacy of massage therapy and kinesitherapy applied by parents of premature infants admitted to hospital to improve biological status, neuro-motor activity, and other associated factors. Our specific objectives will be as follows: (a) Assess the reduction of days of hospitalization due to massage and kinesitherapy procedures applied by parents; (b) determine the effects of massage and kinesitherapy procedures on neuro-motor development in premature infants; (c) examine the effects of intervention on physiological and anthropometric variables; and (d) identify the influence of intervention on care and feeding in premature infants during hospitalization.

3.2 | Design and methodology

A quasi-experimental community intervention trial will be conducted in the Neonatology Unit at University Hospital of León (Spain). The hospital is part of Spain's national health system.

3.3 | Research hypothesis

The high incidence of premature birth and the associated morbidity through these patients' lives are an important public health problem in Spain.

Until now, premature infants hospitalized in the Neonatology Unit at León University Hospital did not receive any type of intervention based on physical methods (for example, massage or mobilization).

We hypothesize that the application by parents of massage therapy and kinesitherapy on premature infants during the infants' hospital stay will facilitate biological, anthropometric, and neurological development in the newborns and will reduce the number of days that they spend in hospital. In addition, such measures will allow significant financial savings.

3.3.1 | Study setting

The study will be conducted at the Neonatology Unit of a public hospital, in Spain.

3.3.2 | Participants

The target population will comprise all the premature infants admitted to the Neonatology whose hospitalization meet the inclusion criteria: (a) 48 hr of life; (b) informed consent given by parents; (c) weight between 1,250 and 2,249 g; (d) intact skin; (e) stable physiological parameters; (f) absence of congenital and genetic abnormalities; (h) absence of central nervous system abnormalities; and (i) hemodynamic stability. The exclusion criteria include: (a) the family's refusal to participate in the study; (b) high-frequency mechanical ventilation; (c) fraction of inspired oxygen >70%; (d) inotropic support; (e) septic shock; (f) persistent tachycardia or bradycardia and (g) gastrointestinal disorders.

3.3.3 | Allocation process

Premature infants who meet the inclusion criteria will be assigned to an intervention group or to a control group. The control group will consist of premature infants from the first to the sixth month and those from the nineteenth month to the twenty-fourth month. Meanwhile, the intervention group will comprise premature infants between the sixth and eighteenth months.

The research team will decide not to randomize the assignment of the premature infants because they share parents-children space in the control and intervention groups, so will consider it more appropriate to allocate groups according to different periods. Thus, the first half will correspond to the control group and the second to the intervention group during the first year, with the opposite correspondence during the second (Figure 1).

3.3.4 | Intervention

Parents who give their informed consent to participate in the project will receive learning and teaching processes during the first 48 hr of the premature infant's life. They will receive these over two 45-min sessions (one per day). In the sessions, they will have to demonstrate ability and proficiency in the application of massage and kinesitherapy in accordance with what we present below.

The moderate pressure massage therapy will consist of the15-min preterm infant massage therapy protocol used by Field etal. (1986). Treatment will be given for two 15-min periods per day, during the morning and late shifts.

Prior to the start of the session, the father/mother responsible for the application of the protocol will wear a gown and remove

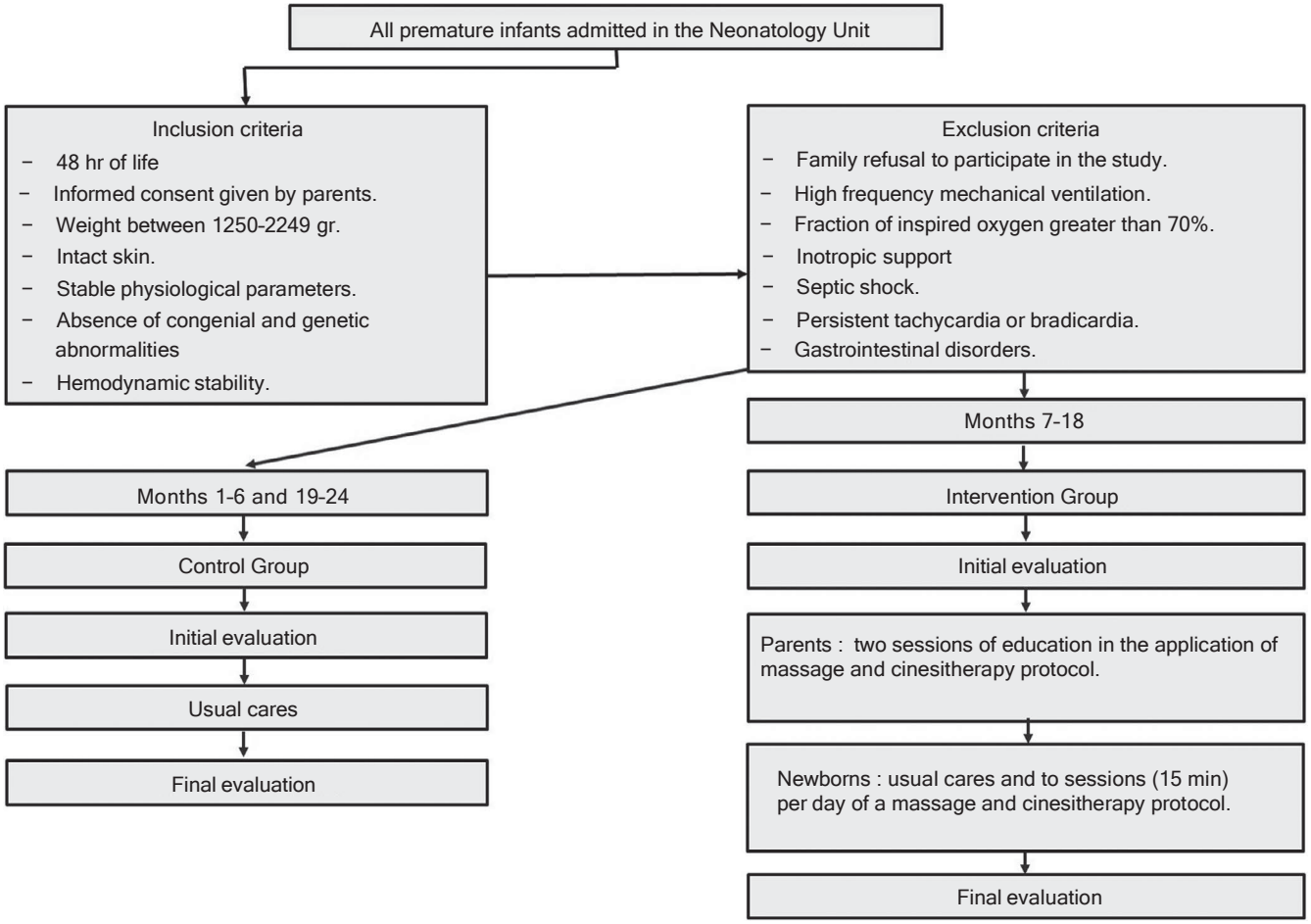

FIGURE 1 Summary of the research protocol

accessories (for example, rings, watches, or bracelets) from their hands. After that, parents will wash their hands properly and according to the hospital's protocol. The hand-washing process will be supervised by staff at the neonatal unit involved in the project.

Each treatment session will be divided into three phases of 5 min each. During the first and third phases (massage therapy phases), the premature neonates will be massaged for 5 min, spending 1 min in each part of the body by following the sequence: (a) from the top of the head to the neck; (b) from the neck across the shoulders; (c) from the upper back to the waist; (d) from the thigh to the foot, on both legs; and (e) from the shoulder to the hand, on both arms. During the kinesitherapy phase (second phase), the preterm infant will be placed in a supine position and each arm, each leg and finally both legs together, will be flexed and extended for 1 min in each segment.

3.3.5 | Study measures

The data collection questionnaire will consist of two parts. In the first part, the research group members will initially collect socio-demographic data such as age of parents, marital status, educational level, ethnicity, and toxic habits such as cigarette consumption. After that, they will obtain information about the infant's date of birth, gestational week, prematurity cause, type of delivery, and gender.

The second part of the questionnaire will consist of data collected during the first contact with the premature infant (at 48 hr of life): anthropometric measurements (birth weight and heightand head circumference) and neurological assessment accord- ing to the Spanish Premie-Neuro Scale (Fernánez et al., 2015).These same variables shall also be collected at discharge (final evaluation). In the final assessment, the research group will also collect other variables such as need for mechanical ventilation, non-mechanical ventilation or supplementary oxygen, or if the premature infant has undergone major medical procedures (lum-bar puncture or central catheterization). We will also obtain the days of hospitalization.

All these variables will be recorded by researchers working at the hospital. They will be responsible for data collection and will use an online database. The nursing staff will be responsible for conducting assessments in relation to unknown parameters to be taken into consideration as study variables (hospital days, anthropometric measurements, neurological assessment, etc.).

3.3.6 | Procedure and data collection

The study will last for 2 years, or four semesters. In the first and the last semesters, we will collect the first data for the control group. In

the second and third semesters, the research group will collect the data for the intervention group.

3.3.7 | Data analysis

A database will be created using Stata 14.0 software and the data obtained from the questionnaire will be entered into the database so that it could subsequently be analysed statistically. For the descriptive analysis, we will calculate mean, median, standard deviation, and total interquartile ranges for each of the continuous variables, and the relative frequencies with confidence intervals of 95% for different values of the qualitative variables. We will also calculate differences between the initial, intermediate, and end situations by calculating the impact of change.

For the analysis of the relationships between variables, correlation values will be calculated by linear regression when both variables were continuous. The odds ratio and the chi-square will be calculated when comparing dichotomous variables. The Student *t* test will be used to compare differences in continuous variables between the two groups and the Mann–Whitney *U* test (Kruskal–Wallis test for two samples) will be applied to compare the differences between the two groups in the non-parametric variables. The relative risk (RR) also associated with the intervention will be calculated as the incidence ratio of change in the intervention group and the incidence of change in the control group. A $p < 0.05$ will be considered statistically significant.

3.4 | Ethical considerations

The principles of written informed consent and confidentiality will be observed during data collection. The study was approved by the hospital's Ethics Committee on 23 November 2010.

3.5 | Validity, reliability, and rigor

The study's scientific rigour will be ensured through a solid foundation of safety, credibility and reliability. The massage therapy and kinesitherapy protocol was designed by Field et al. (1986) for a population of newly hospitalized premature infants and was subsequently employed in another five studies on the same population. All nurses participating in the project will receive specific training in the intervention protocol and in evaluating neuromotor development using the Spanish Premie-Neuro scale. The principal investigator of the project will periodically analyse a percentage of the data collected to ensure their consistency and quality. The participating hospital is a tertiary-level one and has the appropri- ate human and material resources to carry out this project.

4 | DISCUSSION

There is sufficient scientific evidence to support the application of somatic stimulation in preterm infants during hospitalization (Diego et al., 2007; Fallah et al., 2013; Guzzetta et al., 2009; Jabraeile et al., 2016; Massaro et al., 2009), owing to its benefits on multiple aspects associated with prematurity: Increase in weight and size (Diego et al., 2007; Field et al., 2008; Jabraeile et al., 2016; Kumar et al., 2013; Massaro et al., 2009; Niemi, 2017) and facilitation of psychomotor development and brain maturation (Fucile & Gisel, 2010; Guzzetta el al., 2011; Ho et al., 2010; Lai et al., 2016; Procianoy, Mendes, & Silveira, 2010; Stefana et al., 2018) However, there are many hospitals that have not incorporated somatic stimulation in the care given to preterm infants.

Our hypothesis in the present study protocol is that preterm infants whose parents apply a massage therapy and kinesitherapy protocol on them during their hospitalization will have better anthropometric, neuromotor, and biological development than the control group. No adverse effects are expected from the implementation of the protocol and it is also expected that benefits will be obtained in terms of the emotional state of the parents and of a better establishment and maintenance of the mother-infant bond. If this hypothesis is confirmed, the results could help to generalize the implementation of protocols for somatic stimulation in neo-natal premature and intensive care units as an effective and lowcost measure to facilitate growth and development of hospitalized preterm neonates.

4.1 | Limitations

Parental consent to participate in the study is unknown, although it would be expected that there would be few refusals to participate, as the intervention and procedures for collecting the variables are of a non-invasive nature. Moreover, the intervention carried out by parents included in the protocol will be developed for it to be applied by them and so the massage therapy and kinesitherapy will be simplified. On the project web page, parents will be able to find information about the research and a video explaining the protocol of the intervention.

5 | CONCLUSION

The results of this research will identify the effects of a massage therapy and kinesitherapy protocol applied by parents to their hospitalized preterm infants in terms of neuromotor and anthropometric development and of other associated factors.

The results of our study could modestly help to involve families in the care of preterm infants and promote intervention that is focused on the infants' development and adapted to their level of neurological maturity.

The expected beneficial effects will relate to growth and development of the preterm newborn and will entail a reduction in the socio-medical costs associated with preterm births.

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CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

AUTHORS' CONTRIBUTIONS

All authors have agreed on the final version and met at least one of the following criteria [recommended by the ICMJE (http://www.icmje.org/recommendations/)]:

- MJAA, DFG, MDRG, made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data
- BO, JGS, SM, MJAA, DFG, MDRG, involved in drafting the manuscript or revising it critically for important intellectual content;
- BO, JGS, SM, MJAA, DFG, MDRG, given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content;
- BO, JGS, SM, MJAA, DFG, MDRG, agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

ORCID

María José Álvarez-Álvarez https://orcid.org/0000-0002-8126-7350
Daniel Fernández-García https://orcid.org/0000-0001-5072-8436
Juan Gómez-Salgado https://orcid.org/0000-0001-9053-7730
Beatriz Ordás https://orcid.org/0000-0003-0984-9097

REFERENCES

Akhavan, S., Golestan, M., Fallah, R., Golshan, M., & Dehghan, Z. (2013). Effect of body massage on increase of low birth weight neonates growth parameters: A randomized clinical trial. *Iran Journal of Reproductive Medicine*, *11*, 583–588.

Altimier, L., Kenner, C., & Damus, K. (2015). The Wee Care Neuroprotective NICU Program (Wee Care): The effect of a comprehensive developmental care training program on seven neuroprotective core measures for family-centered developmental care of premature neonates. *Newborn and Infant Nursing Reviews*, *15*, 6–16. https://doi.org/10.1053/j.nainr.2015.01.006

Arora, J., Kumar, A., & Ramji, S. (2005). Effect of oil massage on growth and neurobehavior in very low birth weight preterm neonates. *Indian Pediatrics*, *42*, 1092–1100.

Asadollahi, M., Jabraeili, M., Mahallei, M., Asgari-Jafarabadi, M., & Ebrahimi, S. (2016). Effects of gentle human touch and field mas- sage on urine cortisol level in premature infants: A randomized con- trolled clinical trial. *Journal of Caring Science*, *5*, 187–194. https://doi.org/10.15171/jcs.2016.020

Blencowe, H., Cousens, S., Oestergaard, M. Z., Chou, D., Moller, A.-B., Narwal, R., … Lawn, J. E. (2012). National, regional and worldwide estimates of preterm birth rates in the year 2010 with time trends since 1990 for selected countries: A systematic analysis and implications. *Lancet*, *379*, 2162–2172. https://doi.org/10.1016/S0140-6736(12)60820-4

Brett, J., Staniszewska, S., Newburn, M., Jones, N., & Taylor, L. (2011). A systematic mapping review of effective interventions for communicating with, supporting and providing information to parents of preterm infants. *British Medical Journal Open*, *1*, 23–29. https://doi.org/10.1136/bmjopen-2010-000023

Damato, E. G. (2004). Prenatal attachment and other correlates of postnatal maternal attachment to twins. *Advances in Neonatal Care*, *4*, 274–291. https://doi.org/10.1016/j.adnc.2004.07.005

Davis, L., Mohay, J., & Edwards, H. (2003). Mothers' involve-ment in caring for their premature infants: An historical over- view. *Journal of Advanced Nursing*, *42*, 578–586. https://doi.org/10.1046/j.1365-2648.2003.02661.x

Diego, M. A., Field, T., & Hernandez-Reif, M. (2005). Vagal activity, gastric motility, and weight gain in massaged preterm neonates. *Journal of Pediatrics*, *147*(1), 50–55.

Diego, M. A., Field, T., Hernandez-Reif, M., Deeds, O., Ascencio, A., & Begert, G. (2007). Preterm infant massage elicits consistent increases in vagal activity and gastric motility that are associated with greater weight gain. *Acta Paediatrica*, *96*, 1588–1591. https://doi.org/10.1111/j.1651-2227.2007.00476.x

Fallah, R., Karbasi, S. A., Golestan, M., & Fromandi, M. (2013). Sunflower oil versus no oil moderate pressure massage leads to greater increases in weight in preterm neonates who are low birth weight. *Early Human Development*, *89*, 769–772. https://doi.org/10.1016/j.earlhumdev.2013.06.002

Fernánez, D., Álvarez, M. J., Rodríguez, D., Rodriguez, M., Fernández, E., & Urdiales, P. (2015). Spanish validation of the premie-neuro scale in premature infants. *Journal of Pediatric Nursing Care of Children & Families*, *30*, 560–567.

Ferreira, A. M., & Bergamasco, N. H. P. (2010). Behavioral analysis of preterm neonates included in a tactile and kinesthetic stimulation program during hospitalization. *Revista Brasileira De Fisioterapia*, *14*, 141–148.

Field, T., Diego, M., & Hernández-Reif, M. (2006). Potencial underlying mechanisms for greater weight gain in massaged preterm infants. *Infant Behavioral Development*, *34*, 383–389.

Field, T., Diego, M., & Hernández-Reif, M. (2010). Preterm infant massage therapy research: A review. *Infant Behavior and Development*, *33*, 114–124. https://doi.org/10.1016/j.infbeh.2009.12.004

Field, T., Diego, M., Hernandez-Reif, M., Dieter, J. N., Kumar, A. M., Schanberg, S., & Kuhn, C. (2008). Insulin and insulin-like growth factor-1 increased in preterm neonates following massage therapy. *Journal of Development & Behavioral Pediatrics*, *94*, 463–466. https://doi.org/10.1097/DBP.0b013e3181856d3b

Field, T. M., Schanberg, S. M., Scafidi, F., Bauer, C. R., Vegalahr, N., García, R., … Kuhn, C. M. (1986). Tactile/kinesthetic stimulation effects on preterm neonates. *Pediatrics*, *77*, 654–658.

Fucile, S., & Gisel, E. G. (2010). Sensoriomotor interventions improve growth and motor function in preterm infants. *Neonatal Networks*, *29*(6), 356–366.

Gonzalez, A. P., Vasquez-Mendoza, G., García-Vela, A., Guzmán-Ramirez, A., Salazar-Torres, M., & Romero-Gutierrez, G. (2009). Weight gain in preterm infants following parent administered Vimala massage: A randomized controlled trial. *American Journal of Perinatology*, *26*, 247–252. https://doi.org/10.1055/s-0028-1103151

Guzzetta, A., Baldini, S., Bancale, A., Baroncelli, L., Ciucci, F., Ghirri, P., … Maffei, L. (2009). Massage accelerates brain development and the maturation of visual function. *Journal of Neuroscience*, *29*, 6042–6051. https://doi.org/10.1523/JNEUROSCI.5548-08.2009

Guzzetta, A., D'Acunto, M. G., Carotenuto, M., Berardi, N., Bancale, A., Biagioni, E., … Cioni, G. (2011). The effectsof preterm infant massage on brain electrical activity. *Developmental Medicine & Child Neurology*, *53*, 46–51. https://doi. org/10.1111/j.1469-8749.2011.04065.x

Ho, Y. B., Lee, R. S., Chow, C. B., & Pang, M. Y. (2010). Impact of massage therapy on motor outcomes in very low-birthweight infants: Randomized controlled pilot study. *Pediatrics International*, *52*, 378–385.

Im, J., & Kim, E. (2009). Effect of Yakson and Gentle Human touch versus usual care on urine stress hormones and behaviors in preterm infants: A quasi-experimental study. *Internacional Journal of Nursing Studies*, *46*, 450–458. https://doi.org/10.1016/j.ijnurstu.2008.01.009

Ionio, C., Colombo, C., Brazzoduro, V., Mascheroni, E., Confalonieri, E., Castoldi, F., & Lista, G. (2016). Mothers and fathers in NICU: The impact of preterm birth on parental distress. *European Journal of Psychology*, *12*, 604–621. https://doi.org/10.5964/ejop.v12i4.1093

Jabraeile, M., Rasooly, A. S., Farshi, M. R., & Malakouti, J. (2016). Effect of olive oil massage on weight gain in preterm infants: A randomized controlled clinical trial. *Nigerian Medical Journal*, *57*, 160–163. https:// doi.org/10.4103/0300-1652.184060

Kumar, J., Upadhyay, A., Dwivedi, A. K., Gothwal, S., Jaiswal, V., & Aggarwal, S. (2013). Effect of oil massage on growth in preterm neonates less than 1800 g: A randomized control trial. *Indian Journal of Pediatrics*, *80*, 465–469.

Lai, M. M., D'Acunto, G., Guzzetta, A., Boyd, R. N., Rose, S. E., Fripp, J., … Colditz, P. B. (2016). PREMM: Preterm early massage by the mother: Protocol of a randomised controlled trial of massage therapy in very preterminfants. *British Medical Journal Pediatrics*, *16*, 146–158. https:// doi.org/10.1186/s12887-016-0678-7

Liu, L. I., Johnson, H. L., Cousens, S., Perin, J., Scott, S., Lawn, J. E., … Black, R. E. (2012). Global, regional and national causes of child mortality: An updated systematic analysis for 2010 with time trends since 2000. *The Lancet*, *379*, 2151 – 2161. https://doi.org/10.1016/ S0140-6736(12)60560-1

Magill-Evans, J., Harrison, M. J., Rempel, G., & Slater, L. (2006). Interventions with fathers of young children: Systematic litera- ture review. *Journal of Advanced Nursing*, *55*, 248–264. https://doi. org/10.1111/j.1365-2648.2006.03896.x

March of Dimes, PMNCH, Save the Children, World Health Organization. (2012). Born Too Soon. The Global Action Report On Preterm Bird. Retrieved fromhttp://www.who.int/pmnch/media/news/2012/preterm_birth_report/en/

Massaro, A. N., Hammad, T. A., Jazzo, B., & Aly, H. (2009). Massage with kinesthetic stimulation improves weight gain in preterm infants. *Journal of Perinatology*, *29*, 352–357. https://doi.org/10.1038/jp.2008.230

Mathai, S., Fernández, A., Mondkar, J., & Kanbur, W. (2001). Effects of tactile-kinesthesic stimulation in preterms: A controlled trial. *Indian Pediatrics*, *38*, 1091–1098.

Mendes, E. W., & Procianoy, R. S. (2008). Massage therapy reduces hospital stay and occurrence of late-onset sepsis in very preterm neonates. *Journal of Perinatology*, *24*, 815–820.

Muller-Nix, C., Forcada-Guex, M., Pierrehumbert, B., Jaunin, L., Borghini, A., & Ansermet, F. (2004). Prematurity, maternal stress and mother–child interactions. *Early Human Development*, *79*, 145–158. https:// doi.org/10.1016/j.earlhumdev.2004.05.002

Niemi, A. K. (2017). Review of randomized controlled trials of massage in preterm infants. *Children*, *21*, 1–14. https://doi.org/10.3390/children4040021

Pace, C. C., Spittle, A. J., Molesworth, C. M., Lee, K. J., Northam, E. A., Cheong, J. L., … Anderson, P. J. (2016). Evolution of depression and anxiety symptoms in parents of very preterm infants during the newborn period. *JAMA Pediatrics*, *170*, 863–870. https://doi. org/10.1001/jamapediatrics.2016.0810

Pallás, C. R., & Arriaga, M. (2008). Nuevos aspectos entorno a la prematuridad. *Evidencias En Pediatria*, *4*, 26–32.

Procianoy, R. S., Mendes, E. W., & Silveira, R. C. (2010). Massage therapy improves neurodevelopment outcome at two years corrected age for very low birth weight infants. *Early Human Development*, *86*, 7–11. https://doi.org/10.1016/j.earlhumdev.2009.12.001

Saeadi, R., Ghorbani, Z., & Moghaddam, A. (2015). The effect of massage with medium-chain triglyceride oil on weight gain in premature neonates. *Acta Medica Iranica*, *53*(2), 134–138.

Smith, S. L., Haley, S., Slater, H., & Moyer-Mileur, L. J. (2013a). Heart rate variability during caregiving and sleep after massage therapy in preterm infants. *Early Human Development*, *89*, 525–529. https://doi. org/10.1016/j.earlhumdev.2013.01.004

Smith, S. L., Lux, R., Haley, S., Slater, H., Beachy, J., & Moyer-Mileur, L. J. (2013b). The effect of massage on heart rate variability in preterm infants. *Journal of Perinatology*, *33*, 59–64. https://doi.org/10.1038/ jp.2012.47

Stefana, A., Padovani, E. M., Biban, P., & Lavelli, M. (2018). Fathers' experiences with their preterm babies admitted to neonatal intensive care unit: A multi-method study. *Journal of Advanced Nursing*, *74*(5), 1090–1098. https://doi.org/10.1111/jan.13527

Stoll, B. J., Hansen, N. I., Bell, E. F., et al. (2010). Neonatal outcomes of extremely preterm infants from the NICHD Neonatal Research Network. *Pediatrics*, *126*(3), 443–456.

Zeitlin, J., Szamotulska, K., Drewniak, N., Mohangoo, A. D., Chalmers, J., Sakkeus, L., … Blondel, B.. (2013). Preterm birth time trends in Europe: a study of 19 countries. *BJOG: International Journal of Obstetrics & Gynaecology*, *120*, 1356–1365.

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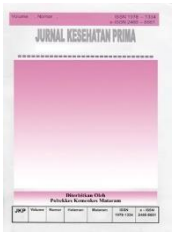

The Effectiveness of Baby Massage in Increasing Infant's Body Weight

Lusiana Lusia Sirait[1]✉, Gusti Seventina Simatupang[2]

[1-2] Institut Kesehatan Sumatera Utara, Indonesia

✉uchiesirait@gmail.com , Phone: +628126549840

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Abstract

Increasing body weight is an indicator for assessing baby growth. The baby's weight gain in the first year of life is based on whether the baby receives good nutrition from birth to the first six months. The weight gain per week ranges from 140-200 grams. Children 1-12 months experience rapid growth, so it is necessary to maintain the baby's weight according to age. They obtain optimal growth and development results from the interaction of several interrelated factors: genetic factors, nutrition, socio-economic status, health status, hormonal factors, environmental factors, cultural environment, parenting patterns, physical activity, and stimulation. Dietary factors play an essential role in the growth process because they influence the nutritional status of children. Stimulation factors are also critical to stimulate children's growth. *Massage* is a technique that combines the physical benefits of human touch withemotional benefits such as bonding and weight gain. This research aims to determine the relationship between baby massage and weight gain in babies at the Kasih Bunda Clinic in 2023. This type of research is the Shapiro-Wilk Testwith a non-equivalent control group design and a pretest-posttest design. Then, measurements were taken before the pretest on both groups of respondents; then, measurements were carried out again (Posttest) to determine the differencein pretest and posttest body weight. The type of sampling uses purposive sampling. The results of the research were carried out with a confidence level of 95% (α=0.05), as proven by the p-value: 0.000 (p-value $\leq$ 0.05). In conclusion,a relationship exists between giving baby massages and increasing baby weight at the Kasih Bunda Clinic in 2023. Itis hoped that health workers will make baby massage one of the counseling materials for mothers to support the increase in baby weight and teach them how to do proper baby massage.

Keywords: Baby Massage; Weight Gain

INTRODUCTION

Weight gain is an indicator of a baby's health that can be used as a benchmark for growth. The increase in baby's weight in the first year of life if the baby gets good nutrition, namely from birth to the first six months, the weight gain per week ranges from 140-200 grams. Furthermore, at 6-12 months, weekly weight gain ranges from 85-400 grams, and body weight will increase by 3x birth weight in the first year (Irva, 2014).

Good growth and development result from the interaction of various interrelated factors, namely genetic, environmental, and behavioral factors, as well as valuable stimuli or stimuli. The problem of weight in babies is susceptible, as evidenced by 2017 World Health Organization (WHO) data, which states that the incidence of baby weight in the world is still below standard, namely more than 5%, with the prevalence of underweight in Southeast Asia being 26.9%. Meanwhile, the global prevalence of underweight is 14% (Carolin, 2020).

The problem with growth (weight gain) is a child's decreased appetite. Therefore, one of the recommended efforts is baby massage. The first massage experience that humans experience is when they are born through a routine birth canal. Baby massages have been done worldwide for a long time, including in Indonesia, and are passed down to this day (Harahap, 2020).

Salsabila's research (2022) found that massaging babies aged 1-12 months for 30 days with an intensity of 3 times for 15 minutes per week increased the average baby's weight from 3,780 grams to 4,305 grams.

Decree of the Minister of Health number 900/MENKES/SK/VII/2002 concerning Registration and Practice of Midwives states that midwives have the authority to monitor the growth and development of babies by carrying out early detection and stimulating growth and development, including by massaging babies (Ministry of Health, 2020).

The 194 countries in the world, one country, namely Indonesia, has implemented baby massage by health workers to stimulate growth and increase body weight because it increases the production of the pituitary gland and the Growth Hormone GH), thereby increasing bone and muscle growth. It is estimated that of more than 20 million babies worldwide, 15.5% have been massaged, so it can be concluded that baby massage can increase the baby's weight (Unicef, 2021).

Initial data, through the Kasih Bunda Clinic lookbook in December 2022, the number of babies aged 0-12 months who were weighed at the visit was 41 babies; there were 33 babies (76.6%) who experienced weight gain according to their age and eight babies (23 .4%) do not experience weight gain according to their age. The results of interviews with five mothers whose children did not gain weight according to their age at the Kasih Bunda Clinic on January 11, 2023, with open questions and answers, obtained information that the baby's parents did not understand that other than nutritious food, massage could be done. Babies that they usually do can stimulate the baby's weight gain. Apart from that, mothers said that their children had difficulty eating, did not want to drink breast milk, and were fussy at night when sleeping, which disturbed their baby's sleep.

From the above background, researchers researched "The relationship between baby massage

and increased baby weight at the Kasih Bunda Clinic in 2023".

METHOD

The method of this study was quantitativeresearch and the Shapiro-Wilk design. The type of research is a control group and a treatment group.

The independent variable is baby massage, and the dependent variable is body weight. Samples were taken using an accidental technique by taking respondents who happened to be in the clinic when the research was conducted. The sample was the total population of healthy babies aged 0-12 months and parents who wanted to be research participants and were at the Kasih Bunda Clinic when the data was collected, namely 30 babies. The sample consisted of 2 (two) groups, namely 15 babies treated with intervention and 15 babies including controls.

Test data differences using a significance of 0.05. The statistical test used the Shapiro-Wilk test to determine whether the data was normally distributed. The results obtained after being tested with the Shapiro-Wilk test were usually distributed. Then, a t-test statistical test will be carried out to determine whether there is a relationship between baby massage and an increase in baby weight at the Kasih Bunda Clinic in 2023.

This study had obtained the ethical approval from the Health Research Ethics Committee.

RESULT AND DISCUSSION

The results of research on the frequency distribution of respondents' characteristics at the Kasih Bunda Clinic in 2023 can be seen in the following table:

Table 1 shows 30 babies divided into two groups, namely 15 respondents in the intervention group and 15 respondents in the control group. Of the 15 respondents in the intervention group, there were 2 people aged 1 month (13%), aged 2 months there were 2 people (13%), aged 3 months there were 3 people (20%), aged 4 months there were 3 people (20%) , aged 5 months there were 2 people (13%), aged 6 months there was 1 person (7%), and aged 7 months there were 2 people (13%). Thus, the majority of respondents in the intervention group were 3 and 4 months old and the minority were 6 months old.

Table 1 Characteristics of Respondents at the Kasih Bunda Clinic in 2023

No	Age	Treatment		Control	
	(months)	f	%	f	%
1	one	2	13	1	7
2	two	2	13	3	20
3	three	3	20	3	20
4	four	3	20	2	13
5	five	2	13	2	13
6	six	1	7	3	20
7	seven	2	13	1	7

Table 2 Normality Test for Baby Weight Data 0-12 Months at the Kasih Bunda Clinic in 2023

		Kolmogorov-Smirnov[a]			Shapiro-Wilk	
	Treatment	**Statistic**	**df**	**Sig.**	**Statistic**	**df**
Infant Weight	Pre-Test Treatment	.112	15	.200*	.946	15
	Post-Test Treatment	.134	15	.200*	.945	15
	Pre-Test Control	.151	15	.200*	.950	15
	Post-Test Control	.186	15	.174	.911	15

Table 2 shows that of the 30 babies, namely 15 respondents in the intervention group before and after being given the intervention and 15 respondents in the control group before and after being weighed and then carrying out the Shapiro-Wilk test to determine whether the data was normally distributed or not. The results obtained after being tested with the Shapiro-Wilk test were normally distributed. Then a t-test statistical test will be carried out to find out the relationship between baby massage and the increase in baby weight at the Kasih Bunda Clinic in 2023.

Table 3 Relationship between Baby Massage and Increase in Baby Weight at the Mother's Love Clinic in 2023.

Infant Weigt	**Weigt Gain**				**Total**	**Percentage**	***p (Value)***
	Treatment		**Control**				
	f	**%**	**f**	**%**	**f**	**(%)**	
Weight Gain	15	50	14	47	29	97	***0,000***
Weight not up/fixed	-	-	1	3	1	3	
Total	15	50	15	50	30	100	

Table 3 shows that there is a relationship between baby massage and the increase in baby weight 0-12 month at the Kasih Bunda Clinic in 2023, the result is a p-value of 0.000 (<0.05), so Ho is rejected and Ha is accepted

Baby massage helps stimulate motor nerves, improve sleep patterns, help the digestive system, increase the child's emotional calm, and make the muscles healthy. Babies who are massaged correctly and regularly can grow healthier and develop more optimally (Soetjiningsih, 2011)

Baby massage is a massage that is done closer to fine strokes or tactile stimulation carried out on the surface of the skin, manipulation of tissues or organs of the body aims to produce effects on nerves, muscles, and the respiratory system and facilitate blood circulation. Baby massage can cause a decrease in levels of adrenaline hormones (stress hormones) a decrease in stress hormone levels will increase endurance, especially IgM and IgG, if the baby's immunity increases then the baby does not get sick easily (Syaukani, 2015)

This is by Roesli's (2013) analysis, which concluded that baby massage can increase body weight and growth, increase body immunity, increase the affectionate relationship between parents and children (bonding), and increase the amount of breast milk.

These results are in line with research by Irva (2014) with the Mann-Whitney test, which obtained a p-value of 0.01 (<0.05) so that giving massage therapy affects the baby's weight gain. The results of the Wilcoxon test for the experimental group before and after giving massage therapy showed a p-value of 0.000 (p<0.05), which means there was an increase in body weight; the increase in body weight that occurred was 700 grams during two weeks of massage.

Baby massage can increase beta endorphins, which affect the growth mechanism, besides that it also increases the tone of the vagus nerves which affects the absorption mechanism of breast milk so that the baby will quickly hungry and breastfeeding more frequently on the mother, which also results in increased milk production. The effect of increasing body weight was also found in babies born at term. A study in China proves that there is an effect of infant massage for 10-15 mins a day since the baby was 15 days old. At 2 months of age, babies who were routinely massaged showed a difference in body weight compared to babies who were not massaged. In infants who were routinely massaged, the average weight gain for one month was 900 grams. Whereas in infants who were not given massage the average body weight for one month was 760 grams. (Lee HK,2016)

Supported by the results of Sunarsih's research, it was explained that there were differences in body weight in the two groups of infants studied. Massages on babies will increase serotonin neurotransmitter activity, which increases the capacity of receptor cells that bind glucocorticoid (adrenaline, a stress hormone), resulting in a decrease in adrenal hormone (a stress hormone), a decrease in levels of this stress hormone will increase endurance. Massage on babies will stimulate the vagus nerve, where this nerve will increase intestinal peristalsis to empty the stomach, so the baby is hungry quickly, so food intake will increase. [16] A research concluded that there was a significant difference in weight gain between term babies who were given massage stimulation, compared with babies who did not receive massage, the difference in the average body weight of babies who were

massaged and did not reach 440 grams. [17] The massage is performed on newborn for 15 minutes a day at home for a period of 4 weeks. The difference in weight gain was seen at 4 weeks of age. The effect of massage on growth isevidenced by research which shows that after regular infant massage is done every 2 times in 1 week for 4 weeks by the parents of each baby, the results show that most babies experience an increase in body weight of more than 1000. gramwhich was done on 11 babies, evidenced by the results of the p-value before =0.454 and the p- value after = 0.121. [11] Based on the results of thepaired *t*-test, it was found that p-value =0.000, because the p value < α = 0.05. Comparison of themean value of body weight before infant massage was 2975 grams, and an increase in the mean value after infant massage was 3175 grams. Based on the results of the p-value and the average comparison between body weight before and after, the conclusion is that infant massage isproven to be effective in increasing baby weight.(Rosyida,2020)

REFERENCES

Andrews. 2020. *Pengaruh pijat bayi terhadap kualitas tidur bayi Usia 0-6 bulan.* Jurnal Penelitian Kesehatan.8(1).25-32

Cahyaningrum, Sulistyorini. E. 2016. *Hubungan Pijat Bayi Terhadap Kualitas Tidur Bayi Umur 0-3 Bulan Di RB Suko Asih Sukoharjo*. Jurnal Kebidanan Indonesia, 5(2)

Carolina, dkk. 2020. *Hemorhoid Dalam Kehamilan*. MKS. Th. 46. No. 2. Hal 164-70

Departemen Kesehatan. 2021. *Pedoman Pelaksanaan Stimulasi, deteksi dan intervensi dini tumbuh kembang anak ditingkat pelayanankesehatan dasar.* Jakarta: Departemen Kesehatan RI

Field.2020.*Pengaruh Terapi Pijat Terhadap Peningkatan Berat Badan Bayi.*Jakarta : PT Bumi Aksara.

Goi. 2009. *Pelayanan Kesehatan Maternal Dan Neonatal*. Jakarta: PT Bina Pustaka

Handayani, Ririn.2020. *Metodologi Penelitian Sosial.* Yogyakarta: Trussmedia Grafika.

Handy. 2013. *Buku Pintar Pijat Bayi*. Buku Biru. Jakarta : Salemba Medika

Harahap, Nursapia.2020. *Penelitian Kualitatif*. Sumatera Utara : Wal ashri Publishing

Hardani.2020. *Metode Penelitian Kualitatif & Kuantitatif*. Yogyakarta: CV.Pustaka Ilmu.

Irva.2014. *Pengaruh terapi pijat terhadap peningkatan Berat badan bayi.* Jurnal Online Mahasiswa Program Studi Ilmu Keperawatan Univ Riau. 2014;1(2):1–9.

Kemenkes RI. 2018. *Profil Kesehatan Indonesia*. Jakarta: Kementrian Kesehatan Republik Indonesia.

Kemenkes RI. 2021. *Profil Kesehatan Indonesia*. Jakarta: Kementrian Kesehatan Republik Indonesia.

Mardiana, L. 2018. 2018. *Pengaruh Pijat Bayi Terhadap Kuantitas Tidur Bayi di Program Studi Ilmu Keperawatan STIKES Dr . Soebandi Jember. 6(1): 462–68.*

Marzali, Amri. 2016. *Menulis Kajian Literatur. ETNOSIA* : Jurnal Etnografi Indonesia 1(2): 27–36.

Notoatmodjo, S, 2018, *Metodologi Penelitian Kesehatan*, Jakarta: Rineka Cipta.

Nursalam. 2015. *Cara Mudah Dan Aman Pijat Bayi*. Jakarta: Dunia Sehat.

Oliver, J. 2013. *Pengaruh Baby Massage Terhadap Kualitas Tidur Bayi Usia 3-6 Bulan.* Journal of Chemical Information and Modeling, 53(9), 1689–1699. https://doi.org/10.1017/CBO9781107415324.004

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PENINGKATAN BERAT BADAN BAYI MELALUI PEMIJATAN

Ummi Kalsum[1*]

1. RSU Salewangang Maros, Sulawesi Selatan 90516, Indonesia

**E-mail: azissa17@yahoo.co.id.*

Abstrak

Pijat bayi merupakan tradisi lama yang digali kembali dengan sentuhan ilmu kesehatan dan tinjauan ilmiah para ahli neonatologi. Pijat merupakan terapi luar yang diandalkan dalam pengobatan berbagai penyakit namun belum banyak diketahui manfaatnya terhadap bayi baru lahir. Tujuan Penelitian ini adalah untuk mengetahui pengaruh pemijatan terhadap peningkatan berat badan bayi. Desain yang digunakan adalah eskperimental semu dengan jumlah sampel 30 responden. Data yang dikumpulkan dengan menggunakan lembaran observasi dan dianalisis dengan uji statistik *mann whitney test* dengan tingkat kemaknaan p< α (0,05). Uji statistik menggunakan uji *mann-whitney test* sebagai berikut pengaruh pemijatan terhadap peningkatan berat badan adalah p= 0,033; α= 0,05. Dari hasil uji *paired* sampel *t-test* pada kelompok kontrol didapatkan nilai p= 0,0517; α= 0,05. Kesimpulan penelitian ini adalah ada hubungan antara pemijatan dengan peningkatan berat badan bayi.

Kata kunci: berat badan, pemijatan

Abstract

Improved Weight Infant by Massage*. Infant massage is an old tradition that was dug up with a touch of health sciences and scientific review of Neonatology experts, massage therapy is a very effective outside and reliable in the treatment of various diseases. The study objective was to determine the effect of infant massage on the baby's weight gain. This study starts from the month of May-June 2010. Research design used is the number of samples found experimental 30 respondents. Data were collected from patients by using observation sheets, collected, and edited, coding, tabulation. Then conducted data analysis with statistical tests Mann-Whitney test with a significance level of p<α (0,05). Statistical tests using SPS program of Mann-Whitney test results following test massaging effect of weight gain is p= 0,033; α= 0,05. From the test results of paired samples t-test in the control group p= 0,0517; α= 0,05. The conclusion of this study is that there is a relationship between a massage with baby weight gain.*

Keywords*: body weight, massage*

Pendahuluan

Kenaikan berat badan pada bayi dan anak di bawah usia lima tahun (balita) merupakan masalah yang masih dihadapai di Provinsi Sulawesi Selatan. Sepanjang tahun 2008 terdapat 26.274 bayi dan balita yang ditimbang di POSYANDU mengalami masalah dalam penambahan berat badanyaitu berat badan bayi tidak sesuai dengan usia bayi. Pada tahun 2009 kasus yang sama dilaporkan sebanyak 81.837 dan tahun 2010, jumlah ini bertambah menjadi 87.000 dari total bayi di Provinsi Sulawesi Selatan sebanyak 497.577 bayi dan balita (Data Dinas Kesehatan Provinsi Sulawesi Selatan, 2010). Dinas Kesehatan Kabupaten Maros Sulawesi Selatan melaporkan bahwa pada tahun 2010, hasil penimbangan bayi dan balita tercatat 2.415bayi/balita yang mengalami gangguan kenaikan berat badan dan berdasarkan data dalam Kartu Menuju Sehat (KMS) sebagian besar berada di garis kuning bahkan di bawah garis merah (Data Dinas Kesehatan Kabupaten Maros Sulawesi Selatan, 2010). Berdasarkan masalah di atas, maka perlu ada upaya untuk meningkatkan berat badan bayi, salah satunya dengan pijat bayi.Pemijatan pada bayi menurut *Heath and*

Bainbridge (2007) akan merangsang nervus vagus. Saraf ini akan meningkatkan peristaltik usus, sehingga pengosongan lambung lebih cepat dengan demikian akan merangsang nafsu makan bayi untuk makan lebih lahap dalam jumlah yang cukup. Selain itu, nervus vagus juga dapat memacu produksi enzim pencernaan makanan maksimal. Di sisi lain pijat juga dapat memperlancar peredaran darah dan meningkatkan metabolisme sel, dari rangkaian tersebut berat badan bayi akan meningkat. Tujuan penelitian ini adalah untuk mengetahui pengaruh pemijatan pada bayi terhadap peningkatan berat badan bayi di wilayah kerja Puskesmas Tunikamaseang.

Metode

Penelitian ini dilakukan di wilayah kerja Puskesmas Tunikamaseang. Kecamatan Bontoa Kabupaten Maros Sulawesi Selatan tahun 2010. Rancangan penelitian menggunakan eksperimental semu, melibatkan 30 orang tua beserta bayinya, yang dibagi menjadikelompok kontrol dan kelompok intervensi.

Hasil

Sesuai hasil penelitian yang telah dilak- sanakan di Kecamatan Bontoa Kabupaten Maros Sulawesi Selatan didapatkan bahwa rata-rata peningkatan berat badan pada kelompok intervensi (Kelompok A) berkisar antara 500-600 gram perbulan; sedangkan pada kelompok kontrol (Kelompok B) berkisar antara 400 gram perbulan.

Berat Badan Bayi pada Kelompok yang Mendapat Pemijatan. Berdasarkan data Tabel 1, berat badan bayi *pra-test* semua responden masuk dalam indek berat badan antara 80-120%. Data *pasca-test* didapatkan indek berat badan responden semua dalam rentang 80-120%. Rata-rata peningkatan berat badan pada kelompok kontrol A berkisar antara 500-600 gram perbulan.

Berat Badan Bayi pada Kelompok yang Tidak Mendapat Pemijatan. Berdasarkan data Tabel 2 didapatkan pada *pra-test* sebagian besar responden (4) memiliki indek beratbadan antara 70–79,9% dan 1 responden mempunyai indek berat badan 80–120%. Pada *pasca-test* sebagian besar masih mempunyai indeks berat badan antara 70–79,9% dan 1 responden memiliki indek berat badan antara 80–120%.

Pada kelompok yang tidak dilakukan perlakuan pemijatan berat badan naik berkisar antara 400 gram perbulan. Dari uraian di atas menunjukkan bahwa pemijatan berpengaruh terhadap peningkatan berat badan. Hal ini dikarenakan dengan pemijatan dapat merangsang peningkatan masukan makanan yang dapat meningkatkan berat badan bayi.

Tabel 1. Berat Badan Bayi Pra-Test dan Pasca-Test pada Kelompok yang Mendapat Perlakuan (Pemijatan)

Kode Responden A	Pra-Testr		Pasca-Test	
	BB	Indek	BB	Indek
1	7500	80-120%	8100	80-120%
2	8000	80-120%	8400	80-120%
3	8100	80-120%	8500	80-120%
4	8200	80-120%	8500	80-120%
5	7800	80-120%	8300	80-120%
N : 5	Corelasi: 0,991 Probabilitas Corelasi: 0,001 Probabilitas = 0,001			

Tabel 2. Berat Badan Bayi Pra-Test dan Pasca-Test pada Kelompok Kontrol (Tidak Mendapat Perlakuan Pemijatan)

Kode Responden B	Pra-Testr		Pasca-Test	
	BB	Indek	BB	Indek
1	6200	70-79,9%	6600	70-79,9%
2	6200	70-79,9%	6300	70-79,9%
3	5900	70-79,9%	6300	70-79,9%
4	5900	70-79,9%	6200	70-79,9%
5	6200	80-120%	6700	80-120%
N : 5	Corelasi: 0,716 Probabilitas Corelasi: 0,174 Probabilitas = 0,007			

Pembahasan

Berdasarkan data yang sudah diperoleh menunjukkan data berat badan bayi *pra-test* dan *pasca-test* pada kelompok yang mendapat perlakuan (pemijatan) maka terjadi pening-katan berat badan bayi yang mendapatperlakuan (pemijatan). Meskipun ada pening- katan berat badan akan tetapi peningkatan beratbadan pada kedua kelompok tersebut masih di bawah standar yaitu menurut Rubiati (2004, dalam Harjaningrum, 2007) 500–600 gram/bulan, sehingga pemijatan yang dilakukan tidak maksimal oleh peneliti atau faktor genetik responden yang lebih menonjol seperti yang disebutkan Ganong (1999) bahwa berat badan sangat dipengaruhi oleh genetik, sedang faktor lingkungan hanya berperan kurang dari 30%. Akan tetapi, bila dilihat pada berat badan awal, pada kelompok perlakuanreratanya lebih baik dari pada kelompok kontrol. Selain itu, berat badan setelah empat minggu menunjukkan bahwa berat badan bayi meningkat dengan rerata kelompok perlakuan tetap baik dari pada kelompok kontrolmenunjukkan hasilnya biasa dan tidak maksimal karena rerata berat badan awal bayi sudah berbeda.

Satu hal yang sangat menarik pada penelitian tentang pemijatan bayi adalah penelitian tentang mekanisme dasar pemijatan. Penelitian Fiel dan Schannberg (dalam *Heath Alam and Bainbridge Nicki*, 2007) menunjukkan bahwa pada bayi yang dipijat akan meningkatkan aktivitas neutransmiter serotonim, yaitu meningkatkan kapasitas sel reseptor yang berfungsi mengikat glucocorticoid (adrenalin, suatu hormon stres), sehingga terjadi penurunan hormon adrenalin (hormon stres), penurunan kadar hormon stress ini akan meningkatkan daya tahan tubuh. Menurut Guyton (dalam Ganong, 1999) bahwa pemijatan pada bayi akan merangsang nervus vagus, dimana saraf ini akan meningkatkan peristaltik usus untuk mengosongkan lambung, dengan begitu bayi cepat lapar, sehingga masukan makanan akan meningkat. Syaraf ini juga merangsang peningkatan produksi enzim pencernaan, sehingga penyerapan nutrisi meningkat. Nutrisi yang diserap akan ikut dalam peredaran darah yang juga meningkatoleh potensial aksi saraf simpatis. Selain itu, peningkatan distribusi mikro dan makro nutrien akan membantu peningkatan metabolisme organ dan sel, sehingga ada penyimpanan bawah kulit dan pembentukan selbaru. Keadaan ini yang dapat meningkatkan berat badan bayi. Adanya kenaikan berat badan menunjukkan bahwa adanya kesinambungan antara masukan nutrisi bayi dengan pengeluaran energi karena berat badan dipengaruhi oleh faktor lingkungan sepertimasukan makanan (Ganong, 1999).

Berdasarkan hasil tersebut sesuai dengan teori yang dinyatakan oleh Ganong (1999) bahwa pertumbuhan setiap individu bervariasi dan bersifat linier dengan proses episode, yang mana penyebab pertumbuhan episode tidak dapat diketahui. Hasil penelitian sesuai dengan pemaparan *Heath Alam and Bainbridge Nicki*

(2007) bahwa pemijatan pada bayi mempunyai banyak manfaatnya antara lain membuat bayi semakin tenang, meningkatkan efektifitas istirahat (tidur) bayi atau balita, memperbaiki konsentrasi bayi, meningkatkan produksi asi bagi ibu bayi atau balita, membantu meringankan ketidaknyamanan dalam pencernaan dan tekanan emosi, memacu perkembangan otak dan sistem saraf, meningkatkan gerak peristaltik untuk pencernaan, menstimulasi aktivitas nervus vagus, memperkuat sistem kekebalan tubuh, meningkatkan kepercayaan diri ibu dan memudahkan orang tua mengenali bayi atau balita, sehingga pemijatan pada umumnya sangat efektif untuk meningkatkan berat badan, menigkatkan pertumbuhan dan dapat membina kasih sayang orang tua dan anak.

Hasil penelitian ini relevan dengan beberapa hasil penelitian lainnya. Beberapa hasil penelitain yang relevan dengan hasil penelitian ini antara lain adalah Setiawati (2010) pada penelitiannya yang berjudul "Pengaruh pijat bayi terhadap peningkatan berat badan bayi usia 0–6 bulan di Polindes Buluk Agung Wilayah Kerja Puskesmas Klampis Bangkalan", menyimpulkan bahwa pijat bayi mempuyai banyak manfaat bagi bayi, yaitu dapat meningkatkan berat badan bayi, partumbuhan bayi, daya tahan tubuh bayi, konsentrasi bayi, membuat tidur bayi lebih lelap dan mempererat ikatan kasih sayang antara orang tua dan anak. Dalam keadaan sehat dan mendapat gizi yang baik, berat badan bayi pada tahun pertama kehidupannya mengalami peningkatan 140–200 gram tiap minggunya. Hasil penelitian didapatkan 15 bayi yang tidak dilakukan pemijatan mengalami perubahan berat badan rata-rata sebesar 1,42%, dengan uji t sampel berpasangan diperoleh p= 0,005. Pada 15 bayi yang dilakukan pemijatan juga mengalami peningkatan berat badan 4,11%, dengan uji t sampel berpasangan diperoleh p=0,000. Di sisi lain, pada perbandingan peningkatan berat badan antara bayi yang tidak dilakukan pemijatan dengan bayi yang dilakukan pemijatan, hasil uji t sampel bebasnya diperoleh p= 0,001. Kesimpulanpenelitian ini adalah adanya pengaruh pijat bayi terhadap peningkatan berat badan bayi usia 0–6 bulan.

Penelitian lain yang ikut memberikan kesimpulan yang sama adalah penelitian yang dilakukan oleh Oktobriariani (2010) pada penelitiannya yang berjudul "Pengaruh pendidikan kesehatan tentang pijat bayi terhadap praktik pijat bayi di Polindes Harapan Bunda Sukoharjo". Hasil penelitiannya menyimpulkan bahwa berdasarkan analisis secara keseluruhan didapatkan nilai t-hitung > t-tabel (29,231 > 2,040) atau p <α (0,000 < 0,05). Hal ini berarti terdapat perbedaan yang bermakna antara praktik ibu dalam melakukan pijat bayi sebelum diberi pendidikan kesehatan dan sesudah diberi pendidikan kesehatan. Berdasarkan hasil analisis dapat diketahui bahwa kemampuan praktik pijat bayi seorang ibu sesudah diberi pendidikan kesehatan tentang pijat bayi lebih baik dibandingkan dengan kemampuan praktik pijat bayi sebelum diberi pendidikan kesehatan tentang pijat bayi, dengan demikian disimpulkan bahwa ada pengaruh pendidikan kesehatan tentang pijat bayi terhadap praktik pijat bayi.

Manfaat pemijatan yang maksimal dapat diperoleh dengan memperhatikan waktu pemijatan yang tepat. Waktu pemijatan yang paling tepat pada pagi hari sebelum melalui aktivitas mandi alasanya kepraktisan sebab, sisa minyak pijat akan lebih mudah diber- sihkan. Pemijatan juga dapat dilakukan padamalam hari menjelang tidur sebab setelah pemijatan biasanya bayi akan santai dan merasa mengantuk, tidur pun akan menjadi lebih nyenyak. Memijat juga dapat dilakukan pada saat bayi santai dan tenang.

Kesimpulan

Pemijatan yang dilaksanakan secara teratur pada bayi digunakan pemijatan pada kaki, perut, dada, tangan, punggung, dan gerakan peregangan dapat meningkatkan berat badan bayi. Pemijatan tersebut akan terjadi potensiaksi saraf yang merangsang nervus vagus kemudian akan merangsang peningkatan

peristaltik usus, sehingga penyerapan makanan dalam tubuh akan lebih maksimal. Pemijatan pada bayi juga dapat melancarkan peredaran darah dan meningkatkan metabolisme sel, sehingga berat badan bayi akan meningkat. Berdasarkan hasil penelitian juga disimpulkan bahwa terdapat pengaruh pemijatan pada bayi terhadap kenaikan berat badan.

Berdasarkan hasil penelitian yang menunjukkan bahwa adanya pengaruh positif pemijatan terhadap perkembangan bayi, maka disarankan kepada perawat anak dan maternitas hendaknya dapat melakukan pemijatan sebagai salah satu pelaksanaan terhadap bayi dan anak. Selain itu, untuk para kader Posyandu perlu dilaksanakan latihan pemijatan bayi yang benar sehingga mereka dapat memberikan contoh kepada ibu-ibu balita, dan pemijatan pada bayi hendaknya dilakukan 2–3 kali seminggu selama kurang lebih 10–20 menit setiap kali melakukan pemijatan dan sesuai dengan prosedur pemijatan yang benar (HW, YR, NN).

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Referensi

Dinas Kesehatan Maros. (2010). *Maros dalam angka*. Maros: Dinas Kesehatan Kabupaten Maros.

Dinas Kesehatan Provinsi Sulawesi Selatan (2010). *Derajat kesehatan di Sulawesi Selatan Tahun 2010*. Makassar: DINKES PEMPROV Sulawesi Selatan.

Ganong, W.F. (1999). *Fisiologi kedokteran*. Jakarta: Penerbit Buku Kedokteran EGC.

Harjaningrum, A.T., Inayati, D.A., Wicaksono, H.A., & Derni, M. (2007). *Peranan orang tua dan praktisi dalam membantu tumbuh kembang anak berbakat melalui pemahaman teori dan tren pendidikan*. Jakarta: Prenada.

Heath Alam and Bainbridge Nicki. (2007). *Baby massage: Kekuatan menenangkan dari sentuhan*. Jakarta: Dian Rakyat.

Oktobriariani, R.R. (2010). *Pengaruh pendidikan kesehatan tentang pijat bayi terhadap praktik pijat bayi di Polindes Harapan BundaSukoharjo* (Karya tulis ilmiah, Fakultas Kedokteran Universitas Sebelas Maret).Program Studi DIV Kebidanan Fakultas Kedokteran Universitas Sebelas Maret, Jawa Tengah, Indonesia.

Setiawati, I. (2010). *Pengaruh pijat bayi terhadap peningkatan berat badan bayi usia 0–6 bulan di Polindes Buluk Agung wilayah kerja Puskesmas Klampis Bangkalan* (Skripsi, Universitas Airlangga Surabaya). Program Studi S1 Kebidanan Fakultas Kedokteran Universitas Airlangga, Surabaya – Jawa Timur, Indonesia

PENGARUH TEKNIK PIJAT BAYI TERHADAP KENAIKAN BERAT BADAN BAYI USIA 0-7 BULAN DI BPS NY. AIDA HARTATIK DESA DLANGGU KECAMATAN DEKET KABUPATEN LAMONGAN

Ida Susila*
***Dosen Program Studi D III Kebidanan Universitas Islam Lamongan**

ABSTRAK

Sebenarnya terapi pijat ini dipraktekkan hampir diseluruh dunia termasuk Indonesia. Salah satu terapi pijat yang ditemukan adalah terapi pijat pada bayi. Sensasi sentuh dan raba ini merupakan indera yang aktif berfungsi sejak dini karena bayi telah merasakan sejak masa janin. Secara ilmiah telah dapat dibuktikan bahwa terapi sentuh pada bayi memeng bermanfaat baik secara biokimia maupun fisik. Tujuan penelitian ini adalah mencari pengaruh teknik pijat bayi terhadap kenaikan berat badan. Desain penelitian ini menggunakan metode Pra Eksperimen (*One Group Pretest Design*).

Metode sampling yang digunakan adalah *simple random sampling.* Populasi dalam penelitian ini sebanyak 34 bayi. Sample yang diambil 31 bayi.Variabel yang digunakan dalam penelitian ini adalah variabel independent yaitu pijat bayi, sedangkan dependent yaitu kenaikan berat badan bayi. Uji analisis dalam penelitian ini adalah *Wilcoxon Sign Rank Test*

Hasil penelitian menunjukkan bahwa terdapat pengaruh yang signifikan pijat bayi terhadap kenaikan berat badan bayi dengan signifikasi sebesar 0,000. Dengan hasil t tabel sebesar 0,0 dan p sebesar 0,000. Hal ini menunjukkan nilai p<0,05 dan nilai z sebesar -3,793 maka H1 diterima.

Penelitian ini memberikan kesempatan pada peneliti lain untuk melakukan perbandingan lain yang dapat menaikkan berat badan bayi, sehingga dapat ditemukan cara lain yang lebih efektif untuk penanggulangan kenaikan berat badan bayi. Maka diharapkan ibu untuk melakukan pijat bayi.

Kata kunci : *Pijat Bayi, Kenaikan Berat Badan Bayi*

PENDAHULUAN

Terapi pijat ini dipraktekkan hampir diseluruh dunia termasuk Indonesia. Salah satu terapi pijat yang ditemukan adalah terapi pijat pada bayi. Terapi pijat ini sekarang masih banyak dilakukan oleh dukun terutama di pedesaan. Menurutketua lembaga peningkatan penggunaan air susu ibu (PP-ASI) RS. Sint Carolus itu, efek bio kimia yang positif dari pijat bayi antara lain, menurunkan kadar hormon stres (catecholamine) dan meningkatkan kadar sterotonin. Sedangkan efek fisik dari pijat antara lain memperbaiki sirkulasi darah dan pernafasan, merangsang fungsi pencernaan dan pembuangan, serta meningkatkan berat badan. (Dede, 2003)

Hal ini didukung oleh penelitian yang dilakukan oleh Prof. T. Field & Scafidi (1986 & 1990), menunjukna bahwa pada 20 bayi premature dengan berat badan 1280 & 1176 gram yang dipijat 3 x 15 menit selama 10 hari mengalami kenaikan berat badan per 20 – 47 % lebih banyak dari yang tidak dipijat. Penelitian juga dilakukan pada bayi cukup bulan berusia 1-3 bulan yang dipijat selama 15 menit dalam 2 kali seminggu selama 6 minggu, didapatkan kenaikan berat badan yang lebih dari kontrol. (Prof .T.Field & scafidi,1986). Rene Spitz, dokter anak dan psikiater dari Amerika melaporkan. Bayi yang banyak memperoleh sentuhan khususnya dari ibu, jarang mengalami symptom hipotalasmus. Pengamatan T. Field seperti dikutip di Dr. J. David Hull, ahli Virology Molekuler dari Inggris dalam makalahnya yang berjudul *Touch Therapy : Science Confirms Instinct*, menyebutkan terapi pijat 30 menit per hari bisa mengurangi depresi dan kecemasan. Tidurpun bertambah tenang dengan pijatan. Dapat juga meningkatkan fungsi motorik dan memperkuat jalinan otot pada bayi yang mengalami down syndrome. Termasuk 44 % mempengaruhi perbaikan fungsi motorik bayi dan 82 % perbaikan pada otot lengan dan kaki.

Pemijatan yang baik adalah pemijatan yang dilakukan oleh ibu bayi sendiri karena support psikologik dengan jalan kontak psikis dan fisik dari ibu adalah sama besar nilainya dengan lingkungan fisik dan kehangatan ketika bayi masih berada dalam rahim ibu (Kartini Kartono, 2002 : 145). Pemijatan bayi oleh ibunya sendiri dapat dilakukan sejak dini. Bayi baru lahir sebaiknya mengawali tahap pemijatan dengan sentuh karena dapat memberikan jaminan adanya kontak dengan tubuh dan berkelanjutan yang dapat mempertahankan perasaan aman pada bayi. Tetapi kenyataannya di masyarakat terutama di pedesaan masih banyak ibu yang mempercayakanpemijatan bayinya kepada dukun. Salah satu faktor yang mempengaruhi adalah tingkat pengetahuan ibu tentang pemijatan bayi yang benar masih rendah. (Utami Roesli, 2001 : 9).

Pemijatan yang dilakukan oleh dukun pijat yang tingkat pendidikannya rendah dan tidak mengerti dengan benar anatomi fisiologis tubuh manusia, ada kemungkinan terjadi kesalahan dalam pemijatan. Dampak pemijatan yang salah dapat mengakibatkan cacat bahkan kematian. Oleh karena itu pendidikan dan pengetahuan bagi seorang ibu sangatlah penting, maka setiap ibu bayi yang mempunyai bayi perlu mempelajarinya, peran tenaga kesehatan terutama peran bidan sebagai pelaksana sangat dibutuhkan untuk memberikan penyuluhan tentang pemijatan bayi yang benar kepada ibu. Penyuluhan merupakan suatu proses penyampaian, suatu proses atau informasi dari penyuluh kepada sasaran.(Utami Roesli, 2001 : 11).

Berdasarkann survei awal yang dilakukan dari 39 bayi di desa Ndllangu yang mengalami kenaikan berat badan bayi usia 0-7 bulan pada bulan januari 2009 berjumlah 22bayi, 10(45%) bayimengalami kenaikan berat badan dan 12(55%) bayi tidak mengalami kenaikanberat badan.

Dengan demikian petugas kesehatan melakukan teknik pijat bayi dengan tujuan agar berat badan bayi bisa naik, selain itu juga mempunyai dampak

positif bagi perkembangan fisik dan psikis anak.

Berdasarkan latar belakang diatas, maka masalah dalam penelitian ini adalah pengaruh teknik pijat bayi terhadap kenaikan berat badan bayi usia 0-7 bulandi BPS Ny. Aida Hartatik Desa Ndlanggu Kecamatan Deket Kabupaten Lamongan.

TUJUAN PENELITIAN

Untuk mengetahui pengaruh teknik pijat bayi terhadap kenaikan berat badan bayi usia 0-7 bulan di BPS Ny. Aida Hartatik Desa Ndlanggu Kecamatan Deket Kabupaten Lamongan.

TINJAUAN PUSTAKA

Pijatan adalah komunikasi pada tingkat terdalam, tanpa bataasan kata-kata merupakan pesan yang mengandung kehangatan dari cinta bagi bayi (Turne Roma, 2001 : 16), pijat adalah terapi sentuh (Utami Roesli, 2001 : 2). Pijatan adalah sentuhan yang ringan dan langsung atau keras dan lembut, gabungan luas dan lembut (Harmoni, 2002 : 4). Pijat merupakan salah satu bentuk dari terapi sentuh yang berfungsi sebagai salah satu teknik pengobatan penting (Kalbe Health Foods, 2001 : 12).

Manfaat Pemijatan

Meningkatkan berat badan

Penelitian yang dilakukan oleh T. Field dan Scafidi (1986 dan 1990), pada bayi cukup bulan yang berusia 1-3 bulan, yang dipijat 12 menit, 2 kali seminggu selama 6 minggu didapatkan kenaikan berat badan yang lebih dari bayi kontrol. Antara lain : meningkatkan pertumbuhan, meningkatkan konsentrasi bayi dan membuat bayi tidur lebih lelap, meningkatkan daya tahan tubuh, ini akan menyebabkan terjadinya penurunan kadar hormon adrenalin (hormon stres) penurunan pada hormon stres ini akan meningkatkan daya tahan tubuh, terutama IgM dan IgG.

Pijatan dapat mengubah gelombang otak, pijat bayi akan membuat bayi tidur lebih lelap dan meningkatkan kesiagaan (alertness) atau konsentrasi. Hal ini disebabkan pijatan gelombang otak, perubahan ini terjadi dengan cara menurunkan gelombang alpha dan meningkatkan gelombang beta serta teta, yang dapat dibuktikan dengan menggunakan electro encephalogram (EEG), antara lain : Membina ikatan kasih sayang orang tua dan anak (Bonding), Mengendalikan temperamennya, Meningkatkan produksi ASI.

Pada penelitian Cintia Mersmann, ibu-ibu yang bayinya dipijat secara rutin ternyata dapat memproduksi ASI perah lebih banyak dibanding kelompok kontrol jadi, dengan meningkatkan volume ASI perah, pijat bayi juga dapat meningkatkan periode waktu pemberian ASI secara eksklusif oleh ibu-ibu yang bekerja : Memacu sistem sirkulasi bayi dan denyut jantung, pernafasan, pencernaan dan sistem kekebalan tubuh. Mendorong pertumbuhan susunan otot dan kelenturan dimana akan membantu dalam pertumbuhan kemampuan fisik bayi.

Petunjuk Memijatan Bayi.

Pijat bayi dapat segera dimulai setelah bayi dilahirkan sesuai dengan keinginan orang tua. Dengan lebih cepat mengawali pemijatan, bayi akan mendapat keuntungan yang lebih besar. Apalagi jika pemijatan dapat dilakukan setiap hari, dari sejak kelahiran sampai bayi berusia 6 – 7 bulan (Utami, 2001).

Waktu terbaik memijat bayi

1. Pagi hari, pada saat orang tua dan anak siap untuk memulai hari baru
2. Malam hari, sebelum tidur, ini sangat baik untuk membantu bayi tidur lebih nyenyak
3. Antara 2 waktu makan saat bayi tidak terlalu kenyang namun juga tidak terlalu lapar

Persiapan alat :

1. Kain tebal untuk alas bayi/selimut bayi
2. Handuk
3. Mangkuk kecil untuk tempat baby oil
4. Baby oil
5. Bila bayi terbiasa diberi susu botol, pastikan susu sudah siapkan sebelumnya
6. Baskom isi air hangat untuk memandikan bayi setelah pemijatan terakhir
7. Baju ganti bayi
8. Bila ada tape atau radio yang terdapat lagu-lagu yang tenang

Cara pemijatan sesuai umur bayi :

1. 0 – 1 bulan, disarankan gerakan yang lebih mendekati usapan – usapan halus. Sebelum tali pusat bayi lepas sebaiknya tidak dilakukan pemijatan di daerah perut.
2. 1 – 3 bulan, disarankan gerakan halus disertai dengan tekanan ringan dalam waktu yang singkat.
3. 3 bulan sampai 3 tahun, disarankan seluruh gerakan dilakukan dengan tekanan dan waktu yang semakin meningkat.

HIPOTESIS PENELITIAN

Hipotesis adalah jawaban sementara terhadap masalah yang diajukan yang kebenaranya akan dibuktikan dengan penelitian yang akan dilakukan.

Uji hipotesis dalam penelitian ini adalah ada pengaruh pijat bayi terhadap kenaikan berat badan bayi usia 1-7 bulandi BPS Aida Hartatik, Amd. Keb Desa Ndlanggu Kecamatan Deket Kabupaten Lamongan pada bulan Januari – Maret 2010.

METODE PENELITIAN

Desain penelitian yang digunakan adalah Pra-Eksperimental (*One Group Pratest Posttest Design)* yaitu kelompok subyek diobservasi sebelum dilakukan intervensi kemudian diobservasi lagi setelah intervensi (Nursalam, 2003:88).

Sampel yang digunakan dalam penelitian ini adalah sebagian ibu yang mempunyai bayi yang berusia 1-7 bulan di BPS Ny.Aida Hartatik desa Ndlanggu Kecamatan Deket Kabupaten Lamongan yang memenuhi kriteria inklusi.

HASIL PENELITIAN

Table 5.1 Frekuensi Responden berdasarkan umur di BPS Ny. Aida Hartatik Amd, Keb. Desa Ndlanggu Kecamatan Deket Kabupaten Lamongan bulan Januari sampai Maret tahun 2016

No	Umur	Jumlah	Persentase (%)
1	1 bulan	4	12,9

2	2 bulan	4	12,9
3	3 bulan	5	16,1
4	4 bulan	5	16,1
5	5 bulan	7	22,6
6	6 bulan	4	12,9
7	7 bulan	2	6,5
Total		31	100

Berdasarkan data di atas menunjukkan hampir sebagian besar responden berumur 5 bulan yaitu sebanyak 7 bayi (22,6%) dan hanya sebagian kecil yang berumur 7 bulan yaitu sebanyak 2 bayi (6,5%).

5.1.2. Data Khusus

1). Hasil analisis mengenai pijat bayi terhadap kenaikan berat badan bayi usia 1-7 bulan

Tabel 5.2 Distribusi berat badan bayi usia 1-7 bulan sebelum dilakukan pijat bayi

No	**Umur**	**BB sebelum di pijat**	**Jumlah**	**Persentase (%)**
1	1 bulan	3 – 3,3	4	12,9
2	2 bulan	3,9 – 4	4	12,9
3	3 bulan	4,2 – 4,5	5	16,1
4	4 bulan	4,9 – 5	5	16,1
5	5 bulan	5,5 – 6,2	7	22,6
6	6 bulan	5,9 – 6,1	4	12,9
7	7 bulan	7,2 – 7,4	2	6,5
Total			31	100

Berdasarkan data dari tabel 5.2 di atas dari 31 responden menunjukkan yang paling banyak bayi berumur 5 bulan yaitu sebanyak 7 bayi (22,6%) dan yang paling sedikit bayi berumur 7 bulan yaitu sebanyak 2 bayi (6,5%).

2). Hasil analisis mengenai pijat bayi terhadap kenaikan berat badan bayi usia 1-7 bulan

Tabel 5.3 Distribusi berat badan bayi usia 1-7 bulan setelah dilakukan pijat bayi

No	Umur	Berat Badan	Setelah dipijat naik		Setelah dipijat tetap	
			Jml	(%)	Jml	(%)
1	1 bulan	2,8 – 4,5	3	9,67	1	3,2
2	2 bulan	3,8 – 4,7	3	9,67	1	3,2
3	3 bulan	3,9 – 5	2	6,5	3	9,67

4	4 bulan	4,7 – 5,7	3	9,67	2	6,5
5	5 bulan	5,7 – 6,6	5	16,1	2	6,5
6	6 bulan	6,4 – 6,8	4	12,9	0	0
7	7 bulan	7,1 – 7,9	1	3.2	1	3,2
Total			21	67,71	10	32,77

Berdasarkan data dari tabel 5.3 di atas dari 31 responden menunjukkan yang paling banyak bayi mengalami kenaikan berat badan berumur 5 bulan yaitu sebanyak 5 bayi (16,1%) dan yang paling sedikit bayi berumur 7 bulan yaitu sebanyak 1 bayi (3,2%)

3). Pengaruh pijat bayi terhadap kenaikan berat badan bayi usia 1-7 bulan
Hasil analisis mengenai pengaruh pijat bayi terhadap kenaikan berat badan bayi usia 1-7 bulan, dapat dilihat pada tabel 5.4 dibawah ini :

Tabel 5.4 Analisis pengaruh pijat bayi terhadap kenaikan berat badan bayi usia 1-7 bulan di BPS Ny. Aida Hartatik Amd.Keb Desa Ndlanggu Kecamatan Deket Kabupaten Lamongan Bulan Januari –Maret Tahun 2016

VARIABEL	Z	P	MEAN	T
SEBELUM DIPIJAT– SETELAH DIPIJAT	-3,793	0,000	21,00	0,0

Berdasarkan Tabel 5.4 yang merupakan hasil analisis statistik *Wilcoxon*, didapatkan hasil nilai t tabel sebesar 0,0 dengan p sebesar 0,000. Hal ini menunjukkan nilai p<0,05 dan nilai z sebesar -3,793 maka H1 diterima dalamarti terdapat pengaruh pijat bayi terhadap kenaikan berat badan bayi usia 1-7 bulan.

PEMBAHASAN

Berat Badan Bayi

Dari tabel 5.2 di atas dari 31 responden menunjukkan yang paling banyak bayi berumur 5 bulan yaitu sebanyak 7 bayi (22,6%) dan yang paling sedikit bayi berumur 7 bulan yaitu sebanyak 2 bayi (6,5%).

Menurut Soetjiningsih kebutuhan dasar anak terbagi atas kebutuhan fisik-biomedis (asuh), kebutuhan emosi/kasih sayang (asih) dan kebutuhan akan stimulasi mental (asah). Kebutuhan fisik meliputi pangan/gizi yang merupakan kebutuhan terpenting. Kebutuhan dasar anak kedua adalah kebutuhan emosi/kasih sayang. Pada tahun-tahun pertama kehidupan hubungan yang erat, mesra dan selaras antara ibu dengan anak merupakan syarat mutlak untuk menjamin tumbuh kembang anak baik fisik, mental maupun psikososial.

Peningkatan berat badan bayi ini disebabkan oleh terjadi karena bayi yang dipijat mengalami peningkatan tonus nervus vagus (saraf otak ke-10) yang membuat kadar enzim penyerapan gastrin dan insulin meningkat sehinggapenyerapan sari makanan menjadi lebih baik.

Berat badan merupakan hasil peningkatan atau penutupan semua jaringan yang ada pada tubuh lain : tulang, otot, caiaran tubuh dan yang lainnya (Soetjiningsih, 2005 :38). Pertumbuhan dan perkembangan merupakan proses yang terjadi pada makhluk hidup. Pertumbuhan dan perkembangan menyangkut semua aspek semua kemajuan yang dicapai sejak dalam kandungan hingga dewasa.

Pertumbuhan adalah bertambahnya ukuran fisik dan stuktur tubuh dalam arti sebagian atau seluruhnya karena adanya multiplikasi (bertambah banyak) sel-sel tubuh dan juga karena bertambah besarnya sel. Adanya multiplikasi dan pertambahan ukuran sel berarti ada pertambahan secara kuantitatif dan hal tersebut terjadi sejak terjadinya konsepsi, yaitu bertemunya sel telur dan sperma hingga dewasa. Jadi pertumbuhan lebih ditekankan pada pertambahan ukuran fisik seseorang, yaitu menjadi lebih besar atau lebih matang bentuknya, seperti pertambahan ukuran berat badan, tinggi badan, dan lingkar kepala (IDAI, 2002).

Kenaikan berat badan anak pada tahun pertama kehidupan, apabila anak mendapat gizi yang baik, menurut Wong, D.L.(2003) adalah berkisar antara:

1. Bayi lahir-6 bulan : pertambahan setiap minggu 140-200 gram. Berat badan lahir dua kpada akhir 6 bulan pertama.
2. 6-12 bulan : pertambahan setiap minggu 85-400 gram. Berat badan tiga kali berat badan lahir pada akhir tahun pertama.

Pengamatan T. Field yang dikutip dr. J. David Hull, ahli virologi mulekuler dari Inggris, dalam makalah berjudul Touch Therapy: Science Confirms Instinct, menyebutkan terapi pijat 30 menit per hari bisa mengurangi depresi dan kecemasan pada bayi sehingga bayi dapat tidur lebih nyeyak dan tenang. Terapi pijat yang dilakukan 15 menit selama enam minggu pada bayi usia 1-3 bulan juga meningkatkan kesiagaan. Diikuti dengan peningkatan berat badan, perbaikan kondisi psikis, berkurangnya kadar hormone stres, dan bertambahnya kadar serotonin. Meningkatnya aktivitas neurotransmitter serotonin ini akan meningkatkan kapasitas sel reseptor yang mengikat glucocorticoid (adrenalin). Proses ini menyebabkan terjadinya penurunan kadar hormone adrenalin (hormone stres),dan selanjutnya akanmeningkatkan daya tahan tubuh.

Berdasarkan hasil penelitian dan teori, maka tidak didapatkan kesenjangan antara hasil penelitian dan teori karena dari 31 responden banyak yang berat badannya naik 21 bayi (67,7%), dan berat badannya tetap 10 bayi (32,3%). Faktor - faktor yang dapat mempengaruhi yaitu umur, keluarga, jenis kelamin. Salah satu cara yang dapat dilakukan oleh orang tua untuk mengoptimalkan pertumbuhan masa bayi adalah dengan memenuhi kebutuhan dasar dalam tumbuh kembang seperti yang telah disebutkan diatas, serta pentingnya untuk melakukan stimulasi tumbuh kembang yang lebih awal pada bayi, salah satu contoh stimulasi adalah dengan melakukan pijat bayi.karena pijat bayi dapat meningkatkan produksi ASI dan merangsang peningkatan nafsu makan sehingga dapat meningkatkan berat badan bayi secara optimal. Banyak caramengatasi masalah ini, salah satu cara yang dengan menggunakan pijat bayi. Cara ini diharapkan mampu menaikkan berat badan bayi.

Pengaruh pijat bayi terhadap kenaikan berat badan bayi usia 1-7 bulan

Uji statistic *Wilcoxon Sign Rank Test* menunjukkan nilai p sign <0,05 dan Z hitung > Z tabel sehingga terdapat pengaruh pijat bayi terhadap kenaikanberat badan bayi usia 1-7 bulan.

Berat badan merupakan hasil peningkatan atau penutupan semua jaringan yang ada pada tubuh lain : tulang, otot, caiaran tubuh dan yang lainnya (Soetjiningsih, 2005 :38). Pertumbuhan dan perkembangan merupakan proses yang terjadi pada makhluk hidup. Pertumbuhan dan perkembangan menyangkut semua aspek semua kemajuan yang dicapai sejak dalam kandungan hingga dewasa.

Pertumbuhan adalah bertambanya ukuran fisik dan stuktur tubuh dalam arti sebagian atau seluruhnya karena adanya multiplikasi (bertambah banyak) sel-sel tubuh dan juga karena bertambah besarnya sel. Adanya multiplikasi dan pertambahan ukuran sel berarti ada pertambahan secara kuantitatif dan hal tersebut terjadi sejak terjadinya konsepsi, yaitu bertemunya sel telur dan sperma hingga dewasa. Jadi pertumbuhan lebih ditekankan pada pertambahan ukuran fisik seseorang, yaitu menjadi lebih besar atau lebih matang bentuknya, seperti pertambahan ukuran berat badan , tinggi badan , dan lingkar kepala (IDAI,2002).

Sebenarnya terapi pijat ini dipraktekkan hampir diseluruh dunia termasuk Indonesia. Salah satu terapi pijat yang ditemukan adalah terapi pijat pada bayi. Terapi pijat ini sekarang masihbanyak dilakukan oleh dukun terutama di pedesaan. Menurut ketua lembaga peningkatan penggunaan air susu ibu (PP-ASI) RS. Sint carolus itu, efek bio kimia yang positif dari pijat bayi antara lain, menurunkan kadar hormon stres (catecholamine) dan meningkatkan kadar sterotonin. Sedangkan efek fisik dari pijat antara lain memperbaiki sirkulasi darah dan pernafasan, merangsang fungsi pencernaan dan pembuangan, serta meningkatkan berat badan. (Dede, 2003)

Hal ini didukung oleh penelitian yang dilakukan oleh Prof. T. Field & Scafidi (1986 & 1990), menunjukna bahwa pada 20 bayi premature dengan berat badan 1280 & 1176 gram yang dipijat 3 x 15 menit selama 10 hari mengalami kenaikan berat badan per 20 – 47 % lebih banyak dari yang tidak dipijat. Penelitian juga dilakukan pada bayi cukup bulan berusia 1-3 bulan yang dipijat selama 15 menit dalam 2 kali seminggu selama 6 minggu, didapatkan kenaikan berat badan yang lebih dari kontrol. (Prof .T. Field & Scafidi,1986).

Berdasarkan penelitian yang dilakukan di BPS Ny.Aida Hartatik Desa Ndlanggu Kecamatan Deket Kabupaten Lamongan pada bayi yang mengalami kenaikan berat badan setelah diberi pijat bayi sebagian besar mengalami naiknya berat badan. Hal ini di sebabkan karenaefek fisik dari pijat antara lain memperbaiki sirkulasi darah dan pernafasan, merangsang fungsi pencernaan dan pembuangan, serta meningkatkan berat badan.

Banyak cara mengatasi masalah kenaikan berat badan, salah satu cara yaitu dengan teknik pijat bayi. Pemberian teknik pijat bayi yaitu adalah terapi sentuh. Pijatan adalah sentuhan yang ringan dan langsung atau keras dan lembut, gabungan luas dan lembut (Harmoni, 2002 : 4). Pijat

merupakan salah satu bentuk dari terapi sentuh yang berfungsi sebagai salah satu teknik pengobatan penting.

KESIMPULAN

1. Sebagian besar responden mengalami kenaikan berat badan setelah dilakukan pijat bayi.
2. Sebagian kecil responden mengalami tetapnya berat badan setelah dilakukan pijat bayi.
3. Ada pengaruh pijat bayi terhadap kenaikan berat badan bayi usia 1-7 bulan di desa ndlangu kecamatan deket kabupaten lamongan, hal ini di dasarkan pada uji statistik Wilcoxon Sign Rank Test dengan menggunakan SPSS versi 16.

SARAN

Bagi Responden diharapkan dalam mengatasi kenaikan berat badan bayi lebih baik di lakukan pijat bayi yang dalam pemberian pijat bayi perlu diperhatikan dengan benar.

Bagi Tenaga kesehatan diharapkan tenaga kesehatan khususnya bidan untuk lebih meningkatkan tentang pemijatan bayi yang benar dan memberikan penyuluhan pada para ibu untuk melakukan pemijatan bayi secara rutin.

Bagi Profesi Kebidanan diharapkan dalam profesi kebidanan dapat mempertimbangkan untuk menerapkan pijat bayi untuk mengatasi kenaikan berat badan. Karena hasil penelitian ini terdapat pengaruh teknik pijat bayi terhadap kenaikan berat badan bayi

DAFTAR PUSTAKA

Aritonang. (2001). *Pertumbuhan berat badan bayi usia 0-6 bulan* : Jakarta.

Cholid Narbuko dan Abu Achmadi.(2001). *Metodelogi Penelitian*. Jakarta : Bumi Aksara.

Dede. (2003). *Konsep Pijat Bayi*. Jakarta (http://www.healthytoday.net), Minggu, 20 Desember 2009.

Harmoni, 2002, *Terapi Turnia*. Tim harmoni; Jakarta (http://www.esilaturahim .com), Sabtu, 2 Januari 2010.

Kalbe, Farma. 2001. *Cara Yang Baik Merawat Si Kecil*. Jakarta: PT. SANGHIANG PERKASA.

Kartono, Kartini, 2002. *Patologi Social 3.* CV Rajawali ; Jakarta.

Nursalam. @ Siti Pariani. (2001). *Pendekatan Praktis Metodologi Riset Keperawatan*. CV. SAGUNG SETO : Jakarta.

Nursalam. (2003). *Konsep dan Penerapan Metodologi Penelitian IImu Keperewatan Pedoman Skripsi, Tesis dan Instrumen Penelitian Keperawatan*. Jakarta : Salemba Medika.

Roesli, Utami.2001. *Pedoman Pijat Bayi Prematur*. Trubus Agri Widya : Jakarta.

Roesli, Utami. 2001. *Pedoman Pijat Bayi* . Trubus Agri Widya : Jakarta.

Roma, Turne, 2001. *Seni Memijat Yang Menyejukan*. Ladang Pustaka : Jakarta.

Soetjiningsih. (2005). *Konsep Pertumbuhan Berat Badan* : Jakarta.

Sugiono. (2006). *Statistika untuk Penelitian*. Bandung : Alfabeta.

Supriasa. (2005). *Penentuan Berat Badan Dengan Cara Menimbang* : Jakarta.

Wong, D.L. (2003). *Kenaikan Berat Badan Anak* : Jakarta.

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EFFECT OF NEONATAL MASSAGE ON WEIGHT GAIN AND PHYSICAL RESPONSES AMONG PRETERM BABIES IN SELECTED HOSPITAL IN FUJAIRAH, UNITED ARAB EMIRATE

Sharifa Mohammed Ali Al Balushi [1] and Victoria Funmilayo Hanson [1]
Author's affiliation: RAK College of Nursing, RAK Medical and Health Sciences University, United Arab Emirates

ABSTRACT: *Background: The prevalence of preterm birth in UAE has increased to around 10 per cent of all deliveries in the UAE. Preterm neonates are more prone to complications; achieving optimal weight is one of the factors that affect the length of hospital stay which is taking into consideration in the discharge of preterm infants from the hospital. Aim: To assess the effect of neonatal massage on the weight gain and physical responses among preterm neonates in Fujairah hospital. Methods: This study is a quasi-experimental design in Neonatal Intensive Care Unit. Forty three neonates who met the inclusion criteria, were divided into two groups of experimental (n = 24) and control (n = 19) selected using consecutive sampling. Both groups received routine care, the experimental group received the massage for 15 minutes daily for 10 days, Results: Male neonates were (58.1%) than female (41.9%), the percentage birth weight in the control group was 1- 1.5kg (58.3%) while it was 1.5-2.0 kg (41.7%) in the experimental group. Neonatal massage showed a positive effect of 266.68 grams at the end of 10 days of study, the experimental group gained between 143.3g-266.67g (54.1%) while the control group gained between 20g-143.33g (15.7%), it significantly improved physical responses (Heart Rate and Respiratory Rate) with P value below (<0.05) level while there was no statistically significant differences in the temperature, oxygen saturation and body activity Conclusion: Neonatal massage has significant difference in weight gain, improved heart and respiratory rate while no significant effect in the temperature and oxygen saturation. The study recommends that, neonatal massage should form part of the routine care for preterm neonates to increase the weight and other responses which will shorten the length of stay in the hospital and prevent neonatal morbidity and mortality*

KEYWORDS: neonate preterm, massage, weight, physical responses

INTRODUCTION

Preterm birth is defined as a delivery or birth at a gestational age less than 37 weeks another criterion used is a weight of less than 2500g at birth (Quinn, 2016). According to the World Health Organization (WHO, 2017), newborn deaths form an increasingly large percentage of overall child deaths even as both figures continue to fall. With prematurity accounting for 35 per cent of newborn deaths globally, preventing deaths from prematurity is more imperative than ever before. The prevalence of preterm birth in UAE has increased to around 10 per cent of all deliveries in the UAE are premature (Ali Zain, A. 2016).

Overall percentage of neonatal admission in NICU is increasing because of neonatal and maternal complications. Preterm and low birth weight neonates are more prone to the following complications: chronic lung disease**,** pneumonia**,** apnoea and bradycardia**,** infection**,** jaundice**,** intraventricular hemorrhage (IVH), inability to maintain body temperature **,** immature gastrointestinal and digestive system**,** anaemia**,** patent ductus arteriosus (PDA)**,** retinopathy of prematurity (ROP)**,** necrotizing enterocolitis (NEC) and **s**epsis. Weight loss is the most common complication of preterm neonates with low birth weight. The physical and psychological wellbeing of a child depends on the correct management of events in the prenatal period and early childhood period. Various modalities of treatments are available for improving the weight of preterm neonates, massage is one among the alternative therapies for weight gain (Massaro,2009).Neonatal massage has been practiced worldwide for centuries in many countries, as it provides greater advantages which can be practiced by parents as well as medical professionals. Several interventions have been designed to promote preterm infant weight gain including massage therapy (National Center for Health Statistics, 2011).

Massage is the manipulation of the body's soft tissue for the purpose of normalizing the tissues and it has effects on the whole body by decreasing muscular tension and flaccidity in musculoskeletal system, Moreover it increases blood flow in circulatory system, lymph in lymphatic system, it stimulates or sedates the nervous system and enhance tissue healing of the skin. As such massage has been recommended as an intervention to promote growth and development of preterm and low-birth weight neonates (Aly, Murtaza.2013).

There are two types of massage; tactile stimulation and kinesthetic stimulation. Tactile stimulation means placing the infant in prone position with head turned to one side and stoking each area of the body with moderate pressure using the flats of the fingers of the both hands. Kinesthetic stimulation means placing the infant in supine position and moving each area of the body for one minute. Kinesthetic is divided into six flexion and extension movements lasting about 10 seconds each. The cycle consists of a typical 15 minutes of massage in the following steps; first: 5 minutes tactile stimulation, second: 5 minutes kinesthetic stimulation and third: 5 minutes tactile stimulation.. The massage can be performed by both mother or trained professionals. Massage is a safe, inexpensive treatment modality for healthy, preterm newborn, that may offer benefits of growth and development for newborn, and lead to shorter hospital stay (Rad, Haghshenas, Javadian,, Hajiahmadi,2015).

Preterm neonates who are admitted in NICU have low birth weight and have problem gaining weight rapidly to meet with development of the organs and survival**.** New intervention by massage can help to gain the weight in short time and improve the physiological and behavior response. Neonatal massage with kangaroo mother care for 15 minutes, twice daily for 15days was significant for neonatal massage ($p<0.001$)and physiological(heart rate, oxygen saturation ,Respiratory rate) and behavioral status improved after the intervention (Afroz & Patil, 2017).There is limited literature that target the effect of massage on preterm neonatal in the Arab countries despite the increase in preterm birth (Ministry of Health Statistic, 2017) In spite ofbeing a very vital aspect of the health and development of preterm babies there is no such study conducted so far in UAE that highlighted the effect of massage on preterm babies. Therefore the

study was conducted to assess the effect of massage (tactile and kinesthetic stimulation) on the weight gain and physical responses (heart rate, oxygen saturation) on the neonate

Statement of the Problem

According to WHO (**2018)**15 million babies are born preterm every year, the prevalence of premature neonates in the UAE is increasing hence the need for admission to NICU for the weight gain. A lot of effort is needed to achieve the desire weight, new intervention is neonatal massage which can help with weight gain within a short time & improve the physiological and behavior disturbance due to separation from the mother for a long time. This study assessed the effect of massage (tactile and kinesthetic stimulation) on the weight gain and physical responses (heart rate, oxygen saturation) and behavioral responses of the neonate.

Aim

The aim of this study is to evaluate the effect of massage (tactile and kinesthetic stimulation) on the weight gain, and physical responses (heart rate, oxygen saturation) of the neonate.

Objectives

1. To assess weight, physiological and behavior responses among preterm neonates in experimental and control group before and after intervention.
2. To compare the weight, physiological and behavior responses among preterm low birth weight neonates in experimental and control group.

Research Questions

1. What is the effect of massage on weight, physiological and behavior responses among preterm low birth weight neonates?
2. What is the comparison between the weight and physiological responses of preterm neonates with selected demographic variables among experimental and control group?

Hypothesis

1-H1.There is significant increase in weight among preterm babies who had neonatal massage than the control group at 0.05 level of significant.

2-H2.Neonatal massage will significantly improve physical responses in preterm babies than control group at 0.05 level of significant.

LITERATURE REVIEW

Effect of massage on weight gain

A single-blind randomized controlled clinical trial conducted by Shaeri , Armanian , Rarani , Valiani (2018), on preterm infants in a neonatal intensive care units in selected hospitals of Isfahan showed that the difference was statistically significant ($p < 0.05$). Abdominal massage affected the weight gain of preterm infants by improving signs of feeding tolerance, stimulating the parasympathetic nervous system, increasing bowel movements and increasing insulin release. Thereby improving weight gain and reduction in the length of hospital stay. Several studies addressed the effects of infant massage on preterm infants' weight gain, there are many variation terms of the massage technique, infants' characteristics, application of different oils and the study duration (Pepino & Mezzacappa, 2015; Salam et al 2015, , Diego, Field & Hernandez-Reif, 2010b, Kale, Naveenkumar, Jain and Siddiqui,2017).

Several studies conducted by Rad, Haghshenas, Javadian, Hajiahmadi and Kazemian (2015) also stated that massage therapy promotes weight gain in very low birth weight neonates and earlier discharge according to a study Both groups received standard care while the case group received the massage therapy 3 times daily for 15 min for a period of 7 days. Average weight of neonates between two, difference became significant after 4th day at ($P = 0.000$). The mean duration of hospital stay in the massage group was (34/1 days ± 7/5) less than the control group (41/7 days ± 9/1) significantly ($P = 0.007$).

Another study by Prince and Prince (2016) and Taheri, Goudarzi, Shariat, Nariman & Matin 2017) on preterm weight revealed that Olive Oil massage increases the weight gain of the pre-term neonates more than the normal care. Sunflower oil massage done daily increased weight gain fast due to decrease absorption of fatty acid and less water loss from the body with the short hospital stay. Other studies from the past few decades have confirmed the effects of massage therapy on weight gain in preterm newborns, use of coconut oil massages twice daily that was then continued by mothers at home for the first month of life (Salam, Darmstadt, & Bhutta, 2015, Jabraeile, Rasooly, Farshi, & Malacouti, 2016 and Johari, Haghgou, Daemi, Rezaeiyan T & Mosala ,2016) collaborate the result of this study that effect of massage therapy on weight gain of LBW neonates in NICUs of Hamedan City hospitals as significant. Massage therapy can be recommended as the special and complementary care for LBW neonates.

Non-blinded trial study was conducted by Khan R, Malik I, Avtar R, Khurana R, Bharadwaj V, & Singh A. (2015) on preterm neonates who were admitted in the N.I.C.U of an India hospital, The weight of every subject was checked and recorded at 1st,7th and 28th post-natal days The mean increase in the weight after 28 post-natal days was shows that oil massage has a good effect on weight gain in neonates.

Effect of massage on physical and physiology responses.

Ramezani, Baniasadi & Baneshi,(2017) in a quasi-experimental study design in Kerman, Iran shows that statistical analyses did not show a significant difference between oxygen saturation across the intervention days ($F=2.87$, $P= 0.13$) while significant differences was observed in the

respiratory rate (F=2.87, P= 0.001) and heart rate (F= 2.25, P=0.03) while Afroz & Patil2(2017) revealed in a comparative study that the pre and post treatment values of heart rate, respiratory rate, peripheral capillary oxygen saturation and temperature, show extremely significant difference in the intervention along with Kangaroo mother care and that it is effective in improving vitals (heart rate, oxygen saturation, and respiratory rate) and behavior of low birth weight infants. Bayomi & El-Nagger (2015) study in Saudi Arabia, revealed that Statistical significance at P _≥ .05, highly statistically significant on premature neonates' physical, physiological and behavioral states, regard to respiratory rate (_2 = 36.34 at P .00), crying and type of feeding respectively (_2 = 33.16, 34.13 at P .01), heart rate, temperature and occurrence of apnea (_2 = 23.32, 26.31 and 32.17 at P .05) & sleeping (_2 = 25.67 at P.05).also length of hospitalization was decreased.

A quasi- experimental design study conducted by Mahmud, Dabash, Ahmed, Kame &Ismail(2016) showed that the intervention group gained significantly more total mean weight gain (254.70± 29.16g) compared with the control group (110.20± 50.98g) after the study period. Neonatal Oil Massage Therapy might be used as an effective, natural, and safe non-medical intervention for increasing anthropometric parameters and improving behavioral state of LBW neonates.

THEORETICAL / CONCEPTUAL FRAMEWORK

A conceptual frame work is constructed with concepts, which are the mental images of phenomenon. These concepts are connected together to express the relationship between them while a model is used to denote symbolic representation of the concepts (Polit, 2017).

Ludwig general system theory

General system consists of concepts namely: input, throughput (process), output and feedback: the inputs are what is in the system and the outputs are the results obtained after running an entire process or just a small part of a process, the intervention.
Input are neonates' profile or characteristics, gestational age, birth weight, gender, mode of delivery, and age at the onset of the study.
Throughput (Process) is the neonatal massage carried out daily on the preterm neonate once a day every day during 10 days.

Output show the end result of the process phase as revealed by evaluating the outcomes in term of change in weight and physical response in the experimental group among preterm babies.

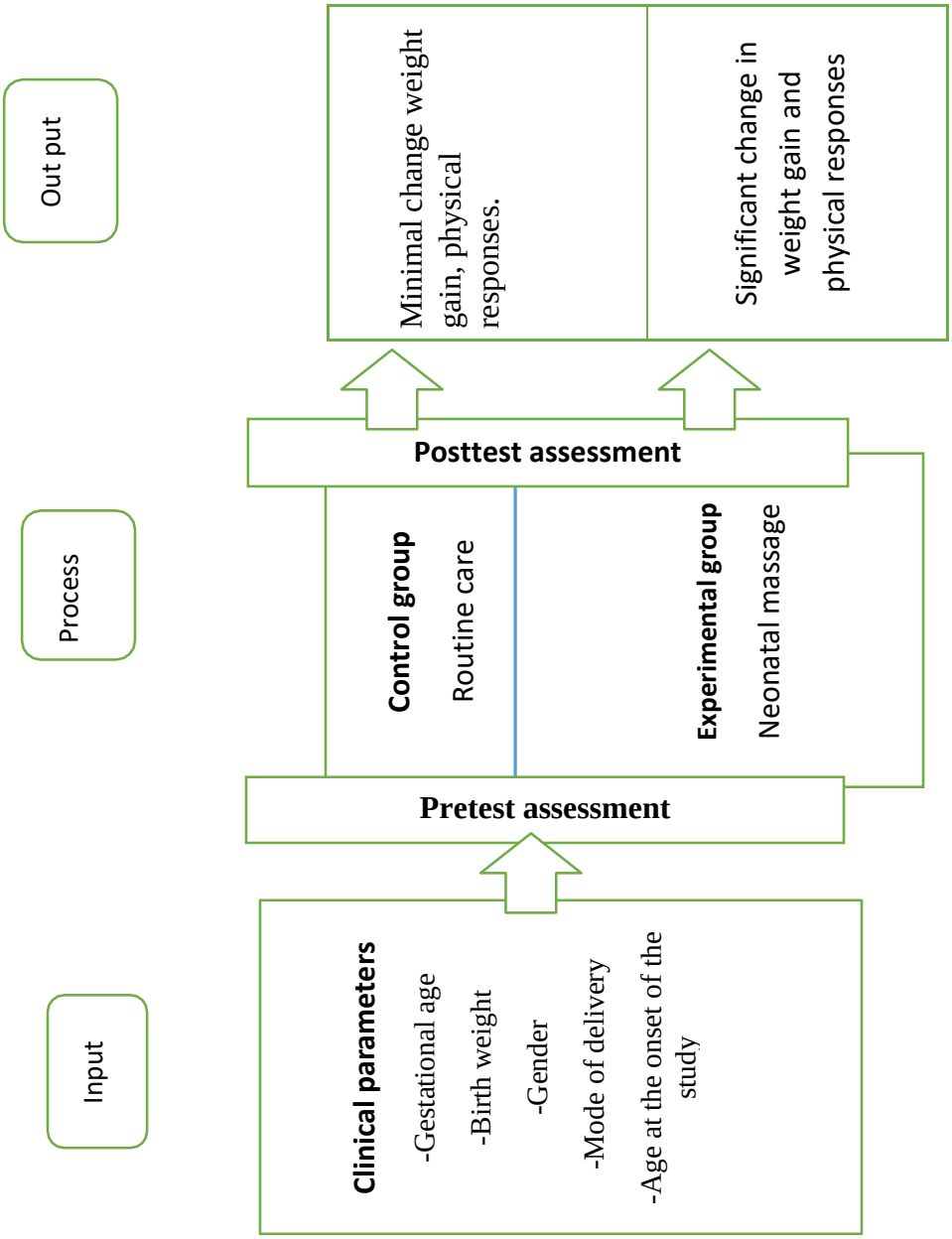

Figure 1. Conceptual framework base on General System Theory (Ludwig, 1972) adapted for the study on neonatal massage for weight gain and physical responses among participant

METHODOLOGY

Research Design
A quasi experimental design was used to assess the effect of nursing intervention (massage) on weight gain and physical response.

Setting
The study was conducted in NICU of Fujairah Hospital, United Arab Emirate, NICU has 18 bed capacity with 20 admission per month.

Population
Preterm neonates admitted to NICU in Fujairah government hospital with less than 35weeks of gestation age and birth weight less than 2 kilogram.

Sampling
Neonates who were admitted to NICU in Fujairah Hospital, United Arab Emirates and fulfill the inclusion criteria. The sample size of 43 was calculated using Raosoft online sample size calculation: confidence level = 95%, margin of error = 5%. Consecutive sampling was used to assign babies using the neonate's registration number. Registration number ending with odd were selected as control group while all even were in experimental (intervention) group.

Data collection instrument
The instruments used are: Demographic data about the preterm neonate: Physiological andphysical assessment: and Massage procedure after pilot testing. The reliability of the tool was obtained by using inter rater method. With value of coefficient was 0.93.

Data Analysis:
The collected data were analyzed based on objectives by using both descriptive and inferential statistics using statistical package for social science (SPSS) version 23 and level of significance P 0.05 and confidence interval of 95% for the analysis T test was used to determine the association

RESULTS/FINDINGS

Hypothesis:
1-H1.There is significant increase in weight among preterm babies who had neonatal massage than the control group at 0.05 level of significant.
2-H2.Neonatal massage will significantly improve physical responses in preterm babies than control group at 0.05 level of significant.
3-H3.Preterm babies who received neonatal massage would have high behavior responses than those in the control group at 0.05 level of significant.

DEMOGRAPHIC CHARACTERISTICS		Experimental		Control	
saliairaV		**Frequency**	**Percentage %**	**Frequency**	Percentage %
Gestational age (weeks)	**1- 30 - < 32**	41	3862	5	3662
	2- 32 - < 34	6	33	6	2466
	3- 34 - ≤ 36	1	4661	8	1364
Birth weight (kg)	**1- 1.000 - < 1.500**	41	3862	3	3662
	2-1.500 ≤ 2.000	41	1461	41	1261
Gender	**1- Male**	41	3862	44	3165
	2- Female	41	1461	8	42.1
Mode of delivery	**1- Normal Vaginal delivery**	1	4661	1	2668
	2- Cesarean section	31	8262	43	6263
Age at the onset of the study	**1- 1- < 7**	8	2262	43	6263
	2- 7- < 14	3	3168	3	3662
	3- 14- < 21	5	2163	3	4163
	4- 21< 28	3	862	1	1
Age at the end of 10 days	**1- 1- < 7**	8	2262	43	6263
	2- 7- < 14	3	3168	3	3662
	3- 14- < 21	5	2163	3	4163
	4- 21< 28	3	862	1	1

Table 1: Demographic characteristics of the neonates

Table 1 shows the percentage distribution of the demographic characteristics of preterm neonate with low birth weight in experimental and control group among which, the following results are shown: Majority of the neonates fall with gestation age 30 <32 weeks with 1.000 <1.500kg (58.3%) respectively 58.3% are male with 83.3% delivered by cesarean. The highest age of 10days 37.5%cooured at 14<21 weeks.

PHYSIOLOGY AND PHYSICAL RESPONSES

This includes the Weight at the onset of the study (kg), Weight increase at the end of the study (kg), Color, Heart Rate (b/min), Respiratory Rate, Temperature, Oxygen saturation, .

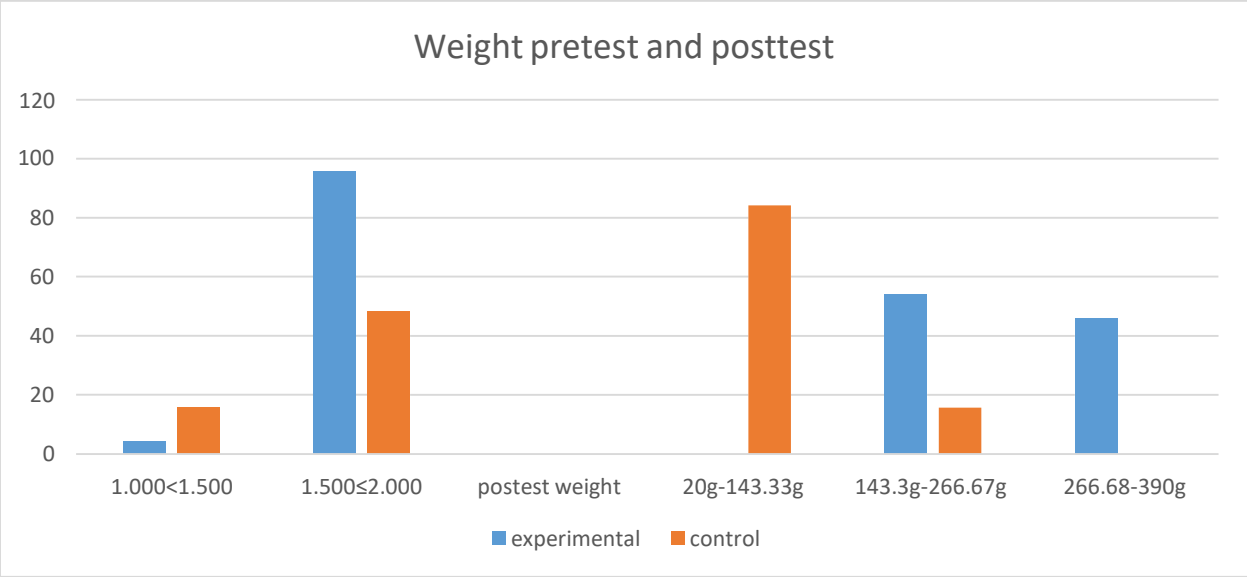

Figure 1: Weight pretest and posttest

The figure above shows that majority of neonate's weight at the onset of the study range from 1,500 kg to 2,000 kg (95.8%), for the experimental and control group (84.2%). The weight increase at the end of 10 days of study, the experimental group gained between 143.3g-266.67g (54.1%) while the control group gained between 20g-143.33g (15.7%).

COMPARISON OF THE WEIGHT AND PHYSIOLOGICAL RESPONSES OF PRETERM NEONATES WITH SELECTED DEMOGRAPHIC VARIABLES

Variable	Group	M ± SD	t	P
Weight at the onset of the study (kg)	Experimental	1.95±0.204	1.398	0.201
	Control	1.84±0.374		
Weight increase at the end of the study (kg)	Experimental	2.45±0.508	9.309	0.001**
	Control	1.15±0.376		

Significant at P<0.001 level

Table 2 Comparison of weight between the experimental and control group.

The finding of the study shows a statistically significant difference with increase in the weight of preterm infants who were massaged from the control group who received only routine care. The value of P was found to be 0.001 which a statistically significant as P <0.05.

Variable		**M± SD**	**Day 1 Control**	**Day 10 Experimental**
Heart Rate	**Pre**	**M± SD**	148.12±9.29	150.98±9.64
	Post	**M ±SD**	139.97± 14.91	144.15±12.03
		t	2.91	2.75
		P	0.01**	0.01**
Respiratory Rate	**Pre**	**M ±SD**	56.81±4.40	55.76±3.83
	Post	**M± SD**	55.65±6.01	53.94±4.23
		t	0.97	1.97
		P	0.33	0.05*
Temperature	**Pre**	**M ±SD**	36.71±0.17	36.74±0.20
	Post	**M± SD**	36.80±0.17	36.77±0.15
		t	-2.455	-.592
		P	0.02*	0.56
Oxygen saturation	**Pre**	**M ± SD**	98.29±1.62	98.29±1.57
	Post	**M± SD**	98.24±1.35	94.49±14.68
			0.17	1.67
		P	0.87	0.10

Significant at P<0.05 level

Table 3: Comparison of physical responses between experimental and control group

The above table shows that the effect of neonatal massage significantly improved Heart Rate and Respiratory Rate with no significant with P value below <0.05 level .There was no statistically significant differences in the temperature and Oxygen saturation in both groups

DISCUSSION

The discussion is based on the hypothesis

First hypothesis

H1.There is significant increase in weight among preterm babies who had neonatal massage in the experimental group than the control group.The finding of the study shows that weight increase in the experimental group due to massage more significant than control group who only received routine care as P 0.001. A single-blind randomized controlled clinical trial study conducted by Shaeri , Armanian , Rarani & Valiani , 2018 & Rad, Haghshenas, Javadian, Hajiahmadi and Kazemian, 2015), with gestational age was between 28-32 weeks and birth weight was 1,000-1,800 g. It was concluded that neonatal/ abdominal massage affect the weight gain of preterm infants by improving signs of feeding tolerance, stimulating the parasympathetic nervous system, increasing bowel movements and increasing insulin release and reduce the length of hospital stay. Other studies conducted by Johari, Haghgou, Daemi, Rezaeiyan T, and Mosala (2016)& Kale, Naveenkumar, Jain and Siddiqui, (2017) both randomized clinical trial to determine the effect of massage therapy on weight gain of LBW neonates in NICUs of Hamedan City hospitals shows that weight gain in the experiment group was significantly higher than the control group and effective in prevention of neurologic and developmental problems in infants. a quasi- experimental design study conducted by Mahmud, Dabash, Ahmed, Kame &Ismail (2016) shows the intervention group gained significantly more total mean weight compared with the control group after the study period, Massage therapy can be recommended as the special and complementary care for LBW neonates.

Second hypothesis

H2.Neonatal massage will significantly improve physical responses in preterm babies than control group. Effect of neonatal massage significantly improved physical responses in preterm infants compared to the control group. Paired t-test was calculated shows that Heart Rate, Respiratory Rate have significant difference while Temperature and Oxygen saturation are not significant. These findings are consistent with the findings of Afroz & Patil (2017), results shows improvement in the heart rate, respiratory rate, peripheral capillary oxygen saturation and temperature, which could be as a result of increased blood supply to all organs during neonatal massage The findings of this study is not in agreement with findings of Ramezani, Baniasadi & Baneshi, (2017) which did not show a significant difference between oxygen saturation

Implications to Nursing

Nursing research

- There is need of an intensive and extensive research in the area of effect to emphasize the importance of applying massage that is effective, safe and non-invasive intervention in all NICUs as standard of care.

- Results of this study can encourage health care professionals to utilize the intervention in increasing the weight of preterm terms neonates and reduce length of hospital stay by neonatal massage.

Nursing practice

- Nurses can assume this role by incorporate massage in the routine care of preterm neonates in NICU as an effective and safe noninvasive intervention. .
- Inculcate teaching program on the massage technique, as evidence based practice for evaluating the massive developmental needs of preterm babies and reduction of hospital stay
- Encourage mothers to apply massage pre discharge through teaching sessions and using booklet, massage guidelines to improve mothers – infant bonding

CONCLUSION

The present study shows the effect of massage for preterm neonates who's admitted in NICU, in Fujairah hospital, there was significant weigh gained in the experimental group.The study also supported the fact that there was high significant difference in physical (Heart Rate, Respiratory Rate, with no significant difference in Temperature and Oxygen saturation).There was also a significant difference in the effect of massage on the behavior between pre and post, while no effect of massage on body activity in both the experimental and control groups.Finding of the study help to spread the positive message about the neonatal massage in the care of preterm neonates among the health care provider in NICU and the mothers at home.This study was based on Ludwig general system theory. This theory has helped the investigator to plan the intervention and assess the effect of neonatal massage on weight and physical responses of the neonate .finding of this study supports the Ludwing general system theory of intervention of throughout (intervention) on the output.

Recommendations/Future research

Based on the findings of the study the following recommendations are made:

- Further studies involving all seven Emirates with larger sample size and over a longer period to verify the effects of neonatal massage on weight and physical responses.
- A comparative study can be conducted with the use of this noninvasive method of preterm management using a larger sample and in a different settings.

Completing interest:

The authors declare that they have no competing interest.

Acknowledgment We are grateful to all the mothers of the neonate who participated in the study and the nurses working in NICU for their support.

References

Afroz, S. G., & Patil, N. (2017). *Effectiveness of Massage Therapy as an Adjunct toKangaroo Mother Care on Physiological and Behavioural Status of Low Birth Weight Preterm Infants*. Indian Journal of Physiotherapy and Occupational Therapy - An International Journal, 11(2), 103.

Ali Zain , A.(2017,November 16). Premature birth may affect baby's development, according to experts. khaleejtimes. Retrived from https://www.khaleejtimes.com.

Aly ,F.F, Murtaza G (2013) *Massage Therapy in Preterm Infants*. Pediat Therapeut 3:155-158.

Bayomi, O. R., & El-Nagger, N. S. (2015). *Effect of applying massage therapy on physical, physiological and behavioral states of premature neonates.* Journal of Nursing Education and Practice, 5(10

CDC - NCHS - National Center for Health Statistics. (2011, September 26). Retrieved from http://www.cdc.gov/nchs/.

Diego, M., Field, T., Hernandez-Reif, M. (2010). *Vagal activity, gastric motility and weight gain in massaged preterm neonates*. J Pediatr., Vol .147,No.50-55.

Jabraeile, M., Rasooly, AS., Farshi, MR. & Malakouti, J. (2016). *Effect of olive oil massage on weight gain in preterm infants: A randomized controlled clinical trial*. Niger Med J., 57:160-3.

Johari ,S.Haghgou H.A,. Daemi ,M.,Rezaeiyan ,T & Mosala Nejad Z. (2016) *The Effect of Massage on Weight Gain of Low-Weight Hospitalized Infants: A Randomized Clinical Trial.* Physical Treatments. 5(4):205-210.

Kale.A.V, Naveenkumar.K., Jain.A, Siddiqui.S & Haseeb.M, (2017).*Effect of oil massage therapy in low birth weight preterm neonates.* MedPulse – International Medical Journal, Volume 4, Issue 3,.

Khan ,R.Malik,I., Avtar, R,.Khurana R, Bharadwaj V, & Singh A.(2015). *Evaluation of effect of massage with or without oil on the weight gain of low birth and very low birth weight babies*. Webmed Central PAEDIATRICS ;6(9):WMC004981.

Mahmud.H.S, Dabash.S.A, Ahmed.E.M, Kame.R.M &Ismail.S.S. (2016).*Effects of Oil Massage Therapy on Anthropometric Parameters and Behavioral State of Stable Low Birth Weight Neonates*. International Journal of Research in Applied, Naturaland Social Sciences (IMPACT: IJRANSS) ISSN(P): 2347-4580;ISSN(E): 2321- 8851 Vol. 4, Issue 6, Jun 2016, 33-42.

Masters, K.(2015).Nursing Theories A framework for Professional Practice.2th ed. Jones &Bartlett learning.

Pepino, V.C & Mezzacappa, M.A (2015.)*Application of tactile/kinesthetic stimulation inpreterm infants*: a systematic review PEDATRIC (RIO.J)242(3):1-21.

Polit, D &Beck,C(2017).Essentials of Nursing Research: Appraising Evidence for Nursing Practice. .8th edition.wolter Kluwer health. Lippincott Williams &Wilkins.

Prince D, Prince J. (2016). Effectiveness of oil massage on weight gain among pre-term neonates in selected pediatric hospitals, Hyderabad. Webmed Central Nursing 2016; 7(7): WMC005167.

Quinn,J. Munoz,F,M. & Gonik,B.(2016)*Preterm birth: Case definition & guidelines for data collection, analysis, and presentation of immunization safety data*. Vaccine 34 (2016) 6047–6056.

Ramezani. T, Baniasadi.H, & Baneshi.M,R,(2017) .*The Effects of Massage on OxygenSaturation of Infants with Respiratory Distress Syndrome Treated with Nasal Continuous Positive Airway Pressure.* British Journal of Pharmaceutical Research 16(5): 1-7,; Article no.BJPR.32751 ISSN: 2231-2919, NLM ID: 101631759.

Rad ZA, Haghshenas M, Javadian Y, Hajiahmadi M & Kazemian F. (2015).*The effect of massage on weight gain in very low birth weight neonates.* Journal of Clinical Neonatology Published by Wolters Kluwer, 5:96-9.

Salam, RA., Darmstadt, GL.,& Bhutta, ZA. (2015). *Effect of emollient therapy on clinical outcomes in preterm neonates in Pakistan: a randomized controlled trial*. Arch Dis Child Fetal Neonatal Ed., 100:210-5.

Sayed, A. M., Youssef, M. M., Hassanein, F. E., & Mobarak, A. A. (2015). *Impact of tactile stimulation on neurobehavioral development of premature infants in assiut city*. *Journal of Education and Practice*, *6*(8), 93-101.

Shaeri M, Armanian AM, Amini Rarani S, Valiani M,& Ghadami A.(2018). *Effects of Abdominal Massage on the Weight Gain of Preterm Infants Hospitalized in SelectedHospitals of Isfahan, Iran: A Randomized Controlled Clinical Trial.* Int J Pediatr2018; 6(9): 8153-60. Statistic: Ministry of Health and prevention, 2018.

Taheri, P. A., Goudarzi, Z., Shariat, M., Nariman, S., & Matin, E. N. (2017). *The effect ofa short course of moderate pressure sunflower oil massage on the weight gain velocity and length of NICU stay in preterm infants*. Infant Behavior and Development, 50, 22-27.

WHO. (2017, February 19). *Preterm birth*. Retrieved from http://www. who.int/en/newroom/fact-sheets/detail/preterm-birth.

THE EFFECT OF BABY MASSAGES ON BABY'S WEIGHT IN PRATAMA KUSUMA MEDISCA CLINIC IN WATES, YOGYAKARTA

Vitrianingsih[1*], Sonia Dora Cardoso[2], Sitti Khadijah[3]

[1,2,3] Faculty of Health Science of Respati Yogyakarta University
***corresponding author: vee.three080589@gmail.com**

Abstract

The optimization of growth and development on children are the results of interaction of various factors which are related to each other. Those factors include genetic, environment, behavior and stimulation. One of the stimulations is a tactile stimulation in the form of baby massage. Baby massages can increase the activity of *nervus vagus* which causes the production growth of enzyme gastrin and insulin so that the absorption of foods will be improved and affect on baby's weight. The purpose of this research was to understand the effect of baby massages on baby's weight. This researchwas conducted using quasi-experimental method with two group post-test design as the control. The subjects of this research were 66 babies who were 0-1 month of age as 33 babies were case group, while the 33 others were control group. The samples were collected using purposive sampling technique with inclusion and exclusion criteria. The baby massages intervention was conducted three times in a month and a weight measuring was done every week for a month with a specified scale. The data were analyzed using independent sample t-test. There is an effect of baby massage towards the increase in babies' weight (*p-value* 0,007<0,05). Then, there was also an effect of baby massage towards the percentage of the increase in babies' weight (p-value was 0.005 < 0.05). There are some effects of baby massages on baby's weight in Pratama Kusuma Medisca clinic in Wates, Yogyakarta

Keywords: baby massage, increase of weight

1. INTRODUCTION

Every child has continuous growing and developing phases [1]. The growths include the increase of weights, heights, head and arm measurements, dentitions, and some other alterations of the body. Meanwhile, growths on a child envelop motor, sensory, cognitive and psychosocial [2].

The attainment of an optimal child's growths and developments is the result of various interrelated factors which are genetic, environment, and behavior as well as stimulation. One of the kinds of stimulation usually done by parents a is tactile stimulation in the form of baby massage [3].

A baby massage is one of the most old-fashioned and most popular methods known by society. A massage is an art of health treatments and it is a traditional therapy which has already been practiced for centuries. Meanwhile, a touch and a massage on babies right after a birth is a continuous body contact that is needed by babies to maintain their security[4]. A baby massage can be categorized asthe applications of contact stimulation since there are affections, caring voices, eye-contacts, movements and massages. This stimulation will excite the development of brain cells structures and functions [5]. Nowadays, there are numerous researches stating that baby massages have some physical and emotional advantages. Several benefits of baby massages are the increase of appetites,

exclusive breastfeeding, weights, body endurance, sleep quality, and relationships between parents and babies

Field and Schanberg [6] cited by Roesli [5], show that there is an increase of *nervus vagus* (tenth brain nerve). The excalation of *nervus vagus* activities causes the growth of absorbing enzyme productions such as gastrin and insulin so that the absorptions of provisions improved. Besides, a massage can also improve blood circulations and cell metabolism so that it can increase baby's weight.

A research conducted by Trisasmi shows that there is an optimization effect of baby massages on the increase of baby's weight and motor developments [5].

Since 1986, experts from the Faculty of Medicines of Miami University have been researching the benefits of baby massages. It proves that the development of premature babies' weight increases 20-40% compared to babies who have not obtained massages [7]. In 2012, experts from Gajah Mada University conducted research on baby massages. The results indicated that baby massages have the possibility to increase babies' weight by 2.68%. The low birth weight babies who are given a massage treatment for 10 days have higher possibility to gain weight increase compared to those who are not given a massage treatment [8].

The results of research on the effectiveness of baby massages conducted by Puspita Kel. Bintaro, Jakarta, showed that baby massages can increase 11 times the ability of the baby to lift the chest, increase 10 times greater the ability to lift the neck, and have great effectiveness in increasing babies' growth (babies' body weight and length). Baby massages can also facilitate the circulation of the babies' blood. Therefore, it can assist the process of babies' growth and development [9].

Problems with the babies' growth in Indonesia have begun at an early age. Therefore, it needs efforts to reduce the growth disorders or to increase the weight gain percentage. This study aims to determine the effect of massages on the weight of babies aged 0 - 1 month and the percentage of the increase of babies' weight.

2. METHODS

This type of this research was quasi-experimental with two group pretest and posttest design a using control group. Subjects in the study were 66 babies aged 0 - 1 month divided into 33 babies in the case group and 33 babies in the control group. This research was conducted at Pratama Kusuma Medisca Wates Clinic.

Sampling process used purposive sampling technique with the inclusion, namely born spontaneously and not prematurely, and exclusion criteria, namely born with Low Birth Weight(LBW).

The intervention of baby massage was conducted 3 times by midwives who had attended the training. Data collection was carried out by 2 D-IV students majoring Educator Midwives. The measurement of body weight is conducted once a week for 4 weeks with the scales which have been modified with tera.

Data analysis was carried out using a computer program. To find out the effect of baby massages with the increase of babies' weight, the researcher used independent samples t-test.

3. RESULTS AND DISCUSSIONS

Table 1. Characteristics of research subjects

Variables	Massage-given (n=33)	Control (n=33)
Sex		
Male	19 (58%)	18(55%)
Female	14 (42%)	15 (45%)
Initial weight (gr)	3117±306	3222±399
Final weight (gr)	3894±377	3801±481

Table 1 showed that babies given massage treatment were 19 male (58%) and 14 female (42%). Meanwhile, babies in the control group were 18 male (55%) and 15 female (45%). Based on the distribution, it indicated that the sex distribution of the massage-given group and the control group was homogeneous. The mean score of initial babies' body weight in the massage-given group was 3117 gram and in the control group was 3222 gram. Moreover, the mean score of babies' body weight after treatment in the massage-given group was 3894 gram and in the control group was 3801 gram.

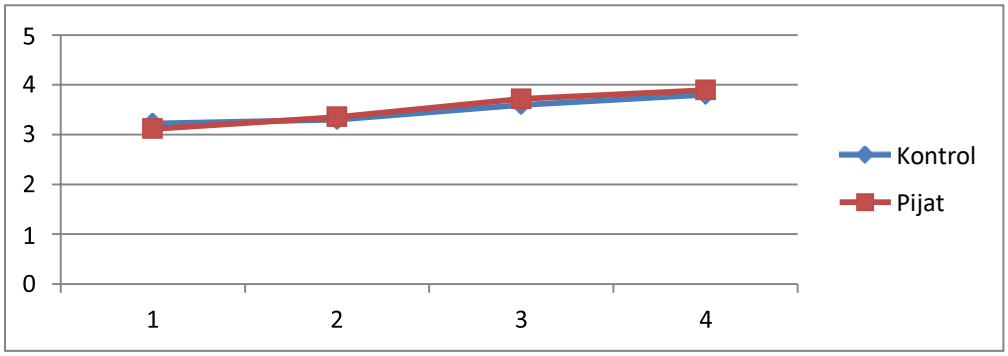

Figure 1. The average weight gain

The weekly increase in babies' weight in control and massage-given groups can be seen in Figure 1. The figure indicated that the increase of weight for babies in the massage-given group was more stable than babies in the control group. The average of the increase in babies' weight in the massage-given group in the first week was 237 grams, in the third week was 360 grams, and the fourth week was 113 grams.

Table 2. The difference (of percentage) of the increase in babies' weight

Variable	N	Median(Q1,Q3)	P
Weight gain (gr)			
Massage-given	33	820(605;992)	0,007
Control	33	460(362;860)	
Weight gain (%)			
Massage-given	33	27(19;33)	0,005
Control	33	14 (11;28)	

Table 2 indicated that the increase in babies' weight in the massage-given group was 820 grams (Q1=605;Q2=992), while the increase in babies' weight in the control group was 460 grams (Q1 = 362; Q3 = 860). The results of the statistical analysis showed that p-value was 0.007 < 0.05. It meant that there was an effect on the baby massage towards the increase in babies' weight. The increase of the percentage of babies' weight in the massage-given group was 27% (Q1 = 19; Q2 = 33), while inthe control group was 14% (Q1 = 11; Q3 = 28). The results of the statistical analysis showed that p- value was 0.005 < 0.05. It meant that there was an effect on the baby massage towards the increase of the percentage of the babies' weight.

DISCUSSION

1. The Characteristics of Respondents

Table 1 showed that babies given massage treatment were 19 male (58%) and 14 female (42%). Meanwhile, babies in the control group were 18 male (55%) and 15 female (45%). Based on the distribution, it indicated that the sex distribution of the massage-given group and the control group was homogeneous.

The sex of the baby will greatly influence the increase in the babies' weight in which, for the same age group, the male babies have a heavier weight than the female babies have. Based on the KIA guidebook, the average weight for male babies in the first month was 3300-5800 grams and for female babies was 3100-3500 grams.

In the research conducted by Wulandari, the average increase of weight for male babies at ages 0 - 6 months in the 50th percentile was 730.1 grams. Moreover, at ages 6 - 20 months, it decreased, namely 231.2 grams/month. The average increase of weight for female babies at ages 0 - 6 months was 634.6 grams. Moreover, the average of the increase of weight for female babies at ages the second 6 months in the 50th percentile decreased, namely 271.3 grams/month. Male babies have a heavier birth weight than female babies. The comparison curve of male and female babies' weight almost coincides at the age of 0 - 4 months, then the growth curve of male babies' weight is greater than that of female babies at the age of 5 - 12 months [10].

The average of initial babies' weight in the massage-given group was 3117 grams and in the control group was 3222 grams. Meanwhile, the average of babies' weight after given treatment in the massage-given group was 3894 grams and in the control group was 3801 grams. Based on these data,it can be concluded that the increase in the average of babies' weight in the massage-given group was 777 grams and in the control group was 579 grams.

2. The Effect of baby massage on the increase in babies' weight

The results of this research showed that the increase in babies weight in the massage-given group was 820 grams (Q1 = 605; Q2 = 992), and in the control group was 460 grams (Q1 = 362; Q3 = 860). The results of the statistical analysis showed that p-value was 0.007 < 0.05. It meant that there was an effect of baby massage towards the increase in babies' weight. Meanwhile, the increase in the percentage of babies' weight in the massage-given group was 27% and in the control group was 14%. The results of the statistical analysis showed that p-value was 0.005 < 0.05. It meant that there was an effect of babies massage towards the percentage of the increase in babies' weight.

This result is in line with the theory put forward by Roesli said that one of the benefits of baby massage is to increase the baby's weight and baby massage can cause positive biochemical and physical effects(4). Baby massage causes the increase of the nervus vagus activity, and will stimulate digestive hormones including insulin and gastrin [4,6]. Insulin plays a role in metabolism, causing an increase in carbohydrate metabolism, glycogen storage, fatty acid synthesis, amino acid synthesis of protein. Therefore, insulin is an important anabolic hormone which works on various tissues including the liver, fat, and muscle. The increase of insulin and gastrin can stimulate digestive function so that absorption of food juices gets better [14,15]. The better absorption of food will cause the baby tostarve quickly and therefore suckle more often.

Another possibility of the difference in the increase in babies' weight is also caused by growth hormones in which the effects of growth hormone are synergic with the insulin hormone [4,15,16].

Based on the research conducted by Shoim, baby massage also affected the weight changes in which the control group experienced a decrease / change in waz by -0.27 and the massage-given group experienced a decrease / change in waz by -0.03 or in other words the control group experienced growth disorders with speed of -0.27SD for one month and the massage-given group experienced growth disorders with speed of -0.03SD. It indicates that baby massage can reduce (prevent) growth disorders for babies [11].

According to Soetjiningsih, environmental factors have an effect on achieving the optimal genetic potential [12]. If the babies' environmental conditions are less supportive, the optimal genetic potential cannot be achieved. Less stress and stimulation are factors that can interfere with child growth. According to Acolet, the baby massage is able to improve emotions and reduce stress hormones [17]. Moreover, the massage can provide good stimulation to increase growth and development, increase the amount and activity of natural killer cells from the immune system and stimulate the digestive function [13,16]. Therefore, growth disorder can be minimized.

The results of this research were also supported by the research conducted by Prof. T. Field & Scafidi cit Shoim [11]. which indicated that 20 premature babies (weight of 1280 grams and 1176 grams) who were massaged for 10 minutes gain the increase of weight of more 20% - 47% per day

days than those who are not massaged. Moreover, babies born not prematurely aged 1 - 3 months who were massaged for 15 minutes twice a week for 6 weeks showed more weight gain than babies in the control group. Babies who are massaged for just 5 days will have an immune system that has increased by 40% compared to babies who are not massaged.

4. CONCLUSION

a. There is an effect of baby massage towards the increase in babies' weight at the Paratama Kusuma Medisca Wates Clinic, Kulon Progo, Yogyakarta (p-value was 0.007 < 0.05).
b. There is the effect of baby massage towards the percentage of the increase in babies' weight at the Paratama Kusuma Medisca Wates Clinic, Kulon Progo, Yogyakarta (p-value was 0.005 < 0.05).

REFERENCE

[1] Wong, L. 1995. Nursing Care Of Infants And Children. Fifth Edition. Missouri: Mosby Year Book, Inc: 814-835
[2] Susanto Ahmad. (2014). Perkembangan Anak Usia Dini. Jakarta: Kencana
[3] Adriana, Dian. 2013. *Tumbuh Kembang dan Terapi Bermain Pada Anak*. Jakarta: Salemba Medika
[4] Roesli, Utami. 2011. *Pedoman Pijat Bayi*. Jakarta: Trubus Adiwdya
[5] Ivra Trisasmi, Hasanah Oswati, Woferst Rismadefi. (2014). Pengaruh Terapi Pijat Terhadap Peningkatan Berat Badan Bayi.*Jom Psik* Volume 1. No 2
[6] Field TM, Schanberg SM, Scafidi F,et al. Tactile/Kinesthetics Stimulation Effects on Preterm Neonates, Pediatr; 77;654-8
[7] Kartini.(2014). *Pijat Bayi.* Diakses pada tanggal 28 Desember 2018
[8] Asmar.(2012). *Pengaruh Pijat Bayi Berat Lahir Renad Terhadap Kenaikan Berat Badan Di RSUD Panembahan Senopati Bantul tahun 2012*. Diakses pada tanggal 28 Desember 2018
[9] Puspita E. K. 2014. *Efektifitas Pijat Bayi Terhadap Pertumbuhan dan Perkembangan Bayi Usia 6 Bulan di Kelurahan Bintaro Jakarta*
[10] Wulandari, A. 2007. Pola Pertumbuhan Badan Bayi Usia 0-12 Bulan di Bogor. Fakulias Matematika dan Ilmu Pengetauan Alam.Institut Pertanian Bogor.
[11] Shoim, Mohammad. 2006. Pengaruh pijat bayi terhadap kenaikan berat badan bayi umur 4 bulan. Jurnal Gizi Klinik Indonesia. Vol2 No3.
[12] Soetjiningsih, IG.N.Gde Ranuh. 2012. *Tumbuh Kembang Anak Edisi II*. Jakarta: EGC.
[13] Field TM. Massage Therapy Effects, Am Psychol; 53 (12): 1270-81
[14] Guyton MD. Fisiologi Manusia dan Mekanisme Penyakit. (Terjemahan) Adrianto P. 3th ed. Jakarta: EGC
[15] Harper HA. Biokimia. (Terjemahan) Muliawan M. 19th ed. Jakrta: EGC
[16] Field TM.2000. Touch in Labour and Infantcy: Clinical Implication [serial online].
[17] Acolet D, Mall N,Giannakoulopoulus X, Bond C, Weg W, Clow A, et al. Changes in Plasma Cortisol and Cathecolamine Concentrationa. Archives of Disease in Childhood.1993; 68: 29-31

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Effects of Baby Massage on Weight Gain in Babies

[1]Susi Hartati, [2]Desmariyenti, Nurul Hidayah

Akademi Kebidanan Sempena Negeri, Sidomulyo Tim., Kec. Marpoyan Damai, Kota Pekanbaru, Riau 28283

Email: hartatisusi@gmail.com

Abstract- *Massage is stimulation of the skin and tissues below it with various levels of hand pressure to reduce pain, make reflexes and improve circulation and have biochemical and psychological effects on the body. Stimulant massage for a term baby can improve the relationship between baby and mother and can increase body weight in baby.But unfortunately there are still many myths in the community, especially in the care of babies who are stillbelieved that babies should not be massaged often, their bodies are still weak or other reasons that have never been verified. Though touching the baby at the beginning of his birth can have a positive influence on the growth of the baby. This study aims tothe effect of baby massage on the increase of baby weight in the work area at pekanbaru payung sekaki primary health center in 2019. This study used a Quasi Experiment design with Cross Sectional research design. Samplestaken as many as 20 babies, 10 babies carried out baby massage and 10 other babies were not carried out baby massage. Sampling technique for consecutive sampling. The data collection tool uses checklist sheets, baby massage SOP, and baby scales. Data analysis was used univariate and bivariate, with statistical tests namely non-parental and Mann Whitney tests with the helpof SPSS. The results showed that the p-value < 0.05. This means that 0,000<0,05, means that there is the effect of baby massage on the increase in baby massage weight in the work area at Payung Sekaki Pekanbaru Health Center in 2019. It is expected that the Payung Sekaki Pekanbaruhealth center Primary can conduct counseling or do baby massage to the local community.*

Keywords: *Increase Weight, Baby Massage*

1. Introduction

Massage is commonly called the stimulus touch. Massage is the art of health care and medicine that is practiced since centuries ago other. Infant massage can stimulate digestive hormones include insulin and Gaselin, so that absorption of the food to be better. This can cause the baby to quickly feel hungry so that more frequent feeding and weight gain can occur(Vivian, 2010),

Btight body is the result of an increase / decrease in all the networks that exist in the body, including the bones, muscles, fat, body fluids and others. At this time the weight is used as an indicator of the best to know the state of nutrition and child development as sensitive to changes in body weight despite little(Soetjiningsih, 2013),

The increase in the weight of children in the first year of life when the children get good nutrition is from birth to 6 months of weight gain per week 140-200 grams. Baby weight to 2-fold birth weight by the end of the first 6 months. Meanwhile, at the age of 6-12 months of weight gain per week ranged from 85-400 grams. The weight will increase by 3 times body weight at the end of the first year of birth(Hidayat, 2008),

Infant massage is beneficial to increase the inner relationship of parents and their babies,develop communication, understanding the infant cues and increase trust dirimenurut (Trilaksono, 2013). In infants not only effect is relaxed, but also a way of giving stimulants to the whole development of the senses of babies, promotes weight loss and stimulate growth, according to(Prasetyono, 2013),

Based on data obtained from Pekanbaru City Health Office of 20 health centers, found the number of babies that most of January - December 2017 was in the health center Sekaki Umbrella is 2,314 babies.

Based on the initial survey has been done in the health center Sekaki Pekanbaru Umbrella obtained result of months of January-August 2017 there were 70 babies and 70 infants that there are 48 babies breastfed by Asi Exclusive and never done before baby massage.

From this background, the hypothesis can pull no effect of infant massage on infant weight gain, so that researchers interested in conducting research that aims to determine the "Influence of Infant Massage To Increase Weight Infants in Puskesmas Umbrella Sekaki Pekanbaru in 2019"

2. Research Methods

This type of research used in this study, namely Quantitative INIA dalah with Quasi Experiment study conducted treatment, measuring the impact of the experimental units but did not use random assignment to create a comparison in order to conclude the changes caused by the treatment. In this research wanted to determine the effect of Infant Massage To Increase Weight Infants In Puskesmas Umbrella Sekaki Pekanbaru Year 2018. By looking at the effect of different weight in infants who do and not do baby massage.

3. Results and Discussion

3.1. Univariate Analysis Results

table 1

Frequency Distribution of Infant Massage Puskesmas Umbrella In Pekanbaru Sekaki 2019

No.	Baby massage	Frequency	Percentage (%)
1.	Yes	10	50
2.	No	10	50
	Total	20	100

Based on Table 1 above there were 10 infants (50%) who do massage infants and 10 infants (50%) who do not do baby massage.

The study states of 20 babies there were 10 infants (50%) who do baby massage and 10 (50%) infants who do not do baby massage.

*message*or touch the baby massage therapy is the oldest and most popular known to man. Infant massage is the art of medical care and treatment that has been practiced since centuries ago(Andrews, 2015).In fact, it is estimated this science has been known since the early humans were created to earth, perhaps because the massage is closely related to human pregnancy and parturition. The first massage experience that people experience is that at the time of birth, ie at a time through the birth canal mother(Cahyaniningrum, 2014),

Table 2.

The frequency distribution of weight gain after baby do baby massage health centers in the region of a foot umbrella pekanbaru 2019.

The increase in BB	Frequency	Percentage (%)
Ride	20	100%
Not up	0	0
Total	20	100%

Based on the above table 2 there were 20 infants (100%) who experienced weight gain and no baby does not gain weight.

The study states of 20 infants who were respondents there were 20 infants (100%) who experienced weight gain and no baby does not gain weight.

Baby weight is strongly influenced by heredity, nutrition, environment, gender, social status (Chomaria, 2015), Weight one anthropometric indicators to measure growth in infants or children.

Adequate and balanced nutrition can improve the baby's weight, sebalikya poor nutrition can lose weight babies. After the baby is born, must be pursued exclusively breastfeeding, namely breastfeeding for 6 months. After 6 months the children were given extra food or supplementary

food. A phenomenon that occurs in the community are still many infants or children who have not been optimal weight gain reach your ideal weight according to the age of children(Irva, 2014),

Weight loss is the most important anthropometric measure that should be measured at every opportunity in all age groups. Weight loss is the result of an increase / decrease in all the networks that exist in the body. At this time the weight is used as the best indicator to determine the nutritional status and development of the child because the child's weight is sensitive to changes although slightly(Soetjiningsih, 2013),

According to the assumptions of researchers, there are many parents who do not perform infant massage to their babies because there are still many myths heard in the community that may not be often massaged babies because the baby's body is still weak. This is because the parents also lack knowledge about infant massage.

a. Bivariate Analysis Results

table 3

Effect of Infant Massage To Increase Weight Infants In Puskesmas Umbrella Sekaki 2019.

Massage Baby	Increase in Weight Loss							
	Ride	%	morbidly ride	%	**Jlh**	%	***P value***	**α**
Yes	10	50	0	0	10	100		
No	10	50	0	0	10	100	0,000	0.05
Total	20	100	0	0	20	100		

Based on Table 3 above are baby massage effect on infant weight gain in Puskesmas Umbrella Sekaki 2019 where the p value <α yaitu0.000 <0.05, it can be concluded that Ha Ho accepted and rejected. The rejection of Ho implies that there is a significant difference to the weight gain did not do baby massage and baby massage.

From the results of the independent t test using the computerized system shows the results of the P-value = 0.000 and a degree of error of 0.05 then Ho is rejected and Ha received means that there is a relationship of infant massage to weight gain in infants in Puskesmas Umbrella Sekaki Pekanbaru in 2019.

theoretical Roesli (2010)with infant massage will increase the activity of the vagus nerve that stimulates the digestive hormones include insulin and gaselin. Insulin plays a role in metabolism. Increased Insulin and Gastrin stimulate the digestive function so that the absorption of the nutrients also be good. This good absorption will cause the baby to quickly feel hungry because the baby will often suckle.

Massaging the baby will stimulate the vagus nerve, the nerve where it will increase the intestinal peristalsis thus increasing gastric emptying thereby stimulate the baby's appetite to eat more heartily in sufficient quantities. In addition vagus can also stimulate the production of digestive enzymes so that the maximum absorption of food. On the other hand massage also can accelerate blood circulation and improve the metabolism of cells, from the series of the baby's weight will increase(Hady, 2014),

Mother is an old man closest to the baby, where mother to baby massage is a gentle sweep of the fabric fastener affection. The mother's skin is the skin of the earliest recognizable to baby. Touch and massage are given the mother is a form of communication that can build closeness mothers with babies by combining eye contact, smile, facial expressions. If stimulation is often given, then the affectionate relationship of mother and baby on a reciprocal basis will be stronger(Irva, 2014),

Research conducted by Lee HD (2009)massaging performed by a mother to her baby (baby just months) after 15 days of the birth, proves that there is an increase in infant weight gain that many touches, especially from the mother. The test results Statistics show that there are differences of weight gain between before and after intervention in the intervention group in infant massage 4 times a week (p valueα ie 0.0001 <0.05).

Hady.A (2013), in the sub-district Puskesmas Wewiku Weoe Belu District, East NusaTenggara results obtained between weight gain massaging baby do baby massage for 4 weeks showed a significant difference in stimulating the body weight in babies.

Based on the assumptions of researchers all babies gain weight, but the weight gain infant exists that exceeds the standard, and there are less than the standard, baby do baby massage and not do infant massage will experience the difference in weight gain that is at least 180 g and a maximum 380 gr. Babies who are massaged but did not experience weight gain badandikarenakan does not want the baby to suckle or difficult to forced feeding for a few days before a massage baby fever. And babies who are not massaged but experience weight gain due to active baby to suckle his mother and get enough sleep.

4. Conclusion

Based on existing research concluded Infant Massage Effect Against Increase in Weight In Infants In Puskesmas Umbrella Sekaki Pekanbaru 2019 "conducted by the action of massage and weight measurements in infants.

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5. Reference

[1] Cahyaniningrum, S. (2014). Hubungan pijat bayi terhadap kualitas tidur bayi umur 0-3 bulan. Sukoharjo: Akademi Kebidanan Mamba'ul 'Ulum Surakarta.
[2] chomaria, N. (2015). Berat Badan Pada Bayi. jakarta: Universitas Andalas.
[3] Field, T., Schanberg, S. M., Scafidi, F., Bauer, C.R., Vega-lahr, N., Garcia, R., et al. (2015). Tactile/Kinesthetic Stimulation Effects on Preterm Neonater. Http://www.pediatrics.org
[4] Hady. (2014). Pengaruh Pijat Bayi Terhadap Berat Badan Bayi Usia 0-12 Bulan. Jurnal Pustaka UNPAD.
[5] Hidayat. (2008). Riset Keperawatan dan Teknik Penulisan Ilmiah, Edisi 2. jakarta: Penerbit Salemba Medika.
[6] Irva, D. (2014). pengaruh terapi pijat terhadap peningkatan berat badan bayi. Penelitian ini menggunakan metode Quasy Ekspeiment dengan pre test dan post test control group design, 1(2).
[7] Prasetyono. (2013). Pengaruh Pijat Bayi Terhadap Peningkatan Berat Badan Bayi Usia 0-3 Bulan. Adln.lib.unair.ac.id/.
[8] soetjiningsih. (2013). Tumbuh Kembang Anak. jakarta: Penerbit EGC.
[9] Trilaksono. (2013). Stimulasi Pada Bayi Dan Ibu. Jakarta: Penerbit EGC.
[10] Vivian. (2010). Asuhan Neonatus Bayi dan Anak Balita. jakarta: Penerbit Salemba Medika.

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Nama Mahasiswa : Ayu Novia Rahmawati Pratama
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Judul : Literatur Riview Pengaruh Terapi Massage Terhadap Pertumbuhan dan Perkembangan Pada Bayi

No	Hari/Tanggal	Saran	Paraf
No	Jumat, 22 Maret 2024	- Konsul terkait Judul KIAN : Literatur Riview Pengaruh Terapi Massage Terhadap Pertumbuhan dan Perkembangan Pada Bayi - Lanjut ACC Judul	[paraf]
	Senin, 08 April 2024	1. Perbaikan Judul : "Pengaruh Terapi Massage Terhadap Pertumbuhan dan Perkembangan Pada Bayi 2. Lihat lagi spasi jarak antar paragraf harus dirapihkan sesuai dipanduan 3. Perbaikan pada Cover penambahan kata : " Program Pendidikan Profesi Ners " 4. Tujuan Cukup 1 : untuk mengetahui Pengaruh Terapi Massage terhadap Pertumbuhan dan perkembangan Pada Bayi berdasarkan kajian Literatur Riview 5. Tambahkan sop terapi massage di BAB 2 6. Kerangka Penelitian harus ada (Input → Proses → Output 7. di kriteria Inklusi dan Eklusi tambahkan secara jelas batasan usia bayi sesuai Jurnal 8. Kriteria Inklusi dan Eklusi harus sinkron dengan data dipembahasan 9. Di desain Penelitian "kata topik yang diambil harus sesuai dengan Judul	[paraf]

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No	Hari/Tanggal	Saran	Paraf
		10. Untuk di Ekslusi kata-katanya boleh menggunakan bahasa Indonesia 11. Harus dicantumkan di Inklusi literatur Review bahwa jurnal yang diambil hanya penelitian murni bukan hasil penelitian yang differalai ritualcan 12. Tambahkan RCT di inklusi tambahkan Randomized Control Trial dengan mencantumkan dengan pembahasan 13. Di kesimpulan jelaskan secara jurnal paparkan pengaruh terapi massage yang berhasil dalam peningkatan apa saja baik itu di pertumbuhan dan perkembangannya.	(paraf)
	Kamis, 16 Mei 2024	1. Masukan penilaian jurnal 2. lengkapi lampiran	
	Rabu, 22 Mei 2024	ACC Sidang KIAN	(paraf)

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LEMBAR KONSULTASI

Nama Mahasiswa : Ayu Novia Rahmawati Pratama
Pembimbing II : Dadang Nurkholik Sidik Permana, S.Kep., Ners., M.M., M.Kep
Judul : Literatur Riview Pengaruh Terapi Massage Terhadap Pertumbuhan dan Perkembangan ~~Pada~~ Bayi

No	Hari/Tanggal	Saran	Paraf
1.	Jumat, 22 Maret 2024	- Consul terkait Judul Kian: Literatur Riview Pengaruh Terapi Massage Terhadap Pertumbuhan dan Perkembangan Bayi - Acc Judul	
2.	Jumat 16 Mei 2024	- Perbaiki data cara penulisan - Perbaiki spasi antar paragraf - Tambahkan Justifikasi masalah	
3.	Rabu ~~17~~ mei 2024	- ditabel PICOS untuk kriteria eksklusi bahasannya diganti yang populasi karena bukan kebalikan misalnya bayi 1 tahun keatas - Di pembahasan asumsi peneliti bahas juga dengan faktor-faktor lainnya yang mempengaruhi tumbuh kembang bukan dilihat dari bayinya saja pola asuh dan sebagainya juga dibahas	
4.	Rabu, 29 mei 2024	- Acc Sidang Kian	