

Evaluation of the Efficacy and Safety of EqualsTwo® Baby Massage Oil in Promoting Growth, Skin Health, and Neurobehavioral Outcomes in Healthy Infants: A 60-Day Clinical Study

Kinjal Barot¹, Dhruv Zaveri¹, Jaimin Vaishnav¹, Nirav Patel², Nayan Patel³,
Sunil S. Iyer⁴, M. E. Kannan⁵

¹Biopharmaceutics and Clinical Development, Pharmaceutical Technology Centre (PTC), Zydus Lifesciences Limited, Sarkhej Bavla N.H. No.8A, Moraiya, Tal: Sanand, Dist.: Ahmedabad 382 210, Gujarat, India,

²Ashirwad Children Hospital, Near Praveen Petrol Pump, Rajoda, Bavla, Gujarat – 382220, India

³Novobliss Research, Silver Radiance-4, 313, Chanakyapuri, Ahmedabad – 380060, Gujarat, India

⁴Head, Biopharmaceutics and Clinical Development, Zydus Lifesciences Limited, Sarkhej Bavla N.H. No.8A, Moraiya, Tal: Sanand, Dist.: Ahmedabad 382210, Gujarat, India

⁵Head, Pharmaceutical Technology Centre (PTC), Zydus Lifesciences Limited, Sarkhej Bavla N.H. No.8A, Moraiya, Tal: Sanand, Dist.: Ahmedabad 382210, Gujarat, India.

Corresponding Author: Kinjal Barot

DOI: <https://doi.org/10.52403/ijrr.20260731>

ABSTRACT

Objectives: Infancy is a critical period marked by rapid physical, neurological, and immune development. Interventions that support growth and well-being during this window are essential. Massage therapy has emerged as a safe, effective, non-pharmacological approach for preterm and low-birth-weight infants; however, limited data exist on its efficacy in healthy infants and toddlers under real-world conditions. To evaluate the efficacy and safety of EqualsTwo® Baby Massage Oil (Investigation product) in improving growth parameters, sleep, behavior, skin hydration, and mother/caregiver satisfaction in healthy infants and toddlers (≤ 3 years) over a 60-day period.

Methods: This prospective, randomised, controlled, open-label study enrolled 64 healthy infants and toddlers aged ≤ 3 years ($n=32$; Test group $n=32$; Control group). 57 participants completed the study (30 in the test group; 27 in the control group).

Anthropometric measurements, sleep patterns, skin hydration, and behavioural cues were assessed at baseline, Day 14, Day 30, and Day 60, while blood flow dynamics and serum biochemical markers were evaluated at baseline and Day 60. Statistical analysis was conducted using t-tests or chi-square tests as appropriate.

Results: The test group showed statistically significant, greater improvements across all primary and secondary outcomes, including a 3.1-fold increase in anthropometric growth, 15.8-fold improvement in sleep duration, 212% rise in skin hydration, 92.9% increase in blood volume flow, and marked behavioral improvements. No adverse events were reported, and mother/caregiver satisfaction was uniformly high.

Conclusion: Daily massage with investigation product (EqualsTwo® Baby Massage Oil) is a safe and effective intervention to enhance overall infant growth and well-being.

Keywords: Growth and development, Infant massage, Natural baby oil, Skin hydration, Sleep quality.

INTRODUCTION

Infancy represents a crucial window in human development, marked by rapid physical growth, neurological maturation, and immune system consolidation. [1,2] During the first three years of life, children undergo rapid physical, neurodevelopmental, and behavioural maturation, making this period critical for establishing long-term health trajectories. A review by Chen et al. (2024) demonstrated that pediatric massage significantly promotes physical growth, enhances sleep quality, and supports psychomotor development in children under five years of age. [3] Any deviation from optimal growth trajectories during this sensitive phase may have lasting consequences, including increased susceptibility to infections, impaired neurodevelopment, and elevated risk of chronic diseases later in life. [4-6] Therefore, continuous monitoring and active support of infant growth parameters—such as weight gain, linear growth, and developmental milestones—are essential components of early pediatric care. [7,8] Interventions that promote safe and effective growth during infancy are increasingly recognized as public health priorities, particularly in resource-constrained settings where infants are vulnerable to nutritional, environmental, and developmental challenges. Among the various non-pharmacological strategies to support healthy infancy, massage therapy has emerged as a safe, cost-effective, and evidence-based intervention with multidimensional benefits. [9-11] Regular infant massage, particularly when combined with appropriate oils, has been associated with improved physical growth parameters. [12] Mechanistically, massage is believed to stimulate the vagus nerve, enhancing gastrointestinal motility and nutrient absorption, which in turn supports better

feeding patterns and growth velocity. Beyond physical outcomes, massage also facilitates neurodevelopment by promoting sensory integration, improving muscle tone, and supporting the maturation of reflexes and motor coordination. [13] Moreover, it contributes to emotional well-being by reducing stress, improving sleep quality, and strengthening caregiver–infant bonding—an essential component of early social and emotional development. These benefits extend even to medically vulnerable groups, including infants born preterm, those with developmental disorders, or those exposed to maternal infections, making massage therapy a valuable adjunct in pediatric health practices. [14]

While previous studies have highlighted the benefits of massage in preterm or at-risk infants, limited evidence exists for its impact in healthy, infants under real-world conditions. In both rural and urban India, traditional oils such as mustard oil, coconut oil, sesame oil, and homemade herbal blends are frequently used for infant massage. However, concerns have been raised regarding the skin irritant potential of mustard oil and the variable quality or purity of unregulated formulations. EqualsTwo® Baby Massage Oil (Investigation product) is a dermatologically tested, preservative-free formulation composed of clinically evaluated natural ingredients designed to support infant skin health and overall wellness. It contains a coconut-based oil blend enriched with sesame, sweet almond, and linseed oils. Its standardized composition ensures safety, tolerability, and consistent therapeutic benefits, addressing the variability often associated with traditional oils. This study was designed to evaluate its efficacy and safety over a 60-day period, focusing on physical growth, sleep, behavior, skin hydration, and caregiver satisfaction, thereby addressing a key gap in pediatric preventive care.

MATERIALS & METHODS

Study Design and Setting

This was a prospective, randomized, controlled, open-label study conducted over a 60-day period. The study was carried out at two pediatric clinics located in urban centers in India.

Study Objectives

The primary objective of the study was to evaluate the effectiveness of investigation product in promoting improvements in anthropometric parameters, specifically weight, height, and head circumference, in healthy infants over 60 days. Secondary objectives included assessing the impact of the investigation product on behavioral endpoints and improvement in dermatological parameters. The study evaluated exploratory endpoints, including changes in feeding patterns (frequency and duration) and variations in serum biochemical markers (calcium, phosphorus, bone-specific alkaline phosphatase [BSA], creatine phosphokinase [CPK], and triglycerides), Doppler-derived cardiovascular and circulatory endpoints, as well as caregiver satisfaction. The safety and tolerability objectives included regular dermatological evaluation for signs of local intolerance (such as erythema, dryness, or rashes) and monitoring of adverse events throughout the study.

Study population:

Healthy infants and toddlers of either gender, aged 0-36 months, were screened as per the eligibility criteria. Participants who were in general good health and medically stable on pediatric examination and if their primary caregivers/mothers provided written informed consent, were included in the study. Participants with any chronic illness, known hypersensitivity to topical products, active skin infections, dermatological conditions, or those receiving any ongoing pharmacological treatment were excluded from the study. Additionally, infants who had received any form of massage therapy or topical skin

treatment within 7 days before enrolment were not eligible to participate.

Randomization and Group Allocation

Following eligibility confirmation and informed consent, enrolled participants were randomly assigned to either the massage oil group (n=32, Test group) or the non-massage oil group (n=32, control group). A computer-generated randomization was used to ensure unbiased allocation, with approximately equal distribution across both arms. The test group received twice-daily massages using investigation product, while the control group continued routine care without any investigation product intervention.

Intervention Details and Study Procedure

The investigation product is a natural formulation developed using advanced enzymatic activation technology. Mothers/caregivers in the test group were instructed to administer a daily full-body massage throughout the 60-day study period. Mothers/caregivers were trained by clinical staff on massage techniques to ensure consistency in application. Each massage session lasted approximately 10–15 minutes and was administered twice daily, preferably before bathing, using 5–10 mL of the investigation product as per the infant's body size. The investigation product was gently applied with moderate pressure over the entire body, including arms, legs, back, abdomen, and face, avoiding sensitive areas such as the eyes and genital region. Participants in the control group did not receive any topical application during the study period and continued with routine care practices.

All participants underwent scheduled follow-up assessments at Day 14, Day 30, and Day 60. At each follow up, anthropometric measurements (weight, length, head circumference, mid-leg circumference, mid-upper arm circumference, and skinfold thickness) were recorded at the study site. In addition, skin hydration and trans-epidermal water loss

were measured using Corneometer® and Tewameter® devices, respectively. Blood samples were collected at baseline and Day 60 (at end of the study) to evaluate serum calcium, phosphorus, bone-specific alkaline phosphatase (BSA), creatine phosphokinase (CPK), and triglyceride levels.

Mothers/caregivers maintained a daily log of massage application (where applicable), feeding and sleep patterns, and any observed changes in infant behaviour using a subject diary. Sleep duration and the frequency of sudden wakeful episodes were specifically evaluated via a parental perception questionnaire. The recorded entries were reviewed and verified by study personnel during each follow-up visit. At the final follow-up (Day 60), Mothers/caregivers feedback on product acceptability, ease of use, and perceived benefits was obtained through a structured questionnaire.

Statistical Analysis

Data from all participants who completed the study were included in the final analysis. Continuous variables such as weight, height, head circumference, serum biomarkers, sleep duration, and skin hydration were expressed as mean $\pm$ standard deviation. Percent change from baseline (CFB) was calculated for all relevant parameters to

assess within-group improvements over the study period. Intergroup comparison for continuous outcomes were performed using independent samples t-tests or Mann–Whitney U tests, depending on data normality. Categorical variables, including changes in behavioral parameters and mother/caregiver-reported outcomes, were analyzed using chi-square or Fisher’s exact tests as appropriate.

Ethical Considerations

The study was conducted in accordance with the principles of the Declaration of Helsinki and Good Clinical Practice (GCP) guidelines. Written informed consent was obtained from the parents/caregivers of all participating infants. This clinical study was registered at CTRI (Clinical Trial Registry of India) under the trial registration number CTRI/2024/03/063975.

RESULT

Demographics Details:

The study population included 64 infants and toddlers (35 males, 29 females) with a mean age of 19.03 ± 9.99 months, average weight of 8.80 ± 2.05 kg, and mean height of 74.55 ± 0.12 cm. Total 57 subjects completed the study as depicted in Figure 1 and Table 1.

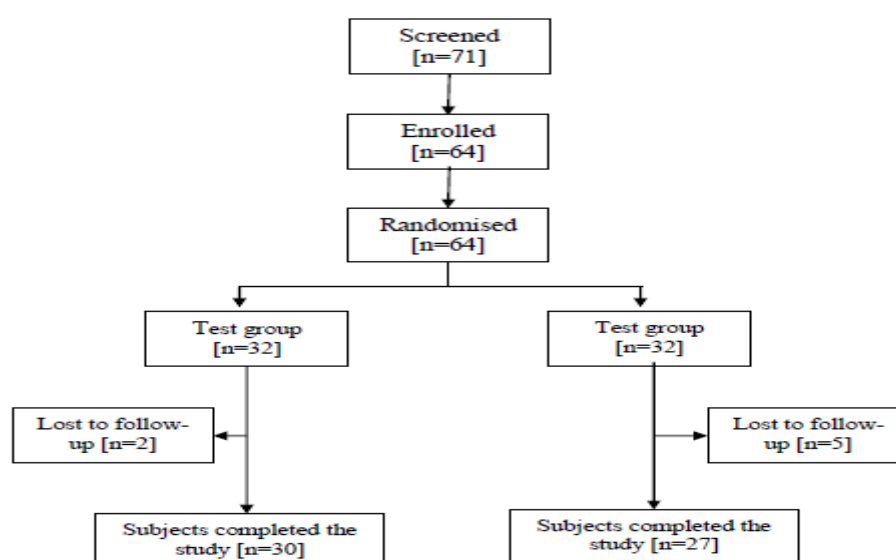


Figure 1. CONSORT flow diagram of participants disposition showing screening, randomisation, follow-up, and study completion

Table 1. Patient demographics

Subjects completed the study [N=57]									
Parameter		Test group [N=30]				Control group [N=27]			
		Count (N)		Percentage (%)		Count (N)		Percentage (%)	
Gender	Male	20	66.67%			12	44.44%		
	Female	10	33.33%			15	55.56%		
Race	Asian	30	100.00%			27	100.00%		
		Mean ± SD	Median	Min	Max	Mean ± SD	Median	Min	Max
Age (Months)		17.03±10.27	15.00	4.00	35.00	19.59±9.44	19.00	3.00	35.00
Weight (kg)		8.62±2.21	8.72	4.10	13.99	8.83±1.86	9.22	5.38	13.49
Height (cm)		73.71±11.00	75.45	51.50	96.00	73.52±8.99	74.50	54.10	89.50
Respiration Rate		27.07±1.31	27.00	24.00	30.00	27.37±1.01	28.00	25.00	29.00
Pulse Rate		111.83±6.31	112.00	92.00	123.00	111.85±5.04	112.00	103.00	119.00
Temperature (°F)		96.03±9.25	97.60	47.10	98.60	97.61±0.27	97.60	97.20	98.20
Weight at birth (kg)		3.00±0.21	3.00	2.70	3.80	3.00±0.12	3.00	2.80	3.20
Age-wise distribution [N (%)]									
0-12 months		13 (43.33%)				7 (25.93%)			
13-24 months		9 (30.00%)				13 (48.15%)			
25-36 months		8 (26.67%)				7 (25.93%)			

Primary Objectives:

Changes in Anthropometric Parameters

A composite assessment of growth was conducted using six anthropometric indicators: weight, height, head circumference, mid-upper arm circumference, mid-leg circumference, and triceps skinfold thickness. The mean

percentage change from baseline to Week 8 (Day 60) for all parameters combined was significantly higher in the Test group (7.45%) compared to the control group (2.40%), with the inter-group difference being statistically significant ($p < 0.0001$) (Figure 2).

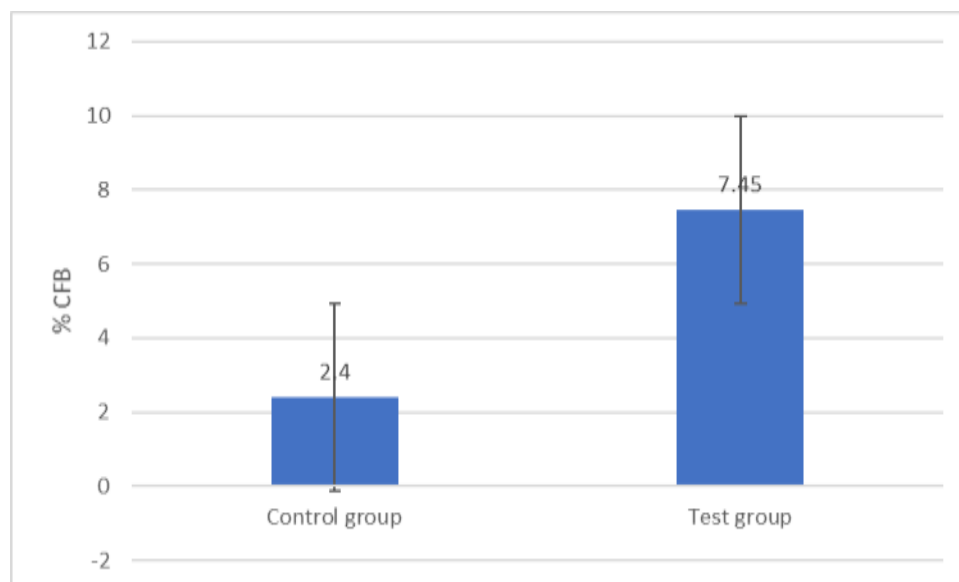


Figure 2. Composite Change in Anthropometric Parameters from Baseline to Week 8

Secondary Objectives:

1. Behavioural outcomes:

Sleep Outcomes:

The Test group demonstrated a significant improvement in sleep duration and quality. The mean sleep duration increased from

9.10 hours at baseline to 12.63 hours on Day 60, representing a 41.47% increase ($p < 0.0001$). In contrast, the control group showed only a minimal change (from 9.85 to 10.07 hours; 2.62% increase), which was not statistically significant. Additionally, the

frequency of sudden wakeful episodes significantly decreased in the Test group (from 2.60 to 0.30; $p < 0.001$), whereas control group exhibited no meaningful change (from 2.78 to 3.11; $p > 0.05$). These findings highlight the investigation product's role in promoting prolonged and uninterrupted sleep (Table 2a).

Wellness outcomes:

Massage with investigation product was associated with a notable reduction in stress-related behaviors. In Test group, 86.67% of infants exhibited a decrease in crying behavior, compared to only 51.85% in

control group. Similarly, grimacing decreased in 76.67% of infants in the Test group versus 25.93% in control group with increase in crying and grimacing in 29.63% and 7.41% of infants in the control group (Table 2b). In addition to behavioural cues, improvements in gross motor activity were also observed. All infants in the Test group (nearly 100%) demonstrated progress in developmental milestones such as rolling over, belly crawling, and leg lifting, with further advancements noted in crawling, standing, flexing arms, and early walking.

Table 2: Effect of Investigation Product Application on Sleep and Wellness Parameters Over a 60-Day Period in Infants.

Table 2a: Sleep Parameters Over the 60-Day Study Period		
Parameter	%CFB	p-value
Sleep Duration (hours)		
Test group (n=30)	41.47%	<0.0001
Control group (n=27)	2.62%	>0.05
Frequency of Sudden Wakeful Episodes		
Test group (n=30)	-88.46%	<0.001
Control group (n=27)	+11.87%	>0.05
Table 2b: wellness parameters Over the 60-Day Study Period		
Crying		
Increased	0 (0.00%)	8 (29.63%)
Decreased	26 (86.67%)	14 (51.85%)
No Change	4 (13.33%)	5 (18.52%)
Grimacing		
Increased	0 (0.00%)	2 (7.41%)
Decreased	23 (76.67%)	7 (25.93%)
No Change	7 (23.33%)	18 (66.67%)

Dermatological and instrumental skin analysis:

Substantial improvements in skin hydration and barrier function, as measured using the Corneometer® CM 825 and Tewameter® TM Hex devices, were observed in the Test group. Skin hydration increased from 19.35% to 56.93% from baseline to Day 60, reaching statistical significance ($p < 0.0001$). This was significantly greater than

the minimal changes observed in the control group, which showed a negligible increase from 22.34% to 22.70 % by Day 60 (Figure 3a). Correspondingly, trans-epidermal water loss (TEWL) decreased by 41.94% in the Test group, indicating enhanced skin barrier integrity ($p < 0.0001$), with the control group showing only a 3.65% reduction in TEWL over the same period (Figure 3b).

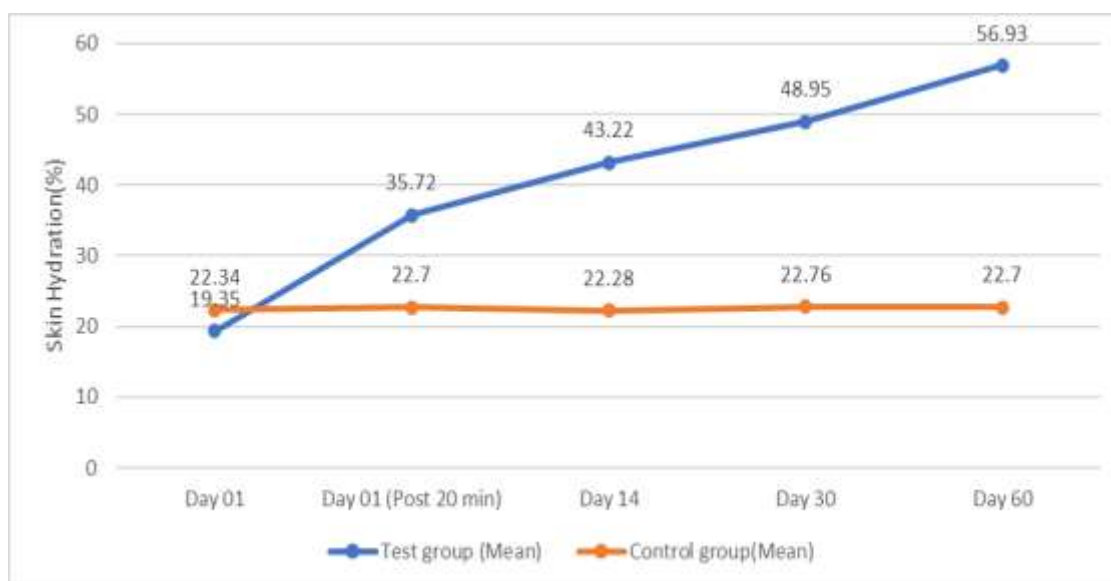


Figure 3a: Change from Baseline in Skin hydration percentage over 60-day duration

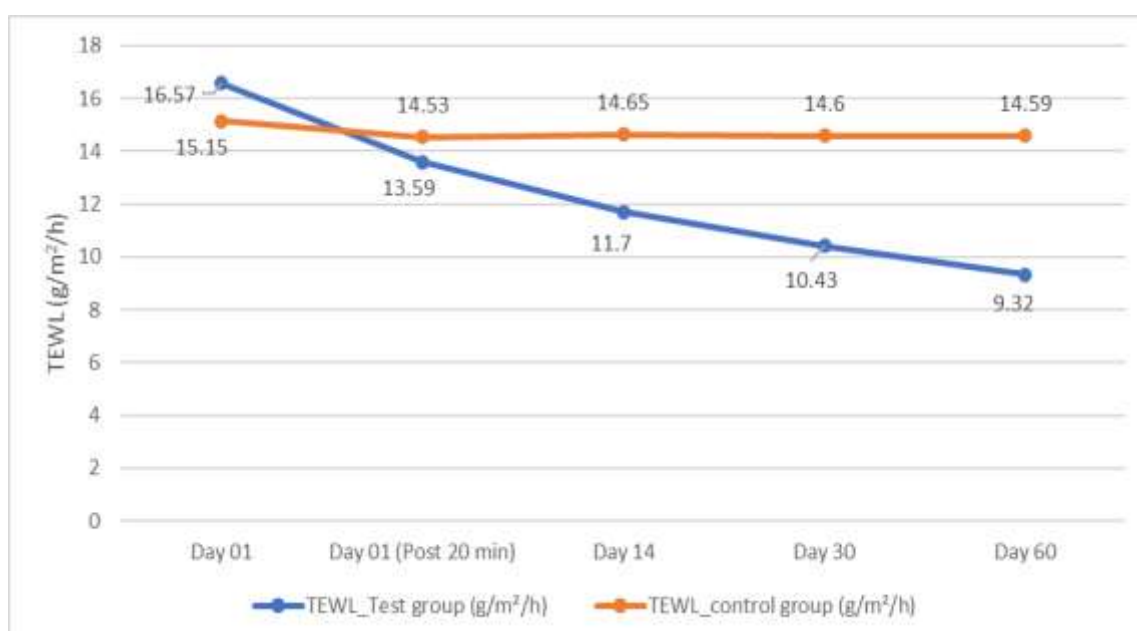


Figure 3b: Change from the baseline in TEWL over a 60-day duration

CFB: Change from Baseline; TEWL: Trans-Epidermal Water Loss, P value is <0.05 is considered clinically significant

Exploratory Outcomes:

1. Cardiovascular and circulatory outcomes:

Infants in the Test group showed a significant 91.54% increase in blood flow velocity (from 5.84 cm/s at baseline to 8.21 cm/s on Day 60; $p < 0.05$), compared to a 52.17% increase control group (from 6.80 to 8.78 cm/s). The greater improvement in the

Test group, suggests enhanced peripheral circulation due to regular massage. Similarly, blood volume flow increased by 92.92% in Test group (from 8.57 to 11.72 ml/min), while the control group showed only a 40.42% increase (from 9.26 to 11.15 ml/min). Although the difference in volume flow was not statistically significant ($p > 0.05$) (Table 3).

Table 3: Effect of Investigation product Application on Circulatory Parameters Over a 60-Day Period in Infants.

Table 3: Doppler Imaging Parameters Related to Circulation			
%CFB Test group	p-value	%CFB (Control group)	p-value
91.54	<0.05	52.17	<0.05
92.92	>0.05	40.42	>0.05

2. Physiological Strength outcomes:

Biochemical markers associated with bone and muscle development revealed important trends. A statistically significant reduction (2.40 %, $p < 0.01$) in serum calcium levels was observed in the Test group compared to the control group (1.10%, $p > 0.05$), indicating enhanced calcium utilisation and potential bone mineralisation. While both groups (test group 6.18%, 3.78%; control group 2.19%, 3.72 %) showed reductions in bone-specific alkaline phosphatase (BSAP) and creatine phosphokinase (CPK), respectively, these changes were not statistically significant, suggesting stable bone turnover and preserved muscle integrity without signs of muscle damage. Serum triglyceride levels increased in both groups, with a notably smaller rise (22.65 % from baseline) in the Test group and 44.17% in the control group.

Safety, Tolerability, and Product Acceptability outcomes:

Throughout the 60-day study period, the test group demonstrated excellent safety and tolerability. None of the infants experienced any product-related adverse events or local skin reactions such as erythema, dryness, oedema, urticaria, pruritus, or allergic responses. Safety was evaluated based on the incidence of usage-emergent adverse events, as reported by mothers/caregivers or assessed by the pediatrician or study physician. Local intolerance was also assessed through clinical examination at each follow-up visit. The investigation product was well-accepted by both infants and Mother/caregivers, with no reports of discomfort or discontinuation. The rapid absorption of the investigation product was confirmed through the Tissue Absorbent Test, which showed that the product was

fully absorbed into the skin within five minutes of application in all cases. Observations by trained study personnel confirmed that the investigation product left no greasy, sticky, or staining residue, reinforcing its suitability for routine pediatric use.

Mother/caregiver -reported outcomes further highlighted high acceptability of investigation product. Visual Analogue Scale (VAS) scores reflecting perceived therapeutic effect increased significantly from a mean of 6.50 on Day 1 to 9.83 on Day 60 ($p < 0.0001$). By the end of the study, all mothers agreed that the investigation product was non-greasy, mild, and gentle on the skin, and contributed to visible improvements in their babies' skin hydration, physical comfort, and overall well-being.

DISCUSSION

This prospective, randomized, controlled study demonstrated that daily massage with investigation product over a 60-day period significantly improved anthropometric indices, sleep duration, feeding patterns, behavioral comfort, skin hydration, and Mother/caregiver -reported outcomes among healthy infants and toddlers aged ≤ 3 years. Test group exhibited a 3.1-fold greater composite gain in growth parameters and a 212% increase in skin hydration, alongside a 15.8-fold improvement in sleep duration and a 92.9% increase in peripheral blood volume flow. These multidimensional improvements reflect a significant impact of massage not only on physical growth but also on physiological regulation and neuromotor readiness, affirming its value as a non-invasive, Mother/caregiver -administered intervention in early infancy. The findings of the present study align

closely with earlier clinical research on massage therapy in neonates and infants. For example, Kumar et al. (2013) observed a 42.3% greater weight gain (476.7 g vs. 334.9 g; $p<0.05$) over 28 days in preterm neonates who received oil massage compared to those receiving standard care, along with a significantly reduced early postnatal weight loss ($p=0.003$).^[15] Although our study population comprised healthy term infants, the 3.86-fold higher weight gain in the test group is consistent with previously reported outcomes, suggesting that oil massage can enhance nutritional efficiency and metabolic utilization irrespective of prematurity. The lack of significant changes in serum triglyceride levels in both studies supports the hypothesis that oil massage facilitates improved nutrient absorption and energy utilization without adversely impacting lipid homeostasis.

In a randomized controlled trial by Piñero-Pinto et al. (2020), infants with Down syndrome showed significant increases in developmental quotients across all domains (e.g., global DQ increased by ~17.6 points; $p<0.001$) after five weeks of parent-administered massage.^[16] Similarly, the present study found marked reductions in crying (87% of infants), grimacing (77%), and improvements in gross motor activity (100%), suggesting improved emotional regulation and neuromuscular coordination. The 41.9% reduction in TEWL and near-doubling of blood velocity ($p<0.05$) reflect enhanced autonomic and circulatory efficiency, which are known contributors to better sleep, digestion, and physical growth—outcomes also emphasized in systematic reviews by Rakhmawati et al. (2024) involving 676 infants across 11 RCTs.^[17]

The present study findings also closely align with those reported by Taheri et al. (2018) in a NICU-based randomized trial, which demonstrated that oil massage in preterm neonates significantly improved daily weight gain and sleep quality.^[18] Similarly, in our cohort, 100% of infants in the test

group showed improvements in weight gain and anthropometric indices over the 60-day period, while 87% experienced prolonged sleep duration and more consolidated sleep cycles. These findings are further supported by evidence from a randomized study by Zhang et al. (2019) where preterm infants who received massage over two weeks showed significantly greater gains in weight, length, and head circumference.^[19]

The observed benefits of investigation product may be attributed to the synergistic effects of its natural ingredients, each known for specific dermatologic and physiologic actions. Coconut oil, the primary base, possesses medium-chain fatty acids such as lauric acid that exhibit antimicrobial properties and support skin barrier integrity through enhanced lipid replenishment. Sesame oil is rich in linoleic acid and vitamin E, which improve skin hydration, reduce trans-epidermal water loss (TEWL), and exhibit antioxidant properties that mitigate oxidative stress in developing skin.^[20] Sweet almond oil, known for its emollient and anti-inflammatory properties, promotes dermal softening and reduces irritation, which may contribute to improved behavioral comfort in infants.^[21] Linseed oil, high in alpha-linolenic acid (an omega-3 fatty acid), supports cutaneous repair and may modulate local inflammation and circulation.^[22] Additionally, the use of advanced enzymatic activation technology in the formulation is likely to enhance the bioavailability and skin penetration of these active components, leading to faster absorption and more efficient delivery of therapeutic benefits. Together, this composition facilitates enhanced skin barrier function, improved microcirculation, and neurosensory stimulation—underpinning the observed improvements in growth, sleep, behavior, and overall well-being.

Massage with a safe, well-absorbed formulation like the test product not only enhances Mother/caregiver –infant bonding but also confers measurable growth and neurobehavioral benefits during a critical

window of neuroplasticity. Importantly, no adverse events or skin reactions were reported, and mother/caregiver satisfaction was uniformly high, indicating excellent safety and tolerability. Nevertheless, limitations include the open-label design, modest sample size, and lack of long-term developmental follow-up. Future research should assess neurocognitive development through standardized scales such as the Bayley Scales of Infant Development and explore comparative efficacy of different massage oils across diverse infant populations.

CONCLUSION

The findings of this study support the use of the investigation product (EqualsTwo® Baby Massage Oil) as a safe, well-tolerated, and effective adjunct to promote early infant development. Twice-daily massage over a 60-day period led to significant improvements in growth parameters, sleep quality, skin hydration, behavioral comfort, and caregiver-reported satisfaction, with no adverse effects reported. The investigation product's natural, dermatologically tested formulation offers a standardized alternative to traditional massage practices. Incorporating such evidence-based, non-pharmacological interventions into routine pediatric care may help optimize physical, emotional, and developmental outcomes during the critical window of infancy, contributing to long-term health and well-being.

Declaration by Authors

Ethical Approval: Approved

Acknowledgement: We would like to express our sincere appreciation and gratitude to Digicare Health Solutions Private Limited (DHSPL), for their significant contribution to the preparation of the manuscript and publication support.

Source of Funding: This study was funded by ZyduS Lifesciences Ltd.

Conflict of Interest: The authors declare that there is no financial conflict of interest with the content of this article. The study

was funded by ZyduS Lifesciences Ltd., who provided financial support for the study design, data collection, and analysis. However, the funding organization did not influence the data interpretation or the preparation of the manuscript. The authors declare that they have no personal or financial interests that could have influenced the conduct or reporting of this study.

REFERENCES

1. Bornstein MH. Human infancy... and the rest of the lifespan. *Annual Review of Psychology*. 2014 Jan 3; 65:121-58.
2. Biagioli V, Volpedo G, Riva A, Mainardi P, Striano P. From birth to weaning: a window of opportunity for microbiota. *Nutrients*. 2024 Jan 17;16(2):272.
3. Chen SC, Lin SL, Wang M, Cheung DS, Liang JG, Cheng ZY, Yuen CS, Yeung WF. Pediatric massage therapy in infants and children under 5 years: an umbrella review of systematic reviews. *Heliyon*. 2024 Aug 30;10(16).
4. Wang SH, Lin KL, Chen CL, Chiou H, Chang CJ, Chen PH, Wu CY, Lin KC. Sleep problems during early and late infancy: Diverse impacts on child development trajectories across multiple domains. *Sleep Medicine*. 2024 Mar 1; 115:177-86.
5. Fenton TR, Barr SM, Elmraged S, Alshaikh B. Expected and desirable preterm and small infant growth patterns. *Advances in Nutrition*. 2024 Jun 1;15(6):100220.
6. Arrieta MC. Microbiome maturation trajectory and key milestones in early life. *Annals of Nutrition and Metabolism*. 2025 Jun 24;81(Suppl. 1):20-7.
7. Ashworth A, Shrimpton R, Jamil K. Growth monitoring and promotion: review of evidence of impact. *Maternal & child nutrition*. 2008 Apr; 4:86-117.
8. Agarwal KN, Gupta A, Pushkarna R, Bhargava SK, Faridi MM, Prabhu MK. Effects of massage & use of oil on growth, blood flow & Sleep. *Indian J Med Res*. 2000 Dec;112(2).
9. Field T. Pediatric massage therapy research: a narrative review. *Children*. 2019 Jun 6;6(6):78.
10. Bennett C, Underdown A, Barlow J. Massage for promoting mental and physical health in typically developing infants under

- the age of six months. Cochrane database of systematic reviews. 2013(4).
11. Mrljak R, Arnsteg Danielsson A, Hedov G, Garmy P. Effects of infant massage: a systematic review. *International journal of environmental research and public health*. 2022 May 24;19(11):6378.
 12. Vickers A, Ohlsson A, Lacy J, Horsley A. Massage for promoting growth and development of preterm and/or low birth-weight infants. *Cochrane Database of Systematic Reviews*. 2004(2).
 13. Priyadarshi M, Kumar V, Balachander B, Gupta S, Sankar MJ. Effect of whole-body massage on growth and neurodevelopment in term healthy newborns: A systematic review. *Journal of global health*. 2022 Oct 18; 12:12005.
 14. Zhang Y, Duan C, Cheng L, Li H. Effects of massage therapy on preterm infants and their mothers: a systematic review and meta-analysis of randomized controlled trials. *Frontiers in pediatrics*. 2023 Aug 31; 11:1198730.
 15. Kumar J, Upadhyay A, Dwivedi AK, Gothwal S, Jaiswal V, Aggarwal S. Effect of oil massage on growth in preterm neonates less than 1800 g: a randomized control trial. *The Indian Journal of Pediatrics*. 2013 Jun;80(6):465-9.
 16. Pinero-Pinto E, Benítez-Lugo ML, Chillón-Martínez R, Rebollo-Salas M, Bellido-Fernández LM, Jiménez-Rejano JJ. Effects of massage therapy on the development of babies born with Down syndrome. *Evidence-Based Complementary and Alternative Medicine*. 2020;2020(1): 4912625.
 17. Rakhmawati W, Mediani HS, Dhamayanti M, Maryati I, Setiawan AS, Hendrawati S, Maryam NN, Hasanah A, Mulyana AM, Mariani D, Rochimat I. Potential of Massage Therapy for Improved Growth and Development Among Infants Under 9 Months: A Systematic Scoping Review of Intervention Type, Technique, and Outcome. *Journal of multidisciplinary healthcare*. 2024 Dec 31:3931-43.
 18. Taheri PA, Goudarzi Z, Shariat M, Nariman S, Matin EN. The effect of a 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*. 2018 Feb 1; 50:22-7.
 19. Zhang X, Wang J. Massage intervention for preterm infants by their mothers: A randomized controlled trial. *Journal for specialists in pediatric nursing*. 2019 Apr;24(2): e12238.
 20. Wei P, Zhao F, Wang Z, Wang Q, Chai X, Hou G, Meng Q. Sesame (*Sesamum indicum* L.): A comprehensive review of nutritional value, phytochemical composition, health benefits, development of food, and industrial applications. *Nutrients*. 2022 Sep 30;14(19):4079.
 21. Ahmad Z. The uses and properties of almond oil. *Complementary therapies in clinical practice*. 2010 Feb 1;16(1):10-2.
 22. Kaithwas G, Majumdar DK. Therapeutic effect of *Linum usitatissimum* (flaxseed/linseed) fixed oil on acute and chronic arthritic models in albino rats. *Inflammopharmacology*. 2010 Jun;18(3): 127-36.
- How to cite this article: Kinjal Barot, Dhruv Zaveri, Jaimin Vaishnav, Nirav Patel, Nayan Patel, Sunil S. Iyer et al. Evaluation of the efficacy and safety of EqualsTwo® baby massage oil in promoting growth, skin health, and neurobehavioral outcomes in healthy infants: a 60-day clinical study. *International Journal of Research and Review*. 2026; 13(7): 276-286. DOI: [10.52403/ijrr.20260731](https://doi.org/10.52403/ijrr.20260731)
