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THE EFFECT *OF INFANT EXERCISE* ON WEIGHT GAIN BY AGE IN INFANTS AGED 6–12 MONTHS IN TULUNGREJO VILLAGE

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ABSTRACT

Growth baby is indicator important health and nutritional status , one of which is assessed through improvement appropriate weight age . Babies aged 6–12 months ideally experience increase weight of around 340–560 grams per month . One of the intervention non-pharmacological which can support growth is infant exercise, which is thought to capable increase activity physical , quality sleep , and lust Eat baby . Research This aim For analyze the effect of infant exercise on improvement weight according to age in babies 6–12 months of age . Research use quasi-experimental design with non-randomized control group pretest–posttest design approach . Sample A total of 28 babies met criteria inclusion , consisting of over 14 babies in the group treatment and 14 babies in the control group control group treatment given infant exercise during four week , while group control get maintenance routine . Body weight is measured before and after intervention . Data analysis using Paired t-test and Independent t-test with level 5 % significance show that group treatment experience improvement overweight tall compared to group control . Paired t-test shows difference meaningful before and after intervention (p = 0.000), while the Independent t-test also showed difference improvement significant weight gain between second group (p = 0.000). Conclusion: Infant exercise is proven to effective increase weight according to age in babies age 6–12 months .

***Keywords**: infant exercise, weight , baby , growth , age 6–12 months .*

INTRODUCTION

Infancy is period golden age in the process of growing flower humans , where it occurs growth physical and developmental ability very fast motor skills . One of them indicator main used For monitor health status and optimal growth in the phase This is weight . In babies age 6–12 months , fluctuations weight becomes attention critical Because simultaneously with a transition period introduction Food Breastfeeding Complementary Foods (MPASI) and improvement activity physique independent like crawling and sitting [1] . Failure in reach addition ideal body weight in phase This can increase risk occurrence *failure to thrive* (failed to thrive) growth) to stunting.

Based on results The 2024 Indonesian Nutritional Status Survey (SSGI) shows that the prevalence of stunting in toddlers in Indonesia has been successfully reduced. down to 19.8%. This figure mark decline significant and first the first time is below 20 %, although Still there are 4.48 million toddlers who experience stunting [2] . The prevalence of stunting in East Java in 2024 shows decline significant to 14.7% (or 12.1% according to report intervention local), making it one of the best in a way national . Achievements This exceeding

the national target , with 70.96% of districts / cities in East Java succeed lower stunting figures [3] . Based on results studies preliminary study conducted by researchers on May 20, 2026 in the village Tulungrejo , District Donomulyo , against 28 babies age 6–12 months , obtained results that as many as 8 babies (28.57%) experienced nutrition less , while 20 babies (71.43%) had normal nutritional status . Findings beginning the show that problem nutrition not enough Still found in babies age 6–12 months .

In effort optimize grow flower baby , intervention non-pharmacological in the form of stimulation physique the more Lots studied . Infant exercise or exercise physique baby is form stimulation structured designed For optimize function neuromuscular system circulation and metabolism body . Stimulation physical activity performed in a way routine proven can support development motor rough and smooth , increasing quality sleep , repair function digestion through vagus nerve stimulation , as well as increase absorption nutrients that contribute to improvement baby's weight [4] . In addition that , quality more sleep Good after stimulation physique related with increasing secretion hormone growth *(Growth Hormone),* so that support the growth process optimally [5] .

A number of study previously show that intervention stimulation physical in babies more Lots focused on improving growth and development through combination various Method : Combination of baby massage and *sensory play exercises* effective increase baby weight age 6–12 months [6] . Giving baby spa has an effect significant to improvement weight loss at once development motor baby aged 6–12 months [7] . On the other hand , Fernández-Sola et al. (2025) proved that training program structured motor skills capable speed up achievement milestone development motor skills in babies through improvement activity appropriate physical with stage age [8] . Results study the show that stimulation physique give benefit to growth and development baby , but part big intervention Still combined with method others , such as massage baby , *sensory play* , or baby spa, so effectiveness *infant exercise* as intervention single to improving nutritional status based on weight according to age (BW/U) in infants age 6–12 months Still Not yet Lots researched . In addition that , still there is perceptions in society that activity too physical many in babies can cause fatigue and inhibiting increase weight . In fact , stimulation physical activity performed in a way structured and appropriate with stage development precisely potential increase activity neuromuscular , quality sleep , lust eat , and supports optimal growth processes [4] . Therefore that , its limited study about the influence of infant exercise as intervention single in babies age 6–12 months become the underlying research gap implementation study this . Remembering importance comprehensive understanding about benefit stimulation physique for growth anthropometry children , research about influence exercise this is very crucial For done . Therefore that , article This aim For analyze in a way deep How the effect of infant exercise on improvement weight according to age in babies 6–12 months old in the Village Tulungrejo , as well as How intervention This can made one of alternative strategy based proof *(evidence-based)* in management grow flower optimal baby .

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RESEARCH METHODOLOGY

Research design This use *Quasi-Experimental* with approach *Non-Randomized Control Group Pretest–Posttest Design* . Study held on April 6 –May 3, 2026 in the Village Tulungrejo , District Donomulyo , Malang Regency . Population study is all over baby 6–12 months of age that meets criteria research . Sample A total of 28 babies were selected use technique *purposive sampling* based on criteria inclusion and exclusion , then shared become two group , namely 14 babies in the group treatment and 14 babies in the control group control . Variable independent in study This is infant exercise, whereas variables dependent is baby weight .

Infant exercise intervention given to group treatment for 4 weeks with frequency 3 times every week , so there are a total of 12 sessions intervention . Every session ongoing about 15–20 minutes and was carried out by researchers who had get training , with parental guidance . The infant exercise program consists of on series movement customized active and passive with stage development baby ages 6–12 months , including movement stretching extremities up and down , flexion-extension arms and legs , movement rolling *(rolling),* exercise prone *(tummy time),* sitting exercises with assistance , stimulation crawling , as well as exercise balance and coordination motoric . Group control only get monitoring growth and care routine without providing infant exercise programs during period study .

Measurement weight loss is done use scales digital baby that has calibrated before intervention *(pretest)* and after all over series intervention finished *(posttest).* Data analyzed use *Paired t-test* for know difference weight before and after interventions in each group , as well as *Independent t-test* For compare change weight between group treatment and group control with level significance $p < 0.05$. Analysis results using Paired t-test shows there is significant difference in body weight before and after providing infant exercise to groups treatment ($p = 0.000$). In addition that , the result *Independent t-test* show there is difference change meaningful weight between group treatment and group control ($p = 0.000$), which indicates that giving infant exercise has an effect to improvement baby weight age 6–12 months .

RESULTS AND DISCUSSION

Table 1 Distribution Frequency Characteristics Respondents

Characteristics	Category	Group Treatment (n=14)	Group Control (n=14)
Amount child	1 child	7 (50%)	7 (50%)
	2 children	3 (21%)	4 (29%)
	3 children	3 (21%)	2 (14%)
	>3 children	1 (7%)	1 (7%)
Birth history	Normal	9 (64%)	10 (71%)
	Operation /SC	5 (36%)	4 (29%)
Heavy born baby	<2500 grams	2 (14%)	2 (14%)
	2500–2999 grams	3 (21%)	6 (43%)
	>3000 grams	9 (64%)	6 (43%)

Based on characteristics respondents , distribution amount children in groups treatment and group control show relative pattern similar . On both group , part big respondents have 1 child , namely 7 respondents each (50 %). Furthermore , respondents who have 2 children as many as 3 respondents (21%) in the group treatment and 4 respondents (29%) in the group control . Respondent with 3 children totaling 3 respondents (21%) in the group treatment and 2 respondents (14%) in the group control , whereas respondents who have more of 3 children , each with 1 respondent (7%) in both group . Based on history childbirth , some big respondents in both group own history normal delivery . In the group treatment There were 9 respondents (64%) who gave birth normally and 5 respondents (36%) through operation cesarean section . Meanwhile that , in the group control there were 10 respondents (71%) with normal delivery and 4 respondents (29%) through operation cesarean section . This result show that proportion Mother with normal delivery is more big compared to labor operation on both group . Based on heavy born baby , some big babies in groups treatment own heavy born more from 3000 grams, namely as many as 9 babies (64%), while in the group control as many as 6 babies (43%). Baby with heavy 3 babies (21%) born weighing 2500–2999 grams in the group treatment and 6 infants (43%) in the group control . While that , baby with heavy born not enough of 2500 grams each amounting to 2 babies (14%) in both group .

Table 2. Distribution Baby's Weight Before and After *Infant exercise* in groups Treatment

Variables	Mean Pre-test	Mean Post-test	Average Change	Elementary School	Paired T-test
Baby weight	6846.4	7301.8	455.4	665.38	0,000

Research result show that group treatment experience improvement weight after given *Infant exercise* for 4 weeks . Average weight increase from 6846.4 grams to 7301.8 grams with an average increase of 455.4 grams. The results of *the Paired t-test* showed p value =0.000 (<0.05), so there is meaningful differences between weight before and after done *infant exercise* . This show that *infant exercise* provides influence positive to improvement baby weight age 6–12 months .

Table 3. Baby Weight Data Table *Pre-Test - Post-Test* in Group Control

Variables	Mean Pre-test	Mean Post-test	Average Change	Elementary School	Paired T-test
Baby weight	7274.3	7614.3	340.0	462.61	0,000

Based on Baby Weight Data Table Pre-test - Post-test in the group control obtained in the group control also occurs improvement baby weight from an average of 7274.3 grams to 7614.3 grams with average increase of 340 grams. The results of *the Paired t-test* showed p -value =0.000 (<0.05), which means there is improvement meaningful weight although without giving *infant exercise* . Improvement This can happen Because factor experience growth baby , intake nutrition , as well as development age baby .

Table 4. Change Baby Weight *Pre Test- Post Test* in Group Treatment and Group Control

Group	Average Increase Weight	Elementary School	Independent T-test
Treatment (Infant exercise)	455.4	105.69	0,000
Control	340.0	116.75	

Based on *Independent t*- test results were obtained p -value =0.000 (<0.05), which indicates there is difference meaningful between group treatment and group control . The group given *infant exercise* experience improvement overweight tall compared to group control , which was 455.4 grams compared to 340 grams. This show that effective *infant exercise* in support improvement baby weight age 6–12 months . In general physiologically , *infant exercise* can help increase stimulation system neuromuscular , repair circulation blood , increase quality sleep , and support improvement lust eating and metabolism body . Condition the can helps the absorption process nutrition so that growth baby weight become more optimal. Therefore that , *infant exercise* can used as one of the intervention non-pharmacological For support growth baby .

Research result show that infant exercise provides significant influence to improvement baby weight age 6–12 months . Average increase body weight in the group treatment reached 455.4 grams, while in the group control only 340 grams. The difference improvement of 115.4 grams shows that providing infant exercise is able increase growth more optimal body weight compared to growth experience without intervention .

Amount child in family can influence pattern parenting , parental attention , and fulfillment need nutrition baby . Parents who have amount child more A little tend own more time Lots For give stimulation development , paying attention pattern eat , and do monitoring growth baby in a way routine . On the contrary , the more Lots amount child in family can cause parental attention divided so that potential influence quality care and nutritional status child [9] . Birth history is also one of the factors that can influence condition beginning baby . Baby born through normal delivery in general have an adaptation process more physiological good , including colonization gut microbiota that play a role in metabolism and systems immune . However so , good newborn baby both normally and through operation fault still can reach optimal growth if get intake adequate nutrition , appropriate stimulation with age , and monitoring growth in a way periodic [10] . Weight born is indicator important thing that determines growth baby in the year First life . Babies with heavy born normally have opportunity more big For reach optimal growth compared baby with heavy born low . Although Thus , growth baby No only influenced by weight birth , but also by other factors such as exclusive breastfeeding , adequate complementary feeding , health status , activity physical , and stimulation the development provided in a way sustainable [11] . According to opinion researchers, characteristics respondents in the study This show relative conditions balanced between group treatment and group control . Similarity

characteristics the give description that change weight gain that occurs during study more allows influenced by infant exercise intervention compared to differences characteristics base respondents . In addition that , the majority babies who have heavy normal birth also shows that part big respondents own potential good growth so that giving stimulation physique through infant exercise it is hoped can optimize the growth process , especially improvement weight gain in babies age 6–12 months .

Improvement body weight in the group treatment allegedly happen because infant exercise is able to stimulate system neuromuscular , smoothing circulation blood , increase metabolism body , as well as repair function channel digestion . Activity physical activity performed in a way regular also improves quality Sleep baby . When baby Sleep sleep well , Growth Hormone (GH) secretion increases so that the growth process network body ongoing more optimal.

Besides that , infant exercise can increase lust breastfeeding and feeding the baby . After doing activity physical , needs energy increase so that baby tend more often breastfeeding or consuming complementary foods. Increased intake nutrition the contribute to increase appropriate weigh age .

Although group control also experienced improvement meaningful weight , p the is a normal physiological process during growth babies . However , the average increase body weight in the group control more low compared to group treatment . Findings This show that infant exercise provides benefit additional outside normal growth that occurs in babies age 6–12 months .

Improvement body weight in the group treatment allegedly happen because infant exercise is able to increase activity neuromuscular so that support the growth and development process network body in babies [12] . Flexion and extension movements are carried out during infant exercise can increase consumption energy, repair function metabolism , and contributes to improvement baby's weight [13] . Stimulation physical given in a way regularity also plays a role in increase quality Sleep baby , so that the recovery and growth process ongoing more optimal [14] . Besides that , infant exercise can increase frequency breastfeeding and ability baby accept intake nutrition , so that need energy For growth can fulfilled with more Good [15] . Improvement intake nutrition followed by stimulation physique in a way regular contribute to improvement weight and growth more babies Good compared to baby who is not get stimulation [16] . Activity appropriate physical with age is also capable repair condition physiological babies , including lower stress physiological that can support the growth and increase process body weight [17] . Although group control also experienced improvement weight , condition the is part from the normal growth process that occurs during year First life baby [18] . However Thus , the increase body weight in the group treatment more tall compared to group control , which shows that stimulation physique give benefit addition to growth infants [19] . Research results This show that infant exercise can made into as one of the intervention effective non- pharmacological For support improvement baby weight age 6–12 months through mechanism physiological and metabolic interrelationships related [20] .

According to opinion researchers , the application of infant exercise routine with correct technique No only potential increase baby 's weight , but also can strengthen parental involvement in the stimulation process grow flower children . The education provided in a way sustainable to parents expected capable increase knowledge , skills , and beliefs self in do infant exercises independent at home , so that benefit intervention can maintained in term long and supportive achievement growth optimal baby .

CONCLUSION

Based on results research , can concluded that infant exercise has an effect to improvement baby weight 6–12 months of age . Babies who receive infant exercise intervention shows improvement overweight Good compared to baby who is not get intervention , so that infant exercise is proven effective as one of the intervention non-pharmacological in support growth infants . Giving infant exercises regular allegedly capable optimize the growth process through stimulation system neuromuscular , increased activity metabolism , repair quality sleep , and improvement lust eating and absorption nutrition . Therefore that , infant exercise can considered as part from service promotive and preventive in health programs mother and child . Midwives and staff health expected can give education and training to parents about correct infant exercise techniques so that you can done in a way independent at home as effort optimize grow flower baby . Research furthermore expected involving amount more samples large , period more interventions long , and add indicator growth and development other so that obtained proof more scientific comprehensive about effectiveness of infant exercise on babies age 6–12 months .

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