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Implementation of *Ginalatrik* as An Integrated of Nutritional Education, *Tuina* Massage and Psychomotoric Exercise for Decreasing of Stunting Prevalence in Klungkung Regency

I Wayan Juniarsana[1], Hertog Nursanyoto[2], I GP Sudita Puryana[3], I Made Suarjana[4]

[1,2,3,4] Poltekkes Kemenkes Denpasar, Denpasar, Indonesia

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Abstract

Stunting is the nutrition problem in Indonesia for this decade. Therefore, it is necessary to make an efforts to accelerate for reducing of stunting rates with an integrated approach. This study aims to compare the stunting reduction by the conventional program compared to the *Ginalatrik* integrated model. The type of research was true experimental with a randomized pre test-post test control group design. The subjects were divided into two groups, i.e *the Ginalatrik* model implementation with the form of nutritional education, *Tuina massage* stimulation 3-5 times/week and psychomotor exercises. Instruments research used questionnaire and anthropometric measurement tools. Meanwhile, the control group was conventional program by the government for treating stunting toddlers. To determine the difference in the effects using independent samples t-test and a Mann Whitney analysis. The results showed that the levels of energy, protein, fat and carbohydrate consumption in the two groups showed significant differences using *the Mann-Whitney* analysis with p=0.010 (p<0,05). Nutritional status with indicators of height/age showed no significant difference with p=0.482 (p>0.05), but the mean rank in the integrated *Ginalatrik* model was greater i e ; 42.33 than 38.67 in conventional program. Integrated *Ginalatrik* implementation have tended to an increase of nutritional status in the normal category. Psychomotor development showed a significant difference by Mann-Whitney analysis with p=0.001 (p<0,05). Based on the results, the integrated *Ginalatrik* was better in accelerating stunting reduction compared to the conventional program in toddlers.

Key words : *Ginalatrik*, Nutritional Education, *Tuina* Massage, Psychomotoric Exercise, Stunting

Corresponding author: wyjuniarsana9@gmail.com1

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Introduction

Stunting is a chronic nutritional problem that occurs when a child doesn't grow to the height that's appropriate for their age. It's caused by a combination of factors, including: Socioeconomic conditions, Maternal nutrition during pregnancy, Infant pain, unhealthy living behaviors, and Lack of food intake. According to WHO (2023), Stunting affected an estimated 22.3 per cent or 148.1 million children under 5 worldwide affected in 2022. Nearly all children affected lived in Asia (52 per cent of the global share) and Africa (43 per cent of the global share)[1)]. The prevalence of stunting in Indonesia is quite high and continues to increase from year to year. The prevalence of stunting in 2010 reached 35.6%, in 2007 it increased to 36.8%, in 2013 the prevalence of stunting was 37.2%, then in 2018 the prevalence of stunting decreased to 30.9%. The prevalence is still in the high category because the tolerance limit according to WHO is a maximum of 20%. Meanwhile, the prevalence of stunting rates from the 2022 (SSGI, 2022) was 21.6% and in 2023 the achievement was 21.5%, a decrease of 0.1%. This prevalence is still in the high category because the tolerance limit according to WHO is a maximum of 20%.

The results of monitoring nutrition status data in Bali Province in 2017 were obtained that the prevalence of stunting prevalence was 19.1% [6)].

Meanwhile, the prevalence of stunting in 2021 in Bali Province has decreased by around 10,9 %, in 2022 decrease sharply around 8% and in 2023 around 7,2 % so the prevalence stunting in Bali was the lowest rates in Indonesia. Nutrition problems in Bali especially stunting was occur in all districts including in Klungkung Regency. The Indonesia Nutritional Status Survey (SSGI) in 2022 the prevalence of stunting in Klungkung district was 7.7% and is the 4th lowest after Badung, Gianyar and Denpasar. Based on health data of toddlers in the UPT area. The Klungkung I Health Center in 2019 obtained the number of children under five as many as 1,796 people and those who suffered from stunting by 83 people or 4.62% and malnourished people as many as 60 people (3.34%). In 2021, stunting cases at the Klungkung I Health Center reached 93 people (4.77%). The percentage of stunting in Bali, including Regencies/Cities in Bali, is already below the WHO standard (20%) but needs attention to find solutions to lead to the acceleration of the achievement of good nutrition.

Corresponding author: wyjuniarsana9@gmail.com1

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The most common cause of stunting is a lack of nutritional intake, which is influenced by the mother's parenting pattern. Among the risk factors for stunting, parenting plays an important role in the occurrence of growth disorders in children. There are four important components, i.e feeding, psychosocial stimulation, hygiene and environmental sanitation and health program. Various efforts can be made to accelerate for decreasing of stunting rates through a holistic approach model, including: balanced nutrition education, complementary therapy by *Tuina* massage stimulation to overcome eating difficulties and psychomotor exercises to stimulate the psychosocial aspects of children towards optimal development. The entire aspect of the holistic approach is abbreviated as the *Ginalatrik* model. The objectives of *Ginalatrik* model implementation include increasing nutritional knowledge of mothers, overcoming eating difficulties, increasing food consumption, increasing weight, correcting height and increasing psychomotor development to accelerate the reduction of stunted children under five years in Klungkung Regency.

Method

This study is a true experimental study with a Randomized Pre Test-Post Test Control Group Design (Pocock, 2008). The number of samples are 40 respondents. In the study, it was sought to increase nutritional knowledge and practice of feeding patterns, nutrient intake, weight and height correction, and psychomotor development by *Ginalatrik* model in an effort for accelerating and decreasing of stunting in toddlers. The phase I research stage in 2023 has resulted in the determination of an integrative model, namely the Selected *Ginalatrik* model, namely the integration of nutrition education, stimulation of *Tuina* massage 3-5 times/week and psychomotor exercises that significantly accelerate the reduction of stunting in children under five. In the second phase of the 2024 research, the implementation of the *Ginalatrik* Model was selected in phase 1 to accelerate the reduction of stunting rates in Klungkung regency.

Corresponding author: wyjuniarsana9@gmail.com1

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Result

The characteristics subject can be show in the table 1 below:

Table 1. Subject Characteristics

Variable	Group				Total	
	Control		Treatment			
	N	%	n	%	N	%
Gender						
Male	18	45	21	52,5	39	48,8
Woman	22	55	19	47,5	41	51,3
Amount	**40**	**100**	**40**	**100**	**80**	**100**
Age						
1-15 months	3	7,5	3	7,5	6	7,5
16-30 months	11	27,5	11	27,5	22	27,5
31-45 months	14	35	14	35	28	35
46-60 months	12	30	12	30	24	30
Amount	**40**	**100**	**40**	**100**	**80**	**100**
Village						
Negari	0	0	4	10	4	5
Banjarangkan	2	5	3	7,5	5	6,3
Tusan	0	0	2	5	2	2,5
Bakas	1	2,5	2	5	3	3,8
Nyalian	6	15	9	22,5	15	18,8
Bungbungan	7	17,5	0	0	7	8,8
Tohpati	4	0	0	0	4	5
Semarapura Kauh	3	7,5	3	7,5	6	7,5
Semarapura Klod	2	5	3	7,5	5	6,3
Semarapura Klod Kangin	3	7,5	3	7,5	6	7,5
Gelgel	5	12,5	5	12,5	10	12,5
Kamasan	3	7,5	4	10	7	8,8
Tangkas	3	7,5	0	0	3	3,8
Tojan	1	2,5	2	5	3	3,8
Total	**40**	**100**	**40**	**100**	**80**	**100**

Based on the table above, it is known that most of the subjects are female, i.e 51.3%. The average age of the subjects in the control group was 31-45 months with the lowest age of 5 months and the highest age of 55 months. The average age in the treatment group was 31-45 months with the lowest age of 9 months and the highest age of 55 months.

Implementation of integrated the *Ginalatrik* Model

Corresponding author: wyjuniarsana9@gmail.com1

Implementation of the *Ginalatrik* model (nutrition education, *Tuina* massage and psychomotor exercises) for toddlers in Klungkung Regency, especially in toddlers in the work area of UPTD Klungkung I Health Center and UPTD Banjarangkan I Health Center for stunted toddlers. There are 14 village locations that are used as research sites in an effort to accelerate the reduction of stunting prevalence. According to the research result for analyzing of food consumption, nutrition knowledge level, Tuina massage knowledge level, pshycomotoric development and nutritrional status using of paired test and wilcoxon test between the group can be seen on table below.

Table 2. Results of Paired t-test and Wilcoxon Pre and Post Intervention Test

Variable	*P value*	
	Control	**Treatment**
Energy Consumption Rate **	0,084	0,001
Protein Consumption Level*	0,001	0,001
Fat Consumption Level**	0,919	0,001
Carbohydrate Consumption Level*	0,001	0,001
Knowledge Level of Toddler Mother*	0,001	0,006
Mother's Level of Knowledge About Tuina Massage*	0,001	0,003
Nutritional Status of Weight/Age**	0,767	0,168
Nutritional Status Height/Age**	0,446	0,010
Nutritional Status of Weight/Height**	0,006	0,197
Psychomotor Development**	0,058	0,011

** Paired t-Test Test

* Wilcoxon Test

The differences of implementation *Ginalatrik* model as the treatment group compared to the control group for the variable such as food consumption, nutrition knowledge level, Tuina massage knowledge level, pshycomotoric development and nutritrional status between the group using *Mann-Whitney* analysis can be seen on table below.

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Table 3. *Mann-Whitney* Pre and Post Intervention Test Results

Mann-Whitney Analysis for Post Test Intervention Results			
Variable	**Average rating**		**P value**
	Control	**Treatment**	
Energy Consumption Rate	33,8	47,2	0,010*
Protein Consumption Level	32,01	48,99	0,001*
Fat Consumption Rate	34,74	46,26	0,026*
Carbohydrate Consumption Level	32,23	48,78	0,001*
Knowledge Level of Toddler Mothers	40,74	40,26	0,923
Mother's Level of Knowledge About Tuina Massage	35,92	45,08	0,044*
Nutritional Status of Weight/Age	41,11	39,89	0,814
Nutritional Status of Height/Age	38,67	42,33	0,482
Nutritional Status of Weight/Age	42,71	38,29	0,394
Psychomotor Development	25,48	55,53	0,001*

*significant with p value < 0,05

According to the table above show that there are some significant differences for implementing of *Ginalatrik* model such as energy, protein, fat and carbohydrate consumption, knowledge of *Tuina* Massage and psychomotor development. Nutritional Status of height/age as an indicator of stunting prevalence show that there is no significant differences, but the average rating of *Ginalatrik* model implementation more than control group

DISCUSSION

Stunting is affected by various factors, including inadequate nutritional intake, which is often influenced by the mother's parenting style. One of the efforts to overcome stunting is through an integrated approach called *Ginalatrik*. This model emphasizes three main aspects, namely first, balanced nutrition education, which is to increase mothers' understanding of the importance of providing a balanced diet and nutrition and how to apply it in daily food.

Corresponding author: wyjuniarsana9@gmail.com1

Second, it is complementary therapy with *Tuina* massage which can help children who have difficulty eating. Third, namely by psychomotor training by providing stimulation to children's psychosocial through activities that can support motor and cognitive development. There was a significant difference in the level of energy consumption in the treatment group which p value < 0.05. This can happen because the treatment group received *Ginalatrik* treatment in the form of nutrition education, *Tuina* massage and psychomotor training for 3 months of intervention.

Nutrition education was given to the treatment group have tend for increasing of mothers knowledge about food pattern consumption according their age and food dietary allowances. On the other hand, *Tuina* massage also had an impact for increasing appetite even more. Massage is carried out on the meridians of the spleen, stomach, liver, and heart which are useful for smoothing blood flow to digestion so that it has an impact on increasing appetite so that nutritional intake increases (Astuti et al., 2024). This is in line with the results of research by Naulia, et al. (2021) which show that nutrition education can increase maternal knowledge and attitudes in fulfilling the nutrition of toddlers as one of the alternative interventions to improve health behaviors in preventing stunting (Naulia et al., 2021).

There is a significant difference in the level of energy consumption between the two groups influenced by the provision of education in the form of selecting the type and amount recommended to be consumed according to the needs of children to meet energy intake for daily activities. This is in line with research by Abdillah, et al. (2020) which stated that nutrition education provided to mothers by trained cadres can increase the energy intake of toddlers (Abdullah et al., 2023).

The results of the protein consumption level study showed a significant difference before and after the intervention. This is also influenced by the provision of nutrition education in the form of selection of types, amounts and processing of protein that is recommended to suit needs, especially the fulfilling of animal protein. Animal protein is the best source of essential amino acids needed by children as building substances, namely the growth of hemoglobin, enzymes, hormones and antibodies, replacing damaged cells and maintaining the acid-base balance of body fluids and as a good source of energy for toddlers (Rahmadhita, 2020).

Corresponding author: wyjuniarsana9@gmail.com1

Fat consumption showed that a significant difference in the level of fat consumption in the treatment group and the control group. This is in line with research by Saskhia, et al. (2021) which stated that there was a difference in fat intake before and after nutrition education (Saskhia, et al. 2021).

There was a significant difference in the level of carbohydrate consumption. Mothers who are given nutrition education will have better knowledge about balanced nutrition, feeding patterns, types and amounts of food and daily needs needed by children. This is in line with research by Rotua and Terati (2021) which stated that there was a significant influence between before and after nutrition education between comparison groups on maternal nutrition knowledge and average carbohydrate intake (Rotua & Terati, 2021).

The provision of nutrition education has an effect on the knowledge of mothers under five about nutrition. This has a great effect on the stunting prevalence in toddlers (Amalia et al., 2021). Lack of maternal knowledge about stunting causes mothers to lack attention to the nutritional intake provided when the child is still less than 2 years old (Palupi et al., 2023).

The results of this study are also in line with the theory that the stimulation of *Tuina* massage stimulates nerve of skin, which reduces the permeability of cell membranes. This facilitates the exchange of sodium and potassium ions which in turn can trigger action potentials on nerves. Activation of the sympathetic and parasympathetic nerves, especially through the Vagus Nerve, can increase the activity of the gastrointestinal system, accelerate gastric peristalsis, and accelerate gastric emptying. As a result, appetite increases and the production of digestive enzymes also increases thereby aiding in the absorption of nutrients (Hidayanti, 2023). In achieving optimal growth and development in babies, stimulation is also required. Salsabila, et al. (2022) stated that optimal development and growth requires stimulation. This stimulation is a tactile stimulus and can be done through baby massage (Ximenes et al., 2024).

According to (Samiasih, A, Nuryani, S, Margaretta, T, Pawestri, Hartini, T, Yanto, 2020) *Tuina* massage is a touch massage therapy directly on the body that aims to provide a sense of comfort to children and toddlers. Tuina massage that is carried out regularly can increase the effectiveness of the circulation of epinephrine and norepinephrine hormones which can stimulate the growth of children and toddlers by increasing the frequency of eating,

Corresponding author: wyjuniarsana9@gmail.com1

stimulating the development of body structure and *motor function* (Fifit & Luvi Dian Afriyani, 2023).

The differences analysis with the Mann Whitney test showed that there was no a significant difference height/ages by implementing Ginalatrik model by 3 months intervention but the correction of average height in stunted children more increased than control. It's mean that the intervention of Ginalatrik model must do more than 3 months. Ginalatrik model can affects the level of knowledge of mothers under five about nutrition, increasing of appetite, food consumption, stimulating of growth until increasing of height correction in stunted children but must be cotinouing more than 3 months.

The psychomotor development showed a significant diferrent before and after Ginalatrik intervention in the form of stimulation of children's psychomotor exercises in the treatment group. In line with research (Sukmawati & Rowa, 2020) shows that there is a significant influence of stimulation on gross motor development. Efforts that can be made are by providing stimulation in the form of gross and fine motor. Stimulation from the outside or from the environment is important in children's growth and development (Sutrisno, 2023).. Children who are given targeted and regular stimulation will develop faster compared to children who do not receive stimulation (Sukmawati & Rowa, 2020). According to (Santos et al., 2008), providing adequate nutrition, early psychosocial stimulation at home and learning opportunities can substantially improve children's cognitive development. The provision of stimulation is important to optimize child development at each advanced stage to avoid delays and deviations in children (Aswan & Ridwan, 2023) (Pranoto, Sibomana, et al, 2023).

CONCLUSIONS

Based on the research that has been carried out, it can be concluded i.e ;

1. There are a significant effect of energy, protein, fat and carbohydrate consumption by *Ginalatrik* implementation program. The average level of food consumption in the *Ginalatrik* was better than the conventional program
2. The nutritional status assessment based on Height/Age indicator showed that there was no significant difference but the mean rank in the Ginalatrik Model implementation was greater i e ; 42.33 than 38.67 in conventional program.

Corresponding author: wyjuniarsana9@gmail.com1

3. Psychomotor development showed an increase in both groups, however the Ginalatrik Model implementation showed a more rapid increase from 62.5% to 75% while in the conventional program was 47, 5% to 57.5% and there was a significant difference with

Conflict of Interest

We all authors declare that there is no conflict of interest from this research activity.

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Corresponding author: wyjuniarsana9@gmail.com1

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Corresponding author: wyjuniarsana9@gmail.com1