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Analysis of children's dietary factors in the first 1000 days of life with the incidence of stunting in Gianyar Regency

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ABSTRACT

Background: 1000 days period first life, which begins since moment conception until child 2 years old, is the most critical period for repair development physical and cognitive child. Stunting, or short stature, is a nutritional problem that persists in Indonesia, alongside underweight and overweight/obesity. Public especially parents who are less good in effort fulfillment need nutrition in the "golden period" become factor emergence problem nutrition. Objective: To analyze the factors of children's dietary patterns in the first 1000 days of life with the incidence of stunting in Gianyar Regency. Method: Study done with using research design case control for know analysis of factors influencing children's dietary patterns during the first 1000 days of life and the incidence of stunting in Gianyar Regency. Results: Material food source carbohydrates that are often consumed by toddlers both in the stunting group and group not stunting is white rice and porridge. Sources of protein that are often consumed by stunting groups and groups not stunting is meat chicken and eggs chicken. Based on results analysis, frequency eat source vegetables, it is known type material frequent foods consumed in the stunting group is spinach and carrots. While those that are often consumed group not stunting is spinach, carrots, and mustard greens green. Conclusion: With focus on optimization intake carbohydrates, protein, and vegetables during 1000 days of life, it is expected prevalence of stunting in the Gianyar Regency can lowered in a way significant, ensuring generation upcoming grow healthy and optimal.

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INTRODUCTION

1000 days period first life, which begins since moment conception until child 2 years old, is the most critical period for repair development physical and cognitive children. Nutritional status mother pregnant and mother breastfeeding, health status and intake good nutrition is factor important for growth and development physical and cognitive child, lower risk pain in babies and mothers. Pregnant mother with nutritional status not enough will cause disturbance growth fetus,

causes main occurrence baby short or stunting and increase risk obesity and disease degenerative in adulthood (Indonesia, 2013).

Nutritional status at 1000 days period of life will influential to quality health, intellectual, and productivity in the future come (Aminah et al., 2012). Mother and baby need adequate and quality nutrition for ensure nutritional status and health status, ability motor, social, and cognitive abilities learning and productivity in the future come. Children who experience lack nutrition during the 1000 days period of life will experience problem neurological, decline ability learning, improvement risk of dropping out of school, decline productivity and capability work, decline income, decline ability provide nutritious food and weight loss ability parenting child. Next will produce transmission not enough nutrition and poverty in the next generation next. Considering importance nutrition for 1000 days period of life, then intervention nutrition at 1000 days period of life is priority main for increase quality life the next generation come (Swaminathan et al., 2019)(Singh, 2020)(Ijaiya et al., 2022).

Riskesdas results 2018 shows that Bali Province is one of the province with prevalence stunting above the limit set by WHO is 24.9% of districts Gianyar set as regency with 10 villages locus stunting where results Riskesdas 2013 shows prevalence stunting reached 40.99%. Ten village locus stunting the spread across 5 sub-districts that is Gianyar (Lebih, Siangan), Tampaksiring (Sanding, Manukaya), Ubud (Lodtunduh, Sidekerta), Tegalalang (Kedisan, Pupuan, Taro) and Payangan (Beresela). District Health Office Gianyar along with Bappeda and related OPDs has try overcome problem existing stunting. Intervention program nutrition specific and sensitive has implemented. The results of the 2015-2017 Nutritional Status Monitoring (PSG) show prevalence stunting in the Gianyar Regency by 22.5% (Bali Provincial Health Office, 2017) and the results Riskesdas 2018 shows prevalence stunting has decrease reached 12.1 % (Kemenkes, 2013).

Nutrition obtained since baby born very influential to growth and development child. No IMD is carried out, failure of exclusive breastfeeding, weaning process early, and no adequate giving food good complementary feeding (MPASI) from aspect quality, quantity and safety food can become factor risk stunting (Kemenkes, 2013)(Bielska et al., 2015). In a way national, percentage baby new births that received IMD amounted to 73.06% with achievement of exclusive breastfeeding by 61.33% (Pramono & Muzakkiroh, 2011). Intake substance optimal nutrition is very important for support growth so as not to happen fail grow (growth faltering). As many as 43.2% of toddlers in Indonesia or almost half of it experience deficit energy and 31.9% experienced protein deficit. Condition social economy and sanitation the environment is also related with incident stunting (Souganidis, 2012). Condition economy relate close with ability in fulfil intake nutritious food and access to service health for mother pregnant and toddlers. While sanitation and safety food become risk infection diseases that affect nutritional status toddlers (WHO, 2014)(Pradnyawati et al., 2019).

Lack of understanding by the community, especially mothers or primary caregivers, about the importance of nutrition in the first 1000 days of life (HPK) is a determining factor in child feeding practices that have a direct impact on the occurrence of stunting, as it affects the selection of food types, frequency and processing. Gianyar Regency was chosen as the research location because it still has a relatively high prevalence of stunting compared to several other regions in Bali, although in general Bali records stunting rates below the national average, so this area is considered representative to examine the influence of cultural, social, and consumption behavior aspects in stunting prevention efforts in more depth.

Based on factors reason problem nutrition in groups the target of 1000 days period of life mentioned above is known that behavior public especially parents who are less good in effort fulfillment need nutrition in the "golden period" become factor emergence problem nutrition. Therefore that need done study about analysis of factors of children's dietary patterns in the first 1000 days of life with the incidence of stunting in Gianyar Regency.

RESEARCH METHOD

Study done with using research design case control for know analysis of factors related to children 's dietary patterns in the first 1000 days of life with the incidence of stunting in Gianyar Regency. Implemented in 10 villages l focus stunting, namely Gianyar (Lebih, Siangan), Tampaksiring (Sanding, Manukaya), Ubud (Lodtunduh, Sidekerta), Tegalalang (Kedisan, Pupuan, Taro) and Payangan (Beresela). In this study divided become group cases and groups control. Case is all child diagnosed 0-24 months of age have nutritional status stunting based on results measurement final with use TB/U indicator (Zscore <-2.0 SD). Control is all diagnosed children have normal nutritional status based on measurement final with use TB/U indicator (Zscore ±1 SD). Amount required samples there are 196 toddlers in 10 villages locus stunting with amount clowns in each village as much as 196/10 = 19.6 (rounded up to 20). Election clowns in each village using SRS (Systematic Random Sampling) with using the existing sampling frame. Data regarding level nutrient intake (energy and protein) is obtained with Food Frequency filling Semi- quantitative questionnaire (FFQ), then processed with the 2007 Nutri Survey.

RESULTS AND DISCUSSIONS

Table 1. Distribution frequency characteristics baduta

Variables	Case N (%)	Control N (%)
Age child		
0-6 months	0 (0.0)	3 (6.67)
7-12 months	11 (24.44)	5 (11.11)
13-24 months	34 (75.56)	37 (82.22)
Type sex		
Man	29 (64.44)	29 (64.44)
Woman	16 (35.56)	16 (35.56)
What order do you come in your family		
1	16 (35.56)	23 (51.11)
2	18 (40.0)	13 (28.89)
≥3	2 (4.44)	9 (20.00)
Birth weight		
<2500 g	9 (20.00)	4 (8.89)
≥2500 g	36 (80.00)	41 (91.11)
Nutritional status		
TB/U		
Normal	0 (0.00)	45 (100.00)
Short	27 (60.00)	0 (0.0)
Very short	18 (40.00)	0 (0.0)
BB/U		
Nutrition bad	3 (6.67)	0 (0.00)
Nutrition not enough	8 (17.78)	2 (4.44)
Nutrition good	34 (75.56)	43 (95.56)
Weight/Height		
Normal	41 (91.11)	44 (97.78)
Thin	2 (4.44)	1 (2.22)
Fat	2 (4.44)	0 (0.00)
BMI/U		
Normal	40 (88.89)	44 (97.78)
Very thin	3 (6.67)	0 (0.00)
Thin	0 (0.00)	1 (2.22)
Fat	2 (4.44)	0 (0.0)

Table 2. Relationship between child health history and stunting incidents in toddlers

Variables	Stunting N (%)	Normal N (%)	P value	OR (95% CI)
Mother takes vitamins/ supplements moment breast-feed				
No	38 (84.44)	35 (77.78)	0.419	1.55 (0.47-5.34)
Yes	7 (15.56)	10 (22.22)		
Given exclusive breastfeeding				
No	8 (17.78)	2 (4.44)	0.044	4.64 (0.84-46.87)
Yes	37 (82.22)	43 (95.56)		
The child is suffering disease infection *				
Yes	30 (66.67)	17 (37.78)	0.006	3.29 (1.27-8.58)
No	15 (33.33)	28 (62.22)		
The child is suffering non- infectious diseases				
Yes	5 (11.11)	1 (2.22)	0.091	5.5 (0.57-265.88)
No	40 (88.89)	44 (97.78)		
Children get vitamin A within 1 year final				
No	8 (17.78)	8 (17.78)	1,000	1 (0.29-3.42)
Yes	37 (82.22)	37 (82.22)		
Get immunization complete				
No	10 (22.22)	13 (28.89)	0.468	0.70 (0.24-2.020)
Yes	35 (77.78)	32 (71.11)		
Children have taboos Eat				
Yes	8 (17.78)	10 (22.22)	0.598	0.75 (0.23-2.41)
No	37 (82.22)	35 (77.78)		

Table 3. Relationship frequency eat source carbohydrate with stunting incidents in toddlers

Variables	Stunting N (%)	Normal N (%)	P value	OR (95% CI)
Source Carbohydrates (in unit Sunday)				
White rice				
≥18 times	25 (55.56)	20 (44.44)	0.292	0.64 (0.25-1.59)
<18 times	20 (44.44)	25 (55.56)		
Rice red				
≥2 times	0 (0.00)	1 (2.22)	0.315	-
<2 times	45 (100.00)	44 (97.78)		
Porridge				
≥7 times	16 (35.56)	20 (44.44)	0.389	1.45 (0.57-3.69)
<7 times	29 (64.44)	25 (55.56)		
Potato				
≥2 times	9 (20.0)	11 (24.44)	0.612	1.29 (0.45-4.00)
<2 times	36 (80.00)	34 (75.56)		
Biscuits				
≥4 times	9 (20.00)	4 (8.89)	0.134	0.39 (0.08-1.56)
<4 times	36 (80.00)	41 (91.11)		
Bread				
≥2 times	7 (15.56)	16 (35.56)	0.030	2.99 (0.99-9.68)
<2 times	38 (84.44)	29 (64.44)		
Sweet potato				
≥2 times	6 (13.33)	6 (13.33)	1,000	1 (0.24-4.10)
<2 times	39 (86.67)	39 (86.67)		
Corn				
≥2 times	8 (17.78)	5 (11.11)	0.368	0.57 (0.13-2.22)
<2 times	37 (82.22)	40 (88.89)		
Cassava				
≥2 times	4 (8.89)	2 (4.44)	0.398	0.47 (0.04-3.55)
<2 times	41 (91.11)	43 (95.56)		

Variables	Stunting N (%)	Normal N (%)	P value	OR (95% CI)
Noodles				
1 time	2 (4.44)	0 (0.00)	0.153	0 (0-1.90)
No Once	43 (95.56)	45 (100.00)		
Rice noodles				
≥2 times	2 (4.44)	0 (0.00)	0.153	0 (0-1.90)
<2 times	43 (95.56)	45 (100.00)		

Table 4. Relationship frequency eat protein source with stunting incidents in toddlers

Variables	Stunting N (%)	Normal N (%)	P value	OR (95% CI)
Meat chicken				
≥7 times	16 (35.56)	17 (37.78)	0.827	1.10 (0.42-2.83)
<7 times	29 (64.44)	28 (62.22)		
Egg chicken				
≥4 times	12 (26.67)	13 (28.89)	0.814	1.11 (0.40-3.12)
<4 times	33 (73.33)	32 (71.11)		
Heart chicken				
≥2 times	7 (15.56)	7 (15.56)	1,000	1.00 (0.27-3.70)
<2 times	38 (84.44)	38 (84.44)		
Freshwater fish				
≥2 times	1 (2.22)	5 (11.11)	0.091	5.5 (0.57-265.88)
<2 times	44 (97.78)	40 (88.89)		
Seawater fish				
≥2 times	3 (6.67)	3 (6.67)	1,000	1 (0.12-7.90)
<2 times	42 (93.33)	42 (93.33)		
Pork				
≥2 times	2 (4.44)	1 (2.22)	0.557	0.48 (0.008-9.78)
<2 times	43 (95.56)	44 (97.78)		
Shrimp				
≥2 times	1 (2.22)	1 (2.22)	1,000	1 (0.01-80.25)
<2 times	44 (97.78)	44 (97.78)		
Meat Cow				
≥2 times	1 (2.22)	2 (4.44)	0.557	2.04 (0.12-123.42)
<2 times	44 (97.78)	43 (95.56)		
Egg duck				
1 time	1 (2.22)	0 (0.00)	0.315	-
No Once	44 (97.78)	45 (100.00		

Table 5. Relationship frequency eat source vegetable with stunting incidents in toddlers

Variables	Stunting N (%)	Normal N (%)	P value	OR (95% CI)
Source Vegetables				
Carrot				
≥4 times	9 (20.00)	10 (22.22)	0.796	1.14 (0.36-3.59)
<4 times	36 (80.00)	35 (77.78)		
Spinach				
≥3 times	9 (20.00)	13 (28.89)	0.327	1.62 (0.55-4.90)
<3 times	36 (80.00)	32 (71.11)		
Broccoli				
≥3 times	4 9(8.89)	2 (4.44)	0.398	0.47 (0.04-3.55)
<3 times	41 (91.11)	43 (95.56)		
Mustard green				
≥2 times	5 (11.11)	11 (24.44)	0.098	2.58 (0.73-10.37)
<2 times	40 (88.89)	34 (75.56)		
Corn				
≥2 times	3 (6.67)	2 (4.44)	0.645	0.65 (0.05-6.01)
<2 times	42 (93.33)	43 (95.56)		
Spinach				
≥2 times	1 (2.22)	2 (4.44)	0.557	2.04 (0.10-123.42)
<2 times	44 (97.78)	43 (95.56)		

Discussion

Stunting, or fail grow consequence malnutrition chronic, still become problem health significant communities in Indonesia, including in the Gianyar Regency. The first 1000 days of life, which begins from conception until child aged two year, is window critical for growth and development optimal (Gernand et al., 2023). Intake inadequate nutrition adequate during period this can impact irreversible changes in height, development cognitive and health term long children. Diet, especially intake macronutrients like carbohydrates and proteins, as well as micronutrients from vegetables, holding role central in prevent incident stunting (Mu et al., 2022).

Carbohydrate is source energy essential main for growth and activity child. In context of 1000 days of life, intake adequate carbohydrates are very necessary for fulfil need energy high metabolic rate in infants and toddlers. Deficiency intake energy from carbohydrate can cause body using protein as source energy, which ultimately reduce protein availability for growth and improvement network, contributing to stunting (Pradnyawati & Juwita, 2022).

Study in five years final show that quality and quantity carbohydrates consumed influence risk of stunting. Intake carbohydrate excessive processed and simple sugars, although give energy, often lacking in nutrition micro and can replace intake food nutritious others (Samuel et al., 2022). On the other hand, carbohydrates complex from source such as rice, corn, sweet potatoes, or cereals fortification, providing energy sustainable and important fiber for health digestion. In the Gianyar Regency, with majority resident consume rice as food main, important for ensure that sufficient rice intake and combined with other foods that are rich in nutrients (Pradnyawati, Juwita, et al., 2021).

Protein is foundation main for growth and improvement cell as well as network body. During the first 1000 days of life, protein requirements are very high. For support growth rapidly cells brain, muscles, bones, and other organs. Protein also plays a role in synthesis important hormones, enzymes and antibodies for function immunity body (Jabbour et al., 2023).

Protein deficiency, either in a way quantity and quality (for example, lack of essential amino acids), are reason main cause of stunting. Children who do not get enough protein will experience disturbance linear growth. References latest (for example, from studies in various regions in Indonesia and Southeast Asia in 5 years last) in consistent show strong relationship between adequate intake of animal protein (meat, fish, eggs, milk) and vegetable protein (nuts, tofu, tempeh) with decline prevalence of stunting (Kabre et al., 2020). In Gianyar, with riches source power sea and agriculture, access to animal and vegetable protein relatively good, but need study more carry on about pattern consumption and utilization at the level house stairs, especially in families with stunting risk. Education about importance variation sources of protein, including animal protein since early as food breast milk companion (MPASI), becomes crucial (Sefrina et al., 2022).

Although vegetables no source main energy or protein, its role in preventing stunting is very important because vitamin, mineral, and fiber content. Vitamins and minerals (such as vitamin A, vitamin C, folate, iron, iron and zinc) function as micronutrients essential support growth, development cognitive and functional immunity body (Pradnyawati, Diaris, et al., 2021). Lack micronutrients this, although no in a way direct cause fail grow like lack energy/protein, can make things worse stunting conditions through disturbance metabolism and improvement risk infection repeat (Sihite et al., 2017).

A number of study latest highlight importance intake vegetables in MPASI and patterns Eat child toddler for fulfil need micronutrients. Vegetables also contain fiber that helps launch digestion and absorption nutrition others. In the Gianyar Regency, with potential large agriculture, diversity vegetables local should easy accessible. However, the challenge possible lies in practice giving eat child, where are the vegetables? often not enough prioritized compared to food staple food and side dishes side dishes. Promotion consumption varied vegetables and introduction to

the taste of vegetables since early through MPASI is very important for form habit eat healthy (Bzikowska-Jura et al., 2020)(O'Connell et al., 2021).

Analysis factor pattern Eat children in 1000 days of life in the Gianyar Regency with stunting incidents must be in a way comprehensive consider intake carbohydrates, protein, and vegetables. Carbohydrates quality tall as source adequate energy, protein for growth, and vegetables as source micronutrients important, mutual interact in determine nutritional status children (Nikmatullah et al., 2023).

With focus on optimization intake carbohydrates, protein, and vegetables during 1000 days of life, it is expected prevalence of stunting in the Gianyar Regency can lowered in a way significant, ensuring generation upcoming grow healthy and optimal.

CONCLUSION

Frequency eating in children measured with use unit time week, based on analysis, materials food source carbohydrates that are often consumed by toddlers both in the stunting group and group not stunting is white rice and porridge. Sources of animal protein that are often consumed by stunting groups and groups not stunting is meat chicken and eggs chicken. Based on results analysis, frequency eat source vegetables, it is known type material food often consumed in the stunting group is spinach and carrots. While those that are often consumed group not stunting is spinach, carrots, and mustard greens green. The need to increase parental knowledge, especially mother, regarding importance nutrition balanced during 1000 days of life, with emphasis on sources carbohydrate complex, animal protein, and variety local vegetables. And do promotions providing appropriate complementary feeding. Local governments and primary health care workers are advised to strengthen family-based interventions through direct education on a balanced diet during the first 1000 days of life (HPK), involving posyandu cadres and community leaders. Local culture-based approaches such as the use of highly nutritious local foods and empowering mothers through sustainable nutrition classes should also be institutionalized in stunting prevention programs. The results of this study can be used as a reference in developing integrated nutrition intervention models that are sensitive to the socio-cultural context of local communities. Replication of similar interventions needs to be supported by social mapping and local food consumption behavior, as well as strengthening the capacity of cadres in nutrition counseling, so that the program is adaptive and sustainable in areas with similar conditions.

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