It has no impact but is useful as a lesson learned from the Gammarana Enrekang stunting prevention project during the COVID-19 pandemic

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ABSTRACT

Indonesia is one of the countries contributing to global stunting. Stunting in Indonesia, South Sulawesi, and Enrekang Regency in 2019 was 30.8%, 35.6%, and 40%, respectively. Prevention efforts through the Gammarana project in 2020. Objective: This study aims to evaluate the impact of Gammarana on preventing stunting, amid the COVID-19 pandemic. Methods: The evaluation study used a cross-sectional study method twice at the beginning and end of the project. The village sample was 30 intervention groups (focus) and 30 non-focus groups. Total subjects were 1086 in the stunting locus area and 997 in the non- focus stunting area. Statistical Analysis with the Independent Test of Kruskal-Wallis. Results: The prevalence of stunting decrease 1.33% in locus villages compared to non-locus villages. The intervention package in the form of micronutrient supplements, macronutrients, nutritional literacy, washing hands, masks and keeping distance did not significantly reduce stunting (p>0.50). Conclusion: Project Gammarana has not been effective in preventing stunting amid COVID-19. Suggestion: to continue this project, to fight the acceleration of stunting due to the COVID-19 Pandemic

Keywords:
Stunting; prevention; COVID-19; Gammarana

1.Introduction

Stunting in Indonesia, South Sulawesi and Enrekang District, is still high, far above the threshold for public health problems (< 20%).[1] The Indonesian government has been trying to prevent new stunting incidents since the last decade. Multisector collaboration has been formulated at the scale of Indonesia's national policy.[2,3,4]

The Gammarana project in 2020, is a solution to dealing with new incidents of stunting in the Enrekang distric. The agreed intervention packages are micronutrient supplements, macro-nutrient supplements, nutritional literacy, for 1 year of implementation.[5,6,7] The potential targets are pregnant women, children aged 0-23 months, in 30 villages. This project complements the regular nutrition project, namely supplementary food for pregnant women, basic immunization for pregnant women and children 0-23 months, monitoring of children's growth every month and mother's class.[8]

The emergence of a pandemic at the beginning of February 2020, at the global level, was responded to quickly by the Indonesian government by refocusing the budgets of all ministries, even though Gammarana was excluded. Despite this, the global and national consequences of a pandemic in Indonesia are very detrimental to the coverage and adherence of the subject to the

regular intervention package. The regular intervention package is decreasing and this is worrying about its impact on various indicators of public health in the future.[9]

The Gammarana project, ideally, is not the only stunting prevention intervention package, but the existence of a public health emergency due to the spread of COVID-19[10], causing this project to run unbalanced with other sectors, especially sensitive and specific interventions. The project implementers worked hard and hard to solve this with strict procedures according to health protocols.

The evaluation study, which measures the impact of this project on stunting prevention, is believed to be useful as a learning material for the implementation of health services during the pandemic. Measuring the efficacy is not on the side of reducing stunting but on the ability to reduce the increase in stunting cases, which is expected to increase by 2%.

2.Methods

This study used an observational design to assess the impact of the *Gammarana* project through two cross-sectional studies, before and after the project. Subjects were selected from the total population of pregnant women and children aged 0-23 months, located in the project village of *Gammarana* (focus). Comparisons were taken from villages outside the *Gammarana* project which were equivalent in various parameters (non-focus). The parameters are food security status, latrine status, transportation access, health facilities, and the COVID-19 social safety net package. The sample size of the intervention group before and after was 1235 and 086 respectively, and the comparison group before and after was 998 and 997 subjects respectively. The primary output is the prevalence of stunting before and after the intervention in 30 focus villages and 30 non-focus villages. Anthropometric measurements were carried out by nutritionist Enumerators were trained for 40 hours on the *Gammarana* project. Health protocols were enforced throughout the study. The intervention package is micronutrient supplements, macronutrients, and nutritional literacy. The duration of the intervention was 6 months. The statistical analysis was the Kruskal-Wallis Test at 95% confidence.

The statistical test used is the Kolmogrov-Smirnov test for data distribution, the Kruskal-Wallis test for comparison of stunting in the intervention and control villages. Potential confounders from villages that are not comparable are eliminated by using the Propensity Score Matching method. The variables are food security status, latrine status, access to transportation, and social safety nets. Missing data in the analysis came from subjects whose input data was inaccurate in the Big Data system, detected by the WHO Anthropometry Application (<-6 SD or > 6 SD). Enumerators trained to take anthropometric measurements were tested for their ability compared to trained experts from the Indonesian Nutritionists Association. The results of the sensitivity and specificity test of competency in anthropometric measurements show that they are eligible as enumerators

3.Results

Characteristic Villages
In this study, the total number of individuals analyzed was 2063 children 0-23 months. 1086 of 2062 from *Gammarana* group villages and 977 of 1086 from non-*Gammarana* group villages.

Table 1. The Villages Caracteristics

Comparison Indicators	Gammarana			Non-Gammarana			Total			
	n	M	SD	n	M	SD	n	M	SD	p-Value
Composite Food Security	30	3.83	1.34	30	4.20	1.27	60	4.02	1.31	0.111
Ratio of Raw Paddy Land	30	0.16	0.32	30	0.08	0.06	60	0.12	0.23	0.317
Ratio of Food Facilities	30	0.07	0.03	30	0.08	0.04	60	0.07	0.04	0.393
Ratio of Poor Population	30	0.06	0.03	30	0.05	0.02	60	0.06	0.03	0.034
Food Security Index	30	57.96	11.04	30	61.12	9.33	60	59.54	10.26	0.351
Latrine Access (%)	30	91.36	9.20	30	89.20	10.54	60	90.28	9.87	0.321
Families Have Access to Clean Water Facilities (%)	30	94.78	5.79	30	92.98	12.74	60	93.88	9.85	0.154
Family Planning (%)	30	18.34	16.53	30	26.52	23.76	60	22.43	20.71	0.545
Health Facilities (%)	30	80.19	21.71	30	81.63	30.16	60	80.91	26.06	0.691
Basic Immunization (%)	30	96.87	5.62	30	97.68	5.19	60	97.28	5.38	0.999
Exclusive breastfeeding (%)	30	93.20	10.16	30	93.40	7.66	60	93.30	8.92	0.999
Toddlers Get Growth Monitoring (%)	30	94.51	8.67	30	96.97	3.21	60	95.74	6.60	0.317
Health Insurance (%)	30	47.65	10.64	30	50.98	11.15	60	49.32	10.93	0.999

Impact Project *Gammarana* to Stunting

Table 2. Changes in the stunting of children aged 0-23 months in Gammarana Village and not in Gammarana Village in Enrekang Regency in 2020

Villages	Status	Before n (%)	OR (CI95%)		After n (%)	OR (CI95%)
Gammarana	Stunting	261(21,13)	1.185	(0.961-1.463)	215(19,8)	1.172 (0.938-1.464)
	Normal	974(78,78)			871 (80,20)	
	Sub-total	1235(100)			1086(100)	
Non-	Stunting	184 (18.44)	1.146	(0.968-1.358)	170(17.40)	1.138 (0,949-1.364)
Gammarana	Normal	814(81.56)			807(82.60)	
	Sub-tottal	998(100)			997(100)	

Total	Stunting	445(19.93)	0,967	(0.932-1.1012)	385(18.66)	0971 (0,932-1.012
	Normal	1788(80.07)			1678(81.34)	
	Total	2233(100)			2063(81.34)	
p-Value		0,113			0,163	

By unadjusted estimate, it is known that the prevalence of stunting in the intervention group was 1.33%, an decreased compared to before the intervention. After being justified based on the coverage and compliance of the subject, the result was 2% in the obedient group in the village whose coverage was> 80%. This means that the efficacy of retaining stunting requires coverage and adherence above 80%.

4.Discussions

The *Gammarana* project did not reduce stunting during the COVID-19 pandemic. This is believed to be from the results of a comparative statistical analysis of the prevalence of stunting before and after in the focus and non-focus village groups (p> 0.05). In detail, it can be proven that stunting has not decreased, which is one proof that *Gammarana* can sustain an increase in stunting, which was corrected by the weakening of various interventions due to the COVID-19 pandemic.

There are two approaches to examining stunting in this study, namely the basis for independent analysis and the basis for pairwise analysis. The independent analysis represents the study of changes in community-level stunting, while the pairwise analysis represents the study of growth velocity.

In many randomized studies, different stunting contexts are analyzed. In this study, the unit of analysis was the subpopulation, while the RCT study unit of analysis was the individual. This study represents a potential public health problem as a population so that the unit of analysis also represents a trend of change at the community level, not at the individual level.[11,12]

It's not easy to interpret the study's unchanging stunting, which is a valuable lesson on how to deal with stunting during a pandemic, an infectious epidemic with a widespread distribution pattern. All is set up to go according to schedule, based on previous research, but applying the same intervention to different conditions will yield different outcomes.[13,14]

This study is similar to the results of several previous studies, such as what happened in Indonesia[2], Bangladesh,[15] the Philippines[16], and Ethiopia[16]. Sensitive and specific interventions did not significantly reduce stunting after the intervention. Various factors can hinder the effectiveness of an intervention, but the focus is only on two sources, namely compliance and coverage. In theory, it can be easily understood that both parameters are related to the dose-response that is believed to affect the outcome. If the dose-response is weak, the effect is not detected.[17]

A study from Guatemala, Malawi, Ghana and Madagascar yielded different results from this study. The study was able to reduce stunting by 4-8% a year. The key to success has also been adopted in this study, but the results are still not the same. This caught the attention of researchers. One of the reasons is that in the *Gammarana* project, natural interventions have decreased in intensity due to limited quarantine. The decline in purchasing power is due to the limited informal employment sector. The location of this study is an agricultural village, which also has barriers to distribution and consumption by the wider community. So, thus, it is not that this intervention is inappropriate, but the prerequisite conditions can not be fully met.

It's not easy to interpret the study's unchanging stunting, which is a good lesson on how to cope with stunting during a pandemic, an infectious illness with a broad dissemination pattern. All is set up to go according to schedule, based on previous research, but applying the same intervention to different conditions will yield different outcomes.[18]

The topic burden for each nutritionist instructor in nutritional literacy is not the same, which is a limitation of this research. Since the subject population of each village cannot be controlled in a balanced way, this is unavoidable. This flaw has been addressed by the enumerator workload in congested villages, but this harms enumerator fatigue.

The lesson from this study is that COVID-19 has an impact on the outcome of community nutrition interventions. This phenomenon can be predicted in advance because the quality of basic health services has declined as well as other interventions.[19],[20]

5.Conclusion

Gammarana did not significantly reduce stunting, but it is considered worth continuing. COVID-19 needs to be followed by appropriate interventions, including Gammarana.

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