SOCIAL PROTECTION WAS NEEDED FOR STUNTING PREVENTION IN URBAN POOR FAMILIES DURING COVID-19 PANDEMIC: A CROSS SECTIONAL STUDY

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Abstract. Social protection is one way to reduce the adverse effects of stunting on the urban poor. This study aimed to analyze the impact of social protection on stunting prevention in urban poor communities. The design of this study was a cross-sectional study, and the study location was in Makassar, the Capital City South Sulawesi Province of Indonesia, which has poor urban settlements. The sample size was 180 people from impoverished families in economically disadvantaged areas of Makassar City located in 12 specific locations. Stunting was presented by height-for-age Z-score (HAZ), based on the 2006 median WHO reference population. The study revealed that a significant proportion of individuals with stunted growth had a documented background of malnutrition, with a staggering 81.4% requiring immediate access to food aid. Moreover, an overwhelming 72.9% lacked social security assistance, while 73.1% reported a lack of access to affordable rice, further exacerbating their circumstances. Therefore, social protection is very much needed by the urban poor to prevent stunting.

Keywords: social protection, stunting prevention, urban poor communities

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INTRODUCTION

In 2021, the prevalence of stunting in Indonesia is 24.4 percent, with the province of South Sulawesi still higher than the national prevalence of 27.4 percent (Ministry of Health Republic of Indonesia, 2021). Although the stunting rate in Makassar city is currently at 18.8 percent, it still falls short of the Indonesian government's national target of 14 percent by 2024. This means that Makassar is still 3.8 percent away from the national target (Syam *et al*, 2020). The poor people of Makassar City, are already good at parenting but are limited in income, and need food assistance (Syam *et al*, 2020). The results of another study related to environmental quality in the slum areas of Makassar city, concluded that government support was needed to improve infrastructure (Surya *et al*, 2020). Environment is one of the variables directly related to the risk of stunting (Beal *et al*, 2018; Das *et al*, 2021).

A history of malnutrition is one of the unique characteristics of stunting children. This is due to repeated infections (Arini *et al*, 2020). The trigger for stunting is an infectious disease (Oliveira *et al*, 2015). If the infectious diseases can be overcome, the risk of stunting can be reduced (Pickering *et al*, 2019; Smith *et al*, 2015). The PROCOMIDA study in Guatemala reduced stunting in the first thousand days of life by providing food assistance. This method is one of the keys to success in overcoming stunting (Olney *et al*, 2018). A similar study in Burundi, *Tubaramure*, (Leroy *et al*, 2018) has also succeeded in reducing stunting, so it is very feasible to be adopted as an effort to prevent stunting in urban areas such as Indonesia.

Apart from food aid, the social safety net program is also the key to success in reducing stunting in eastern Ethiopia (Tesfaye *et al*, 2022). Programs like this need to be increased in scope in Indonesia to have the same effect (Widiastuti *et al*, 2016). Prices of staple foods, such as rice, need to be controlled through a stable supply and demand mechanism (Badolo *et al*, 2015; Widiastuti *et al*, 2016). This can trigger malnutrition in people

with low incomes people with low incomes. Bangladesh's experience from 1987-2012 proves that the price of rice is related to the risk of poverty and under-five children's nutrition (Sayeed and Yunus, 2018). Indonesia especially tackled this, with cheap rice packages for low-income families. This package has been going on since 1998 during the global economic crisis (Christian *et al*, 2010; Purwestri *et al*, 2018).

This study aimed to investigate the history of malnutrition and social protection (food aid, social safety nets and low rice prices) to prevent stunting in low-income families in Makassar.

MATERIALS AND METHODS

Setting and research participants

The study design was a cross-sectional study. The population was Makassar city residents who lived in dense settlements. Twelve locations indicated cases of high malnutrition in Makassar City in 2020 (Fig 1). All subjects were low-income families who were listed by the local government. The formula for a large sample size in a two-sample proportion test with a 5% level of significance, 80% test power, and a two-sided alternative hypothesis is as follows:

$$n = \{(z_{(1-\alpha/2)})^2 \times P1(1-P1) + (z_{(1-\beta)})^2 \times [P1(1-P1) + P2(1-P2)]\} / (P1-P2)^2$$

where $z_{(1-\alpha/2)}$ = Z-score corresponding to the 5% significance level

$z_{(1-\beta)}$ = Z-score corresponding to the 80% test power

P1 = Proportion of stunted children in the poor urban community with good access to maternal and child health services, used 10%

P2 = Proportion of stunted children in the poor urban community with poor access to maternal and child health services, used 30%

Based on the given values, the sample size for P1 is 90 (increased by 10% or 8 individuals), and for P2, it is 90. A total of 180 children aged 0-23 months and their caregivers who were in the list of low-income families were included in the study. Low income families were selected from the data recipients of subsidized rice during the period of January-June 2021, from the local government.

Data collection

Data were collected on January to June 2021 in 12 data collection sites in the Makassar City (Fig 1). History of malnutrition recorded in the Maternal Child Health Book (MCHB) was confirmed with the caregivers by interviews. Malnutrition is defined by indices of weight-for-age Z-score (WAZ), weight-for-height Z-score (WHZ), height-for-age Z-score (HAZ) (WHO, 2009). Height was measured by a portable SECA stadiometer (Masta Medica, West Jakarta, Indonesia). Data on social protection consisting of food aid, social safety net, and low prices were collected through interview methods with caregivers using a questionnaire. The instrument has undergone testing and has been found to be both valid and reliable (Sirajuddin, *et al*, 2021).

Statistical analysis

Statistical analysis was performed by the Statistical Package for Social Sciences (SPSS), version 16 (SPSS Inc, Chicago, IL). Distribution of demographic characteristics (age, education, occupation, gender of children) between poor families with stunted children and low-income families with normal children was used as descriptive statistics. To analyze the distribution of history of malnutrition, social safety nets, low rice prices and food aid for stunting versus normal children in low-income

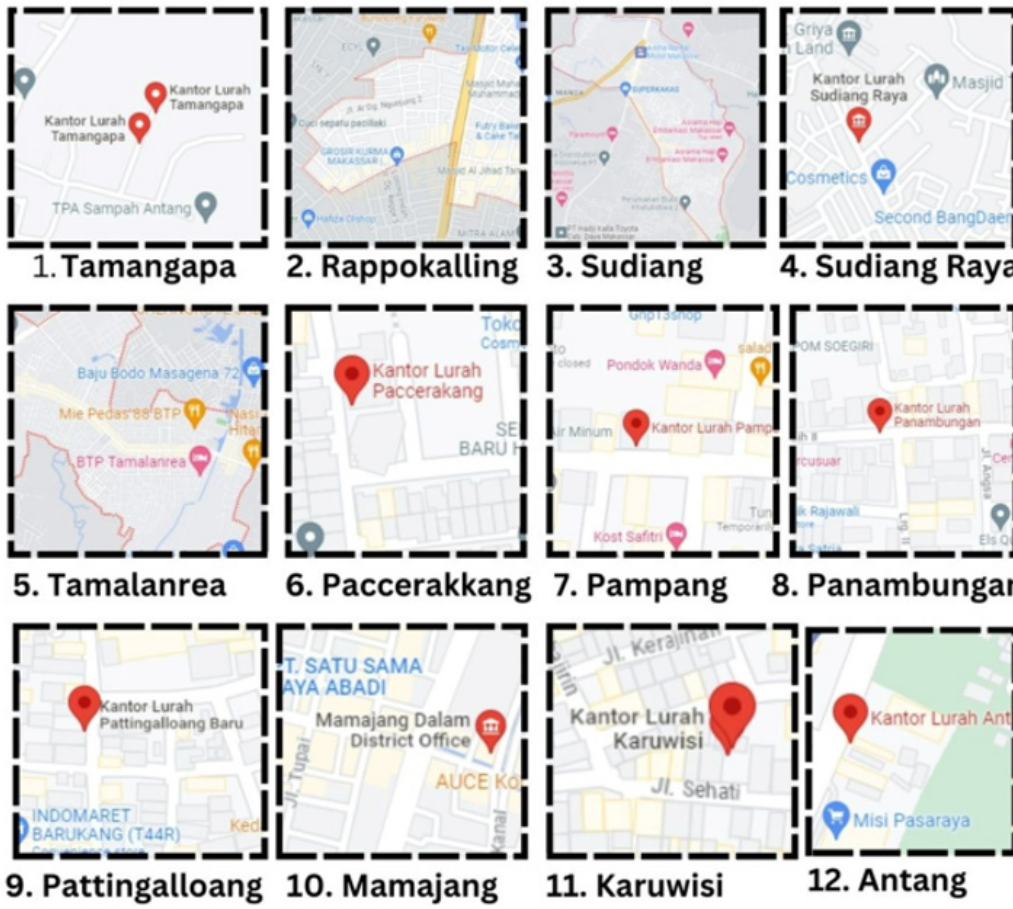

Fig 1 - Location of data collection

families, the Mann-Whitney test was used at 95% confidence significance to be defined as p<0,05.

Ethical consideration

This study has obtained ethical approval from the Ethics Commission of Makassar Health Polytechnic, Approval Number: 0034/KEPK-PTKMKS/II/2021.

RESULTS

A total of 180 mothers (caregivers) were interviewed in the study, 144 mothers had children with normal growth and 66 mothers had stunted. Based on the results of statistical analysis, it is known that parental education, occupation, and gender are similarly distributed in normal growth and stunted children groups from low-income families (Table 1).

History of malnutrition in stunting versus normal is much higher at 81.4% versus 18.6% (p<0.001) (Table 2). This means that repeated infections pose an aggravating risk for stunting. If this can be overcome, the chances of poor children not being stunted are 49 times better than if this is not treated correctly. Variable food aid to people experiencing poverty is very good for preventing stunting as it can prevent stunting 11 times better than not given food aid (p<0.001) (Table 3).

DISCUSSION

The main result of this study is that social protection packages such as food aid, social safety nets and cheap rice affect and prevent the stunting of low-income families. This means that if stunting has not decreased in several places, the coverage or beneficiaries of this package must be increased.

Result of his study is similar to the results of a study in Nepal, that cash transfer as an intervention was able to reduce stunting in children aged >24 months, although it did not have an impact on children aged <24 months (Renzaho *et al*, 2017). However, a social protection package such as cash transfer can be more effective only if it is followed by a more effective child feeding package (Renzaho *et al*, 2017). Whereas cash transfer is a sensitive intervention and child feeding is a specific intervention, it should be combined. This follows the recommendations

Table 1
Results of rat liver histology analysis

Characteristic	Frequency, *n* (%)		*p*-value
	Normal (N = 114)	Stunting (N = 66)	
Mother's education			0.889
Never go to school	4 (3.5)	3 (4.5)	
Elementary School	26 (22.8)	12 (18.2)	
Junior school	31 (27.2)	17 (25.8)	
High school	43 (37.7)	26 (39.4)	
Collage/University	10 (8.8)	8 (12.1)	
Father's education			0.343
Never go to school	3 (2.6)	6 (9.1)	
Elementary School	21 (18.4)	13 (19.7)	
Junior school	26 (22.8)	11 (16.7)	
High school	57 (50.0)	31 (46.9)	
Collage/University	7 (6.2)	5 (7.6)	
Mother's occupation			0.140
Informal sectors	107 (93.9)	65 (98.5)	
Labor	7 (6.1)	1 (1.5)	
Father's occupation			0.332
Informal sectors	36 (31.6)	18(27.3)	
Labor	78 (68.4)	48 (72.7)	
Sex of the child			0.229
Male	58 (50.9)	29 (43.9)	
Female	56 (49.1)	37 (56.1)	
Child's age group			0.002
0-6 months	18 (15.8)	7 (10.6)	
7-12 months	40 (35.1)	9 (13.6)	
13-24 months	56 (49.1)	50 (75.8)	

Note: Informal sectors include street vendor, small shop, helper

Table 2
Distribution of children based on malnutrition history

Category	Family of child with normal growth (n = 114)	Family of child with stunting (n = 66)	95% CI	p-value
History of malnutrition				
No	101 (91.8)	9 (8.2)	49.2 (18.8-122.2)	<0.001
Yes	13 (18.6)	57 (81.4)		

CI: confidence interval

of compiled by Bhutta *et al* (2013). This study differs from the study in Pakistan, where cash transfers should be handled with care (Soofi *et al*, 2022).

Food aid in this study was the same as the study reported in Guatemala with the PROCOMIDA program (Olney *et al*, 2018), which positively reduced stunting in the intervention group, but not in the control group. Based on the recommendations of this study, it is clear that food aid can be provided, especially for the urban poor (Olney *et al*, 2018). The reason is that food expenditure is the most significant proportion of expenditure for people experiencing poverty. If this is helped, it will reduce the burden of daily food expenses or increase the quality of children's food dishes. This study is also similar to the results of the *Tubaramure* study in Burundi (Leroy *et al*, 2018). Another study in Haiti also gave the same results as this study, that food aid was able to reduce stunting by 3% per year (Donegan *et al*, 2010). This can be more effective in preventing stunting, especially during the economic crisis.

The social safety net is another intervention model which is more flexible for the government, including the Indonesian government. The results of this study are in line with the study in Ethiopia that social

Table 3
Distribution of children based on the social protection

Social protection received	Family of child with normal growth (n = 114)	Family of child with stunting (n = 66)	95% CI	p-value
Food aid, n (%)				
No	16 (27.1)	43 (72.9)	11.4 (5.5-23.8)	<0.001
Yes	98 (81.0)	23 (19.0)		
Social safety net, n (%)				
No	20 (26.0)	57 (74.0)	29.7 (12.6-69.8)	<0.001
Yes	94 (91.3)	9 (8.7)		
Low price rice, n (%)				
No	7 (26.9)	19 (73.1)	6.1 (2.4-15.6)	<0.001
Yes	107 (69.5)	47 (30.5)		

CI: confidence interval

safety nets can improve the quality of child feeding and are expected to affect reducing stunting (Tesfaye and Egata, 2022). However, the results of this study differ from the results of a study in Pakistan on social safety nets. A study in Pakistan reported that a minimal reduction in stunting due to social safety nets only fell by 3% over the 4 years of the program but social safety nets was still recommended because of its benefits in health care and education (Soofi *et al*, 2022).

Concerning the food aid, it is necessary to explain that this is a package that is used to increase access to basic food for families. The Bangladesh study report noted that poverty's effects can be slowly controlled if this package is given (Sayeed and Yunus, 2018). However, a study from Demak Indonesia reported that rice surplus areas still have the potential to have high stunting reaching 31.9% (Purwestri *et al*, 2017). This case is because the profits from rice production are not diverted to various food expenditures. So, as reported by Burkina Faso, whatever assistance is given to people experiencing poverty, the basic principle is to reduce poverty disparities and provide rice for the poor (Badolo and Traoré, 2015). The consequences of cheap rice packages on the health status of children and risk groups are different variables that need assistance, so the effect is more precise (Ilman and Wibisono, 2019).

The generalization of this study is that in stunted children, low-income families have a history of repeated malnutrition. Stunting in urban low-income families can be prevented by increasing the coverage of cash transfer packages, social safety nets, and cheap rice. The city government has provided all these packages as a social responsibility. Monitoring and evaluation of social protection packages are needed to reduce stunting effectively.

The limitation of this study is that it does not have a comparison in other cities where stunting is still above 20%, although it is known that the same package has been running for a long time but does not have the same effect as Makassar City. Further investigation is needed to answer

why the closest cities to Makassar have stunting >20% even though the social protection package has also been provided.

In conclusion, social protection packages such as food aid, social safety nets, and low rice price, if carried out properly according to procedures, will be effective in preventing stunting in the urban poor. The strength of this study lies in its detailed evidence that maximizing social assistance for impoverished families can protect against stunting. However, its limitation is the inability to conduct comparative studies across different cities

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CONFLICT OF INTEREST DISCLOSURE

There is no conflict of interest in this study.

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