Instrument of Inequality in Accessibility of Maternal and Child Health Services, for early detection of stunting: Cross-Sectional Study

Sirajuddin[1*], Trina Astuti[2], Ulty Desmarnita[3] , Sitti Saharia Rowa[4]
[1,4]Nutrition Department, Health Polytechnic of Makassar, South Sulawesi, Indonesia
[2]Nutrition Department, Health Polytechnic of Jakarta II, Jakarta, Indonesia
[3]Nursing Department, Health Polytechnic of Jakarta III, Jakarta, Indonesia
*Email: sirajuddin.gizi@poltekkes-mks.ac.id

ABSTRACT
Inequality of access to health services (health inequalities) triggers differences in the quality of services to vulnerable groups (mothers and children), which increases the risk of stunting. This risk is higher in poor families. The purpose of this study was to create a valid and reliable instrument to measure differences in access to maternal and child health services. The design of this study was case-control study with a retrospective cohort design, with the matching variables in the case group are poor families, the inclusion criteria are not having their own home, daily worker status, having children aged 0-23 months, registered as recipients of social assistance from the local villages. The inclusion criteria for the control group were poor families who did not have stunting children. The sample size in each group was 90 people. Statistical analysis used the Cronbach Alfa test. The results of the study found that the mother's education was generally high school in the control group and junior high school in the case group, respectively 44.4% and 33.3%. Mother's occupation is the informal sector in the control and case respectively 95.6%. Stunting between 33.3% -40% in poor families is higher in those who experience inequality in access to maternal and child health services. The results of the analysis of validity and reliability are known to have the value of Cronbach Alfa = 0.67 (Valid & Reliable). Conclusion access to maternal and child health services can be measured using the instrument. The suggestion is that this instrument can be used for the early detection of stunting risk in poor families.
Keywords*: Inequality, Access, Poor, Stunting*

INTRODUCTION

Inequality of access to maternal and child health services affects the magnitude of the risk of stunting in children. The more imbalanced access to maternal and child health services, the greater the gap in health services in maternal and child health services, childbirth, immunization, growth monitoring and child feeding.(Gostin și Friedman, 2020), (Gunther Fink *et al.*, 2017a, 2017b; Hosseinpoor, Nambiar și Schlotheuber, 2018; Gatica-Domínguez, Victora și Barros, 2019)

Stunting is still high in Indonesia, South Sulawesi and Makassar City, respectively, 30.8%, 36%, and 30%. Data at the Makassar City Health Office, in 2020 stunting reached % in 53 Puskesmas. This number is concentrated in densely populated areas in Makassar City, especially from urban poor families. All Puskesmas have dense and poor residential areas.

One of the knowledge gaps related to inequality in access to maternal and child health services with stunting is the unavailability of a valid and reliable instrument to measure the potential inequality in access to health services. This instrument is needed for early detection of stunting risk because with a valid and reliable instrument the potential risk can be known long before stunting appears as a symptom of the failure to thrive.(Mohammed *et al.*, 2019; Rizal și van Doorslaer, 2019a)

This study identifies potential inequality in access to health services and their impact on stunting in children from poor families in Makassar City. This study investigates the forms of inequality in access and how to overcome them. This study measures the magnitude of the risk of stunting in children, if poor families do not have sufficient access to maternal and child health services in the first thousand days of

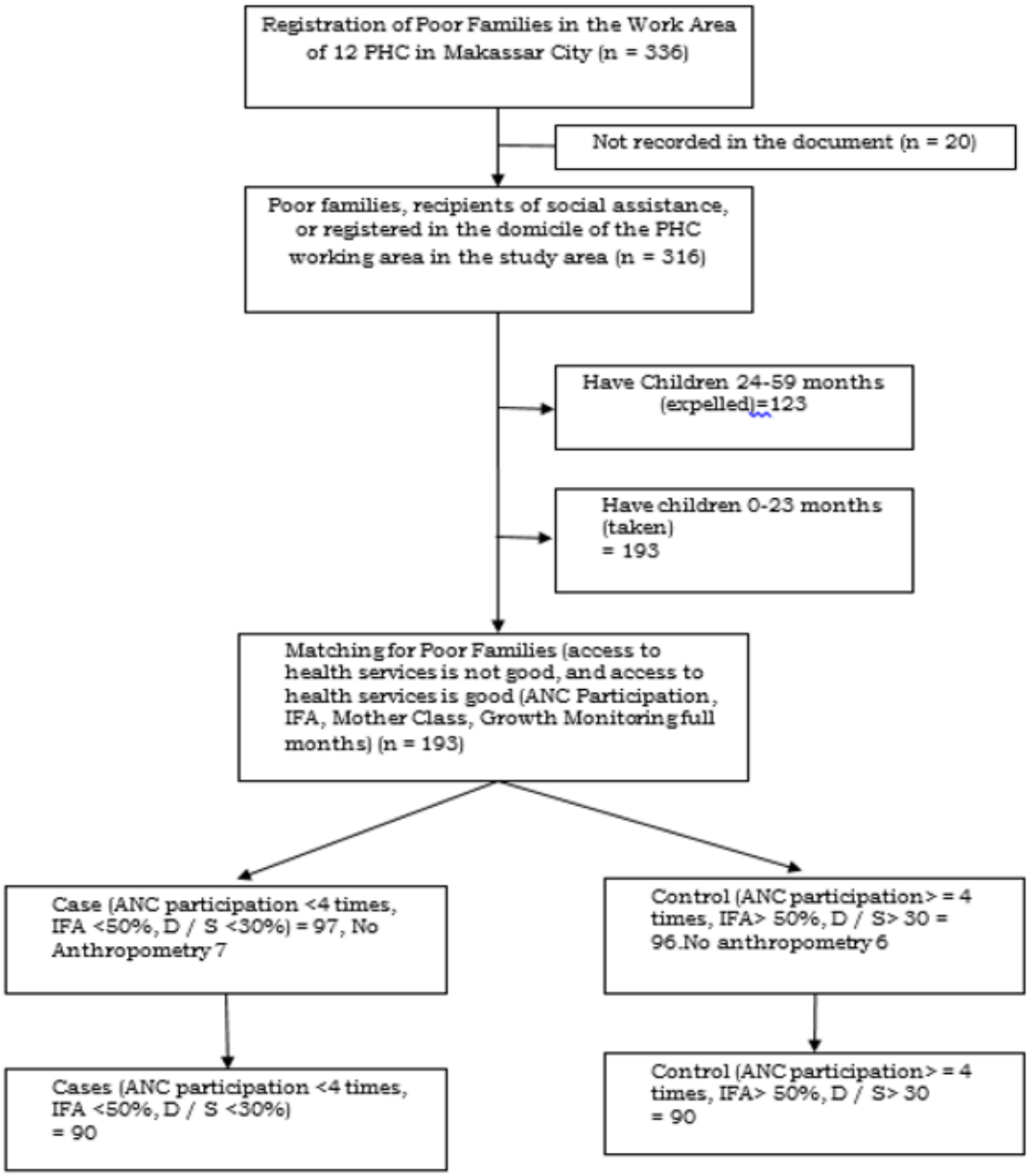
life.(Shanti Mendis, Keiko Fukino, Alexandra Cameron, Richard Laing, Anthonio Filipe Jr și Jerzy Leowski & Margaret Ewene, 2007), (Rizal și van Doorslaer, 2019b)

The purpose of this study is to establish a valid and reliable instrument in measuring access to inequality in maternal and child health services.

METHOD

Study Design

This study was a case-control study, with a retrospective cohort design. The case group was stunted children from poor families and the control group was non-stunted children from poor families. Observations were made on discriminatory treatment and inequality in access to maternal and child health services from pregnancy to 24 months of age through interviews. This research has received approval from the Makassar Health Polytechnic Ethics Commission Number: No. : 0034 / KEPK-PTKMKS/ II /2021



Setting

The research sites are 12 Public Health Centers in Makassar City. The selection of points is determined as densely populated areas with the number of poor families reaching 30% based on the list of beneficiaries of the 2020 Family Hope Program (PKH) assistance. Time of the research. The first year is August to October 2021. Before data collection, the following were carried out: (1) Enumerator training, conducted February 26, 2021, located at the Gazebo of the Department of Nutrition at the Health Polytechnic of Makassar,

Study Size

The sample size is the number of mothers who will be respondents in this study calculated based on the formula by Standly Lameshow (1997). The sample size formula for the two-sample proportion test with a significance level of 5%, Power Test 80%, a two-tailed alternative hypothesis is:

$$n = \frac{\{z1-\alpha/2\sqrt{[2P2(1-P2)]} + z1-\beta1\sqrt{[1-P1)+P2(1-P2)]}\}^2}{(P1-P2)^2}$$

Information, = Normal distribution probability at 5% significance confidence, = 80% power test, P1 = proportion of stunted children under five in the Case group, used 10% and P2 = proportion of stunted children under **five** in the control group, used is 30% (Study of pregnant women in the City Makassar Year 2019). Based on the figures above, the sample size is 82 + 8.2 = 90 case groups and 90 control groups. The total sample is 180 mothers who have children aged 0-24 months (Figure 1)

Variable

The outcome variable in this study is inequality in access to maternal and child health

the number of participants was 12 people (2) Coordination Meeting of Field Officers with Enumerators, held on March 10, 2021, at each Public Health Centers by each person in charge of the field. This meeting aims to map the areas and targets of poor families in each Puskesmas. (3) Field officers are nutritionists at the Public Health Services (PHC) with 12 people and Enumrarors are alumni of nutritionist has as many as 12 people. Divided into 6 teams, each team consists of 2 people to facilitate anthropometric measurements

services. Inequality in access to health services is defined as a comprehensive score of health services and the number of indicator items, respectively, for maternal and child health services (12), childbirth (3), immunization (4), growth monitoring (3), child feeding (8), social support (5), social influence (7), social cohesion (8), access to health services (5) and stunting (HAZ).

Data sources and Measurement

Sources of health service data, through interviews, while stunting data through anthropometric measurements. Interviews were conducted directly with the application of health protocols in the context of preventing the transmission of COVID-19. The use of masks and social distancing was applied by enumerators and respondents. Anthropometric measurements are carried out to ensure that the anthropometric tools are sterile by cleaning after each measurement, only measuring height with a the length board made of fibre. Enumerators are provided with hand sanitisers and masks both for themselves and for measuring subjects and

respondents. ..

Bias

The source of the bias in this study generally comes from the recall bias towards a long history of access to maternal and child health services, even though currently access to health services is better. The selection of subjects from the list of Social Safety Net (SSN) recipients in each location is not updated because the change in population status in Makassar is very dynamic. These two sources of bias are minimized through validation to health centre nutrition officers who know the subject more closely and are up to date. Subjects who do not match even though they are registered as beneficiaries are excluded if the validation results do not meet the criteria.

Statistical Analysis

Validity analysis using Pearson's test of correlation of all question items with the total score of all items. If the P-Value Pearson correlation <0.05, then the item is declared valid. Reliability analysis with Cronbach Alfa reliability test. Only valid items were included in the reliability analysis. The instrument is declared reliable if the value is > 0. 6, at the 95% confidence level.

RESULTS AND DISCUSSION

Educational characteristics of mother, father, occupation of mother, father, and sex of the child in Table 1. The distribution of children's education, occupation and sex between case and control groups is the same as the respective significance values. Based on the results of Table 2. The instrument validity test was carried out with a total of 53 items. The results showed that the validity of this instrument was very good because it only issued 9 items with a significance value > 0.05. The number of valid items is 44 of 53. The following Reliability testing used the Cronbach's Alfa is 0,67 (67%) see Table 3.

Table 1. Characteristics of Subject

Characteristic of the subject were majority level education high school both mother and father (see Figure 1);

Subject Characteristics	Control n(%)	Case n(%)
Mother's Education		
Never school	3(3.3)	4(4.4)
Primary school	21(23.3)	17(18.9)
Junior school	18(20.0)	18(33.3)
High School	40(44.4)	29(32.2)
University	8(8.9)	30(11.1)
Father's Education		
Never school	2(2.2)	7(7.8)
Primary school	16(17.8)	18(20.0)
Junior school	19(21.1)	18(20.0)
High School	43(47.8)	45(50.0)
University	10(11.1)	2(2.2)
Mother's occupation		
Informal sector	4(4.4)	0(0)
Entrepreneur/trade	26(28.9)	24(26,7)
labourer	60(66.7)	66(73,3)
Father's occupation		
Informal sector	86(95,6)	86 (95,6)
Entrepreneur/trade	4(4,4)	3(3,3)
laborer	0(0)	1 (1,1)
Child Gender		
Girl	47(52,2)	40(44,4)
Boys	43(47,8)	50(55,6)

Validity and reliability instrument in this studi

Table 2. Testing validity for across items instrument

No of an item for assessing inequalities	r (p-Value)

	Inequality of access to mother and child health	
1	Were you checked for pregnancy by a midwife or other health workers? 1= Yes; 0= No	0,370 (0,000)*
2	If you were examined, did you go to the officer? [1= Yes][0=No]	0,369 (0,000) *
3	When you were examined, where was the inspection place? [1= Posyandu] [2= Mother's house / Mother's place of residence] [3= Place of practice][4= Health Center] [5= Maternity Hospital/Mother and Child]	0,010 (0,896)
4	Is the pregnancy check-up place crowded? [1= Yes][0=No]	0,273 (0,000) *
5	Did you get a queue number or not? [1= Yes][0=No]	0,202 (0,007) *
6	Is the mother known by the examining officer, [1= Yes][0=No]	0,352 (0,000)
7	If you are not known, do you feel that you have been served the same as other mothers? [1= Yes][0=No]	0,168 (0,099)
8	Do you pay for the pregnancy check-up? [1= Yes][0=No]	0,376 (0,000) *
9	If yes, do you think the fee is too expensive? [1= Yes][0=No]	0,523 (0,000) *
10	If you have to choose, do you want free pregnancy check-ups? [1=Yes][0=No]	0,028 (0,708)
11	Was the mother given Blood Add tablets? [1= Yes][0=No]	NA
12	If given, did you pay for the Blood Add Tablet? [1= Yes][0=No]	0,400 (0,000) *
	Inequality in access to delivery	
13	Birthplace; [1= Maternity Home][2= Hospital][3= PHC][4= Midwife Practice][5= own house]	0,660 (0,000) *
14	Who suggested you choose a place to give birth; [1= a close friend or close relative][2=in-law or husband][3= own desire]	0,677 (0,000) *
15	Do you feel that the delivery place is far away?;[1=Yes][0=no]	0,067 (0,377)
	Inequality in access to immunization services	
16	Have your children been immunized; [1. Yes][0 = no]	-0,113 (0,139)
17	Where is your child immunized? [1= Maternity Home][2= Hospital][3= PHC][4= Midwife Practice][5= own house]	-0,044 (0,568)
18	Who suggested you choose the place of immunization;[1= a close friend or close relative; 2=in-law or husband]	-0,018 (0,815
	Inequality in access to growth monitoring services	
19	Do your children have growth chart? [1. Yes, 0 = no]	0,889 (0,000) *
20	Is your child weighed on this months? Last year 2000 [1][2][3][4][5][6][7][8][9][10][11][12] This year 2021 [1][2][3][4][5][6][7][8][9][10][11][12]	0,851 (0,000)
21	If not weigh, what is the mother's general reason	0,776(0,000) *
	Inequality in access to children's feeding services	
22	Have your children ever been malnourished? [1. Yes, 0 = no]	0,205 (0,006) *
23	If so, have you ever been given a free food programs?[1= Yes; 0= No]	0,300 (0,002) *
24	If not, are you registered as a target recipient of Social Assistance? 1= Yes; 2= No; and 3= Doubtful	0,217 (0,005) *
25	Have you ever received Cheap Rice Aid? [1=Yes;0=No]	0,046 (0,554)
26	If not, what is the reason 1= even though it's cheap but doesn't always get a share 2= even though it's cheap, we can't afford it 3= cheaper rice at the stall or market	0,617 (0,034) *
27	Is the mother's family the recipient of the Family Hope Program? 1= Yes; 0= No	0,882 (0,000) *
28	If yes, how many times a year do you receive social safety Net	0,093 (0,000) *
29	What kind of social safety net that you're accepting	0,603 (0,000) *
	SOCIAL SUPPORT	
29	I feel that all the costs of social services, whether at the village	0,265 (0,000) *

	head office or the PHC, I can afford to pay	
30	I feel that we are still very limited in getting the support of neighbours if we need help with living expenses	0,159 (0,033) *
31	All information on health or population services such as ID cards, childbirth certificates, I have been able to access for free	0,498 (0,000) *
32	I am still reluctant to ask for help from health workers if there are health complaints	0,509 (0,000) *
33	I am still reluctant to ask the RT for help if there are economic difficulties	0,509 (0,000) *
34	I believe all my neighbours are alive please help	0,364 (0,000) *
35	We, always feel close to each other in the neighbourhood	0,419 (0,000) *
SOCIAL INFLUENCE		
36	If there is a celebration in our neighbourhood, we rarely come	0,428 (0,000) *
37	Normal kinship is highly respected in our home environment	0,268 (0,000) *
38	Tired of waiting for your turn when queuing at the checkpoint	0,582 (0,000) *
39	I get the last turn in every health check	0,537 (0,000) *
40	Health workers, prioritize acquaintances over strangers when serving patients	0,400 (0,000) *
41	During pregnancy, I did not get Free Supplementary Food	0,444 (0,000) *
SOCIAL ENGAGEMENT		
42	I always participate when there is a mother-to-five group activity	0,832 (0,000) *
43	I have a special task or administrator in the mother-to-five class group	0,464 (0,000) *
44	I am not a member of my mother's class	0,368 (0,000) *
45	We always hold a mother's class meeting every two months	0,827 (0,000) *
46	We already know each other in mother's class	0,934 (0,00) *
47	We always share food in mom's class	0,933 (0,000) *
48	We are always assisted by donors in mother class	0,733 (0,000) *
ACCESS PUBLIC SERVICES		
49	I am not well known by the health workers at the PHC	0,545 (0,000) *
50	I find it difficult to get antenatal care services during pregnancy	0,447 (0,000) *
51	There are too many pregnancy check-ups at the PHC	0,500 (0,000) *
52	Tired of waiting for your turn while queuing at the checkpoint	0,587 (0,000) *
53	I got the last turn in every health check	0,379 (0,00) *

*Significant P-Value <0,05 based on Pearson Correlation 95%.

Table 03. The item's validity is based on correlation person values

Variable		Items Valid	Cron-bach Alfa
1.	Inequalities in pregnant and child services	1,2,4,5,6,8,9, and 12	0,670
2.	Inequalities in delivery	15	
3.	Inequalities in immunizations		
4.	Inequalities in growth monitoring	19, 20, 21	
5.	Inequalities in the feeding program	22, 23,24,26, 27, 28	
6.	The social supporting	29, 30, 31,33,34,35	
7.	The social influencing	36, 37, 38,39,40,41	
8.	The social engagement	42, 43,44,45,46, 47,48,	
9.	Accessibility in primary health services	49, 50, 51,52,53	

Discussions

One hundred eighty (180) out of 336 mothers met the inclusion criteria in this study. Divided into 90 cases and 90 controls. The results of the validity test on questions on 180 subjects were 44 out of 53 items which were declared valid with a significance of <0.050. The results

of the reliability test show that the Cronbach Alfa value is 0.670 which can be said that this instrument is reliable. Although immunization is an important variable, all items cannot be valid or excluded from the instrument. This is because the immunization package for all subjects is relatively evenly distributed.

Health care during pregnancy is believed to be the most important point in the first thousand days of life. This period is the period in which early detection of pregnancy disorders and distribution of folic acid supplements. If this period is not served properly, it will put the baby at risk of stunting (Nisar, Dibley și Aguayo, 2016), (Upadhyay și Srivastava, 2016), (Adu-Afarwuah *et al.*, 2016). The reason is that all packages provided during this period in Indonesia are only available for regular services. Immunization services for children in Indonesia are very wide, there is no disparity between rich and poor, so this variable is not a source of disparity in health services.(Widayanti *et al.*, 2020)

The case of monitoring child growth in Indonesia is still very varied. This variable is one of the variables to be measured if you want to explore inequality in access to maternal and child health services. This activity is also an effective and sustainable promotion platform for stunting prevention.(Paul Garner, Ratana Panpanich, 2000). (Connor și Manary, 2011), (Claus Bohn Christiansen, Jan Albert, Roberto Machuca, 1997), (Günther Fink *et al.*, 2017)

The child feeding program in Indonesia is a regular package. The conditions needed are poor families and the status of malnourished children. Although this is rehabilitation, it is believed to be able to reduce the rate of increase in cases of malnutrition including stunting.(Inoue *et al.*, 2012; Mukhopadhyay *et al.*, 2013; Aguayo și Menon, 2016; Mirkovic *et al.*, 2016), (Sirajuddin *et al.*, 2020)

Social support is important for the distribution of various resources in the community to the poor. Social support, either as a cultural product or designed by the government, is needed for service fairness. (Reeves *et al.*, 2006). Social influence is very difficult to measure, but it is important because it affects the family burden. If inequality occurs because of social influences, it is important to have an educational process on the issue of equal rights. If the opposite condition where equality of rights has become a value, then it will turn into variable protection.(Siagian *et al.*, 2019)

Social engagement is important as a shared control over inequality. This is the active nature of individuals to participate in activities in public spaces. Indonesia is very concerned about issues like this. This study finds evidence that social involvement is a variable measured in the study of inequality in access to maternal and child health services.(Webb Girard *et al.*, 2020). Basic health services are services that reach the entire community. This service is important to measure because it is directly related to the health status of mothers and children. If this service is good, the morbidity and mortality rates can be reduced. This means that the risk of stunting can be controlled.(Syam și Jafar, 2012), (Wakerman *et al.*, 2019)

The generalization of this study is that inequality in access to maternal and child health services can be measured precisely. This instrument is valid and reliable, especially in Indonesia. Early detection of stunting can be known if the score of this instrument is low. The limitation of this study is the recall bias so that ideally inequality in access to health services is measured directly through surveillance of access to maternal and child health services.

CONCLUSION

The form of inequality in health services is in delivery services, growth monitoring and child feeding packages. The distribution of stunting among those who experience discrimination in maternal and child health services is higher than those who do not experience discrimination. This instrument can be used to study inequality in access to maternal and child health services for early detection of stunting risk.

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