

Compliance Determinants of Mothers in Full Child Immunisation in Bangkalan District

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Abstract: Child immunisation is one of the cost-effective interventions in response to health problems and it provides protection against a variety of health problems for children. Universal Child Immunisation (UCI)'s achievement is a projection of the coverage of complete child immunisation. Child immunisation coverage in Bangkalan in 2011 had a gap compared to the target. The study aims to analyse the factors that influence mothers' compliance with child immunisation based on maternal characteristics, community support, and health workers in Bangkalan district. This research used a cross-sectional design and the populations were all mothers of children aged 12-24 months. The analysis was then continued using Path Analysis. The data was collected using a multi-stage sampling method. The samples included 360 respondents selected by the snowball technique. The results reveal that 37.3% of infants had been fully immunised on schedule and this indicates the mothers' compliance with child immunisation. The Path Analysis Model is able to predict immunisation compliance. The predictive factors are Community Support, Mother's Characteristics, Health worker, Service, and the Mother's Factors. Result showed that mother's characteristics and the health service directly affected the mother's compliance of child immunisation. Community support, health manpower and the mother's factors only have indirect effects.

1 INTRODUCTION

Child immunisation is one of the most effective health interventions in terms of cost. Budiman (2011) in Kompasiana (2012) said that in 1974, since the launch of the Expanded Program on Immunization (EPI) that included immunisation against seven diseases, immunisation has saved more than 20 million in two decades. UNICEF in the Report Card on Immunisation (2005) stated that vaccines have saved millions of children in the last three decades. Immunisation has become one of the programs for decreasing the child death rate in MDGs and programs of health development in Indonesia.

What Universal Child Immunisation (UCI) has achieved is a projection of the coverage of complete immunisation towards a group of infants. If UCI's coverage is put into a certain area, we can see the level of people or infants' immunity (herd immunity) against disease contagions that can be anticipated by immunisation (PD3I).

In the past few years, some mothers refused to bring their children to health care services for immunization even though it's free and provided by the government. The low mother's compliance to giving their children immunization caused by several factors such as mother's characteristics (age, education, income, attitude, etc), family support, poverty, lack of information about immunization, and other socio-economic factors (Ramayani, 2007; Falagas, 2008; Goofman & Frerichs, 2000; Octaviani, 2015).

The UCI of Ministry of Health's target was 80% in 2008, and the UCI of East Java's target pursuant to the Minimum Standard of Service (SPM) up until 2015 was $\geq 95\%$, and the UCI of Bangkalan District's target amounted to 90% in 2011.

Table 1: Coverage of Immunisation in Bangkalan District for the January - December 2011 period.

Immunization	Target	Coverage	Coverage Gap
HB0	90%	69.5%	20.5%

Immunization	Target	Coverage	Coverage Gap
BCG	95%	76.2%	18.8%
POLIO 1	95%	77.3%	17.7%
POLIO 2	90%	76.0%	14.0%
POLIO 3	90%	74.3%	15.7%
POLIO 4	90%	72.9%	17.1%
DPT-HB1	95%	76.1%	18.9%
DPT-HB 2	90%	73.8%	16.2%
DPT-HB 3	90%	73.2%	16.8%
MEASLES	90%	73.2%	16.8%

Source : Report of PSE Division of Bangkalan District Health Office 2011 (2012)

According to Table 1, there is a gap between immunisation coverage in Bangkalan District and the target. Therefore, there is a need to do a study that analyses the mothers' compliance determinants in giving children immunisation based on the mother's characteristics, community support, and the role of health workers in Bangkalan District.

2 LITERATURE REVIEW

2.1 Immunisation

In accordance with the Verdict of the Minister of Health of the Republic of Indonesia No. 1059/MENKES/SK/IX/2004 on Guidelines of Immunisation Implementation, immunisation is one of the preventive actions against diseases through the administration of immunity to the body. Administering immunity should be done regularly, completely, and in compliance with the set standards to provide health protection and to stop disease contagions.

As one of the government's policies, immunisation is the most effective measure to prevent infectious diseases. It is considered as an investment since in the long run, immunisation is able to decrease morbidity and the child death rate in several countries. For the children, immunisation aims to provide immunity for infants and toddlers against diseases and against the deaths caused by the infection of such illnesses.

Immunisation through certain vaccine provisions will also protect children from particular diseases. Despite the available facilities in the society, not all infants have complete immunisation. The paper size must be set to A4 (210x297 mm). The document margins must be the following:

2.2 Compliance

Kyngas, et al. (2000) believed that the low level of compliance will contribute to the decrease of effectiveness and medication benefits as well as the increase of treatment cost as a result of off-standard implementation. Lack of compliance also influences the health of the surrounding society; for example, TBC patients who do not obey the treatment conditions will contaminate others.

Kyngas (1999) found that motivation, health services, normal feelings and adequate energy as well as the willingness to reach the goals in the context of the health services are the factors that increase compliance. Motivation could be improved by support and affirmation from parents, and it also influences the individual energy and willingness to reach the goal of the health services.

According to Haynes (1979) in Evangelista (1999), compliance in the health sector is the increase of someone's behaviour (taking medicine, going on a diet, or changing their lifestyle) in implementing the health workers' advice. The definition was also stated by Fletcher (1989) in Evangelista (1999) that compliance is how patients do what the health professionals want them to do.

2.2.1 Compliance with Immunization

Ramayani, et al. (2007) conducted a study on several factors related to the lateness of giving immunisation in Health Centres in urban and suburban area. The results show that late immunisation is related to social-economic factors including poverty, vaccination cost, and late first immunisation. A lack of information about immunisation for parents and health workers and also health practices in private institutions where the schedule of the practice and immunisation do not often meet which also contributes to the lateness. Other factors include the lack of reminder system for immunisation times and difficulties in implementation in accordance with standards.

Another study conducted by Falagas (2008) stated the factors that influence incomplete immunisation such as under-age mothers (under 20 years old) which most commonly leads to a lack of knowledge. Goodman & Frerichs (2000) who did a research study on compliance with immunisation in Kern Country, California, found that the main factors of immunisation disobedience are ill condition, postponement, and a lack of access to information and services. Several other factors related to lack of compliance are demographic

characteristics such as the mother's age, race, income, education, and also the father's education level. Information on the purpose of immunisation for parents from health workers is also considered to be significant in increasing compliance with immunisation.

An analysis study by Waluyanti (2009) in Depok City that aimed to learn the causes and analysis factors influencing the low coverage rate of complete immunisation for infants that led to vulnerability from PD3I diseases found that health insurance and the response towards immunisation has a meaningful relationship with compliance with immunisation.

2.3 The Interaction Model of Client Health Behaviour/IMCHB

The theories used to understand, predict, and improve the level of compliance are among other's theory of Health belief model, the theory of Planned Behaviour, and the Transtheoretical Model. Pender (2004) stated that there is a model theory, namely The Interaction Model of Client Health Behaviour/IMCHB proposed by Cox (1984).

Health behaviour can be predicted more easily by understanding the client's social-economic status, the influence of social or community values on the patient's health, as well as finance and health accessibility. The background variables are considered relatively static ones both in terms of influence and influencing dynamic variables. Dynamic variables tend to be more active than the background variables that include intrinsic motivation, cognitive assessment, and affectionate response. The interaction between the client and health workers involves four factors, namely information, affectionate support, control of decision, and skill.

3 METHOD

This is a cross-sectional design research. The population were all mothers with children in the susceptible age range of 12-24 months in Bangkalan District, while the research subject were mothers registered in UCI and non-UCI Health Centres.

The sampling technique used was Multi-stage Sampling where Stage 1: Selecting Health Centres (8 UCI Health Centres and 4 non-UCI Health Centres); Stage 2: Categorising Health Centres into 3 village groups with 3 categories of UCI coverage namely A (Good, 80-100%), B (Fair, 70-79.9%),

and C (Poor, <69.9%); and Stage 3: Selecting villages through Stage 2 that resulted to 36 villages from 12 Health Centres with 10 respondents each Centre, which made it 360 respondents in total. The respondents were determined by using the Snowball technique and the data analysis used univariate, bivariate, and multivariate analyses.

The influence of the various variables on the mother's compliance with complete child immunisation was identified through Path Analysis, which was executed after each variable was analysed by using a computerised program.

4 RESULT AND DISCUSSION

The data results of all 360 respondents show that 351 of them (97.5%) take their child for immunisation and 9 of them (2.5%) do not take their child for immunisation. The coverage of Child Immunisation based on the type of vaccine implemented on schedule is: BCG at 53%, Hepatitis B0 at 49.6%, Hepatitis B1 at 63.0%, Hepatitis B2 at 47.6%, and Hepatitis B3 amounts to 54.1%. Meanwhile, coverage of DPT1 is at 49.3%, DPT2 at 58.1%, DPT3 at 47.0% and Measles amounts to 51.3%. Polio1's coverage amounts to 66.4%, Polio2 at 47.3%, Polio3 at 63.0% and Polio4 is at 56.4%.

Approximately 37.3% of infants have been given complete immunisation per vaccine type (antigen) on schedule (compliant). The coverage of complete immunisation given to infants off schedule or incomplete immunisation amounts to 62.7%. The result of immunisation completeness in accordance with the schedule is basic for the mother's compliance level in taking their child for immunisation.

4.1 Mother's Characteristics

The mother's individual aspects being studied in this paper include motivation, knowledge on immunisation, and response towards the immunisation knowledge. The result shows that the mother's motivation to take their child for immunisation is derived from the self-factor (intrinsic) at 52% and non-self-factor (extrinsic) at 48%. Extrinsic factors included as the source of the mother's motivation are family, neighbour, health worker, and health cadre. The mother's self-motivation becomes the determinant factor for them to take their child for immunisation.

The result of the mother's characteristics is based on aspects of knowledge and responses as shown in Table 2.

Table 2: Distribution of the Mother's Characteristics Based on Knowledge and Response Category

Mother's Characteristics	Category				Total
	Poor	Inadequate	Fair	Good	
	(%)	(%)	(%)	(%)	(%)
Mother's Knowledge	7.9	65.2	21.0	5.9	100
Mother's Response	23.2	33.3	25.0	18.5	100

The mother's knowledge on immunisation and its schedule, as the result shows, shows that 65% of mothers are in the inadequate category. The mother's insight on immunisation is needed to develop their willingness to take their child for immunisation on time. Inadequate knowledge on the importance of on time immunisation will have an impact on the mother's obedience in relation to taking their child for full immunisation. Octaviani (2015) and Falagas (2008) stated that mother's knowledge have significant influence on mother's compliance to take their children for immunization.

The mother's responses towards their insights determine how much they comply with the obligation to give full immunisation to their child. Good response is when mothers take their child for immunisation in accordance with the schedule. The study result shows that among the mothers taking their child for immunisation, 33% of them shows

negative response. These negative responses cause the off-schedule implementation of immunisation.

4.2 Community Support

The role of the community in successfully implementing immunisation is in their support of mothers taking their children for immunisation on time. Elements of community that supports the mother's compliance includes public figure, neighbours, health cadre, as well as local religious figures as the connector or due to the affirmation of information on the importance of immunisation.

Community support based on the mother's compliance result shows that most mothers (49%) do not have sufficient community support. Approximately 4.3% of mothers receive good community support, 41% of them gain fair support, and the other 5.75% have poor support. Inadequate support from the community will encourage the mother's to not taking their child for full and on schedule immunisation. Research showed that support especially from family affected in mother's compliance to take their children for immunization (Octaviani, 2015).

4.3 Health Workers Support

The health worker factor in this study includes affectionate support of health workers, information on health, control of decision, and the health worker's skill. The distribution of the health worker's support based on the category of support is shown in Table 3.

Table 3: Distribution of Health Workers Support Based on Category of Support

Health Workers Support	Category of Support				Total
	Poor	Inadequate	Fair	Good	
	(%)	(%)	(%)	(%)	(%)
Affectionate Support of Health Worker	5.8	22.2	16.8	55.2	100
Information on Health	25.2	34.7	24.5	15.6	100
Control of Decision	38.0	33.9	7.9	20.2	100
Health Workers' Skill	5.6	15.9	36.7	41.8	100

The result shows that 55.2% of health workers have been given affectionate support for mothers to take their child for immunisation properly. Support from health workers is able to give comfort to mothers in taking their child for immunisation. The support could be in a form of care and suggestions that boosts the mother's trust in the health workers.

Effective support can also convince mothers that immunisation for their child is important.

Inadequate information about health becomes the most determining factor (34.7%) of the mother's compliance with child immunisation. This result consistent with research by Goodman & Frerichs (2000) which stated that lack of access to

information affected the mother’s compliance of immunization. The availability of health information is significant in giving more insights and reinforcing the mother’s adherence to full child immunisation. Health workers who actively share information to mothers could be working as a reminder for mothers on the importance of on time and full immunisation.

Poor control of decision from the health workers (at 38%) indicates that the lack of health worker’s role in persuading mothers to take proper action and reducing their anxiety about child immunisation. Health workers could have control over the mothers’ decision to have child immunisation. The mother’s decision in taking immunisation for their child determines their adherence to full and on time immunisation.

The standard of competence for health workers is closely related to their skill in their service and practices. Health workers with good skill can give mothers a secure feeling and trust in taking their child for immunisation, particularly related to after-immunisation effects. The study result shows that the health workers’ skill is categorised as good at approximately 41.8%.

4.4 Health Services

The health service facility has a significant role in child immunisation implementation. Various kinds of health service available in the residential area are options for having immunisation arranged. The choice of immunisation venue is also related to stronger community support. Table 4 shows the choices of health service venue available based on community support.

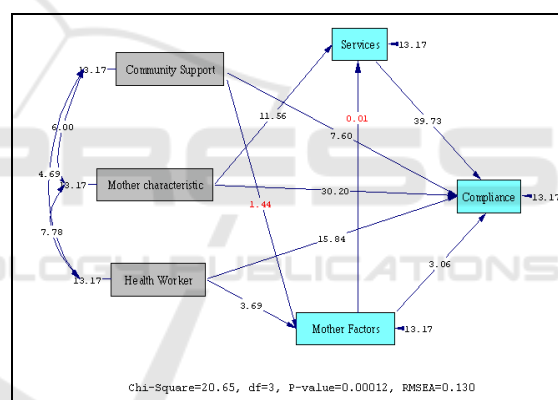
Table 4: Distribution of Health Service Venue

Venue of Health Service	Total	
	n	%
Regional Hospital	16	4.5
Health Center	88	25.0
Village Health Clinic/Branch Health Center (<i>Polindes/ Pustu</i>)	25	7.1
Integrated Health Service (<i>Posyandu</i>)	17	4.8
Private Hospital	26	7.4
Health Clinic	23	6.5
Private Doctor Practice	20	5.6
Private Midwife Practice	136	38.7
Total	351	100

The most utilised health service facility is the private midwife practice at approximately 38.7%. The choice of venue for immunisation arrangements was most likely related to the location of childbirth. The more flexible open hours of the midwife practice might probably be the reason of mothers’ choice for immunisation venue.

4.5 Analysis

The various factors of the mother’s compliance with full and on time child immunisation has been further analysed to learn the influence of each factor. The analysis was conducted by using Path Analysis to learn the cause-effect relationship or the direct/indirect effects of the factors. Factors of the mother’s characteristics, community support, and health workers are analysed with the mother’s compliance, mother’s factors or the health service factor. The analysis result of each factor is shown in Figure 1.



Community support, the mother’s characteristics, and health workers are independent variables while services, compliance, and mother factor are the dependent variables. The calculation of the relationship between the factors uses computerised calculations. The red numbers show that the variables do not have a correlation or relationship.

On the analysis of community support on compliance and the mother factor, the assessment result shows that the aforementioned does not influence the mother factor (motivation, knowledge, and response) as it is shown by the low number (1.44) while community support does influence the compliance variable (7.60). The mother factor shows a low score (0.01) in the services factor, thus the mother factor does not correlate with services.

Factors that have a relationship or that correlate to each other include: community support with service and compliance, health worker with compliance and the mother factor, as well as the services factor with compliance.

In light of the relationship between the independent and dependent variables, further analysis is needed to learn if there is effect and whether it is direct or indirect, which can be seen in Figure 2.

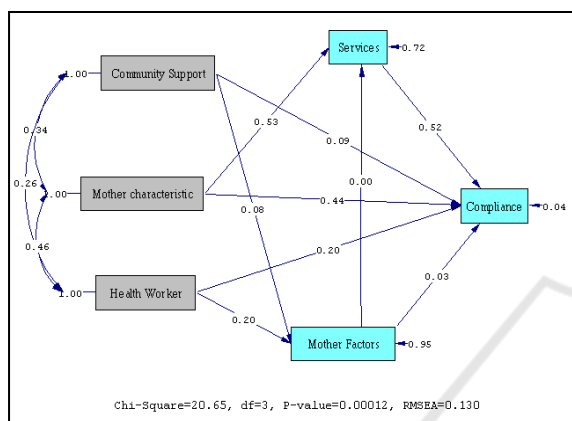


Figure 2: Direct and Indirect Effect

The total of effect influencing the dependent variables is determined by adding up the direct and indirect effect. Direct effect is a variable that directly influences the variable of compliance. Indirect effect is a variable that indirectly influences the compliance variable.

Variable of community support influences variable of compliance with immunisation with a total of 0.09 effect composed only by direct effect. Variable of mother's characteristics has a total of 0.72 effect (0.28 of indirect effect and 0.44 of direct effect).

Variable of health worker has an influence on the variable of compliance in a total of 0.20 (0.006 of indirect effect and 0.2 of indirect effect). The services variable influences compliance at a total of 0.52 entirely from direct effect. The mother factor variable has a total of 0.03 effect on compliance, all coming from direct effect.

In accordance with the scores of the 5 indicators of Good Fit Index (P-value Chi Square, P-value RMSEA, RMSEA, GFI, NFI), 4 out of 5 indicators (except P-Value Chi Square), it shows that the effect assessment result using Path Analysis has met the requirements, thus this model can be used in predicting compliance with immunisation.

5 CONCLUSIONS

Approximately 37.3% of infants have received complete and on schedule immunisation. The mother's compliance with child immunisation is identified through the use of a Path Analysis model from various variables that include community support, the mother's characteristics, health workers, health services, and the mother factor. There is no relationship between the community support variable and mother factor variable as well as between the mother factor variable and health services.

According to the assessment result, it can be concluded that the variables which have greatest influence on compliance with immunisation is the mother's characteristics variable (0.72) and services variable (0.52). The high score of compliance suggests that the variable of the mother's characteristics and health services directly influences the mother's compliance with full child immunisation. Meanwhile, the variables of community support, health workers, and mother factor have an indirect influence on the mother's compliance with full child immunisation.

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