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著者	MIZUTANI Mayumi, TASHIRO Junko, Nakayama Kazuhiro, MAFTUHAH, SUGIARTO Heri, RIYANTO
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- Original Article -

Identifying important aspects of quality of life among Muslims with hypertension in rural West Java, Indonesia

Mayumi MIZUTANI [1)], Junko TASHIRO [2)], Kazuhiro NAKAYAMA [2)],

MAFTUHAH [3)], Heri SUGIARTO [4)], RIYANTO [4)]

1) Department of Public Health Nursing, Shiga University of Medical Science

2) Graduate School of Nursing Science, St. Luke's International University

3) Syarif Hidayatullah State Islamic University Jakarta, Indonesia

4) Indramayu College of Health Science, Indonesia

Abstract Hypertension almost invariably impacts people's quality of life (QOL). The WHO Quality of Life-BREF instrument (WHOQOL-BREF) is used widely in high-income countries and is comprised of physical, psychological, social and environmental domains. Few studies have measured QOL of people with hypertension in rural areas in low- and middle-income countries, including Indonesia. Our study aims were: 1) to assess whether WHOQOL-BREF is suitable for studying QOL among rural Muslim Indonesians with hypertension, and 2) to describe the characteristics of rural Muslim Indonesians' QOL. In 2014, we conducted a cross-sectional survey of QOL among 447 residents of an economically stressed rural district in West Java. To assess WHOQOL-BREF's goodness of fit, we performed structural equation modeling. We calculated Cronbach's alpha to assess internal consistency reliability. Independent t-tests and one-way ANOVAs were used to compare differences between socio-demographic groups. Participants were mostly women (77%). Mean age was 54 and 24% were widows/widowers. Most (62%) had less than primary level education. Regarding measures of goodness of fit, only root mean square error of approximation reached a marginally acceptable level. Cronbach's alpha for the overall scale was fairly high (0.893). Psychological QOL received the highest mean domain score (13.8). Environmental QOL received the lowest (12.6). The highest mean item score was for mobility. Financial status, access to information, and leisure received the lowest mean item scores. Domain scores differed by socioeconomic status. Low QOL on one or more domains was associated with lower education, being a widow/widower, and living in a remote area. Since the model showed that WHOQOL-BREF did not achieve desired levels on two of three goodness-of-fit indexes, other aspects of the participants' QOL may have gone unmeasured. When providing healthcare services to Muslim patients with hypertension in rural Indonesia, planners and providers should attend to aspects of QOL identified in this study.

Keywords: Hypertension, Indonesia, quality of life, rural health, socioeconomic factors

Introduction

Hypertension is one of the leading causes of the global burden of disease [1] and one of the main risk factors for cardiovascular diseases. The large majority of hypertension cases (85%) occur in low- and middle-income countries (LMICs) including in Indonesia [2]. In contrast with global trends showing gradual decreases in mean systolic blood pressure, in Southeast Asia, including Indonesia, the trend has been the opposite [3,4]. Prevention of hypertension requires continuous and lifelong efforts. Yet, in some populations in LMICs blood pressure control remains poor.

WHO defines Quality of life (QOL) as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a

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Correspondence: Mayumi Mizutani, Department of Public Health Nursing, Shiga University of Medical Science
mayumi@belle.shiga-med.ac.jp

broad ranging concept affected in a complex way by the person's physical health, psychological state, personal beliefs, social relationships and their relationship to salient features of their environment." [5]. The impact of chronic noncommunicable diseases on QOL can be substantial. A systematic review concluded that hypertension can impair individuals' QOL [6]. Assessment of QOL has been recognized as being a useful part of assessing people's overall health status regardless of whatever health problems they may face. In public health, QOL is an important indicator for planning and evaluating health programs [7].

The World Health Organization Quality of Life Instrument (WHOQOL-BREF) is a short version (26-item) of the WHOQOL-100 instrument. WHOQOL-BREF consists of 4 domains (24 items measuring physical, psychological, social and environmental aspects of QOL), overall QOL (1 item) and general health (1 item). WHOQOL-BREF was developed and tested to measure QOL in people with various health conditions in 23 countries spanning diverse cultures [8]. Studies using WHOQOL-BREF have been done throughout the world, revealing characteristics and differences in QOL by age, gender, marital status, educational attainment, social relations, adherence to treatment and physical activity [9-13]. Few studies have explored QOL in rural areas in LMICs, including in rural Indonesia.

To begin to address this gap in knowledge, our study aims were: 1) to assess whether the WHOQOL-BREF 4-domain model is suitable for studying QOL among rural Indonesians with hypertension, and 2) to describe the characteristics of rural Indonesians' QOL. Findings from this study may help to form a basis for understanding rural Indonesian's values in life so that health professionals can develop and implement more effective community health programs.

Methods

1. Design

The study design was a cross-sectional survey.

2. Setting and participants

In West Java, Indonesia, we selected an economically stressed rural district as the setting for conducting this study. The district's average gross domestic product per capita per year was 31,320,523 Indonesian rupiah (about USD 2,788) [14,15], which was 24% lower than the national average (USD 3,688 in 2012) [16]. Adult literacy rates in the district were males 89%, females 71% compared to nationally males 97%, females 94% [15,17]. About 99% of the population in this district are Muslim [18].

Within the district, we divided 49 *puskesmas* (community health centers) into four strata based on the population density of the sub-districts (high: ≥1,000 people/km^2 or low: <1,000 people/km^2) and geographic area (coastal or remote inland). Using stratified random purposeful sampling, four *puskesmas* were selected from a list of 49 *puskesmas* in the district. From each stratum, three *puskesmas* were then selected using simple random sampling, and then one was selected through purposive sampling to ensure that the area would be safe for the researchers and research assistants. Finally, nurses in each *puskesmas* recruited middle-aged residents of the district from the four *puskesmas* to be participants applying the following inclusion criteria: 1) aged 40–64 years, 2) had hypertension, 3) Muslim, 4) able to communicate, 5) not pregnant, and 6) willing to participate. Using this procedure, a sample of 450 was generated. This sample size is adequate for structural equation modeling because it fulfills the required minimum sample size of 10 sample units per anticipated parameter [19].

3. Ethical considerations

The Research Ethics Committee of St. Luke's International University reviewed and approved the study protocol (No. 14-029). Permission to conduct the study was obtained from the *Dinas Kesehatan Kabupaten* (i.e., the District Health Office) and the *Badan Kesatuan Bangsa, Politik dan Perlindungan Masyarakat* (the Agency for National Unity, Politics, and Community Protection). Participants were informed of the study aims and methods, and they were assured that their participation would be voluntary and every effort would be made to protect their privacy. Written informed consent was obtained from all participants.

4. Study instruments

We developed and pilot tested a questionnaire written in Indonesian to measure participants' socio-demographic characteristics. Characteristics were measured using single items and included gender, age, educational attainment, monthly family income, marital status, residential area, current systolic blood pressure, duration of hypertension history, and possession of health insurance (i.e., payment of medical fees). WHOQOL-BREF (Indonesian version) [20] was used to measure QOL. The WHOQOL-BREF questionnaire is widely used in many countries and its reliability and validity have been established [20,21].

5. Data collection

All data were collected in September 2014 through face-to-face interviews at each participant's location of choice, typically at their home. The Indonesian members of our

research team recommended conducting face-to-face questionnaire interviews because of the low literacy rates in the district and generally low level of education in the population [22]. Research assistants who were nursing or public health students in bachelor's degree programs in the district conducted all of the interviews. The researchers trained the research assistants for two days on the study aims, protocol, and ethical considerations, as well as personal safety prior to entering the field.

6. Data analysis

We analyzed the data using SPSS Statistics v. 23.0. Structural equation modeling was used to assess the model goodness of fit indices for the WHO-BREF instrument. Acceptable model fit indices are as follows: goodness-of-fit index (GFI) > 0.90, comparative fit index (CFI) > 0.90, and root mean square error of approximation (RMSEA) < 0.08 [23]. Mediocre level of model fit index for RMSEA is 0.08-0.10 [24]. Acceptable internal consistency reliability for Cronbach's alpha is commonly set at a lower limit of ≥ 0.70. For exploratory studies such as this one, the marginally acceptable lower level is set at ≥ 0.60 [23]. Descriptive statistics were used to calculate each item score. Each domain score was calculated using WHO's recommended formula [21,25]. In addition, the overall WHOQOL-BREF scores was calculated by multiplying each average score by 4. Independent t-tests and one-way ANOVAs were used to compare mean scores among socioeconomic groups.

Results

1. Sample characteristics

Of the 450 people contacted, 100% agreed to participate in the study. Based on Hair et al.'s advice [23], we excluded three participants with >10% missing data from analysis. The percentage of variables with missing data for the remaining 447 participants was less than 3.8%. All missing values were filled in with the average item score for the variable.

The mean age was 54.1 years (SD = 7.2 years). The majority of participants were female (77.2%), 24% were widows/widowers and 62.0% had not completed primary school. Many of participants (44.3%) were farmers. Only 2% of our sample had national health insurance. The mean systolic blood pressure was 169.3 mmHg (SD = 19.5 mmHg), and the mean duration of hypertension was 2.5 years (SD = 3.5 years).

2. Model fit

The results of structural equation modeling (Figure 1) revealed that the model GFI of 0.804 and CFI of 0.738 did not meet the minimum criteria of acceptability. Only the RMSEA of 0.096 reached a marginally acceptable level.

3. Internal consistency reliability

Cronbach's alpha (Table 1) was acceptable (≥ 0.70) for the psychological and environmental domains, marginal for social and physical domain. Cronbach's alpha for the overall scale was fairly high (0.893) indicating that nearly all of the 26 items contributed to the variance in the data generated using the WHOQOL-BREF.

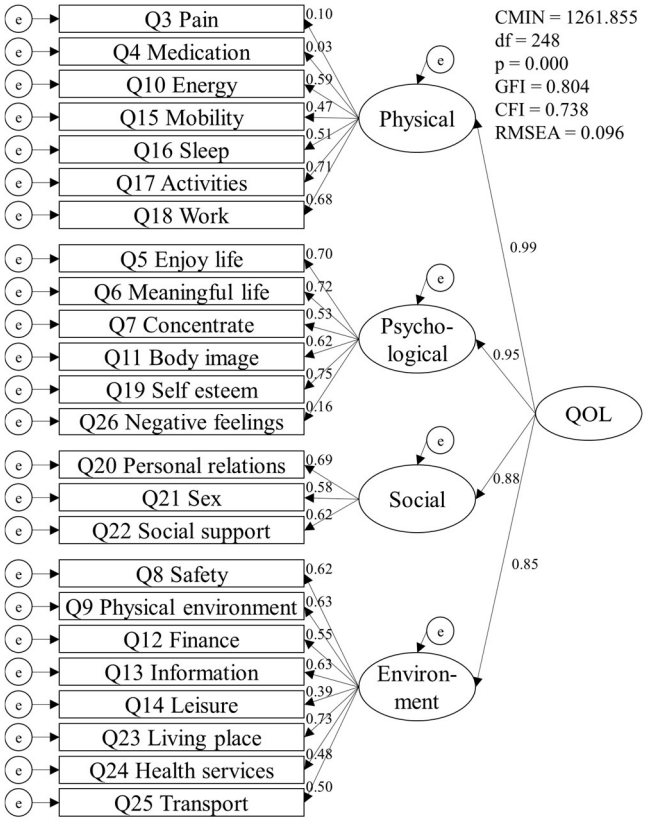

Figure 1. Structural equation modeling of 4-domain model

Table 1. Internal consistency reliability for domains (N=447)

Domains	Cronbach's α
1. Physical (7 items)	0.61
2. Psychological (6 items)	0.71
3. Social (3 items)	0.65
4. Environment (8 items)	0.78
Overall	**0.89**

4. Frequency of responses and means for items and domains

Results from descriptive statistics (Table 2) show that the mean domain score for the psychological domain was the highest (13.8) while the mean domain score for the environmental domain was the lowest (12.6). Among the 26

items, item scores for mobility (physical domain) were the highest on average (3.8). The lowest item scores were for leisure (2.5), finance (2.9), and access to information (3.0).

5. Comparison of the mean domain and overall scores by socioeconomic status

The mean domain scores differed by socioeconomic status (Table 3). People with lower education had lower psychological, social, and environmental QOL. Those who were widows/widowers had lower psychological and social QOL than those living with a spouse. Regarding geographic area, those living in low-density inland areas (i.e., rural, far from the district's capital city) had lower social QOL compared to those in other groups. In terms of possession of health insurance, the few participants who had national health insurance had higher environmental QOL than participants who received governmental assistance.

Discussion

This study is the first to investigate QOL in a rural district in Indonesia and among the first to study QOL in LMICs. Our study shows that the model did not reach a desirable level of fit based on the data we collected. Of the three model fit indices only one reached a marginally acceptable level. This finding is similar to findings in WHO's research which targeted 3,313 sick people from 23 countries (CFI=0.876, RMSEA=0.07) [8] It is also similar to findings from research conducted in Sudan that studied 623 adults in the general population (GFI=0.89, RMSEA=0.063) [26]. Our findings about model fit suggest that for low-SES Muslim Indonesians living in rural West Java there may be other important dimensions of QOL that are unmeasured in the WHOQOL-BREF model. For example, all of the participants were quite religious. The Qur'an teaches that God was the one who created people and provided fulfillment of their current and hereafter life [27]. For many Indonesians, spirituality is a significant part of fulfillment. Thus, it is important to consider this population's religious convictions and experiences when measuring QOL as is done in the WHO-SRPB questionnaire [28]. Additionally, our findings suggest that other nonmaterial aspects of their lives may have not have been measured using WHOQOL-BREF. Further research is needed to identify aspects of QOL for people with hypertension in rural Indonesia that are not measured in WHOQOL-BREF.

Our study found that for Indonesians with hypertension living in rural West Java, QOL was most greatly influenced by mobility, a feature of the physical domain. For our sample of participants with hypertension, the mean score for QOL in the physical domain was higher than for sick people in WHO's international field trial [8]. This is likely because we recruited participants who had access to community health centers. Although our participants had hypertension, they maintained enough physical function to be able to get around in the district. Thus, their physical QOL, especially regarding mobility, was high. Since several other studies concluded that hypertension can reduce QOL [6,29], physical QOL may decline if the participants' hypertension becomes more severe and they experience impaired physical function due to complications like stroke. Since the number of physical therapists (2.3 per 100,000 population) is much fewer than that of nurses (114.8 per 100,000 population) or midwives (63.2 per 100,000 population)[30], it is important for nurses to provide preventative and rehabilitative health care services in the community in collaboration with physical therapist to help maintain hypertensive patients' physical QOL.

The participants' environmental QOL was the lowest among the four domains, and it was lower than among sick people in WHO's international field trial [8]. Leisure and financial status were particularly low. In 2014, Indonesia started a new national health insurance system, but the coverage rate was still low. Nearly all of the participants paid out-of-pocket for medical services and this presented a significant risk for most and a burdensome expense for some. The leisure and financial aspects of most participants' QOL were the lowest because of the constraining economic conditions throughout the district and the difficulty most participants faced trying to earn a living. Few participants had extra time and money to enjoy leisure activities. Currently, the Indonesian government is struggling to achieve universal health coverage by 2019 [31]. It is important to achieve universal health coverage so that people in rural areas can have access to health care services without experiencing a financial burden and so they have more disposable income for leisure.

The scores for informational QOL were also low. Most of the participants had little or no primary education. Our finding that those with the lowest level of formal education had the lowest QOL in all four domains is consistent with other research [9,32]. Thus, it is imperative that people with hypertension receive appropriate health information regarding lifestyle and self-care to control their condition, to prevent complications, and to maintain their QOL. Other research has shown that treatment adherence can have a positive impact on QOL [33] and a controlled trial demonstrated that physical activity can have a positive influence on QOL [10]. Our study suggests that further research is needed to determine how to provide culturally and linguistically appropriate hypertension education for

people with low educational levels in rural Indonesia.

Our finding showing the social and psychological importance of living with a spouse to QOL is also consistent with previous research [12]. Additionally, as other studies have shown [34,35], living in remote low-density rural areas seems to result in a lower social QOL. Our study suggests that participants living in remote areas who have strong ties within their community may have had beliefs and behaviors that were strongly influenced by community norms. Thus, those with hypertension who have fewer social relationships may need to be given extra attention when providing community-based health programs to maintain and improve QOL. Outreach services provided at each village by nurses or midwives may be useful to empower the community-based health programs.

One limitation of this study is that a sizable majority of our participants were women. Thus, our findings may not fully describe the condition of men. Another limitation is that because the model fit did not reach a desired level, our description of factors influencing QOL in this population is incomplete.

In terms of implications for policy, practice and clinical care, when providing community healthcare services to people with hypertension in rural Indonesia, planners and caregivers should be attentive about patients' mobility, quality of spousal relationships, environmental conditions, financial circumstances, health insurance status, and opportunities for leisure to ensure that patients can achieve the highest possible quality of life.

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Table 2. Frequency responses and means for items, domains and overall (n = 447)

Domains and items	Frequency responses (%)						Mean	SD
	1 Poor	2	3	4	5 Good	Missing value		
Q1 General QOL	1.1	12.5	52.1	28.0	6.3	0	3.3	0.8
Q2 General health	0.4	17.7	40.7	35.3	5.8	0	3.3	0.8
1. Physical							**13.6**	**1.7**
Q3 Pain	0.4	19.2	44.3	29.5	5.6	0.9	3.2	0.8
Q4 Medication	0.2	11.9	43.8	32.0	11.0	1.1	3.4	0.8
Q10 Energy	3.4	13.9	52.8	23.0	6.9	0	3.2	0.9
Q15 Mobility	0.9	2.2	26.6	54.1	15.4	0.7	3.8	0.8
Q16 Sleep	0.4	12.3	27.3	53.7	6.3	0	3.5	0.8
Q17 Activities	0	7.8	52.3	37.4	2.5	0	3.3	0.7
Q18 Work	1.6	9.4	48.5	37.6	2.7	0.2	3.3	0.7
2. Psychological							**13.8**	**2.1**
Q5 Enjoy life	0.9	8.7	46.8	38.3	5.4	0	3.4	0.8
Q6 Meaningful life	0.7	8.9	40.7	41.8	7.6	0.2	3.5	0.8
Q7 Concentrate	0.7	13.0	47.4	34.7	3.4	0.9	3.3	0.8
Q11 Body image	0.9	7.4	50.8	30.4	10.3	0.2	3.4	0.8
Q19 Self esteem	0.4	4.7	43.6	43.2	7.6	0.4	3.5	0.7
Q26 Negative feelings	4.0	10.1	22.8	38.3	24.6	0.2	3.7	1.1
3. Social							**13.5**	**2.3**
Q20 Personal relations	0.4	3.6	42.5	49.2	4.3	0	3.5	0.7
Q21 Sex	4.9	10.7	48.5	33.6	1.8	0.4	3.2	0.8
Q22 Social support	1.1	5.8	49.4	39.8	3.8	0	3.4	0.7
4. Environment							**12.6**	**2.0**
Q8 Safety	0.2	5.4	43.6	47.2	3.6	0	3.5	0.7
Q9 Physical environment	0.4	6.5	48.1	41.8	3.1	0	3.4	0.7
Q12 Finance	6.0	21.5	51.0	18.6	2.7	0.2	2.9	0.9
Q13 Information	1.3	25.1	51.9	19.9	1.8	0	3.0	0.8
Q14 Leisure	19.2	28.0	39.6	12.3	0.9	0	2.5	1.0
Q23 Living place	0.7	7.8	41.8	45.2	4.5	0	3.5	0.7
Q24 Health services	0.7	10.1	43.2	41.4	4.7	0	3.4	0.8
Q25 Transport	2.0	16.3	51.2	24.8	5.6	0	3.2	0.8
Overall							**13.3**	**1.7**

Table 3. Comparison of the mean domain and overall scores by socioeconomic status (n = 447)

			Physical		Psychological		Social		Environment		Overall	
	n	%	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Gender												
Female	345	77.2	13.5	1.8	13.8	2.1	13.4	2.2	12.6	2.0	13.2	1.6
Male	102	22.8	14.0	1.6	14.1	2.1	13.8	2.3	12.7	2.0	13.5	1.6
p-value [a]			0.009		0.157		0.088		0.809		0.171	
Age (years)												
40-49	117	26.2	13.7	1.8	13.9	2.0	13.7	1.8	12.8	1.8	13.4	1.6
50-59	183	40.9	13.5	1.7	14.0	2.1	13.6	2.3	12.6	2.0	13.3	1.6
60-64	142	31.8	13.6	1.7	13.7	2.2	13.1	2.5	12.5	2.1	13.2	1.8
p-value [b]			0.716		0.463		0.118		0.300		0.477	
Education [d]												
< PS	277	62.0	13.4	1.8	13.5	2.2	13.2	2.2	12.3	2.1	13.0	1.7
PS	99	22.1	13.9	1.6	14.2	1.9	13.8	2.1	12.9	1.7	13.6	1.5
JHS	43	9.6	13.8	1.4	14.6	1.6	14.0	1.9	13.1	1.7	13.7	1.3
HS	24	5.4	14.0	1.7	15.0	2.0	14.7	2.2	13.6	1.8	14.2	1.6
> Diploma	2	0.4	15.4	0.8	14.3	0.5	16.0	0.0	14.0	0.0	14.6	0.2
p-value [b]			0.024		0.000		0.000		0.003		0.000	
Monthly income												
< 1 million rupiah	327	73.2	13.6	1.8	13.8	2.1	13.5	2.3	12.6	2.0	13.3	1.7
< 2 million rupiah	94	21.0	13.4	1.6	13.8	2.1	13.3	2.2	12.4	2.0	13.2	1.6
< 3 million rupiah	16	3.6	13.5	1.7	14.2	2.2	13.8	2.7	13.0	2.3	13.4	1.9
>= 3 million rupiah	6	1.3	13.7	1.5	14.6	0.8	13.3	3.0	13.3	1.3	13.7	0.6
p-value [b]			0.838		0.729		0.819		0.530		0.727	
Spouse												
The same place	323	72.3	13.6	1.8	14.0	2.0	13.8	2.0	12.7	1.9	13.4	1.6
Different place	10	2.2	14.2	1.6	13.9 [c]	2.0	14.1 [c]	2.1	14.0 [c]	2.2	14.0 [c]	1.7
Passed away	105	23.5	13.4	1.7	13.3	2.2	12.4	2.6	12.2	2.3	12.9	1.8
Divorced	9	2.0	14.1	1.2	14.6	2.5	13.1	1.6	13.1	1.4	13.7	1.3
p-value [b]			0.315		0.030		0.000		0.022		0.028	
Residential area												
High-density coast	120	26.8	13.9	1.6	14.1	1.8	14.0	2.0	13.5	1.8	13.8	1.5
High-density inland	118	26.4	13.3	1.4	13.8	2.0	13.6 [c]	2.3	12.2 [c]	1.8	13.1 [c]	1.5
Low-density coast	90	20.1	13.6	1.6	13.9	2.0	13.8	1.8	12.5	1.8	13.3	1.5
Low-density inland	119	26.6	13.6	2.2	13.6	2.5	12.5	2.5	12.2	2.2	13.0	1.9
p-value [b]			0.080		0.339		0.000		0.000		0.000	
Health insurance [e]												
By oneself	182	40.7	13.5	1.8	13.8	2.2	13.5	2.0	12.8	2.0	13.4	1.7
Jamkesmas	149	33.3	13.7	1.7	13.7	2.0	13.2	2.4	12.4	2.0	13.2	1.6
BOK	100	22.4	13.3	1.6	13.9	2.1	13.6	2.3	12.3 [c]	1.7	13.2	1.6
JKN/BPJS	10	2.2	14.7	1.7	15.3	2.4	14.9	2.9	14.2	3.0	14.7	2.2
Askes/Jamsostek	5	1.1	13.5	1.0	13.3	1.2	13.6	1.7	12.9	1.5	13.2	1.2
p-value [b]			0.114		0.204		0.167		0.020		0.061	

[a] Independent t-test, [b] One-way ANOVA, [C] $p<0.05$ by post-hoc Tukey HSD test, [d] < P/S: Did not complete primary school, P/S: Completed primary school, JHS: Completed junior high school, HS: Completed high school, > Diploma: Holds a diploma/bachelor's degree, [e] Jamkesmas: community health insurance for the poor, BOK: government subsidization for the poor, JKN/BPJS: national health insurance, Askes: government health insurance, Jamsostek: company health insurance