



■ Original Article

"GENOGRAM Physician Involvement Model" New Approach for Indonesian Physician Involvement with Family

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Background: The family, as the smallest social institution, has responsibilities across many functions, including maintaining family health. Increases in chronic diseases and life expectancy require more family support to prevent disease and implement treatment for family members with chronic diseases. Therefore, physician involvement in not only the treatment of diseases but also their prevention and rehabilitation is required in Indonesia. Hence, a new approach for physician involvement with families is required, especially with regard to comprehensiveness. This study aimed to develop a physician involvement program with the family model for primary health-care in Indonesia.

Methods: A two-round Delphi method with family medicine experts from 17 of the highest accredited medical faculties in Indonesia as participants was conducted, and factor analysis performed thereafter. The items were considered relevant at ≤ 0.8 validity content ratio. The second step of this research is survey using e-questionnaire involving 101 primary care physician from all over Indonesia. They live scattered in several provinces in the main islands of Indonesia such as Sumatra, Java, Kalimantan, Sulawesi and Bali.

Results: Results showed an adequately measured sample and correlation for all items (Kaiser-Meyer-Olkin of sampling = 0.821; Bartlett's test < 0.001). Seven dimensions were derived from results with eigenvalue of > 1 , and 25 items were filtered after determining the loading factor of > 0.5 . The Cronbach's α for each factor varied from 0.602 to 0.829, and that for the total 25 items was 0.913, with a total variation documented as high as 66%.

Conclusion: A new physician involvement model with the family approach model, known as the "GENOGRAM model," was developed, which consisted of seven dimensions and 25 items.

Keywords: Family Practice; Physician; Family; Comprehensive Care; GENOGRAM Model

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INTRODUCTION

Family medicine is the medical specialty that provides continuing and comprehensive healthcare for a patient and their family.¹⁾ Family is a tremendous resource in patients' welfare.²⁾ Physicians need the patient's family as partners in maintaining family health and vice versa. Physician involvement with the family was expressed by Doherty and Bairds,³⁾ as consisting of five levels. The level of family involvement (LFI) of family physicians is assessed as doctors' involvement with families.²⁾ According to Takenaka et al.,⁴⁾ in the LFI context, level 3 should not be assumed to be necessarily inferior to level 5. For this reason, the term "phase" rather than "level" more appropriately describes this type of approach.⁴⁾

Physician involvement with the family does not only involve its levels, where level 2 is higher than level 1, or level 4 is higher than level 3, and so on, but should also include the aspect of intervention. The comprehensive care aspect can also indicate a physician's level of involvement with a family. Additionally, in a primary care setting, more activity details are required to indicate physician involvement with the family, in particular, information that encompasses more than details on global involvement levels. To address this requirement, this study aimed to develop a new approach for physician involvement with the family, particularly with regard to Indonesian family physicians implementing family-oriented primary care.

METHODS

A two-round Delphi method was conducted to investigate physician involvement with the family.^{5,6)} Before the first round, a desk research and focus group discussion was conducted with primary care physicians, resulting in the first draft of the first Delphi round, which comprised 31 items of family physician activities assessed by experts and four items added by another expert. These additional four items were visiting the patient's home (home visit) (item no. 28); assessing family coping (item no. 29); assessing the impact of the patient's illness on the family (item no. 30); and conducting family counselling to resolve problems due to the patient's illness (item no. 31). A content validity ratio (CVR) analysis was performed on these 31 items, resulting in the items having a CVR of ≥ 0.8 .⁷⁾ In the second Delphi round, the 31 items

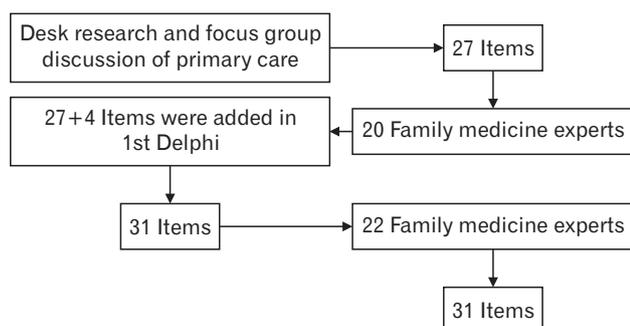


Figure 1. Item validation through the Delphi method by the family medicine experts.

with a CVR of ≥ 0.8 were included as part of the instrument validation using factor analysis. The item validation process through the Delphi method by the family medicine experts is presented more clearly in Figure 1. Participants of both the first and second Delphi rounds were family medicine experts from 17 of the highest accredited medical faculties throughout Indonesia, across the Sumatra, Java, Sulawesi, and Bali islands. Item correlation and dimension reduction were defined through exploratory factor analysis, through both eigenvalue of >1 and scree plot.⁸⁾ The total variation of physician involvement with the family score can be explained through the number of formed dimensions, expected to be ≥ 0.6 . After establishing the number of dimensions, the loading factor was determined as 0.5.⁹⁾ Then, items that were fixed as final items were those that had inter-item correlations of 0.3–0.9, with a minimum 0.4 correlation toward the dimension and Cronbach's α of 0.6 for each dimension.⁹⁾ A total of 101 primary care physicians participated by completing the draft for the physician involvement with the family model, considering the 31 items that had been developed from the Delphi method.

Ethical approval number is 846/UN26.8/DL/2018 provided by Health Research Ethical Commission Faculty of Medicine University of Lampung. Informed consent was obtained from all individual participants included in the study.

RESULTS

The physician involvement with the family "GENOGRAM" model was developed from references and physician clinical practice experience, and then strengthened by family medicine experts from 17 of the highest accredited medical faculties in Indonesia. Primary care physicians throughout Indonesia and members of professional organizations were involved in the item factor analysis. This method was followed to ensure conformity between the items and actual conditions of the In-

Table 1. Participant characteristics in the Delphi method and factor analysis

Characteristic	1st Delphi (N=20)	2nd Delphi (N=22)	Physicians in factor analysis (N=101)
Gender			
Male	9 (45)	3 (17)	25 (25)
Female	11 (55)	19 (83)	76 (75)
Education			
MD	0	6 (27)	80 (80)
Master/specialist	10 (50)	12 (55)	19 (19)
PhD/subspecialist	10 (50)	4 (19)	2 (2)
Occupation			
Full-time lecturer	5 (25)	6 (27)	0
Lecturer and practitioner	15 (75)	13 (59)	5 (5)
Full-time practitioner	-	-	96 (97)
Other	-	2 (9)	
Age (y)	45.9	39.3	37.8
Length of professional career (y)	0	10	15
Time as lecturer (y)	24	16	0

Values are presented as number (%) or number.

Indonesian primary health care field. The characteristics of experts and primary care physicians who participated in the Delphi process are presented in Table 1.

The number sufficient to perform the factor analysis (Kaiser-Meyer-Olkin test) was 0.832.¹⁰ The cut-off value was >0.1 for the eigenvalue; reduced dimensions resulted in seven dimensions, and the total variation that can be explained through these seven dimensions was 66%. The loading factor minimum of 0.5 was defined for the items selected.¹¹ The following items were excluded: doctors who consider the patient's family and the patient as a whole (item no. 11); consider family values and preferences in taking medical decisions (item no. 12); overcome the impact of the patient's illness on the family (item no. 17); consider that the patient's daily life may be influenced by circumstances beyond the control of the doctor (item no. 20); assess the family's ability to solve problems (item no. 21); and conduct family counselling to resolve problems due to the patient's illness (item no. 31). The item extraction with factor analysis is presented in Figure 2. The total score variation of physician involvement with the family, as explained through the number of formed dimensions, was 66%, which meets the expectation of ≥ 0.6 . The new dimensions formed and their total variations and indicators are presented in Table 2. After establishing the number of dimensions, the loading factor was determined as 0.5, which also meets the criteria of a loading factor of >0.4.⁹ The final

items enlisted were those with an inter-item correlation of 0.3–0.9, with a minimum 0.4 correlation toward the dimension and Cronbach's α of 0.6 for each dimension (Table 3).⁹

Each of the 25 items selected had a minimum correlation of 0.5 in terms of their dimensions, indicating that each of the 25 selected items were validated to describe their dimension group. A Cronbach's α of >0.6 for each dimension was also obtained, confirming that the dimensions and their items were consistent or stable. The item correlation was 0.368–0.767, demonstrating that the remaining 25 items were valid. The physician involvement with the family GENOGRAM model, consisting of seven dimensions and 25 items, was established to assess physician involvement with the family in Indonesian primary care settings. Each dimension and their items are shown in Table 4.

DISCUSSION

The GENOGRAM model dimensions can be understood as a scope of strategies to engage families in healthcare. They are: family profile; family environment and lifestyle role; home visit; communication; activation and empowerment; and multilevel prevention.¹² These dimensions rarely differed compared with previous studies.^{3,4} The LFI by Doherty and Baird,³ which ranks physician involvement with the family, and the GENOGRAM model explain the required extent of

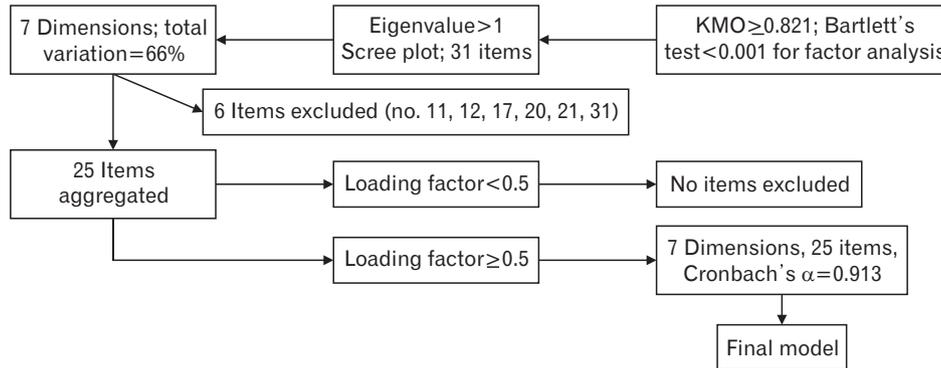


Figure 2. Item extraction with factor analysis. KMO, Kaiser-Meyer-Olkin test.

Table 2. New seven dimensions formed with aggregated items, based on loading factor >0.5, total variations and indicators

Dimensions	Aggregated items	Total variation (%)	Indicators
Family profile	1, 2, 3, 6	5.023	(→ G) indicates identification of demographic data, history of disease in three generations of the family and family function
Environment and lifestyle	4, 5, 13	5.668	(→ EN) indicates identification of health risk factors, including family lifestyle and physical/social environment
Role of family	7, 8, 9, 10, 16	29.870	(→ O) indicates identification and continuing assessment of family role and support for patient, including caregiver
Go to patient's home (home visit)	28	3.762	(→ G) indicates physician performs home visits
Relay (communication)	14, 15, 19	7.991	(→ R) indicates physician communicates the patient's condition to the family, including medical condition, treatment plan, complications and prognosis
Activating and empowering	24, 25, 26, 27, 29, 30	9.359	(→ A) indicate physician performs family activation and empowerment to manage patient problems
Multilevel prevention	18, 22, 23	4.064	(→ M) indicates physician performs comprehensive care defined by five levels of prevention

The items excluded from the final model were items no. 11, 12, 17, 20, 21, and 31.

Table 3. Instrument dimension, item correlation, and loading factor of the physician involvement with the family GENOGRAM model

No.	Factor/dimension	Item indicators and numbers	Item correlation	Loading factor	Cronbach's α
1	Family profile	1: Assess demographic information (name, birth date, occupation, religion, education, etc.) of each family member	0.453	0.731	0.707
		2: Explore history of disease of core family members	0.504	0.636	
		3: Develop family genogram (including 3-generation disease history)	0.523	0.630	
		6: Assess family functions	0.517	0.544	
2	Environment and lifestyle	4: Identify healthy and unhealthy behaviours in family members' lifestyles	0.767	0.807	0.834
		5: Assess the stages of the family lifecycle	0.749	0.748	
		13: Identify potential hazards in the family environment (physical, chemical, biological, psychological, ergonomic)	0.579	0.532	
3	Role of family	7: Assess family support for patient	0.502	0.701	0.827
		8: Identify family members who act as caregivers or key health providers	0.642	0.705	
		9: Appreciate and listen to the caregiver or key health provider's opinions	0.767	0.709	
		16: Continue family assessment	0.678	0.610	
		10: Cooperate with family members to improve the patient's family support	0.547	0.655	
4	Communication	14: Provide the patient's medical information to the family	0.755	0.852	0.816
		15: Explain the prognosis of the patient's illness to the family, including complications	0.726	0.811	
		19: Describe the patient's treatment plan to the family	0.546	0.741	
5	Activating and empowering	24: Initiate family meetings to resolve the patient's health, or that arise because of it	0.511	0.574	0.831
		25: Conduct family counselling to solve the patient's health problems	0.686	0.775	
		26: Increase family skill to manage health problems	0.667	0.718	
		27: Increase family knowledge to manage health problems	0.613	0.747	
		29: Assess family coping	0.578	0.701	
		30: Assess the impact of the patient's illness on the family	0.592	0.591	
6	Multilevel prevention (comprehensive care)	18: Disease prevention via intervention and family wellness plan	0.425	0.667	0.602
		22: Initiate family to curative and disability limitations due to the patient's disease	0.368	0.536	
7	Home visit	23: Initiate family in disease rehabilitation	0.439	0.645	0.913
		28: Visit the patient's home (home visit)	0.547	0.789	

Total Cronbach's α of 25 items=0.913.

physician involvement with patients and their families. LFI ranks involvement from routine consultations with no involvement with the family, to the highest involvement between physicians and families in family therapy. The conception principles of this result are in accordance with the Japanese physician involvement with the family by Takenaka et al.,⁴⁾ which states that physician involvement is determined by condition, and the context of the patient's and the family's health problems.

The scope of physician involvement with a patient's family is included in their dimensions (Table 3). They include various aspects of family life, demographic aspects, functions, healthy and unhealthy behaviors, the physical and social environment, as well as discussing matters related to the family. In the Indonesian setting, all seven dimensions of the GENOGRAM model are in accordance with the Ministry of Health program, "Healthy Indonesia Programme with a Family Approach" (PIS-PK).¹³⁾ The GENOGRAM model and its items could explain how physicians should be involved with the family.

The multilevel prevention dimension in the GENOGRAM model is also in accordance with comprehensive care.^{14,15)} Physicians should work with families not only for curative purposes but also for health promotion, disease prevention, and rehabilitation. In providing comprehensive care, doctors have a number of aspects to consider, such as suggesting changes for a healthy lifestyle, treatment disease, patients

compliance with chronic disease, as also dealing with different cultural backgrounds.¹⁶⁾ Primary care doctors by them selves, face obstacles in changing healthy lifestyles,^{17,18)} so they need family involvement to optimize support. Previous study have shown the involvement of physicians and families for strengthening family role in multilevel prevention, promotive care such as fruit and vegetable consumption,¹⁶⁾ increasing physical activity in children,¹⁷⁾ curative care such as supporting diabetes therapy¹⁹⁾ and palliative care;²⁰⁾ and strengthening the role of the family in multilevel prevention. Examples of curative care are give support for patient withh diabetes or elderly.

The family profile dimension of the GENOGRAM model requires physicians to assess not only the demographic data of the nuclear family but also the history of family illness and family functions, including the social, cultural, economic, educational, and medical functions. Understanding family profiles is a way to understand patients as a part of their families holistically. In addition to risk assessment, family history information can be used to personalize health messages, which are potentially more effective in promoting healthy lifestyles than standardized health messages.²¹⁾ Family characteristics provide some of the most consistent influences on family health. Families represent the first point of contact between children and the world outside their homes. For most, they provide the basic essentials of life and environment that foster early childhood development.²²⁾

Table 4. The GENOGRAM model with all 25 item indicators

Dimension	Item indicator	Scoring based on proportion of total variation
G → Family profile	a. Assess demographic information (name, birth date, occupation, religion, education, etc.) of each family member	1
	b. Explore history of disease of core family members	1
	c. Develop family genogram (including 3-generation disease history)	1
	d. Assess family functions	2
EN → Environment and lifestyle	a. Identify healthy and unhealthy behaviours in family members' lifestyles	2
	b. Assess the stages of the family lifecycle	1
	c. Identify potential hazards in the family environment (physical, chemical, biological, psychological, ergonomic)	2
O → Role of family	a. Assess family support for patients	3
	b. Identify family members who act as caregivers or key health providers	3
	c. Appreciate and listen to the caregiver or key health provider's opinions	3
	d. Continue family assessment	10
	e. Cooperate with family members to improve family support for the patient	10
G → Go to patient's home	a. Visit the patient's home (home visit)	3
R → Relay/communication	a. Provide the patient's medical information to the family	3
	b. Explain the prognosis of the patient's illness to the family, including complications	3
	c. Describe the patient's treatment plan to the family	2
A → Activating and empowering	a. Initiate family meetings to resolve the patient's health problem, or that arise because of it	1
	b. Conduct family counselling to solve the patient's health problems	3
	c. Increase family skill to manage health problems	3
	d. Increase family knowledge to manage health problems	3
	e. Assess family coping	1
	f. Assess the impact of the patient's illness on the family	1
M → Multilevel prevention (comprehensive care)	a. Disease prevention via intervention and family wellness plan	1
	b. Initiate family in an effort to disable limitations due to the patient's illness	1
	c. Initiate family in disease rehabilitation	1
Total score		65

The environment and lifestyle dimension requires physicians to identify health risk factors, including family lifestyle and physical and social environment, which includes holistic care.²³⁾ Families offer early elements of community and provide formative influences on physical development, cognition, knowledge, socialization, attitude, behavior, and beliefs. Aspects of family environment are modifiable as one strategic approach for prevention.²⁴⁾

The role of the family dimension had a one-third total variation, the biggest proportion based on the total variation (Table 2), indicating that the role of family is the most dominant dimension in this model. This dimension requires physicians to assess family support for patients, identify family members as caregivers or key health providers, appreciate and listen to the key health providers, continue family assessment, and cooperate with family members in improving the patient's family support. It must be understood that the item "continue family assessment" plays an important role that contributes and greatly impacts physician involvement with the family. This is in accordance with the concept of continuity of care by Barker et al.,²⁵⁾ where the continuity of care framework is built based on interpersonal, management, longitudinal, and information continuities. This means that the physician-patient relationship is longitudinal; therefore, the physician and the family should meet not only when one person is sick, but the entire family should meet the same physicians to manage their

health problems. This follows an analysis of linked data on primary and secondary care from 230,472 adults aged 62–82 years in 200 general practices in England, which showed that patients who saw the same general practitioner a greater proportion of the time had fewer admissions to hospital for ambulatory care-sensitive conditions.²⁶⁾

The home visit dimension assesses not only the physical environment but also the social and psychological environment and healthy and unhealthy family lifestyles. In this model, the home visit dimension is not associated with a specific purpose but could be affiliated to various purposes. This is indicated through the factor analysis where the home visit dimension is not related to other items, as it does not have an aggregated item (Table 2). Preventive home visits to a healthy elderly person can postpone mortality in a Swedish context, if they are carried out by professional health workers in a structured manner.²⁷⁾ Previous research showed that multidimensional preventive home visit programs might have the potential to reduce mortality, in particular for younger participants, and may improve functional autonomy.²⁸⁾ Primary care physicians in Indonesia conduct home visits for several reasons: completing family profiles, identifying health risk factors for family members, providing home medical measures due to the university or home care, or empowering and activating families as part of a patient's health management. In this dimension, physicians not only engage with families in the treatment of patient illnesses but are also

involved in efforts to promote health, prevent disease, and offer rehabilitation efforts resulting from patients' illnesses.

The relay or communication dimension had almost 8% include "big 3" dimensions after the role of family and family empowerment. The relay dimension requires doctors to communicate with the family on matters related to the patient's disease, with reference to the patient centered communication that includes family and friends to support improvement, families should understand the disease, treatment, complications, and prognosis in order to provide support properly.²⁹⁾

The activating and empowering dimension had an approximately 10% total variation, meaning that this dimension is most predominant in this model after the role of family dimension. Activating and empowering assesses whether physicians initiate family meetings to resolve a patient's health problem, or problems that arise because of the health problem; conduct family counselling to solve the patient's health problems; increase the family's skill to manage the patient's health problems; increase the family's knowledge to manage the patient's health problems; assess family coping; and identify the impact of the patient's illness on the family. Broad evidence from a systematic review of family empowerment on several health problems shows significantly better outcomes from solutions such as fruit and vegetable consumption,¹⁶⁾ increasing physical activity in children¹⁷⁾ supporting diabetes therapy¹⁹⁾ and palliative care.²⁰⁾

This model is the first scope of physician involvement developed in an Indonesian setting. Physicians are required to be more involved with families in the scope of involvement, regarding promotive, preventive, curative, and rehabilitative care in primary healthcare.

In conclusion, the physician involvement with the family GENOGRAM model for Indonesian family physicians in primary care settings was developed in this current study. This model consists of seven dimensions and 25 items, with a total variation score of 66% and Cronbach's α coefficient of 0.913. This is the first time that a GENOGRAM physician involvement model of this nature has been designed in Indonesia.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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