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Research Article

Perceived Family Functionality among Elderly Patient with Covid-19 Infection: A Perspective from Developing Country

Persepsi Fungsionalitas Keluarga pada Pasien Lansia Penyintas COVID-19: Perspektif dari Negara Berkembang

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ABSTRACT

Family is a basic social unit of senior citizen. Relationship among family members considered as source of emotional comfort. Meanwhile, economic, political, and social changes during pandemic has an impact on the family, the support provided can be manifested among vulnerable groups such as the elderly. Prolonged stress due to isolation care of Covid-19 infection increase psychological distress by reducing family support. This study aimed to explore perceived family function among elderly patients after Covid-19 infection. A cross sectional study was conducted among 33 elder patients with history of Covid-19 infection in Saiful Anwar General Hospital, Indonesia. Perceived family functionality was evaluated using APGAR family score. Data was analyzed using descriptive analyses, independent T test, correlation and regression. Mean total APGAR score was 9.610.70 with joint pain had significant association with APGAR score (p 0.021) indicating full family support in elder person with symptoms. Gender female was associated with 'Resolve' (p 0.038) which might correlate with bigger role of elder female in Indonesian family. Length of stay was significantly associated with 'Partnership' (p 0.012) and 'Growth' (0.043) with inverse correlation. It showed how prolonged hospital stay affected family relationship especially in terms of communication. Perceived family supports remained high in elderly during Covid-19 isolation in Indonesia. Specific symptoms such as joint pain, even strengthen the family support for elder member of family. Prolonged stay in the hospital during Covid-19 infection, might become a communication barrier between elder person and the family which affect decision sharing and emotional expression.

Keywords: *APGAR, Covid-19, elderly, family functionality*

ABSTRAK

Keluarga adalah unit sosial dasar warga lanjut usia. Hubungan antar anggota keluarga dianggap sebagai sumber kenyamanan emosional. Sementara itu, perubahan ekonomi, politik, dan sosial selama pandemi berdampak pada keluarga, dukungan yang diberikan dapat diwujudkan di antara kelompok rentan seperti orang tua. Stres berkepanjangan akibat isolasi perawatan infeksi Covid-19 meningkatkan tekanan psikologis dengan mengurangi dukungan keluarga. Penelitian ini bertujuan untuk mengeksplorasi persepsi fungsi keluarga pada pasien lanjut usia pasca infeksi Covid-19. Studi potong lintang dilakukan pada 33 pasien lansia dengan riwayat infeksi Covid-19 di RSU Saiful Anwar, Indonesia. Fungsi keluarga yang dirasakan dievaluasi menggunakan skor keluarga APGAR. Analisis data menggunakan analisis deskriptif, uji T independen, korelasi dan regresi. Rerata skor APGAR total adalah 9,610,70 dengan nyeri sendi memiliki hubungan yang signifikan dengan skor APGAR (p 0,021) menunjukkan dukungan keluarga penuh pada orang tua dengan gejala. Jenis kelamin perempuan dikaitkan dengan 'Keputusan' (p 0,038) yang mungkin berkorelasi dengan peran yang lebih besar dari perempuan tua dalam keluarga Indonesia. Lama tinggal secara signifikan terkait dengan 'Kemitraan' (p 0,012) dan 'Pertumbuhan' (0,043) dengan korelasi terbalik. Hal ini menunjukkan bagaimana lama tinggal di rumah sakit mempengaruhi hubungan keluarga terutama dalam hal komunikasi. Dukungan keluarga yang dirasakan tetap tinggi pada lansia selama isolasi Covid-19 di Indonesia. Gejala spesifik seperti nyeri sendi, bahkan memperkuat dukungan keluarga bagi anggota keluarga yang lebih tua. Lama tinggal di rumah sakit selama infeksi Covid-19, mungkin menjadi penghalang komunikasi antara orang tua dan keluarga yang memengaruhi pengambilan keputusan dan ekspresi emosional.

Kata Kunci: APGAR, Covid-19, lansia, fungsi keluarga

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INTRODUCTION

The global pandemic of coronavirus disease or COVID-19 was initially started as coronavirus disease outbreak that 1st emerged in Wuhan, China, in December 2019. Throughout history, either epidemics or pandemics have generated long term consequences on mental health and the quality of life (QOL) (1). Epidemiological study data showed that age is associated with the clinical severity and mortality related to the infection of COVID-19 (2,3). The Centers for Disease Control and Prevention (CDC) published a survey in August 2020, which was conducted on June, 2020, of 5412 community-dwelling adults across the US (4), mentioning that among the 933 participants aged 65 years or older there were significantly lower percentages of anxiety disorder (6.2%), depressive disorder (5.8%), or trauma- or stress-related disorder (TSRD) (9.2%) (5). Indonesian government reported more than 4 million people had been infected by COVID-19 until November 2021 with 143.766 confirmed deaths(6). Based on Survey Economic Research Institute for ASEAN and East Asia (ERIA) about 25% (95%CI: 23.0%–26.2%) of the respondents' depression scores increased compared to the pre-pandemic period(7).

Family is the basic social unit of senior citizens, and family function that contains gratifying physical needs, e.g., food, shelter, and sex, and need of feeling accepted and loved, is associated with old people's Quality of life (QOL). The relationship among the family members, which usually considered as the major source of emotional comforts, greatly impact the quality of life because the family members live together for a long time, especially in children–parent and marriage relationship. The emotional comforts of the family increase the psychological and physical well-being. Close relationship between elderly people and their adult children influence the quality of life in elderly as they are less likely to be depressed or lonely, with higher morale and higher life satisfaction (5). In addition, improving emotional comfort from the family is important to enhance the life quality of older adults, that rely on the relationship among the family members because close relationship between children and elder parents influence not only the parents' economic and health needs, but also the long-term care for the aging parents(8,9).

Meanwhile, the changes in the economic, political and social values during pandemic heavily impact the family and the support of the family which is reflected especially among vulnerable family members such as elderly person (6). Previous study stated that during COVID-19 pandemic, family support was significantly associated with good quality of life of the elderly (10). The prolonged isolation care during COVID-19 infection may impose prolonged psychological distress by reducing family support in elderly patients (3). It is also supported by other study which stated that elderly person with good family support showed lower stress level than without good family support(11,12).

Family functionality depicts the condition of physical, psychological growth, and maturation from all of the family members. APGAR Index is one of the tools to assess family functionality by using 5 aspects questionnaire (13). The functionality of a family has great impact to elderly person. A study by Elias *et al.,* (14) mentioned a significant association between elderly who lived alone and poor family functionality. And yet, the social restriction during pandemic might give a greater impact to the perceived family functionality by elder person. Previous study by Fernandes *et al.,* (15) suggested that during pandemic, about 20% of people perceived their family as moderate to severe dysfunction. Study by Rahmadhani *et al.,* (16) also noted that COVID-19 pandemic in Indonesia brought a significant relationship between family function, social support, and the quality of life of the elderly.

Therefore, this study aimed to explore perceived family function among elderly patients after Covid-19 infection. To the best of our knowledge this study is among the first few study to use APGAR Index score as a measurement tool for assessing family functionality of elderly patients in Indonesia during COVID-19 pandemic.

METHOD

Study Design

A cross sectional survey study was conducted in Saiful Anwar General Hospital, Malang, Indonesia to analyse factors that might influence the perceived family functionality. The factors that were analysed in this study were the socio-demographic profiles of study participants including age, gender, employment status, level of education, length of stay at hospital, hypertension, diabetes mellitus, and joint pain. Perceived family functionality was measured by using APGAR Family Index score. Interviews using APGAR index were carried out by telephone contact because of pandemic restriction. Elderly patients which unable to understand the questions were assisted by one of the family member. The interviews were done after patient had been discharged. Telephone number of the patients or their families were collected from hospital medical records. The procedure of this study had been approved by the Health Research Ethic Committee of Faculty of Medicine, Universitas Brawijaya (Ethical Approval Letter Number: 220/EC/KEPK/07/2021).

Population and Sample

All patients >60 years old with history of Covid-19 infection that hospitalized during December 2020 until January 2021 were eligible for the study. A total of 67 patients were recruited for the study. Unfortunately, 10 of the patient had already been deceased because of other medical conditions including stroke, coronary artery disease, and chronic kidney disease. Nine patients did not give consent regarding the interview. Fifteen patients did not answer the call. Total only 33 patients participated in the study, with mean of age was 68.09 years old and 19 (57.9%) were male.

Measurement

APGAR score

The family APGAR Index was initially developed by Smilkstein, Ashworth, and Montano in 1982 (17). This instrument evaluates the satisfaction with global family function as self-report questionnaire. It consists of five questions, i.e., Adaptation, Partnership, Growth, Affection, and Resolve (APGAR), which each questions representing to a component of family function. Each item is scored on a 3-point Likert scale: 0 (hardly ever), 1 (some of the time), and 2 (almost always). Higher scores indicate

higher satisfaction with family function, with total score ranges from 0 to 10 (17). The APGAR Family Index score had been tested for reliability with Cronbach's alpha 0.896. The validity of the instrument was preserved by careful transliteration with validity >0.182 (Pearson correlation) (Table 1)(18,19).

Adaptation represents the utilization of inner intra and extra-familial resource for problem solving when the crisis affects the family dynamics; *Partnership* reflects how decision making process and nurturing responsibilities are shared by family members; *Growth* reflects how mutual support and guidance from family could attain physical and emotional maturation and self-fulfilment of the family members; *Affection* measures the caring or loving relationship among family members; *Resolve* represents the commitment to provide time to other members of the family for physical and emotional nurturing, which also involves sharing wealth and space (10). These scores are then summed, resulting in a final score which reflects the condition of family functionality (good functionality: score of 7–10 points; moderate dysfunctionality: score of 4–6 points; high dysfunctionality: score of 0–3 points)(8).

Data Analyses

The data was analysed using IBM SPSS version 26.0. Socio-demographic variable, baseline characteristic, and APGAR scoring results of the sample were evaluated with descriptive statistic. Normality of data were assessed by using Kolmogorov Smirnov test while homogeneity was assessed by using Levene test. Independent T and ANOVA test were performed to assess the differences of APGAR scoring between every categorical sociodemographic variable and baseline characteristic variable. Pearson correlation and regression analysis were used to calculate correlation between APGAR score and the Length of Stay of the samples, $p < 0.05$ was considered significant.

RESULTS

Table 2 showed socio-demographic characteristics of the subjects. About 72.7% (n=24) of all participants were <70 years old and 57.6% (n=19) were male. More than half of the participant were already unemployed at the moment (69.7%). The level of educations was varied from low/basic education, junior high, senior high, and university. 57.6% (n=19) participants had >14 days length of stay at the hospital during Covid-19 infection. The mean for length of stay was 15.094.13 days with range between 9 and 25 days. There were 15 participants (45.5%) with hypertension and 18 participants (54.5%) with diabetes mellitus. It indicated that nearly half of all participants had chronic comorbidity. About 33.3% (n=11) of participants had joint pain.

Table 2. Socio-demographic characteristic of participants

Characteristic	N (%)
<70	24 (72.7%)
>70	9 (27.3%)
Male	19 (57.6%)
Female	14 (42.4%)
Employed	10 (30.3%)
Unemployed	23 (69.7%)
Low/Basic	7 (21.2%)
Junior High	3 (9.1%)
Senior High	11 (33.3%)
University	12 (36.4%)
<14	14 (42.4%)
>14	19 (57.6%)
Yes	15 (45.5%)
No	18 (54.5%)
Yes	18 (54.5%)
No	15 (45.5%)
Yes	11 (33.3%)
No	22 (66.7%)

Data Analyses

The data was analysed using IBM SPSS version 26.0. Socio-demographic variable, baseline characteristic, and APGAR scoring results of the sample were evaluated with descriptive statistic. Normality of data were assessed by using Kolmogorov Smirnov test while homogeneity was assessed by using Levene test. Independent T and ANOVA test were performed to assess the differences of APGAR scoring between every categorical sociodemographic variable and baseline characteristic variable. Pearson correlation and regression analysis were used to calculate

Table 1. APGAR index score

	Question	2	1	0
APGAR Family Index Score	*Adaptation* How have family members helped other family member in time of need? In what way have family members received help from friends and community agencies?	Always	Sometimes	Never
	Partnership How do your family members communicate with each other about regarding vacations, finances, medical care, large purchases, and personal problem?	Always	Sometimes	Never
	Growth How have you or your family members changed during the past years? How has this change been accepted by family members? In what ways have family members helped each other in developing independent life-styles? How have your family members responded to your desires for change?	Always	Sometimes	Never
	Affection How have your family members responded to your emotional expressions such as affection, love, sorrow, or anger?	Always	Sometimes	Never
	Resolve How do your family members share matters such as time, space, and money?	Always	Sometimes	Never
Total Score				

correlation between APGAR score and the Length of Stay of the samples, p <0.05 was considered significant.

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Table 3. Socio-demographic characteristic of participants

APGAR Scale	Mean	SD	Range
Total APGAR score	9.61	0.70	7-10
Adaptation	1.94	0.242	1-2
Partnership	1.97	0.174	1-2
Growth	1.94	0.242	1-2
Affection	1.91	0.292	1-2
Resolve	1.85	0.364	1-2

Table 4 (Appendix) showed complete analysis of every aspects of APGAR scoring for every variable of participants' characteristics. The APGAR score was analysed for every sample characteristic. Each of 5 APGAR components were also analysed for every participants' characteristic. Joint pain was the only significant variable influencing total APGAR score (p 0.021). But, when it was analysed separately, joint pain did not give significant association with every aspect of APGAR score. Gender variable was the only significant variable for association with aspect of 'Resolve' in APGAR score (p 0.038).

Table 5 described the correlation between APGAR score and the length of stay in the hospital during Covid-19 infection. Length of stay did not give statistically significant correlation to total APGAR score (p 0.069), although it showed that length of stay and APGAR score had negative correlation (r' = -0.220). But length of stay did have significant correlation with aspect of 'Partnership' (p 0.012) and 'Growth' (p 0.043) of the APGAR score. Correlation analyses also revealed negative correlation between length of stay and every aspect of APGAR score except 'Resolve'.

Table 5. Correlation between APGAR score and LOS during Covid-19 Infection

Variable	p	r'
APGAR	0.069	-0.200
Adaptation	0.684	-0.074

Table 5. Correlation between APGAR score and LOS during Covid-19 Infection

Variable	p	r'
Partnership	0.012	-0.431
Growth	0.043	-0.355
Affection	0.307	-0.183
Resolve	0.537	0.111

Note: p significant if <0.05

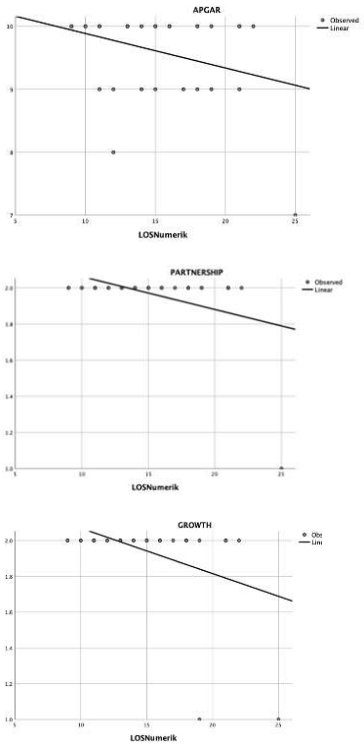

Figure 1. (a) Regression curve between length of stay and APGAR score. (b) Regression curve between length of stay and 'Partnership' aspect. (c) Regression curve between length of stay and 'Growth' aspect.

Figure 1 (a) depicted regression curve between APGAR score and length of stay. Figure 1 (b) showed regression curve between 'Partnership' and length of stay (r' = -0.431) and figure 1 (c) described regression curve between 'Growth' and length of stay (r' = -0.355).

DISCUSSION

Reactions to the Covid-19 pandemic represented a global social experiment in family life, perhaps the biggest social experiment throughout the world (15). Family function depicts how family works as a unit, how the family is able to cope and adapt to different situation (17). Social restriction created new situations within families in which they have restriction to interact with main family or they have to have close interaction with extended family. An author suggest that increasing family interaction would increase stress level, especially with the extended families (15). In that context, family could be a source of support or of stress, especially for elder members of the family (20).

Negative association was identified between chronological

age and both loneliness and distress during Covid-19 pandemic as mentioned in a study by Losada-Baltar *et al*. (3). Our study also showed high average score for APGAR Family Index (mean APGAR 9.610.70) which reflected a good perceived family functionality among elderly subjects. This result was supported by other studies (15,18,20) which discovered that most elderly subjects had good perceived family functionality even during social restriction.

Aging is associated with new life challenges. New situations often encourage elderly people to apply accommodative measures to cope with the situations. Accomodative strategies of the elderly people imply the decrease of personal growth with age, and in the conditions of situational restrictions or insufficient resources to achieve life goals, those strategies could help with personal adjustment which makes elderly adequately adapt to situations (20). Therefore, even in the limitations of family functionality during pandemic, elder people tend to be more adapt to those limitations and their perception regarding family functionality does not change. We suggested it might also partially related to Indonesian culture of kinship and mutual cooperation even between extended family.

All participant with joint pain even scored 10 for APGAR which showed the tendencies of full family support if the elder family had symptoms of joint pain. Although it did not give statistically significant association, analyses between level of education and APGAR score showed that lower educational level gave higher score for APGAR. Even though the study of association between level of education and APGAR score is still limited, it might reflect that person with lower educational level had lower expectation towards achievement in life and higher perceived satisfaction (21,22).

Female gender showed significant association with 'Resolve' aspect of APGAR family score with higher score than male gender. It contradicted the study by Chaves *et al*., which found there was not any statistical significance association between APGAR score and gender (23). And, other study by Prazeres and Santiago, found that female more frequently reported perceived family dysfunction (24). It might associate with different family role and structure in our country in which usually elder female had bigger role in extended family. As 'Resolve' is measurement of family disengagement (25), this study result depicted that during pandemic the perceived family engagement was higher in elder female.

Meanwhile, although length of stay did not significantly associate with total APGAR score, but overall, APGAR score had inverse correlation with length of stay. Support of family became really important in the time of crisis such as in time of isolation during Covid-19 infection management. Family support generally increase quality of elderly life (1). Other study by Wiraini *et al*., also mentioned that during pandemic family support had significant correlation with the quality of life of elderly people (10). Within the long period of treatment and isolation, family support might be strong at the beginning of illness but it tended to be weaker overtime, because family itself also experience some resources difficulties regarding restriction policy from the government. We suggested it might associate with the decrease of perceived family functionality with the length of treatment.

Partnership' and 'Growth' had significant inverse correlation with length of stay. 'Partnership' as measurement of shared decision making and nurturing responsibilities (8), had significant association with the quality of life in elderly in Indonesia, in which the family structure in Indonesia made the elder person indispensable from problem solving in the family (26). Meanwhile, 'Growth' was measurement of physical and emotional maturation and self-fulfilment which was achieved through family support (8). Unfortunately, study regarding the relationship between aspects of APGAR Index, partnership and growth, and length of hospital stay was limited. But, we suggest the inverse correlations between those two aspects and LOS might be related to restricted family support during isolation treatment in the hospital. Previous study also mentioned that the APGAR score of the elderly was strongly correlated with the caring time, either from family or from caregiver(27).

Several limitations of the study need to be acknowledged. This study still needs more sample to confirm the results. Some biases might be occurred during questionnaire filling especially for elderly patient which had to be assisted by one family member. The current study also did not take into account the severity of Covid-19 infection of the elder person and it has cross sectional design so it was not possible to establish causal relationship. We suggest to develop further studies regarding the association between family perception of Covid-19 infection of their elderly member with perceived family functionality. Further study was also needed to confirm elder female role in the family and connection with her family member regarding family functionality.

Perceived family functionality among elderly patients with Covid-19 infection in Indonesia remained high, which was reflected by high APGAR family score. Specific symptoms such as joint pain, even strengthen the family support for elder member of family. Contradictory to other studies, female gender had higher APGAR score than male, even significant association with 'Resolve'. Length of hospital stay during Covid-19 infection inversely correlated with partnership and growth aspect. Even the result of study showed good family function among our elderly, but the physicians and team must be continued educate to family patient giving more support to not only covid-19 infection patient but also all cases.

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Appendix

Table 4. Analysis between APGAR score and sociodemographic characteristic of the participants

Variable		Mean (SD)	p	A		P		G		A		R	
				Mean (SD)	p	Mean (SD)	p	Mean (SD)	p	Mean (SD)	p	Mean (SD)	p
Age (years)	<70	9.63 (0.770)	0.805	1.96 (0.204)	0.472	1.96 (0.204)	0.549	1.96 (0.204)	0.472	1.92 (0.282)	0.812	1.83 (0.381)	0.703
	>70	9.56 (0.527)		1.89 (0.333)		2.00 (0.000)		1.89 (0.333)		1.89 (0.333)		1.89 (0.333)	
Gender	Male	9.53 (0.612)	0.457	1.89 (0.315)	0.223	2.00 (0.000)	0.250	2.00 (0.000)	0.095	1.89 (0.315)	0.748	1.74 (0.452)	0.038
	Female	9.71 (0.825)		2.00 (0.000)		1.93 (0.267)		1.86(0.363)		1.93 (0.267)		2.00 (0.000)	
Employment	Employed	9.50 (0.972)	0.577	2.00 (0.000)	0.352	1.90 (0.316)	0.131	1.90 (0.316)	0.546	1.90 (0.316)	0.908	1.80 (0.422)	0.622
	Unemployed	9.65 (0.573)		1.91 (0.288)		2.00 (0.000)		1.96 (0.209)		1.91 (0.288)		1.87 (0.344)	
LOS (Days)	<14	9.71 (0.611)	0.457	1.93 (0.267)	0.830	2.00 (0.000)	0.399	2.00 (0.000)	0.223	1.93 (0.267)	0.748	1.86 (0.363)	0.909
	>14	9.53 (0.772)		1.95 (0.229)		1.95 (0.229)		1.89 (0.315)		1.89 (0.315)		1.84 (0.375)	
Hypertension	Yes	9.53 (0.834)	0.596	2.00 (0.000)	0.194	1.93 (0.258)	0.280	1.87 (0.352)	0.117	1.93 (0.258)	0.670	1.80 (0.414)	0.494
	No	9.67 (0.594)		1.89 (0.323)		2.00 (0.000)		2.00 (0.000)		1.89 (0.323)		1.89 (0.323)	
Diabetes mellitus	Yes	9.61 (0.608)	0.965	1.89 (0.323)	0.194	2.00 (0.000)	0.280	1.94 (0.236)	0.898	1.89 (0.323)	0.670	1.89 (0.323)	0.494
	No	9.60 (0.828)		2.00 (0.000)		1.93 (0.258)		1.93 (0.258)		1.93 (0.258)		1.80 (0.414)	
Joint pain	Yes	10 (0.000)	0.021	2.00 (0.000)	0.317	2.00 (0.000)	0.488	2.00 (0.000)	0.317	2.00 (0.000)	0.211	2.00 (0.000)	0.091
	No	9.41 (0.796)		1.91 (0.294)		1.95 (0.213)		1.91 (0.294)		1.86 (0.351)		1.77 (0.429)	
Education	Basic/Low	10.0 (0.000)	0.215	2.00 (0.000)	0.317	2.00 (0.000)	0.593	2.00 (0.000)	0.839	2.00 (0.000)	0.640	2.00 (0.000)	0.411
	Junior High	10.0 (0.000)		2.00 (0.000)		2.00 (0.000)		2.00 (0.000)		2.00 (0.000)		2.00 (0.000)	
	Senior High	9.45 (0.934)		2.00 (0.000)		1.91 (0.302)		1.91 (0.302)		1.91 (0.302)		1.73 (0.467)	
	University	9.42 (0.669)		1.83 (0.389)		2.00 (0.000)		1.92 (0.289)		1.83 (0.389)		1.83 (0.389)	

Note: p significant if <0.05