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Prevalence and Factors Related to Functional Status of Older Adult Patients in Primary Health Care

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Abstrak

Status fungsional merupakan kemampuan untuk melakukan perawatan diri, pemeliharaan diri, dan aktivitas sehari-hari. Lanjut usia (lansia) berisiko mengalami penurunan status fungsional terkait kondisinya dan faktor lainnya. Literatur studi belum menemukan bukti yang jelas tentang faktor-faktor yang berhubungan dengan status fungsional lansia, terutama mereka yang memiliki penyakit penyerta dan secara teratur datang ke pelayanan kesehatan primer. Penelitian ini bertujuan untuk mengidentifikasi prevalensi dan faktor yang berhubungan dengan status fungsional lansia yang berkunjung ke Poliklinik Lansia di Puskesmas. Desain *cross-sectional* digunakan untuk menilai 100 sampel pasien lansia di salah satu Puskesmas di Indonesia dengan menggunakan instrumen karakteristik responden, The 12-Item Short Form Health Survey (SF-12), Berg Balance Scale (BBS), Mini Nutritional Assessment (MNA), dan Instrumental Activity Daily Living of Lawton. Status fungsional responden memiliki kategori baik dengan rerata 7,45 (SD = 1,07). Rerata usia sampel adalah 66 tahun, jenis kelamin utama perempuan (59%), tingkat pendidikan lebih cenderung tamat SD (45%), utamanya mengkonsumsi obat (71%) serta lebih dari separuhnya memiliki multimorbiditas (60%). Model analisis multivariat menunjukkan 44% dari semua variabel berpengaruh terhadap status fungsional, faktor yang paling berpengaruh adalah keseimbangan dan status kesehatan. Oleh karena itu, aksesibilitas pelayanan kesehatan lansia di masyarakat dapat ditingkatkan dengan menyediakan fasilitas kesehatan yang lebih ramah lansia.

Kata Kunci: status gizi, status kesehatan, status keseimbangan, status fungsional, pasien lanjut usia

Abstract

Functional status is the ability to perform self-care, self-maintenance, and daily activity. Older adults are at risk of experiencing a decline in functional status regarding their condition and other factors. The study literature found no clear evidence of the factors related to it, especially those who have comorbid and regularly come to primary health care facilities. This study aimed to identify the prevalence and factors related to the functional status of older people who visit geriatric out-patient in the primary health care center. A cross-sectional design was used to assess 100 elderly patients at one of the health centers in Indonesia using the respondent characteristic instrument, The 12-Item Short Form Health Survey (SF-12), Berg Balance Scale (BBS), Mini Nutritional Assessment (MNA), and Instrumental Activity Daily Living of Lawton. The functional status of the respondent was good where the mean score was 7.45 (SD = 1.07). The mean age was 66 years old, primarily women (59%), the education level was only elementary school (45%), and they consume prescribed medication (71%) and more than a half of respondent have multimorbidity (60%). The model fit of multivariate analysis resulted in 44% of all the variables giving effect to the functional status where the most influential factor was balance and health status of the older adults. Therefore, the accessibility of health services for the older adult in the community can be improved by providing more elderly-friendly health facilities.

Keywords*:* nutritional status, health status, balance status, functional status, elderly patients

Introduction

Various theories about the aging process mention that increasing age is accompanied by a decrease in various bodily functions, one of which was the functional consequences theory by Miller (2012). Another theory also mentioned that the increasing age would be followed by decreasing body function (Ebersole et al., 2014). The declining quality of body functions is related to the older adults' body systems, including heart and blood vessel function, respiratory, digestive, kidney, bone, and joint function, hearing and vision function, immune system, nervous system, endocrine, and lastly integument system (Miller, 2012). These various functions influence each other and have an impact on the daily activities of older adults, which can be measured by assessing their functional status.

Functional status is the ability to perform self-care, self-maintenance, and daily activities (Reuben, 2020). Davenport et al. (2011) also added from the first definition that this ability is required to maintain health and well-being (Chen, Moeliono, & Amalia, 2016). This status has a multidimensional scope that shows the ability of the elderly to meet their basic needs and their role in maintaining their health and well-being. The dimensions in question include the ability to perform various daily activities, ranging from the basic (e.g., eating and drinking, toileting, moving, bathing, and others) to the instrumental (e.g., driving and shopping) (Antoniu et al., 2021). Sudden changes in the elderly's daily activities are a sign of worsening health problems or the occurrence of an acute illness.

Research conducted in Dublin found that age, pain, and polypharmacy were highly related to functional status in older adults (Connolly et al., 2017). Older adult patients with diverse functional statuses, come to primary health care and have various physical health problems. Besides functional status, other conditions need to be explored for the older adults in the dwelling community such as nutritional status, health status, and balance status. These statuses also influence the independence of older adults to keep active in the community.

Changes in the ability of older adults to carry out daily activities are influenced by several things. Age is the first factor in changing the functional status of older adults. Liang et al. (2003) in their research conducted in Japanese older adult stated that as they get older, the more limited their ability to carry out their activities. Besides, Liang et al. (2003) also mention other factors such as cognitive impairment, self-rated ill health status, gender, education, marital status, occupation, and chronic conditions have a significant influence on the functional status of older adults. Many previous studies have stated that functional status has a relationship with several physical conditions of older adults such as nutritional status, health status, balance status, and diseases suffered by older adults (Skinner, 2010; Liang et al., 2003; Wensing et al., 2001). However, several other studies have also stated that the various health statuses of older adults are not related (Schrader et al., 2016; Mathewson et al., 2021).

Even so, the results of previous studies have not clearly identified the position of various factors related to the functional status of older adults. Nutritional status is allegedly related to the functional status of older adults (Wei et al., 2019; Awuviry-Newton et al., 2022; Rodríguez-Mañas et al., 2020); however, several other studies have shown the opposite (Mathewson et al., 2021). On the other hand, according to some experts, health status is related to the functional status of older adults in the community (Gyasi et al., 2022, Marventano et al., 2014; Khalagi et al., 2021). Because of those reasons, this study was conducted to identify what are the factors that contribute to the

functional status of the elderly, especially those who have comorbidity and regularly come to the primary health care center.

Methods

A cross-sectional design with the purposive technique sampling was performed. Estimation of Proportion was employed to determine the number of sample in this study using Slovin formula, and founded about 100 elderly patients who visited Older Adult Clinic in one Primary Health Care in Depok City, West Java Province, Indonesia, were asked to join the research. They were assessed by the research assistant in a private area. All the research assistants have freshly graduated nursing student which has competency and skill regarding the instrument used to assess the client. All the ethical principles were adhered to when conducting the research in accordance with obtaining the ethical clearance from the Institutional Review Board of the Faculty of Nursing, University of Indonesia No.267/UN2.F12.D/HKP.0204/2018.

The instruments used in this study consist of fifth parts. The first part is the baseline data which asks about age, gender, education, consuming medicine, and history of health. The second part is SF-12 (Ware et al., 2009), the instrument to assess health status. The third part is Berg Balance Scale (BBS) to assess balance status (Berg et al., 1992), the fourth is Mini Nutritional Assessment to measure the nutritional status (Société des Produits Nestlé SA, 2009), and the last is the Instrumental Activity Daily Living of Lawton to measure functional status (Lawton & Brody, 1969). All of these instruments have been available in Bahasa Indonesia and proven to be valid and reliable and are widely used globally, especially in Indonesia's hospitals and clinics. All the data were gathered and summarized in descriptive statistics. For further bivariate analysis, several statistical analysis was used such as Pearson r, ANOVA, and Student-t test.

Result and Discussion

The demographic characteristic of the participants are presented in Table 1. The average age was 66.37 years, mainly women (59%), almost a half-finished elementary school (45%), about 2 per 3 participants were consuming drugs (71%), and more than a half had multi pathologic (60%) also well nourished (72%). Moreover, the health status, balance status, and functional status of the older adults were in good condition where all of the mean scores were over the half or almost reach the maximum score for each scale.

Table 1. The Description of Respondent's Characteristic (n=100)

Variables	N	Mean (SD)
Age		66.37 (5.03)
Health status		47.59 (5.72)
Balance status		51.53 (5.58)
Functional status		7.45 (1.07)
Gender		
Female	59	7.58 (0.894)
Male	41	7.27 (1.285)
Education		
No school	9	7.67 (0.5)
Elementary	45	7.40 (1.01)
Junior high school	26	7.19 (1.55)
Higher education	20	7.80 (0.41)

Consuming medicine		
Yes	71	7.46 (0.969)
No	29	7.41 (1.323)
History of Illness		
Multi pathological	60	7.27 (1.284)
Non-multi pathological	40	7.71 (0.602)
Nutritional status		
Malnourished	1	8.00 (0)
At the risk of malnourished	27	7.11 (1,423)
Well-nourished	72	7.57 (0.901)

Correlation analysis of independent variables and the functional status that presented in Table 2. According to the information shown in the table, some of the variables are had a statistical correlation to the functional status. Those variables are age, health status, balance status, and history of the illness. The value of relationships between health and balance status to the functional status is a positive linear relationship. It means, when the health or balance status is in good condition, the functional status is also in a good score. In addition, according to the Colton relationship strength category, the r score of this correlation falls into the medium relationship category for the health status and the strong relationship category for the balance status. Meanwhile, the correlation between age and history of illness to the functional status was in a negative line, which means more aged and more illness that elders had, they will get a lower score of functional status and need more help for doing the activity of daily living.

Table 2. Correlation between the characteristic of the respondent and functional status (n=100)

Carracteristic of respondent	Functional Status		
	95%CI	r/t/F	p Value
Age	65.37-67.37	-0.27	0.007*
Health status	46.46 - 48,73	0,432	0,0005*
Balance status	50.42 - 52.64	0,595	0,0005*
Functional status	7.24-7.66		
Gender Female Male	-0.124 - 0.740	1.414	0.161
Education No school Elementary Junior high school Higher education	7.24 - 7.66	1.37	0.257
Consuming medicine Yes No	-0.422 - 0.524	0.214	0.831
History of Illness Multi pathological Non multi pathological	-0.864 - (-0.008)	-2.023	0.046*
Nutritional Status Malnourished At the risk of malnutrition Well-nourished	0	1.948	0,148

*correlation significant p < 0,05

Moreover, the last analysis was looking for the most relatable predictor which influences the functional status of the older adults. All the independent variables that had p-value < 0.25 was put in the model multiple linear regression shown in Table 3. This result showed that the F score of 10.345 and p-value of 0.000 means the regression model fit with the data or all the predictors could predict the functional status significantly. The R square score of 0.440 means this model explains about 44% variance of the functional status. According to the **β** score, balance status is the most influenced predictor among the other independent variables because it has the highest **β** score compared to others, furthermore, among all the predictors only health status and balance status had a statistically significant correlation to the functional status. The result shows that with every increase of one point in health status, the functional status will increase by about 0.041 points. And with every increase in one point of balance status, the functional status score will increase by about 0.092 points.

Table 3. Multiple Linear Regression Between Predictors Variables and Functional Status

Predictors	B	**β**	t	p-value	R^2	Adjusted R^2	SEE	F score
Model								
(Constant)				0.000*	0.440	0.398	0.835	10.345
Age	2.685		1.521	0.132				
Health Status	-0.023	-0.117	-1.372	0.173				
Balance Status	0.041	0.209	2.284	0.025*				
History of Illness	0.092	0.485	5.577	0.000*				
Gender	0.121	0.023	0.272	0.786				
Consuming medicine	-0.259	-0.101	-1.229	0.222				
Education	-0.226	-0.096	-1.153	0.252				
	0.034	0.029	0.355	0.723				

*correlation significant p < 0,05

The older adults population in Indonesia is divided into three categories according to age groups, namely young older adults (60-69 years), intermediate older adults (70-79 years), and old older adults (more than 80 years) (Central Statistics Agency, 2018). The average age of the older adults in this study was 65.37 - 67.37 years means it belongs to the young older adults group. The previous study conducted by Ran (2017) mentioned that older adults in the young group have the highest score of independent IADL level compared to other groups. That study supported the result which showed there is a significant correlation between age and functional status of older adults. Furthermore, the correlation was negative linear which means the elder of older adults, the lower score of functional status will be obtained. The lower score of functional status means the elderly need more help in various daily activities.

Moreover, regarding gender, this study resulted that more than half of the respondents were female. According to the data from the Indonesian Ministry of Health, the number of older female adults is greater than that of males in that year. It might be caused by the women's life expectancy being higher than the man's. The previous research conducted by the Indonesian Ministry of Health showed that older female adults were more independent compared to the male. However, this study resulted in the opposite and has no significant correlation between gender and the independence

status of older adults. Another study conducted by n-Calenti (2010) mentioned that male was more independent compared to female older adults. The activities that the female older adults looked more dependent on were financial management and transportation utilization, while the male older adults only depended on washing clothes.

The next discussion is about the educational background of older adults. This study shows almost half of the respondents have the last education limited to elementary school. Based on the data from the Indonesian Central Statistic Agency, most of the elderly in Indonesia are poorly educated (elementary or lower) with an average length of time of schooling of only 4.65 years. A Previous study conducted by Qian (2016) revealed that the elderly with low levels of education had a significant relationship with the inability to carry out daily activities of both BADL and IADL, though this study resulted that there was no significant correlation between educational background and functional status.

The other result of this study showed that there was a significant relationship between disease history and functional status. The history of disease in this study was measured by looking at the multi-pathological conditions of respondents. According to the analysis, it is known that older adults with multi-pathological conditions have more difficulty in carrying out IADL activities. This result follows research conducted by Qian (2010) said that older adults with hypertension and other comorbid diseases have difficulty in committed of daily activities. The comorbidity condition that had a significant correlation with the ability to perform IADL in that study were mentioned included chronic lung diseases, stroke, memory-related diseases, and arthritis or rheumatism. Furthermore, this study also looked at the relationship between drug consumption and functional status which showed that there was no significant relationship. This result did not correspond to the studies conducted by Peron (2011) which says that there is a relationship between drug use and the functional status of the elderly in both BADL and IADL. A similar thing is also mentioned by Connolly (2017) that the three main factors that influence the level of difficulty of older adults in doing IADL are pain, drug consumption, and depression.

Respondents in this study have good health status with an average value of 47,59 from a maximum value of 59,55. After correlating with functional status, it was found that there was a significant relationship between those two variables. The better the health status of a person, the better the functional status will be. The study by Whittle and Goldenberg (1996) revealed that the health status of the elderly has a significant relationship with the functional status of IADL, especially for activities to cleaning the house, shopping, and transport. In addition, Gobbens (2018) revealed that the health status of older adults aged 75 years and over measured using SF-12 also had a significant relationship for all IADL items. This might happen because we analyzed older adults who have chronic illnesses, but they are still able to come independently to the primary health center to take their medicine.

In line with the above statement, the older adults come independently to the clinic, showing that their moving performance is stable. This is evidenced by the result of the research that shows that most respondents have a high balance status or a low risk of falling with a mean value of 51,53 from the maximum value of 56. Moreover, they came to the clinic utilizing public transportation and private vehicle such as motorcycles. Utilizing public transportation or riding a motorcycle is a part of the instrumental activity in daily living. Therefore, the significant correlation between balance status and functional status is already explained and proven. A previous study conducted

by Yamazaki et al (2017) mentioned that there is a significant relationship between the risk of falls with the ability to do IADL. The same result was also shown in another study in Taiwan conducted by Wang et al (2006) the score of BBS in the group that was able to do IADL was higher compared to the group that had limitations in doing IADL.

Nutrition is the most essential thing for a person to be able to carry out activities, especially for older adults that have a big issue of malnutrition. Without adequate nutrition, a person has no strength even to stand up. This study resulted that there was no significant difference in functional status among older adults with different nutritional statuses. This condition may be due to the statistical reason, which is the lack of variety in the number of older adults who are in each category of nutritional status. However, some previous studies related to this result such as the study conducted by Schrader et al (2016) and Mathewson et al. (2021).

Conclusion

Functional status of older adults in outpatient who come to the Primary Health Care Center was in good condition where the mean score of their IADL is above half of the total score. The most influential factor for it was balance status. All the older adults were able to come to the clinic independently or with a companion to take their routine medicine, which means they had enough power and ability to do their instrumental of daily living, especially in mobilization activities. Their age, health status, and chronic illness also contribute to their functional status. However, their gender, level of education, drug consumption, and nutritional status were not significantly related.

The results of this study provide implication for older adult health services in the community, especially in primary health services. the results of the study can also be used to improve the health services provided to the older adult. some of the implications that can be taken from the results of this study include knowing the picture of the functional status of the older adult who often come to the Puskesmas so that they can understand the specific health needs of the older adults and the services provided can be tailored to these needs. The accessibility of health services for the older adult in the community can also be improved by providing more elderly-friendly health facilities. Education about the health of the older adult to the community can also be done to raise awareness about the importance of health care for the elderly. The quality of health services for the older adult is also important to improve by conducting special training for health workers who will work with the older adult. And finally, by improving coordination between various health facilities and social services available to the older adult in the community to provide integrated care.

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