ORIGINAL ARTICLE

Better Cognitive Function Increase the Independence Level of Eldery

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ABSTRACT

Background: The number of elderly is increasing, estimated by the year of 2020 reach 28,800,000 (11.34%) of the total population. One of the common problems of the elderly is dependence on daily activity function and cognitive function. There is no data about the relationship between cognitive function with independence in daily activity in rthe nursing home. The objective of this study is to analyze the relationship between cognitive function with the level of independence on daily activity in the elderly who live in a nursing home.

Methods: Study design was analytical observation by the cross-sectional study. The instruments that used in this study was the Mini Mental Status Evaluation (MMSE) questionnaire, to measure the cognitive function, Katz index questionnaire to measure the level of independency. analyzed by Spearman correlation test.

Results: The subjects were 107 elderly, the mean age was 69.7±8.7. MMSE score were 0-17 (severe), 18-23 (moderate), and 24-30 (Normal), respectively were; 62 (57.9%) ,26 (24.3%),19 (17.8%). Katz Index score were 02 (severe dependency), 3-5 (moderate dependency), and 6 (independence), respectively were; 8 (7,5%), 24 (22,4%), 70 (70,1%). There is the positive relationship between cognitive function and the level of independence in elderly (p=0.000, r = 0.335).

Conclusion: The higher cognitive function correlates with the higher independence level of elderly in nursery home.

Keywords: *cognitive function, independence level, elderly, nursery home*

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INTRODUCTION

Elderly is individual with age 60 years old and above [1]. The number of elderly in Indonesia in 2020 predicted about 80.000.000. [2] Base on population projection, Indonesia will enter a period of aging in 2010-2035, where 10% of the population will be aged 60 years old and above. [3] Increasing degree of health services and well being of the society will affect to rise of life expectancy in Indonesia. According to a report from the Central Bureau of Statistic, In the year of 2000, life expectancy in Indonesia is 64.5 y.o (7.18% of the population). In 2010 increased to 69,43% in 2010 (7.56%), and in 2011 become 69.65 years (7,58 4%).(4) There is a challenge of medical services to increase knowledge and skill to serve the elders.

Being elder is a natural process, which is a function of all system will decrease. One important function that controls the activity is a cognitive function. Cognitive function is an essential role in memory and most of the daily activities. The impact of the decline of cognitive function is the physical and psychological function will be disturbed, and become dependence on daily activity.

Data about elder dependency ratio was about 13.72% in 2008. It means 13 elders supported by 100 young age (1544 years). This data increased from 2007 which 12 elders supported by 100 young people age. [5] Cognitive function is the mental process of knowing and taking decisions, including aspects of awareness, perception, reasoning and decision making. Cognitive function acts as a process of information, knowledge, and application of decision making in humans. [6,7] Thus decline of cognitive function, expected disrupt the independency level of daily activity. Several factors can affect declines in cognitive function, such as age, gender, genetics, hypertension, style life like smoking, alcohol, physical activity, and sleep quality. [7] The tool widely used to measure cognitive function is Mini Mental Status Evaluation (MMSE). [6]

The level of independence includes the understanding of some terms which is about autonomy, independence, and self-reliance. Independence is a behavior that activities are directed by the selves without any assistance from others. Self-sufficiency is the absence of outstanding needs to gain recognition from others, feeling capable of controlling themselves and full of initiative. [8] To measure the level of self-sufficiency on the elderly is by KATZ Index. Index of KATZ measure the activities of daily life such as bathing, eating, moving, hold urination, dressing, and toileting. [10]

The elderly who have the disease, mainly chronic diseases have disruption of the activities and have a dependency on the family member. [11]

Based on the background of the above, explained that the decline in cognitive function would decrease the level of independence. This study conducted to analyzed correlation between cognitive function and the level of

independence on the elderly who lived in Tresna Werdha Budhi Mulia 2 Social nursing home. This study expected can add the knowledge to prevent deterioration of independency on elder lifes

METHODS

The design study was cross-sectional with analytic observational. The Univariate analysis test is done to describe each variable's characteristic. Spearman test was used to analyze the correlation between cognitive function with independence level. Location of the study was at Tresna Werdha Budi Mulia 2 nursing home, Cengkareng, West Jakarta. The survey conducted from October to December 2017. The population was the elders who lived in nursing home, age above to 60, agreed to be interviewed and could communicate well. Cognitive function measure by MMSE, and independency level by Katz index. Samples were selected using simple random sampling technique.

RESULTS

Study on 107 subjects, consisted of 65 (60,7%) female and 42 (39,3%) male. Cognitive function was determined using MMSE questionnaire, the results categorized into the normal, mild, and severe decline of cognitive function. Independence level is determined using Katz Index the results were classified into independent, mild dependent, and severe dependent.

Table 1. Characteristic of the research subject

Variable	Frequency	
	total (n=107)	Percentage (%)
Age		
elderly (60-74)	82	76.0
Old elderly (75-90)	21	19.6
Very old elderly (>90)	4	3.7
Gender		
Female	65	60.7
Male	42	39.3
MMSE		
Normal (24-30)	19	17.8
Mild(18-23)	26	24.3
Severe (0-17)	62	57.9
Katz Index		
Independent (≥6)	75	70.1
Mild dependent (3-5)	24	22.4
Severe dependent (0-2)	8	7.5

In univariate analysis, researcher divided respondent's age into three groups age i.e., elderly (60-74), old elderly (75-90), and very old elderly (>90), respectively 82 (76%), 2 (19,6%), and 4 (3,7%). Female subjects were 65 (60,7%). Most of subjects 62 (57,9%) have The MMSE score were severe cognitive impairment. Score of The Katz Index questionnaire showed that most of subjects 75 (70,1%) were independent in daily activity

Table 2. Average score of MMSE *and Katz index*

	Mean ± SD
MMSE	16,85 ± 6,17
MMSE in female elderly	16,36 ± 6,17
MMSE in male elderly	17,59 ± 6,18
Katz index	5.00 ± 1,36
Katz index female	5.00 ± 1,63
Katz index male	5.00 ± 0,50

The mean score of the MMSE was 16,85, which male score had better than female elderly. K*atz index* means score was 5.00, i.e., mild dependency, which equal between male and female.

Bivariate analysis was done to determine the correlation between cognitive function with independence level in elderly. The data analyzed by Kolmogorov-Smirnov test was abnormal (p>0,05).

Table 3. Distribution of frequency between Cognitive Function and Independence Level

Cognitive function (MMSE)	Independece Level Katz index		
	Independent (≥6)	Mild (3-5)	Severe (0-2)
	n	n	n
Normal (24-30)	18	1	0
Mild (18-23)	21	5	0
Severe (0-17)	36	18	8

Table 4. Correlation between score of MMSE and Katz index

Correlation r		p
MMSE-Katz index	r=0,335 *	p=0,00 *

*spearman-rho test

List of the data in Table 3 showed the distribution of subjects with MMSE normal and moderate cognitive impairment were more independent than the subjects with severe cognitive impairment. Bivariate analysis in table showed a weak positive correlation between cognitive function and independence level among elderly (r = 0.335, p=0.000, by spearman-rho test, which mean the higher score of MMSE (milder cognitive impairment) has correlation with higher score of Katz index (more independent)

DISCUSSION

The score of cognitive function by the MMSE was found 19 (17,8%) have a normal cognitive function, 26 (24,3%) had the mild cognitive impairment, and 62 (57,9%) had the severe cognitive impairment. The majority of elderly respondents (82,2%) got mild and cognitive impairment. This research was different with the study by Tria Coresa in Semarang, whose found that 63,3% elderly had a mild cognitive impairment, which is higher than this study, and 16,7% had the severe cognitive impairment, which is lower than this study.[14] The study conducted by Mongisidi at the Kawangkoan Minahasa found 72% of the elderly had normal MMSE results, and presumably educational backgrounds affecting the outcomes of elderly cognitive function.[18]The previous study by Domiciano found the mean score of the MMSE was 19,22 ± 6.35. The MMSE score improved to 28.33 ± 7.95 after performed 10-20 times of physiotherapy by doing games that stimulate the brain function.[19]The MMSE interview showed that the majority of elderly forgot about the date, month and the city or province they lived. The research also found that the majority of the subjects had difficulty in counting and memory. The correlation between gender and the MMSE score shows that female subjects were having more cognitive impairment than male. It presumably activity influenced cognitive function, which male subjects were more active (gardening, playing chess, angklung, carambola). Se-hong Kim suggested that cognitive function could affect physical activity in elderly, which is active elderly, such as doing aerobic regularly might be had the low risk of chronic disease, and had the higher cognitive function.[17] It presumably that good physical activity correlates with independence level as well, and elderly which not active could have the higher risk to decline the cognitive function and to develop into more dependent in daily activity.

This study found the level of independence by KATZ index; 75 (70,1%) was independent, while 21(22,4%) was medium and 8 (7.5%) was a severe dependent. This study found that the elder who lives in this Social Institution tend to be more independent, due to the limitation

of assistance (caregiver), so they had to do all their daily activities and be motivated to be independent. The study by Rohani conducted in social home Tresna Wardha Mulia Rawi found 21 subjects, of which 15 subjects were moderate dependence, and three subjects had severe dependence.[12]

The data in table 3 showed score of K*atz index* were similar between male and female elderly. Bivariate analysis by using Spearman test shows a weak positive correlation between cognitive function and independence level among elderly ($r = 0.335$, $p=0.000$). This study is indicating that the higher score of cognitive function or milder cognitive impairment has a relationship with the higher of independence level or more independent. Result study support the previous study by Keithlen in Natal, Brazil also found the similar result, that cognitive status is correlated with activity of daily living functional status and Barthel Activity of Daily Living. Study by Keithlen studied in the community found a fair relationship between cognitive function and independence level among elderly as well. [15]

Another study by Lilik M in Sahril N, in Mojokerto, also found a strong positive correlation between cognitive function and independence level among elderly in Mojopahit Social Home.[16] The study by Rebustini Renata in Brazil, also found a decreased of cognitive function on the elderly is experiencing a decrease in the level of independence or activities of daily life.[20]

CONCLUSION

The study result showed that level of higher cognitive function correlates with higher independence activity in the elderly. Male subjects were more active and had a higher cognitive function. This data are indicating that higher physical activity correlates with higher cognitive function in elderly. Base on study result, it recommended to the elder to be more active to stimulate cognitive function and increase independency on daily activity.

The limitation of the study was the study conducted in Nursing Home, which the subjects were more homogenous, and study design was cross-sectional. Further investigation is necessary to do longitudinal study of the effect of physical activity on cognitive function and independency on elderly in a community and nursing home.

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