

Conference Paper

How to be aware of Cognitive Impairments? Descriptive Studies Using HVL, CDT and AD8 As Screening Tools for Dementia in Older Adults

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Abstract

Background: The increasing incidence of dementia in Indonesia's elderly population is creating a health problem that affects sufferers' quality of life, as well as family and wider community life. The elderly who suffer from dementia have cognitive impairment and other disabilities that interfere with daily activities. An important tool for preventing dementia is screening. **Objective:** This study describes dementia screening tools including HVL, CDT and AD, each designed for elderly with risk factors of dementia. **Methods:** Descriptive study with a cross-sectional approach was used. The population was elderly who live in capital region of Jakarta. A sample 354 elderlies aged 60 years or more were recruited and screened through multistage random sampling. **Result:** The results of screening dementia using HVL were 56.5 % very likely to suffer dementia; 92.1 % (CDT) and 56.2 % (AD8) were suffered cognitive impairments. **Conclusions:** Community Health Center could be considered to be used screening tool according to elderly conditions to diagnose dementia early. Besides that, elderly individuals and their family could enhance their awareness about prevention of dementia by identifying existing risk factors.

Keywords: Cognitive Impairment, Dementia, Prevention, Screening

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1. Introduction

It was estimated there were approximately 1 million Indonesians suffering from Alzheimer in 2013. That number is predicted to doubly by 2030, and that there will be around four million with Alzheimers in 2050 [1,2]. The increasing number of dementia sufferers has increasingly become a challenge for health workers as dementia affects the physiology, mental, social, and economic standards of the elderlies as well as care-takers, families, and their social environments [3,4].

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Elderlies are a vulnerable group within the society facing a variety of risk factors, such as economic, social, physiological, biological, genetic, and lifestyle factor. The risk factors which are the predisposition of health problems are environmental, nutritional intake, and sociocultural factors [5]. Understanding the risk factors of dementia is really important in order to prevent and treat dementia earlier.

There are several dementia screening tools that would screen dementia early, such as Mini Mental State Examination (MMSE), Mini Cognitive (Mini-Cog), Clock Drawing Test (CDT), Hopkins Verbal Learning Test (HVLT), Ascertain Dementia 8 Questionnaire (AD8), Montreal Cognitive Assessment (MoCA), Clinical Dementia Rating (CDR), etc. Each screening tools has advantages and disadvantages. Simple and effective instruments with administration time of five minutes or less seem most suitable for dementia screening.

There are several advantages of the HVLT such as requires no more than 10 minutes to administer and well-tolerated by even moderately to severely demented patients. The AD8 was developed as a brief instrument to help discriminate between signs of normal aging and mild dementia. It is considered an informant-based assessment because instead of the patient being questioned, the patient's informant (usually a spouse, child, or non-family caregiver) is asked to assess whether there have been changes in the past few years in certain areas of cognition and functioning. The clock-drawing test is a simple tool that is used to screen people for signs of neurological problems, such as Alzheimer's and other dementias. It can provide helpful insight into a person's cognitive ability [6,7,8,9].

This study uses a cross-sectional dataset to describe dementia screening tools including Hopkins Verbal Learning Test (HVLT), Clock Drawing Test (CDT) and Ascertain Dementia 8 questionnaire (AD8) that are commonly used for elderly with risk factors of dementia.

2. Methods

This study was a cross-sectional conducted in 5 region in the Special Capitol Region of Jakarta province, Indonesia using multistage random sampling. From July to November of 2018, 354 subjects were recruited. The inclusion criteria was subjects aged 60 or more, living with the family, signed the informed consent. Subjects were excluded under following circumstances: lack of communication, being critically ill (bedrest condition), impaired hearing, and being unwilling to participate.

The protocol of this study was approved by Faculty of Nursing Ethics Committee of Indonesian University. The subjects were informed about the objectives and methods of the study. Written and signed informed consent was obtained from their guardians.

The survey was conducted in residence of participants. SPSS 20 was used for data entry and analysis. The demographic information was obtained from subjects and caregivers, including age, sex, education, illness history (hypertension, diabetes, hyper cholesterol), history of smoking, social activity, body mass index, and doing exercise were summarized using frequencies (percentages).

Tests and scales including Hopkins Verbal Learning Test (HVLT), Ascertain Dementia 8 questionnaire (AD8), and Clock Drawing Test (CDT) were used as dementia screening tests. HVLT consists of three trial of free-recall of a 12-item (lion, diamond, horse, tent, agate, hotel, cave, amethyst, tiger, pearl, cow, and hut) that must be repeated by elderly, AD8 had 8 yes/ no questions for caregiver, takes only 3 minutes or so to complete and contains 8 items that test for memory, orientation, judgment, and function. CDT consists of 4 commands to draw a circular clock with numbers and hands completely.

3. Results

A total of 354 elderlies who reside with their families participated in this research. Most of the elderlies are above 66 years old (52.3 %), female (70.3 %), are have only completed elementary schooling (87.3 %), did not doing routine physical exercise (73.2 %), smoking habit (10.7 %), and are not involve in social activities, such as Quran recitation in their community (26.0 %). The 352 elderlies who have diabetes were 15.9 %, had high blood pressure 45.2 %, hyper cholesterol 76.1 %, and overweight 42.9 %. These need to be wary by the families, especially the care-takers. The demographic characteristic of participants were showed in Table 1.

A large-scale community-based cross-sectional study was conducted to describe for dementia screening tests including HVLT, AD8 and CDT. Of the 354 subjects in the dataset, 200, 199 and 326 subjects were identified as risk of dementia. More detailed information about the 3screening tests can be seen in table 2.

4. Discussion

The respondent with aged over 66 years are significantly associated with the risk of dementia (p value 0.005 with HVLT and 0.004 with AD8) where the risk is 1.9 times higher compared to those who aged between 60-65 years. This is supported by a

TABLE 1: Elderlies characteristics distribution in Special Capital Region of Jakarta in 2018.

Characteristic(s)	Frequency	Percent(%)
Age		
60 – 65 years old	169	47.7
≥ 66 years old	185	52.3
Sex		
Male	105	29.7
Female	249	70.3
Educational Background		
Poor	309	87.3
High	45	12.7
Social Activity Involvement		
Yes	262	74.0
No	92	26.0
Physical Exercise		
Yes	95	26.8
No	259	73.2
Smoking Habit		
Yes	38	10.7
No	316	89.3
Body Mass Index		
Underweight	36	10.2
Normal	165	46.9
Overweight	151	42.9
Cholesterol Check		
Normal	84	23.9
High	268	76.1
Blood Glucose Check		
Normal	296	84.1
Diabetes Mellitus (DM)	56	15.9
Blood Pressure Check		
Normal	193	54.8
High	159	45.2

TABLE 2: The results of screening test using HVL, AD8 and CDT in 2018 (N =354).

Screening Tools	Frequency		Percent	
	Risk of Dementia	Normal	Risk of Dementia	Normal
HVL	200	154	56.5	43.5
AD8	199	155	56.2	43.8
CDT	326	28	92.1	7.9

research that the elderlies aged ≥ 65 years have chance 2.5 times higher compared to those aged between 60-64 years [10]. Prior studies have also found that increasing

TABLE 3: The correlation of elderlies' risk factor and the screening tools of dementia in 2018 (N =354).

Risk Factors	HVLТ		pValue 95%CI	CDT		pValue 95%CI	AD8		pValue 95%CI
	Risk of Dementia	Norm		Risk of Dementia	Norm		Risk of Dementia	Norm	
>= 66 y.o	118	67	0.005 OR 1.9	169	16	0.732 OR 0.8	118	67	0.004 OR 1.9
60 - 65 y.o	82	87	(1.2 – 2.9)	157	12	(0.4 – 1.8)	81	88	(1.3 – 2.93)
Female	143	106	0.669 OR 1.1	237	12	0.002 OR 3.5	146	103	0.195 OR 1.4
Male	57	48	(0.7 – 1.8)	89	16	(1.6 – 7.8)	53	52	(0.9 – 2.2)
Smoking	17	21	0.169 OR 0.6	32	6	0.101 OR 0.4	17	21	0.181 OR 0.6
No Smoking	183	133	(0.3 – 1.2)	294	22	(0.2 – 1.1)	182	134	(0.3 – 1.2)
No Social activity	62	30	0.020 OR 0.5	85	7	1.000 OR 1.1	66	26	0.001 OR 2.5
Yes	138	124	(0.3 – 0.9)	241	21	(0.4 – 2.6)	133	129	(1.5 – 4.1)
No exercise routine	153	106	0.135 OR 1.5	240	19	0.661 OR 1.3	153	106	0.095 OR 1.5
Yes	47	48	(0.9 – 2.4)	86	9	(0.6 – 3.03)	46	49	(0.96 – 2.5)

TABLE 4: The correlation of elderlies' risk factor and the screening tools of dementia in 2018 (N =352).

Risk Factors	HVLТ		pValue 95%CI	CDT		pValue 95%CI	AD8		pValue 95%CI
	Risk of Dementia	Norm		Risk of Dementia	Norm		Risk of Dementia	Norm	
Diabetes	29	27	0.495 OR 0.8	48	8	0.100 OR 0.4	33	23	0.769 OR 1.1
No Diabetes	171	125	(0.4 - 1.4)	276	20	(0.1 – 1.04)	165	131	(0.6 – 2.03)
Hypert- ension	80	79	0.033 OR 0.6	146	13	1.000 OR 0.9	88	71	0.840 OR 0.9
Normal	120	73	(0.4 – 0.9)	178	15	(0.4 – 2.1)	110	83	(0.6 – 1.4)
High Cholest- erol	152	116	1.000 OR 0.9	248	20	0.705 OR 1.3	147	121	0.413 OR 0.8
No	48	36	(0.6 – 1.6)	76	8	(0.6 – 3.1)	51	33	(0.5 – 1.3)

age will also increases the chance of suffering from degenerative diseases including dementia and the increasing number of elderly outnumber the health care facilities for

TABLE 5: The correlation of elderlies' risk factor: IMT (N= 352) and Education (N=354) with the screening tools of dementia in 2018.

Risk Factors	HVLt		pValue	CDT		pValue	AD8		pValue
	Risk of Dementia	Norm		Risk of Dementia	Norm		Risk of Dementia	Norm	
Obesity	77	74	0.024 OR 2.5	138	13	0.958 OR 1.03	75	76	0.070 OR 2.02
Normal	97	68		153	12		99	66	
Low weight	26	10		33	3		24	12	
Poor education	180	129	0.218 OR 0.7	290	19	0.005 OR 10.6	184	125	0.025 OR 0.0
Middle	18	23		32	9		15	26	
High	2	2		4	0		0	4	

the elderly [11]. One of the elderly health care facilities that are effective in providing health care for the elderly and are conducted through the Public Health Center program.

The proportion of female (237 person) and male (89 person) shows the chance of suffered risk of dementia. The statistical test with CDT's screening tool shows p value = 0.002 which means there is meaningful correlation between gender and risk of dementia. And the proportion of elderlies who do not social activity compared to those who doing social activity have statistical test shows p value = 0.020 (screening tools with HVLt) and p value = 0.001 (screening tools with AD8) which there is a meaningful correlation between do not social activity and the risk of dementia.

The result of statistical test about hypertension and risk of dementia shows p value = 0.033 with HVLt meaning that there significant correlation between hypertension with the risk of dementia. The correlation between body mass index and the risk of dementia shows that the proportion of elderlies with obesity have an increased risk of dementia compared to those with normal and low weight. The result of statistical test shows p value = 0.024 (screening tool with HVLt) which means there is a significant correlation between obesity and the risk of dementia.

The analysis of correlation between educational background and the risk of dementia shows that the proportion of elderlies with poor education have an increased risk of dementia compared to those who are well-educated. The result of statistical test shows p value = 0.005 (CDT) and p value = 0.025 (AD8) which means there is a significant correlation between educational background and the risk of dementia.

The result show that screening tools with HVLt, CDT and AD8 have difference meaning from the statistical test. The use of each of the 3 screening tools have strengths

and weaknesses depending on elderly condition and caregiver's perception. The detection and early diagnosis of dementia are increasingly important as our population ages [12], and using brief cognitive screening tools enabled us to detect mild cognitive impairment at the earliest stages [9] making them an important tool. Knowing the risk factors for dementia early is important for families because if there is dementia will experience behavioral changes that require special attention.

Behavioral changes occur due to dementia include delusions, hallucinations, depression, physical damage, anxiety, inability to take action which also means disability to carry out daily activities independently, mood changes, resistance, apathetic, and running away from home [13,14, 3, 15, 16]. This kind of condition causes elderly with dementia requiring special attention and treatment from families and health workers.

Research with 354 elderly and families as respondents in Jakarta province estimated the performance of 3 dementia screening tools including HVLIT, CDT, and AD8 together. Nevertheless, there were limitations such as did not measure sensitivity and specificity of each instruments.

5. Conclusion

The three screening tests including HVLIT, CDT and AD8 show that the elderly are at risk of developing dementia. Community Health Center should consider using HVLIT or CDT or AD8 as screening test according to elderly conditions to diagnose dementia or mild cognitive impairment early. Elderly individuals and their family could enhance their awareness about prevention of dementia by identifying existing risk factors.

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Conflict of Interest

The authors have no conflict of interest to declare.

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