

# Dementia Screening in the Elderly with Chronic Disease Using the General Practitioner Assessment of Cognition

Hanna Ulfatun Zaiyan<sup>1</sup>, Nurul Hadi<sup>2</sup>, Dara Febriana<sup>2\*</sup>

## ABSTRACT

**OBJECTIVE:** This study aimed to describe dementia screening in older adults with chronic diseases in Banda Aceh using the General Practitioner Assessment of Cognition (GPCOG) instrument.

**METHODOLOGY:** An exploratory-descriptive design with a cross-sectional approach was used in this study. The study sample consisted of 253 respondents selected using a purposive sampling technique. A translated and modified questionnaire was used to collect data by interviewing all respondents and several respondents' families/guardians. The frequency distribution, percentage, mean, and cross-tab analysis were used to analyze the data.

**RESULTS:** The screening showed that 71.1% of elderly with chronic illnesses didn't have dementia, while 28.9% did show signs of dementia. Early detection of dementia through screening programs can prevent more severe cognitive impairment in older adults.

**CONCLUSION:** The results suggest that healthcare providers, especially those in primary care, should make dementia screening more available to the community by using the right instrument, such as GPCOG, especially among the elderly population.

**KEYWORDS:** Dementia, screening, elderly, chronic disease

## INTRODUCTION

The rapid growth of the older adult population in Indonesia occurs due to the demographic transition because Indonesia has low death and birth rates. In addition, the epidemiological transition from infectious diseases to degenerative diseases also accompanies demographic changes toward an older population structure. In Indonesia, the elderly population has risen steadily during the last five decades (1971 – 2020), with female elderly being 9.92%, about one percent more than male elderly (10.43% compared to 9.42%). Overall, the youngest - old aged 60 to 69 years, were far more dominating, accounting for up to 64.29%, followed by the middle-old (70–79 years) at 27.23 percent and the oldest-old (>80 years) at 8.49 percent. Six provinces had an increase in population in 2020, including West Sumatra (10.07%), Central Java (13.81%), East Java (13.38%), Yogyakarta (14.71%), Bali (11.58%), and North Sulawesi (11.51%)<sup>1</sup>.

Indonesia is approaching the aging population period due to its growing old population. As a result of this problem, the aging population has become a topic of discussion in international forums such as the G20, with several commitments being discussed, including Resolution World Health Assembly (WHA), Regional Strategy for Healthy Aging, Response to Aging

Societies and Dementia<sup>2</sup>. Dementia is one of the health issues that has been highlighted, and it is claimed that it will reduce the quality of life of older adults. Dementia is a progressive and permanent loss of mental function that occurs without causing a loss of consciousness. According to the World Health Organization (WHO), more than 55 million people worldwide have dementia, rising to 10 million cases annually. Global aging is associated with an increased likelihood of persons with dementia to 131.5 million by 2050. It was reported that dementia affects 30% of older adults over the age of 80 worldwide<sup>3</sup>. It has risen to become the world's seventh leading cause of death and the main cause of disability and dependency among the elderly. Dementia also has medical, psychological, and social consequences for sufferers, caregivers, families, and society<sup>4</sup>.

The older an individual is more often associated with chronic disease due to a loss in the body's resistance that they experience on a physical, psychological, and social level<sup>5</sup>. Therefore, screening is offered to detect dementia and optimize therapy to slow the severity of dementia, which is especially important for older adults with a history of other chronic conditions. This secondary prevention emphasizes the early detection of disease. The target population is healthy-looking people who have a subclinical form of the disease with pathological alterations but no overt symptoms to diagnose. Secondary prevention aims to reduce the impact of the disease as soon as possible so that it can hinder its progression, encourage personal strategies to prevent re-injury or relapse and implement programs to restore normal function to prevent long-term problems<sup>6</sup>.

<sup>1</sup>Faculty of Nursing, University of Syiah Kuala, Aceh, Indonesia.

<sup>2</sup>Department of Geriatric Nursing, Faculty of Nursing, University of Syiah Kuala, Aceh, Indonesia.

**Correspondence:** dara.febriana@usk.ac.id  
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The General Practitioner Assessment of Cognition (GPCOG) is one of numerous measuring instruments that can screen for dementia. The GPCOG instrument is considered suitable for primary health care as a tool for detecting the risk of cognitive impairment in the elderly<sup>7</sup>. The GPCOG is easier and faster to use than the Mini-Mental State Examination (MMSE), which is widely known and practiced. On average, MMSE takes 7-10 minutes, whereas GPCOG takes less than 5 minutes and has higher sensitivity and specificity<sup>8,9,10</sup>.

A prior study at the Muhammadiyah Nursing Home and the Pondok Lansia Tulus Kasih Foundation in Bandung, Indonesia, discovered that 42.75% of people had Alzheimer's disease. They used the Montreal Cognitive Assessment Indonesian Version Questionnaire (MoCA Ina) to test cognitive function. Another 2019 study in Banda Aceh employed the Mini-Cog instrument and discovered that 65.5% of older people in nursing homes may have cognitive impairment. The current study intends to build on these findings by describing dementia screening in older adults with chronic conditions in Banda Aceh on a bigger scale using the GPCOG instrument<sup>11,12</sup>.

## METHODOLOGY

### Study Design

This study employed a quantitative descriptive cross-sectional design to examine and screen older adults for cognitive impairment. Data collection was conducted in March 2022 in Banda Aceh Municipality.

### Population and Sample

The 253 respondents were selected using a purposive sampling technique in which the respondents chosen must meet the specific inclusion criteria below:

- Willing to participate in study
- Over 60 years of age
- Living in Banda Aceh
- Living with chronic disease(s)
- Not having hearing or communication problems
- Able to read and write
- Living with family/guardian

### Instrument

The GPCOG consists of two parts: patient examination and informant interview. If the patient score in the first step of the examination is nine and the informant received a score between 4-6 in the second step of the interview, the individual was not diagnosed with dementia. The respondent would be indicated as having dementia if the score is 0-4 in step one or if step one gets a score of 5-8, but step two gets a score of 0-3. The data was collected using translated and modified General Practitioner Assessment of Cognition (GPCOG) instrument<sup>8</sup>. This modified instrument had been tested and validated, and all translated and modified items were valid ( $r$  count >  $r$  table). In addition, the value of Cronbach's alpha for the reliability test is 0.77.

### Data Analysis

The frequency distribution, percentage, mean, and

cross-tab analysis were used to analyze the data.

### Ethical Statement

Data was collected after receiving ethical approval on January 21, 2022, from the Research Ethics Committee of the Faculty of Nursing, Universitas Syiah Kuala, with the ethics certificate number 111083271221.

## RESULTS

Demographic data of the study included age, gender, marital status, last education, history of head trauma, type of disease, and status of residence. The following results were derived based on data collected from 253 elderly.

Table 3 shows that most samples were female (66.8%) and aged 60-74 (62.8%). Of the respondents, 147 were married (58.1%), 95 (37.5%) graduated middle school, 195 people (77.1%) without a history of head trauma, and 106 respondents (41.9%) with chronic hypertension. Most respondents lived with a spouse (husband/wife), 121 people (47.8%).

**Table I** shows that the one-step category of the GPCOG instrument has the highest frequency of 147 people in the screening category (58.1%). If achieving a perfect score of 9 in step one, the respondent only has to complete one step. However, if the score in step one is between 5-8, the respondent must complete the second phase, the informant interview.

According to **Table II**, the highest frequency of dementia screening in older adults with chronic conditions using the GPCOG instrument is in the categories of no indication of dementia, which has 180 participants (71.1%) and indicated dementia, which has 73 participants (28.9%).

**Table I: Frequency Distribution of Used Screening Categories**

Category	f	%
One step (Patient Examination)	147	58,1
Two steps (Patient Examination and Informant Interview)	106	41,9

**Table II: Frequency Distribution of Total GPCOG Score**

Dementia	f	%
Indicated	73	28,9
Not Indicated	180	71,1
<b>Total</b>	<b>253</b>	<b>100</b>

## DISCUSSION

Dementia is a clinical syndrome that affects people's memory, thinking, behavior, and capacity to complete daily tasks. It can be detected using various instruments, one of which is GPCOG. The screening revealed that 180 participants (71.1%) showed no signs or symptoms of dementia. This finding aligns with a study conducted in Bandung; the results found

that more than 61.2% of respondents were classified into the average category or did not indicate dementia<sup>13</sup>.

According to the data, 13% of respondents aged 60-74 and 15.8% of respondents aged >75 indicated dementia. Based on gender, 7.9% of male respondents and 20.9% of female respondents stated dementia. According to marital status, 49 widowed/widowed respondents (19.4%) reported dementia. Regarding education background, 33 respondents (13%) graduated from elementary schools, 32 (12.6%) middle school, and (8%) higher education. Moreover, 73 respondents (29.6%) suggested dementia based on their history of head trauma. There were 73 participants with chronic conditions (28.9%) who had dementia, with older adults with hypertension having the highest proportion 18 participants (7.1%). There were 36 elderly (14.2%) living with their children who had dementia. **Table III**

**Table III: Frequency Distribution of Dementia Status Cross-tab with Demographic Data**

Variables	f	%	GPCOG			
			Not Indicated		Indicated	
			f	%	f	%
<b>Age (WHO)</b>						
Elderly (60-74)	169	66.8	136	53.8	33	13
Old (75-90)	84	33.2	44	17.4	40	15.8
<b>Sex</b>						
Male	94	37.2	74	29.2	20	7.9
Female	159	62.8	106	41.9	53	20.9
<b>Marital Status</b>						
Single	3	1.2	2	0.8	1	0.4
Married	147	58.1	124	49	23	9.1
Widow/widower	103	40.7	54	21.3	49	19.4
<b>Education Level</b>						
Elementary School	76	30	43	17	33	13
Secondary School	95	37.5	63	24.9	32	12.6
Higher Education	82	32.4	74	29.2	8	3.2
<b>Head Trauma</b>						
No	195	77.1	138	54.5	57	22.5
Yes	58	22.9	42	16.6	16	6.3
<b>Chronic Diseases</b>						
Hypertension	106	41.9	88	34.6	18	7.1
Diabetes Mellitus (DM)	41	16.2	36	14.2	5	2
Stroke	12	4.7	3	1.2	9	3.6
Hyperlipidemia	26	10.3	17	6.7	9	3.6
Joint disorders	65	25.7	34	13.4	31	12.3
Asthma	3	1.2	2	0.8	1	0.4
<b>Living status (with)</b>						
Spouse	121	47.8	103	40.7	18	7.1
Son/daughter	81	32	45	17.8	36	14.2
Extended Family	51	20.2	32	12.6	19	7.5

The results revealed that the majority of elderly aged 60-74 were 169 people (66.8%), while the elderly aged 75-90 years were 84 people (33.2%). This result supported the statistical data from the Indonesia

Central Bureau of Statistics, where an increase in the elderly population in Indonesia aged over 60 years is greater than 7% of the total population; even in 2019, it reached 9.6% or around 25.64 million people<sup>14</sup>. This study's respondents were primarily female, as many as 159 people (62.8%), while men were 94 (37.2%). These results are in accordance with data from the Indonesian Ministry of Health and Banda Aceh Health Office, where the female population is more than the male<sup>15,16</sup>.

According to the previous illustration, most older adults aged 60-74 were 169 participants (66.8%), while the elderly aged 75-90 years were 84 people (33.2%). This result is consistent with 2019 reports from the Central Bureau of Statistics, which show that the old population in Indonesia aged over 60 increased by more than 7% of the total population in 2019, reaching 9.6% or approximately 25.64 million people<sup>12</sup>. In this study, the respondents were 159 females (62.8 %) and 94 males (37.2%). These data indicated that the female population outnumbers the male population<sup>15,16</sup>.

In this study, 147 respondents (58.1%) were married. The number of married elderly was more than those who were widowed or unmarried. A study at nursing homes showed that unmarried elderly and widows/widowers have a twofold more significant risk of dementia. On the other hand, married status can be considered as social assistance for at-risk individuals in preventing dementia or other emotional disorders that can accelerate mental decline<sup>17,18</sup>.

Most participants had completed secondary school (37.5%). Level of education is a factor that can affect the risk of dementia. Lower levels of education are associated with an increased likelihood of developing dementia. Education is considered to be an intellectually challenging activity. Therefore, engaging in education is essential in training the brain and protecting against the risk of dementia in old age<sup>19</sup>.

In this study, 41.9% of the 253 elderly had hypertension. The remaining 58.1% of respondents suffered from other chronic diseases such as Diabetes Mellitus (DM), stroke, hyperlipidaemia, joint problems, and asthma. Genetic variables (one of which is apolipoprotein E), age, hypertension, depression, and social activity factors are considered risk factors for dementia. In dementia, hypertension can cause blood vessels to stiffen, increasing blood vessels. These situations can exacerbate the effects of aging on brain structures, such as a decrease in white and grey substances in the prefrontal lobes and an increase in white substance hyper-intensity in the frontal lobes<sup>20</sup>.

Elevated blood pressure is associated with a higher risk of dementia. Controlled hypertension may lower the risk of dementia in people under 70, suggesting that reducing the burden may help minimize the possible risk of dementia<sup>21</sup>. People can lower their risk of cognitive decline and dementia by keeping good blood pressure, cholesterol, and blood sugar levels<sup>4</sup>.

Older people with one or more chronic comorbidities are more likely to have cognitive impairment that interferes with everyday functioning in people 45 years or older<sup>22</sup>.

## CONCLUSION

Based on the study findings and discussion, it can be concluded that the dementia screening carried out for older adults with chronic diseases in Banda Aceh revealed that the majority of older adults (180 respondents/71.1%) were not indicated for dementia, and 73 respondents (28.9%) dementia indicated. As a result, whether there are symptoms or not, additional identification is required through dementia screening programs for the population, particularly older adults, in healthcare settings such as hospitals, clinics, and communities. It is believed that this research will provide a reference for increasing efforts to improve elderly health, mainly cognitive function, and will also be helpful for future research.

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## AUTHOR CONTRIBUTION

Zaiyan HU: Writing, original draft preparation

Hadi N: Writing, review and editing

Febriana D: Editing, visualization, and supervision

All authors have read and agreed to the published version of the manuscript.

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