

Relationship Between Depression and Cognitive Function Disorders in Elderly Fishermen in Socah Bangkalan Village

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Abstract

The current incidence of Alzheimer's dementia is approaching 50 million people globally. In Indonesia, data from Alzheimer's Indonesia (ALZI) records 1.2 million people with dementia (ODD), expected to increase to 2-4 million in 2050. Depression in the elderly is a mental disorder with symptoms such as feelings of sadness, anxiety, difficulty sleeping, and loss of hope. This study aims to understand the relationship between depression and the cognitive function of elderly fishermen and non-fishermen in Socah Village. Data collection was carried out through the Mini Mental State Examination (MMSE) and Geriatric Depression Scale (GDS) tests. This research is a type of observational analysis with a sample of 84 elderly people in Socah Bangkalan village.

The results showed that the majority of respondents were male (65.48%), the majority worked as fishermen (52.38%), and the majority had high school education (40.48%). In GDS, the majority of respondents were normal/not depressed (57.76%) and mildly depressed (45.24%). In the MMSE, the majority were normal/not experiencing cognitive impairment (57.14%) and probable cognitive impairment (42.86%).

Data analysis using the chi-square test showed a significance (p-value) of 0.000, indicating a relationship between depression and cognitive impairment in elderly fishermen in Socah Bangkalan Village. Odd Ratio (OR) is 6.119 with CI = 2.359-15.869, indicating that elderly people with depression have 6.119 times the risk of cognitive impairment.

Depression is a major cause of cognitive impairment, including factors such as the neurotransmitter hypothesis, neurological pathways, neuroendocrine factors, genetics, psychosocial, and environmental.

There is a relationship between depression and cognitive impairment in elderly fishermen in Socah Bangkalan Village, Madura

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Introduction

Dementia itself is a condition where there is a syndrome of deficits in cognitive function accompanied by a loss of ability to carry out daily activities¹. Alzheimer's is one of the common dementia diseases that we can encounter, there are disturbances and deficits in brain function that affect one's emotions, memory and decision-making, known by the general public as senile

disease².

Alzheimer's dementia often occurs at the age of > 65 years but is not uncommon in individuals aged around 40 years. (Armadi Setiawan, 2015). A common problem found in Alzheimer's is that there are obstacles for someone to be able to carry out early detection because senility is considered common in the elderly so unsupportive management results in the optimal quality of life conditions not being achieved³. According to a study by the Alzheimer's Association, Alzheimer's dementia is very influential on public health conditions (high cases, mortality rates, prevalence), social costs, costs for health, and career life, so the prevention of Alzheimer's disease is a top priority in health problems in the world⁴.

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One of the methods used to detect deficits in cognitive function is the Mini-Mental State Examination (MMSE). The MMSE is a simple psychometric examination to determine deficits in cognitive function which must be examined further with the help of other examination tools. There are various tests to diagnose dementia, for example the Mini Mental State Examination (MMSE). Diagnostic criteria for dementia, namely: Intellectual ability has decreased causing disruption of activities in the environment and work. Deficits in cognitive function always involve memory, reduced ability to analyze problems, abstract thinking, judgment, and changes in one's personality. During the interview activities, there were several things that could be found, for example questions related to name, date of birth, age, address, occupation, and medical history. Using the results of the answers that appear, an impression will be obtained regarding memory, language skills and pronunciation of words. Can also ask whether the respondent is aware of the conditions experienced related to cognitive. This MMSE questionnaire has several questions related to the respondent's memory. Each question is worth 0 to 5. Respondents with normal dementia category must have test scores of 24 to 30, respondents with possible cognitive function deficits have scores of 17 to 23 and respondents in the definite category have scores of 0 to 16. Can also ask whether the respondent is aware of the conditions experienced related to cognitive. This MMSE questionnaire has several questions related to the respondent's memory. Each question is worth 0 to 5. Respondents in the normal dementia category must have a test score of 24 to 30, respondents with possible cognitive function deficits have a score of 17 to 23 and respondents in the definite category have a score of 0 to 16. Can also ask whether the respondent is aware of the conditions experienced related to cognitive. This MMSE questionnaire has several questions related to the respondent's memory. Each question is worth 0 to 5. Respondents in the normal dementia category must have a test score of 24 to 30, respondents with possible cognitive function deficits have a score of 17 to 23 and respondents in the definite category have a score of 0 to 16^{5,6}.

Depression is a mental disorder that often occurs in a person's life and is characterized by emotional, motivational, functional, behavioral,

and cognitive disturbances. Someone who is depressed tends to have no hope or feelings of brokenness or excessive helplessness. Depression in the elderly is a mental disorder experienced by individuals aged 60 years and over, such as feelings of sadness, anxiety, difficulty sleeping, and having no hope^{7,8}. Based on the description of the data above, the researcher is interested in conducting research on the relationship between depression and cognitive dysfunction in the elderly in Socah Village, Bangkalan, Madura.

Depression will disturbance many systems of the body for example diabetes mellitus influences periodontitis and the system in the dentist disturbance emotional and could increase depression^{9,10}

Formulation of the problem of how the relationship between depression and impaired cognitive function in the elderly.

Specific objectives in this study:

- Knowing the description of the depression level of the elderly in Socah Village.
- Knowing the description of the cognitive function of the elderly in Socah Village.
- Knowing the relationship between depression and the cognitive function of the elderly in Socah Village uses the results of the Mini-Mental State Examination (MMSE) and Geriatric Depression Scale (GDS) tests.

Materials and methods

Research design

The research conducted is Observational and Analytical in nature, using quantitative research because measurements and observations are obtained through the identification of large and small rather than variations in value.

Place and time of research

The location and time of the research were carried out in Socah Village, Bangkalan, Madura, in January - March 2023.

Results

Characteristics of Respondents

Based on table 1, it was found that based on gender, the majority of respondents were male, as many as 55 people (65.48%), based on work, it was found that most of the respondents worked as fishermen, as many as 44 people

(52.38%), based on the level of education, most of the respondents 34 people with high school education (40.48%).

Characteristics	Amount	%
Gender		
Man	55	65.48
Woman	29	34.52
Work		
Fisherman	44	52.38
Not fishermen	40	47.62
Education		
No school	2	2.38
SD	16	19.05
JUNIOR HIGH SCHOOL	26	30.95
SMA/SMK	34	40.48
S1	5	5.95
S2	1	1.19

Table 1. Characteristics of respondents.

Analysis univariate

Table 2 shows the depression level of the respondents as measured using the Geriatric Rating Scale (GDS). It was found that the majority of respondents did not experience depression/normal as many as 46 people (57.76%) and experienced mild depression as many as 38 people (45.24%).

Depression level	Amount	%
Not depressed/ Normal	46	54.76
Mild Depression / Mild Depression	38	45.24
Depression is / Moderate Depression	0	0
Severe depression / Severe Depression	0	0
Amount	84	100

Table 2. Respondents' level of depression.

Cognitive impairment	Amount	%
No cognitive impairment / Normal	48	57.14
Probable Cognitive Disorder	36	42.86
Definite Cognitive Disorders	0	0
Amount	84	100

Table 3. Respondents' cognitive impairment.

Table 3 shows the cognitive impairment of the respondents as measured using the Mini-Mental State Examination (MMSE) and the results showed that the majority of respondents did not experience cognitive impairment / normal as many as 48 people (57.14%) and probable cognitive impairment as many as 36 people (42.86%).

Bivariate analysis

Based on table 4, the results of data analysis using the chi square test obtained a significant value / p value of 0.000, which means that there is a relationship between depression and cognitive impairment in elderly fishermen in Socah Bangkalan Village, Madura. The Odd Ratio (OR) value was 6.119 with CI = 2.359-15.869, which means that the elderly who suffer from depression experience 6.119 times cognitive impairment compared to the elderly who do not experience depression.

Depression	Cognitive impairment				P-value	OR	CI 95%	
	Normal		Cognitive impairment				Min	Max
	Amount	%	Amount	%				
Normal	35	41.67	11	13.10	0.000	6,119	2,359	15,869
Depression	13	15.48	25	29.76				
Amount	48	57.14	36	42.86				

Table 4. Relationship between depression and cognitive impairment in elderly fishermen in Socah Bangkalan Village, Madura.

Discussion

The GCS results test showed that most of the respondents were male (65.48%), fishermen (52.38%) and high school graduates (40.48%). The GDS results showed that most of the respondents did not experience depression/normal as much as 57.76% and experienced mild depression as much as 45.24%.¹¹ stated that men in Qionghai, Hainan Province, China who work as fishermen have the opportunity to experience depression caused by smoking habits and work stress.

The results of the MMSE showed that most of the respondents did not experience cognitive impairment/normal as much as 57.14% and probable cognitive impairment as much as 42.86%. Impaired cognitive function is most often experienced by elderly individuals with late-onset depression¹².

The results of the study found that there was a relationship between depression and cognitive impairment in elderly fishermen in Socah Bangkalan Village, Madura. The results of this study are in line with research¹³ in China which states that there is a significant relationship between depression and impaired cognitive function (OR = 3.33; 95% KI: 1.97–5.63; p <0.001). Individuals with depression tend to have decreased performance related to neuropsychological aspects and impaired

execution function when compared to individuals without depression¹⁴.

Depression is a major cause of cognitive impairment such as memory loss in the elderly population. Many factors contribute to the development of depressive cognitive impairment such as⁴:

- The neurotransmitter hypothesis—The serotonin hypothesis forms the basis of the treatment of major depressive disorder and the memory disorders that accompany it. The serotonin 5-HT-1B receptor has been suggested as a possible factor in depressive disorders. 5-HT-1B receptor dysfunction was detected in the brains of depressed patients¹⁵
- Neurologic pathways—Memory and learning processes are linked by intricate circuits involving the amygdala and its connections to structures in the frontal and temporal lobes: the medial temporal gyrus, prefrontal, and anterior cingulate cortex. Major depressive disorder primarily affects these brain structures (particularly the amygdala and hippocampus), leading to reduced memory and verbal learning processes¹⁶.
- Neuroendocrine factors—Researchers have found that hypercortisolemia caused by depressive disorders is associated with degeneration of neurons in the hippocampus that causes cognitive impairment¹⁵.
- Genetic factors—C9ORF72 repeat on chromosome 9 is found in patients with depressive cognitive disorder. This has previously been associated with neurodegenerative dementia. These findings confirm a genetic link with depressive cognitive impairment¹⁷.
- Psychosocial and environmental factors—the interaction of factors such as past (mental and physical) abuse, poor social support, job loss, negative life events, and substance abuse lead to increased stress and depression by altering the hypothalamic-pituitary system. axis, which ultimately leads to cognitive impairment¹⁸
- On depression we must consider there is the role of the neurotransmitter dopamine, Lead Acetate, L-NAME, and Nitric oxide¹⁹

Conclusions

1. The majority of respondents were male (65.48%), fishermen (52.38%), and high school educated (40.48%).
2. Most of the respondents did not experience depression/normal (57.76%) and cognitive impairment (57.14%), with a small number experiencing mild depression (45.24%) and probable cognitive impairment (42.86%).
3. There is a relationship between depression and cognitive impairment in elderly fishermen in Socah Bangkalan Village, Madura, in line with the findings of other studies.

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Declaration of Interest

The authors report no conflict of interest.

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