

# The Relationship between Cognitive Function and the Ability of Social Interaction in the Elderly in Gresik

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**Abstract:** Cognitive impairment analysis that is associated with social interaction problems is important in order to know whether the intellectual ability of the elderly influences social activities carried out daily. The aim of the study was to identify cognitive functions and their relation to the ability of social interaction in the elderly. A cross-sectional study was conducted from 1 February to 30 May 2019, among the elderly in Gresik District. The sample selected as many as 102 respondents. The sampling technique used proportional random sampling. The independent variable is the cognitive function. The dependent variable is the ability of social interaction. The statistical test used is the Phi Coefficient test which showed a significant relationship between cognitive function and social interaction abilities in the elderly with the value ( $X^2$ ) count of 75.683 and Phi coefficient ( $\phi$ ) value of 0.861,  $p = 0.000$ . The elderly need an environment that supports social interaction to avoid cognitive decline so they need facilities that can be used to interact and communicate with fellow elderly people.

**Keywords:** Elderly; Cognitive Function; Social Interaction Ability

## I. INTRODUCTION

The demographic bonus that has occurred so far, has helped to increase the number of elderly people in the world which affects increasing Alzheimer's disease due to vascular dementia [1]. According to world reports on Alzheimer's, more than 46 million people were living with dementia in 2015, and this number is expected to increase to reach 131.5 million in 2050 [2]. Estimates of the number of senior citizens in Indonesia also experienced an increase from 18 million people (7.56%) in 2010, to 25.9 million people (9.7%) in 2019, and is expected to continue to increase to 48,2 million people in 2035 (15.77%). Besides vision and hearing disorders, cognitive disorders are a major problem in the elderly [3].

Cognitive disorders that accompany Alzheimer's disease in the elderly can cause a decrease in performance on cognitive tasks primarily when making decisions due to delays in processing, working memory and executive cognitive functions [4]. This is in line with other studies that the decline in memory due to decreased cognitive function that occurs in the elderly is the main cause of difficulties in expressing what you want to say [5] and becomes an obstacle in social activities [6]. This results in functional dependence [7] and decreased quality of life in the elderly [8], and overcoming this cognitive impairment can improve listening ability [9]–[11], speech perception [12], [13], and play an important role in realizing cognitive work [14].

The involvement of the elderly in the community environment is a major indicator of their health [15]. Some of the elderly who have cognitive impairment and dementia problems has always been associated with the contact social [16], and the need for more frequent social contact is very important to avoid psychosocial problems for the elderly [9]

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[17] [18], avoiding loneliness and suicidal ideation [19], although some elderly often experience communication difficulties in interacting [20], so the elderly still need help to maintain a more stable emotional atmosphere in making contact with others [21] [22]. The results of the systematic review also agree with the importance of social support for social activities for the elderly [23]. In addition, the elderly also need social interaction in order to maintain their psychological well-being [24].

While this previous research has discussed a lot about social relationships, the important aspects of social relations such as social interaction have not yet been discovered. With this evidence in mind, research on the relationship between cognitive functions and social interactions is needed. Identification of specific aspects of social interaction with cognitive functions is expected to provide broader information in providing nursing services for the elderly who experience cognitive decline, especially those living in the community. The aim of the study was to identify cognitive functions and their relation to the ability of social interaction in the elderly.

## II. METHODS

- Method

A cross-sectional study was carried out at the Cerme community health center in Gresik district on the grounds that the integrated elderly service post at the Cerme community health center in Gresik Regency always carried out routine activities every month and the number of active elderly people was very large, besides the location being easily accessible. The study was carried out from March 1 to March 30, 2019. The sample consisted of 102 elderly people in the integrated services selected by proportional random sampling. The sample size is determined using the formula for calculating the sample size and setting the error margin to 5% with a confidence level of 95%.

The Cerme community health center in Gresik district is a pioneer of integrated elderly service post activities in Gresik district by placing the activity as a superior program. It is in charge of the work area of 4 sub-health centers and 22 village health posts. There are 300 elderly, spread across 4 integrated service posts for the elderly who are actively and routinely carrying out activities every month. A structured questionnaire, which contains closed questions including information about cognitive function and a social interaction ability questionnaire were used. The questionnaire was prepared in Indonesian and the pattern of delivery in the local language. Before data collection, the questionnaire was tested on 10% of the elderly, at the Cerme community health center, who were not selected for research but were randomly selected from the elderly who did not participate in the integrated services post for the elderly.

The Ethics Standards were confirmed to obtain approval obtained from the Airlangga University Faculty of Nursing Ethics Commission number 1564-KEPK on July 11, 2019. The survey began after written approval was obtained from the Gresik Regency Government through the Gresik District Health Office which oversees the Cerme Community Health Center. The results of the trial were then carried out; the data normality test through validity and reliability testing. By not using a research instrument whose value is below 0.5, the researcher then made some necessary corrections for 2 days. After the corrections were made for improvement, data collection was performed on the respondents who had met the inclusion and exclusion criteria.

During data collection, the questionnaire was checked for completeness every day by data collectors and supervisors. The completed questionnaire was also re-examined by the principal investigator to maintain data quality. After data collection, each questionnaire was checked for completeness, then coded and entered into SPSS window version 20 for analysis. The results are presented in tabular form, and the text uses frequency and statistics.

- Material

Cognitive function questionnaire and social interaction skills

## III. RESULTS

#### Distribution of respondents by sex

Table 1. Respondents' demographic data (n = 102 )

Characteristics	Indicator	Frequency	%
Gender	Male	24	23.53
	Female	78	76.47
Age (years)	48 - 59	45	44.10
	60 - 74	51	50
	> 75	6	5.90
Religious social activities	Come along	75	73.53
	Do not participate	27	26.47

Table 2. Research cross tabulating data

Cognitive Functions	Interaction skill				Total	
	Not good		Good		F	%
	F	%	F	%		
Not Good	40	95.24	2	4.76	42	41.18
Good	5	8.33	55	91.67	60	58.82
Total	45	44.12	57	55.88	102	100

The statistic test results obtained were:

( $X^2$ ) count of 75.683 and Phi coefficient ( $\phi$ ) value of 0.861,  $p = 0.000$ .  $H_0$  is rejected, meaning that there is a significant relationship between cognitive function and social interaction ability.

## IV. DISCUSSION

This research was meant to determine aspects of cognitive function related to the ability of social interaction in the elderly who live in the community. The results showed that cognitive function has a great influence on the ability of social interaction in the elderly and this shows that good cognitive function can facilitate the elderly's social interaction in the community. This is in line with the results of research showing that elderly people who have a good cognitive function can make social relations with high intensity [7] [25], and poor cognitive functions can cause the elderly to isolate themselves [26]; also, the elderly who are always active in organizations show success in living their old age [15] and preventing dementia [27]. But in the elderly, the ability of social interaction consisting of social contact and communication cannot be run properly because each person's cognitive abilities are different.

The social contact subscale of social interaction evaluates how the elderly contact others. The results showed that contact more often done by the elderly was associated with efforts to maintain functional cognitive status. This is in line with this study that social contact can maintain and reduce cognitive impairment [16] [28]. Longitudinal studies of social contact also found an effort to participate in social activities rather than gathering with family and relatives maintained cognitive dysfunction [29]. The same is done by retired women in China but not men [6]. Other studies have shown a link between the use of social media and maintaining cognitive function for the elderly [30][27]. However, the results of other studies found efforts to maintain cognitive decline through programmed physical activity exercises [31], making crafts [32], doing scheduled daily activities [33], regular exercise [34]. Consistent with this study, there is a relationship between social interaction and cognitive function. Thus, gathering with others is very important, not only maintaining a tolerant Javanese culture and living in harmony but also at the same time maintaining a better cognitive function.

Communication subscale on social interaction evaluated how the elderly communicate with others. The results of the study indicate that there are maximum efforts to be able to understand others about the meanings are associated with efforts to maintain functional cognitive status. Using a larger and clearer written word size is often done by the elderly in conveying their thoughts [35], and using important signals through nonverbal language is often done in the hope that the other person can understand, want to hear and pay attention to what is said [36].

## V. CONCLUSION

Cognitive function significantly influences the ability of social interaction in the elderly. A good cognitive function enables social interaction in the elderly both in social contact and communication with the surrounding community. This is used to maintain daily activities. By having a good cognitive function, the elderly can express their thoughts through verbal or nonverbal language and can thus carry out social interactions with others.

## CONFLICTS OF INTEREST

This study does not have the potential to cause a conflict of interest. This study only links two variables and does not cause physical harm to respondents. All the participants gave written informed consent before participating, and confidentiality of identity was protected.

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## REFERENCES

- [1] N. K. Seetlani, N. Kumar, K. Imran, A. Ali, N. Shams, and T. Sheikh, "Alzheimer and vascular dementia in the elderly patients," *Pakistan J. Med. Sci.*, vol. 32, no. 5, pp. 1286–1290, 2016.
- [2] M. Prince, A. Wimo, M. Guerchet, A. Gemma-Claire, Y.-T. Wu, and M. Prina, "World Alzheimer Report 2015: The Global Impact of Dementia - An analysis of prevalence, incidence, cost and trends," *Alzheimer's Dis. Int.*, no. August, p. 84, 2015.
- [3] D. M. Guthrie *et al.*, "Combined impairments in vision, hearing and cognition are associated with greater levels of functional and communication difficulties than cognitive impairment alone: Analysis of interRAI data for home care and long-term care recipients in Ontario," *PLoS One*, vol. 13, no. 2, pp. 1–27, 2018.
- [4] G. Murman, Daniel L and L. E. Jorgensen, "The Impact of Age on Cognition Cognition and the Aging Auditory System," *Semin Hear*, vol. 36, no. 1, pp. 111–121, 2015.
- [5] K. C. McCullough, K. A. Bayles, and E. D. Bouldin, "Language performance of individuals at risk for mild cognitive impairment," *J. Speech, Lang. Hear. Res.*, vol. 62, no. 3, pp. 706–722, 2019.
- [6] C. Fu, Z. Li, and Z. Mao, "Association between social activities and cognitive function among the elderly in china: A cross-sectional study," *Int. J. Environ. Res. Public Health*, vol. 15, no. 2, 2018.
- [7] K. Watanabe *et al.*, "Association between Social Relationships and Cognitive Function among the Elderly," vol. 6, no. 2, pp. 59–63, 2016.
- [8] E. Lara *et al.*, "Cognitive reserve is associated with quality of life: A population-based study," *Exp. Gerontol.*, vol. 87, pp. 67–73, 2017.
- [9] M. Grassi, C. Meneghetti, E. Toffalini, and E. Borella, "Auditory and cognitive performance in elderly musicians and nonmusicians," *PLoS One*, vol. 12, no. 11, pp. 1–21, 2017.
- [10] A. Martini, A. Castiglione, R. Bovo, A. Vallesi, and C. Gabelli, "Aging, cognitive load, dementia and hearing loss," *Audiol. Neurotol.*, vol. 19, no. suppl 1, pp. 2–5, 2014.
- [11] M. K. Pichora-Fuller, P. Mick, and M. Reed, "Hearing, Cognition, and Healthy Aging: Social and Public Health Implications of the Links between Age-Related Declines in Hearing and Cognition," *Semin. Hear.*, vol. 36, no. 3, pp. 122–139, 2015.
- [12] B. J. Kim and S. H. Oh, "Age-related changes in cognition and speech perception," *Korean J. Audiol.*, vol. 17, no. 2, pp. 54–58, 2013.
- [13] L. M. A. de Carvalho, E. C. de M. Gonzalez, and M. C. M. Iorio, "Reconhecimento de fala no ruído de idosos: interações entre desempenho cognitivo, sintomatologia depressiva e escolaridade," *Braz. J. Otorhinolaryngol.*, vol. 83, no. 2, pp. 195–200, 2017.
- [14] T. Froese, H. Iizuka, and T. Ikegami, "Embodied social interaction constitutes social cognition in Pairs of humans: A minimalist virtual reality experiment," *Sci. Rep.*, vol. 4, pp. 1–10, 2014.
- [15] H. Douglas, A. Georgiou, and J. Westbrook, "Social participation as an indicator of successful aging: An overview of concepts and their associations with health," *Aust. Heal. Rev.*, vol. 41, no. 4, pp. 455–462, 2017.

- [16] A. Sommerlad, S. Sabia, A. Singh-Manoux, G. Lewis, and G. Livingston, "Association of social contact with dementia and cognition: 28-year follow-up of the Whitehall II cohort study," *PLOS Med.*, vol. 16, no. 8, p. e1002862, 2019.
- [17] L. Boss, D.-H. Kang, N. Bergstrom, and J. L. Leasure, "Psychosocial Correlates of Cognitive Function in the Elderly: A Biobehavioral Approach," *Int. J. Nurs.*, vol. 2, no. 1, pp. 48–55, 2015.
- [18] D. S. N. Aziz and D. Krinatuti, "Cognitive Function, Social Interaction, and Self Concept of Elderly Widows and Widowers," *J. Fam. Sci.*, vol. 2, no. 2, p. 1, 2017.
- [19] V. A. Wright-St Clair, S. Neville, V. Forsyth, L. White, and S. Napier, "Integrative review of older adult loneliness and social isolation in Aotearoa/New Zealand," *Australas. J. Ageing*, vol. 36, no. 2, pp. 114–123, 2017.
- [20] K. M. Yorkston, M. S. Bourgeois, and C. R. Baylor, "Communication and aging," *Phys. Med. Rehabil. Clin. N. Am.*, vol. 21, no. 2, pp. 309–319, 2010.
- [21] K. Harada, H. Sugisawa, Y. Sugihara, S. Yanagisawa, and M. Shimmei, "Social Support, Negative Interactions, and Mental Health: Evidence of Cross-Domain Buffering Effects Among Older Adults in Japan," *Res. Aging*, vol. 40, no. 4, pp. 388–405, 2018.
- [22] T. A. M. Tengku Mohd, R. M. Yunus, F. Hairi, N. N. Hairi, and W. Y. Choo, "Social support and depression among community dwelling older adults in Asia: a systematic review," *BMJ Open*, vol. 9, no. 7, p. e026667, 2019.
- [23] G. Lindsay Smith, L. Banting, R. Eime, G. O'Sullivan, and J. G. Z. van Uffelen, "The association between social support and physical activity in older adults: A systematic review," *Int. J. Behav. Nutr. Phys. Act.*, vol. 14, no. 1, pp. 1–21, 2017.
- [24] G. R. Lee and M. Ishii-Kuntz, "Social Interaction, Loneliness, and Emotional Well-Being among the Elderly," *Res. Aging*, vol. 9, no. 4, pp. 459–482, 1987.
- [25] D. E. Sörman, M. Rönnlund, A. Sundström, M. Norberg, and L. G. Nilsson, "Social Network Size and Cognitive Functioning in Middle-Aged Adults: Cross-Sectional and Longitudinal Associations," *J. Adult Dev.*, vol. 24, no. 2, pp. 77–88, 2017.
- [26] I. E. M. Evans *et al.*, "Social isolation, cognitive reserve, and cognition in healthy older people," *PLoS One*, vol. 13, no. 8, pp. 1–14, 2018.
- [27] V. C. Crooks, J. Lubben, D. B. Petitti, D. Little, and V. Chiu, "Social network, cognitive function, and dementia incidence among elderly women," *Am. J. Public Health*, vol. 98, no. 7, pp. 1221–1227, 2008.
- [28] R. E. Marioni *et al.*, "Social activity, cognitive decline and dementia risk: A 20-year prospective cohort study Chronic Disease epidemiology," *BMC Public Health*, vol. 15, no. 1, pp. 1–8, 2015.
- [29] D. A. Gleib, D. A. Landau, N. Goldman, Y. L. Chuang, G. Rodríguez, and M. Weinstein, "Participating in social activities helps preserve cognitive function: An analysis of a longitudinal, population-based study of the elderly," *Int. J. Epidemiol.*, vol. 34, no. 4, pp. 864–871, 2005.
- [30] K. Quinn, "Cognitive Effects of Social Media Use: A Case of Older Adults," *Soc. Media Soc.*, vol. 4, no. 3, 2018.
- [31] S. Balsamo *et al.*, "Effectiveness of exercise on cognitive impairment and Alzheimer's disease," *Int. J. Gen. Med.*, vol. 6, pp. 387–391, 2013.
- [32] J. Krell-Roesch *et al.*, "Quantity and quality of mental activities and the risk of incident mild cognitive impairment," *Neurology*, vol. 93, no. 6, pp. e548–e558, 2019.
- [33] M. T. Lee, Y. Jang, and W. Y. Chang, "How do impairments in cognitive functions affect activities of daily living functions in older adults?," *PLoS One*, vol. 14, no. 6, pp. 1–14, 2019.
- [34] D. Laurin, R. Verreault, J. Lindsay, K. MacPherson, and K. Rockwood, "Physical activity and risk of cognitive impairment and dementia in elderly persons," *Arch. Neurol.*, vol. 58, no. 3, pp. 498–504, 2001.
- [35] E. Aramaki, S. Shikata, M. Miyabe, and A. Kinoshita, "Vocabulary size in speech May Be an early indicator of cognitive impairment," *PLoS One*, vol. 11, no. 5, pp. 1–13, 2016.
- [36] S. Banovic, L. Zunic, and O. Sinanovic, "Communication Difficulties as a Result of Dementia," *Mater. Socio Medica*, vol. 30, no. 2, p. 221, 2018.