

FACTORS ASSOCIATED THE INCIDENCE OF DEMENTIA ON THE ELDERLY IN COMMUNITY HEALTH CENTER DEPOK I MAGUWO HARJO SLEMAN YOGYAKARTA

Paskalia Nini¹, Rodiyah Soekardi^{2*}

¹Undergraduate Student of Public Health Study Program of Universitas Respati Yogyakarta

²Lecturer of Public Health Study Program of Universitas Respati Yogyakarta

*corresponding author: rodiyahfikes@respati.ac.id

Abstract

Dementia is degradation of memory and intellectual capacity. Dementia causes problems in human daily activities. Risk factors of dementia are divided into four categories such as demographic, atherogenic, non-atherogenic, and factors associated with stroke. The aim of this study was to find out factors associated with the incidence of dementia of elderly in Community Health Center Depok I Sleman Yogyakarta. This was an analytical study with cross sectional approach and the data was carried out from 9th to 19th June 2014. Population of the study were the elderly at Community Health Center Depok I.. Samples were selected by purposive method, comprising 62 people. Data were taken by questionnaire and medical records of the elderly and data analyzed using Chi-Square. **Result:** The study showed 53.2% of the elderly were male, 51.6 % of the elderly have elementary education, 54.8 % elderly were non-hypertension, most of the elderly (74.2%) not suffer of diabetes mellitus, most of the elderly (69.4 %) had stress, most of the elderly (67.7 %) had dementia. **Conclusion:** There was association between level of education, hypertension, diabetes mellitus and the incidence of dementia; there was no association between gender, stress and the incidence of dementia.

Keywords: dementia, elderly, hypertension

1. INTRODUCTION

The number of elderly population in Indonesia is increase. In 2000 there were 14.439.967 people (7.18%), it increased to 23.992.553 people (11.34%) in 2010. Based on data of Central Statistics Agency (BPS), the number of elderly in Yogyakarta increased, in 2010 about 454,200 people or 13.2% of the total population. In 2011 the population of the elderly increased to 459,200 people or 13.3% of the total population, while in 2020 will be 578,000 or 15.6% elderly [1].

Degenerative human age will have an impact on cognitive, physical, and psychological [2]. As a center of regulation of the body's system and cognitive center, the brain is one of the organs which is vulnerable to the degenerative process [3]. Impaired cognitive function generally leads to signs of dementia such as disorders in counting, language, semantic memory (words), and problem solving. Disorders of cognitive function which are not handled optimally will increase the incidence of dementia [4]. Dementia is a decrease of the memory ability, thought power that cause effect to the quality of human life [2].

In America, people over 85 years old are around 4.2% or 2.2 million experiencing dementia [5]. Meanwhile, in 2005 there were 13.7 million people with dementia in the Asia Pacific [6]. Some countries in Southeast Asia have population with dementia, for example in 2005 Malaysia 63,000 people, Philippines 169,800 people, Singapore 22,000 people, and Thailand 229,100 people. In Indonesia the incidence of dementia in 2005 was 606,100 people [5]. Meanwhile, there was not data regarding the incidence of dementia specifically in Yogyakarta. Several risk factors of dementia have been studied in recent years such as Herbert et al in Taufiqurrohman, divide the causative factors of

dementia in four categories. The first factor are demographic factors including age, race and ethnicity (Asia, Africa-American), gender, low education, and rural areas. Second, are atherogenic factors such as hypertension, diabetes mellitus, smoking, heart disease, hyperlipidemia, carotid noise, menopause, and abnormal picture of electrocardiogram (ECG). Third, are non-atherogenic factors, namely genetic factors, changes in homeostatic, high alcohol consumption, stress, work-related exposure, and socio-economic. Fourth are factors related to stroke such as brain tissue, as well as the number and location of infarction [7].

In general, dementia occurs in elderly, the incidence rate and the prevalence of dementia cases following the increasing the age of a person. After 60 years the prevalence of dementia increased twice every 5 years. Based on the Ministry of Health profile 1998, in Indonesia there are 7.2% of the elderly of 60 years and above with dementia. While, about 5% at the age of 65-70 years suffered dementia and doubled every 5 years, and more than 45% in the age above 85 years. Research in West Jakarta showed the average age of elderly with dementia is 70.3 years and that is not dementia 66.08 years [5].

In Community Health Center of Depok 1 there were 658 elderly consisting of 249 men , and 409 women. Based on the preliminary study conducted on 17 December 2013 through Mini Mental State Examination (MMSE), showed that 3 of 5 elderly have difficulty in recognizing the time, such as forgetting the day, date, month, and year, difficulties in counting, can't recall the name of the object, having difficulty in reading and writing, and get score of MMSE less than 24 that shows the elderly tend to have dementia. Based on the background the researcher was interested in examining factors related the incident of dementia in elderly such as demographic factor (gender and education), atherogenic factor (hypertension and diabetes mellitus), and non-atherogenic factors (stress) with the incidence of dementia.

2. MATERIALS AND METHODS

This was an analytical study with cross sectional approach, the data was carried out from 9th to 19th June 2014. Population of the study were the elderly at Community Health Center Depok I. Samples were selected by purposive method, comprising 62 people. Data were taken by questionnaire and medical records of the elderly and data analyzed using Chi-Square.

The research was conducted in Community Health Center Depok I on North Ring Road KM 1 Maguwoharjo, Depok, Sleman Yogyakarta. Incident of dementia carried out by MMS, data of characteristic were taken by questionnaire. The data of hypertension, DM, and data of stress were taken from medical records of Community Health Center Depok I.

3. THE RESULT OF RESEARCH

Table 1 Respondent Characteristic Based on Age, Gender, Education, Marital Status, Job Status

Characteristic	n	%
Age		
60-70	54	87,2
≥71	8	12,8

Gender		
Women	29	46,8
Men	33	53,2
Education		
Basic	32	51,6
Middle	21	33,9
High	9	14,5
Marital Status		
Married	62	100
Unmarried	0	0
Pekerjaan		
Government Employees	18	29
Privat Employees	15	24,2
Others	29	46,7
Total	62	100

Based on Table 1 the characteristic of the respondents was most or 54 (87%) were 60-70 years old, 33 people (53,2%) were men, 32 people (51,6%) had basic education, all of the respondent were marriage and worked.

Table 2. Distribution Variable of the Research Covers Hypertension, Diabetes Mellitus, Stress, and Dementia

Variable	n	%
Hypertension		
Hypertension	28	45,2
No Hypertension	34	54,8
Diabetes Melitus		
Diabetes mellitus	16	25,8
No diabetes melitus	46	74,2
Stres		
High	2	3,2
Medium	43	69,4
Low	17	27,4
Demensia		
Dementia	42	67,7
No Dementia	20	32,3
Total	62	100

Based on table 2. Known most of respondent or 34 people (54,8%), 46 people (74,2%) not suffer diabetes mellitus, 43 people (69,4%) have medium stress, and most or 42 (67,7%) experiencing dementia.

Correlation Gender and Education Level with Incident of Dementia

Correlation gender and education level with incident of dementia on elderly in Community Health Center of Depok I

Tabel 3 Correlation Gender and Education Level with Incident of Dementia

Incident of Dementia	Total	p
----------------------	-------	---

	Dementia	No Dementia		
	n	n	n	
Gender				
Women	20	9	29	0,847
Men	22	11	33	
Education				
Basic	27	5	32	0,012
Middle	11	10	21	
High	4	5	9	

Table 3. Shows from 29 female respondent, 20 people experience dementia and 9 people do not dementia, from 33 respondents whose male are 22 suffering dementia and 11 are not dementia. Based on the results of Chi-square analysis acquired value $P = 0.0847$. At significant level of 5% or 0.05. The value of $P (0.847) > \alpha (0.05)$ it mean statistically there is no relationship between sex with the incidence of dementia in the elderly in the Community Health Center of Depok 1 Maguwoharjo Sleman Yogyakarta.

While based on the education known from 32 elementary educated respondents, 27 respondents had experience of dementia and 5 people were not dementia, while from 21 respondents who were secondary education 11 people dementia and 10 people were not dementia. Meanwhile, of the 9 people who were highly educated 4 people dementia and 5 people were not dementia. Based on the results of Chi-square analysis acquired value $P = 0.012$. At a significant level of 5% or 0.05, the value of $P (0.012) < \alpha (0.05)$ means statistically there is a relationship between education and the incidence of dementia in the elderly in the Community Health Center of Depok 1 Maguwoharjo Sleman Yogyakarta.

Correlation Hypertension, Diabetes Mellitus, and Stress with Incident of Dementia of Elderly

Tabel 4. Correlation Hypertension, Diabetes Mellitus, and Stress with Incident of Dementia of Elderly

	Incident of Dementia		Total	
	Dementia	No Dementia		p
	n	n	n	
Hypertension				
Hypertension	23	5	28	0,028
No Hypertension	19	15	34	
Diabetes Mellitus				
Diabetes Mellitus	14	2	16	0,050

No diabetes Mellitus	28	18	46	
Stress of Level				
High	2	0	2	0,014
Medium	28	15	43	
Low	12	5	17	

Table 4 shows from 28 respondent whose has hypertension, 23 people had dementia and 5 were not dementia, while from 34 respondents who did not have hypertension 19 people dementia and 15 people do not suffer from dementia. Based on the results of Chi-square analysis acquired value $P = 0.028$. At a significant level of 5% or 0.05, the value of $P (0.028) < \alpha (0.05)$ means statistically there was correlation between hypertension and incidence of dementia in the elderly in Community Health Center Depok 1 Maguwoharjo Sleman Yogyakarta.

Table 4 also shows from 16 respondent whose suffer of diabetes mellitus, 14 people had dementia and 2 were not dementia, Based on the results of Chi-square analysis acquired value $P = 0.050$. At a significant level of 5% or 0.05, the value of $P (0.050) < \alpha (0.05)$ means statistically there was correlation between diabetes mellitus and incidence of dementia in the elderly in Community Health Center Depok 1 Maguwoharjo Sleman Yogyakarta

Based on table 4 known all the respondents were stressed and from 43 respondents who stress moderate 28 people dementia and 15 people are not dementia, while from 17 people with mild stress 12 people dementia and 5 people do not dementia. Based on the results of Chi-square analysis acquired value $P = 0.416$. At a significant level of 5% or 0.05, the value of $P (0,416) > \alpha (0.05)$ so that it can be declared statistically there is no relationship between stress with the incidence of dementia in the elderly in the Community Health Center Depok 1 Maguwoharjo Sleman Yogyakarta.

4. DISCUSSION

The results showed most respondents were male and the prevalence of dementia increasing both on males and females, this was supported by the results of research stating that the factors risk of dementia is not related to gender⁸. The results of this study showed no relationship between gender and incidence of dementia in the elderly. It is means that there are same chance of dementia in men and women. This is in line with research⁸ that the risk factor of dementia is not related to gender. To date it has not been found evidence and a clear reason, but it is alleged that it may be caused by trigger factors such as heart disease and vascular that is more common in males than females. The prevalence of dementia increases as increasing age. At very old age dementia is often found due to vascular or degenerative lesions jointly⁸.

The majority of the respondent had primary education or elementary, MI, SMP, and MTS level. The level of education correlates with dementia and the risk of disability in the elderly. The results showed that statistically there was a relationship between levels of education and incidence of dementia in the elderly in the Community Health Center of Depok 1 Sleman Yogyakarta. This happens because the level of education affects the cognitive abilities that become one of the factors the risk of dementia. This results in accordance with research¹⁵ which says that there is a link between the level of education and the incidence of dementia and higher education has a lower risk of dementia. But these results differ from research⁸ which concluded that low education does not differ meaningfully with the incidence of dementia. The results of the study stated, the risk of dementia with low education was shown in several prevalence studies related to the effect of education on cognitive screening and neuropsychology tests used in studies. While other

researchers said that the education level is a stage of education that is set based on the level of learners ' progression, goals to be achieved, and ability to be dikembangkan¹⁶.

The results of this research reinforce the theory that the level of education is paramount in dealing with problems. The higher education gave more life experience so it will be better prepared in the face of a problem¹⁷. Generally, elderly who have a higher level of education still productive so using free time with a variety of positive and productive activities. Researchers also argue that education is very important improve intelligence and skills to avoid amnesia so that the quality of human resources depends heavily on the quality of education

The results showed that most of the respondents did not suffer from hypertension. This means that not all elderly were in the case of hypertension or systolic blood pressure conditions equal or higher than 140 mmhg and diastolic pressure higher than 90 mmhg. Hypertension becomes a problem on the elderly. Many epidemiologic studies obtained that hypertension is closely related to the aging process². It is supported by research⁹ that there is a tendency increase in hypertension as age increases. Hypertension occurs due to decreased elasticity of the arteries in the aging process. Untreated hypertension can trigger strokes, vascular damage (arteriosclerosis), cardiac arrest, and kidney failure¹⁰. It is supported also by the results of research¹¹ that people who were over 60 years old, 50-60% have blood pressure greater than or equal to 140/90 mmhg. Comparing the average blood pressure and the increase of the age, is the age below 40 years have prevalence rate below 10% but the age above 50 years, the prevalence rate reaches 20% or more¹¹. It mean serious problems arise in the elderly.

Statistically there was a link between hypertension and the incidence of dementia in the elderly in Community Health Center Depok 1 Sleman Yogyakarta. This occurs because hypertension causes vascular damage that impairs cerebral circulation and leads to decreased cognitive function. In addition, hypertension and dementia are 2 conditions that occur in the age of more than 60 years. The result supported by the research⁷ which proved that the history of hypertension to be a risk factor occurrence of vascular dementia. Hypertension is the condition in which a person's blood pressure is above the normal limit to be a risk factor of dementia in the elderly. Thus, blood pressure is an initial determinant of dementia, and maintaining blood pressure can prevent or slow the occurrence of demensia². These results further strengthen the theory that the healthy brain not disturbed by the disease will stay healthy until old age. The brain and mental ability of a person can indeed descend due to the attack of some physical diseases such as diabetes, high blood pressure, and stroke. It mean if the body healthy, the capacity of the brain will not decrease because of getting old¹⁸.

The results showed that some respondents did not suffer from diabetes mellitus (DM). According to the results research¹² diabetes mellitus is a chronic disease that is characterized by blood glucose levels exceeding normal and impaired carbohydrate, fat and protein metabolism caused by the relative deficiency of insulin hormones Absolute. Meanwhile, another research¹³ showed that the prevalence of DM in elderly tends to increase because the DM on elderly are influenced by the intrinsic factor and extrinsic factor. Age is one of the factors that affect the change of body tolerance to glucose. Moreover, the increasing age of glucose intolerance also increases. Factors related diabetes mellitus in the elderly is increasing because of pancreatic cell function decline and insulin secretion causes insulin resistance due to muscle mass and vaskuler change¹³.

The results showed that statistically there is diabetes mellitus relationship with the incidence of dementia in the elderly in the Community Health Center Depok 1 Sleman

Yogyakarta. Dementia is associated with diabetes mellitus because lack of blood flow to the brain causes the fulfillment of oxygen needs to the brain is also reduced. This makes the brain experience a memory decline. The results of this research reinforce the research stating that there is a strong link between type 2 diabetes mellitus history and the risk of demensia⁸. Therefore, patients with type 2 DM need to get diabetic medication to prevent dementia. Brain function depends on the supply of glucose in an adequate energy source, so that changes in blood sugar concentration will cause atherosclerosis of cerebral arteries and increase the risk of dementia. In addition to the main mechanisms of vascular disease causing dementia is the disconnection of functional relationships between one part of the cortex and the other, subcorous cortex and nuclei as well as of subcortil nuclei and korteks¹³. Diabetes mellitus is a chronic disease that is characterized by blood glucose levels exceeding normal and impaired carbohydrate, fat and protein metabolism caused by insulin deficiency in relative or absolute¹². The results of this strengthening theory that says that diabetes can increase the risk of dementia associated with stroke that can lead to multi-infrac dementia⁷.

The results showed that all respondents were stressed. Stress is a condition or state of the body that is disturbed by psychological distress. Many things can spark stress like anxiety, feelings of resentment, frustration, depressed feelings, deep sadness, feelings of confusion, mourning and persistent fear. It is supported by the results of research¹⁴ stating that depression is more common in the elderly than in the general population.

Based on sufficient analysis, the results of a statistically no relationship between stress and the incidence of dementia in the elderly in Community Health Center Depok 1 Sleman Yogyakarta. Stress causes dementia because of the stress the body condition become unstable that can affect the brain. This reinforces research on the influence of emotion on the body. Stress will cause the body to become anxious and constantly overcome by feelings of fear. When someone stressed, the brains will trigger the hypothalamus, the pituitary gland, and the adrenalin to secrete certain hormones that will secrete the epinephrine hormone called andrenalin¹⁸.

The results showed that stress stimulates the hormonal center in the brain called the hypothalamus that serves regulate water balance, body temperature, body growth, hunger, anger, appetite, fear, integration of sympathetic nerve responses, and maintain a homeostatic. When the sympathetic nerve is aroused, the pulse and heart rate will increase. Blood flow to the heart, brain, and muscles also increases so that the pressure is increase¹⁹.

In addition, stress is a psychiatric disease. In mild stages stress will not cause physical illness, but if the stress at severe and ongoing levels can lead to chronic physical illness. This occurs because the immune system is diminished and hormonal imbalance occurs when someone are experiencing stress. Diseases caused by stress one of them is a reduction in the part of the brain. The brain is controlling the whole body activity. If there is a reduction in the part of the brain then it can be ensured all activities in the body will be interrupted. Health and neural performance systems will also be disturbed¹⁴.

5. CONCLUSION

- a. Most of elderly (87.2%) in Community Health Center Depok I are male, 51.6% elementary educated, 54.8% do not suffer from hypertension, most of the respondents (74.2%) not suffer from diabetes mellitus, mostly (69.4%) moderate stress, and most (67.7%) experiencing dementia.
- b. Statistically there is no relationship between gender and incidence of dementia in the elderly.

- c. Statistically there is correlation between education level and incidence of dementia in elderly.
- d. Statistically there is correlation between hypertension and incidence of dementia in elderly.
- e. Statistically there is relationship between diabetes mellitus and the incidence of dementia in the elderly.
- f. Statistically there is relationship between stress levels and the incidence of dementia in the elderly.

6. SUGGESTION

- a. For Community Health Centers Depok 1
Conducting health promotion for elderly and preparentists with the material "Dementia and risk Factors" and presented to the elderly the importance of activities such as reading, filling the crossword or playing chess and balanced with regular exercise habits. To remain the day of date, month, year, training strikethrough
- b. For further researchers
For further researchers it is advised to research on variable smoking, heart disease, alcohol consumption, stroke with the incidence of dementia.

REFERENCES

- [1] Setyaningrum, Nuraini. 2012. "Upaya Peningkatan Pelayanan Sosial Bagi Lansia Melalui Home Care Service di Panti Sosial Tresna Werdha (PSTW) Yogyakarta Unit Budhi Luhur". *Skripsi Universitas Negeri Yogyakarta*.
- [2] Azizah, Lilik. 2011. *Keperawatan Lanjut Usia*. Surabaya : Graha Ilmu
- [1] Turana, Yuda. 2013. "Stimulasi Otak pada Kelompok Lansia di Komunitas". *Buletin Jendela Data dan Informasi Kesehatan, Semester 1, 2013*. Pusat Research Kesehatan UNIKA Atma Jaya. Kementerian Kesehatan RI.
- [3] Firmansyah. 2007. "Gangguan Kognitif pada Penderita Stroke Merupakan Prediktor Terjadinya Demensia". *Skripsi FK UGM Yogyakarta*.
- [4] Aisyah, Bunga. 2009. "Hubungan Asupan Zat Gizi Mikro, Aktivitas Fisik, Latihan Kecerdasan dan Karakteristik Responden dengan Kejadian Demensia pada Lansia di Kelurahan Depok Jaya". *Skripsi FKM UI, 2009*.
- [5] Alzheimer's Disease International, 2005. *Apa itu Demensia?* <http://www.alzheimers.org.au>. diakses tanggal 16 November 2013
- [6] Taufiqurrohman, A. 2008. "Hipertensi sebagai Faktor Risiko Demensia Vaskuler pada Penderita Stroke". *Skripsi FK UGM Yogyakarta*
- [7] Sampe. 2008. "Diabetes Melitus Tipe 2 Sebagai Faktor Risiko Demensia Vaskuler pada Kasus Stroke". *Skripsi FK UGM Yogyakarta*
- [8] Bustan, M. N. 2000. *Epidemiologi Penyakit Tidak Menular*. Jakarta. Rineka Cipta
- [9] Padila, 2010. *Buku Ajar Keperawatan Gerontik*. Yogyakarta. Nuha Medika.
- [10] Misti. 2009. "Faktor-Faktor Kejadian Hipertensi pada Perempuan Usia 20-50 tahun di Kota Bengkulu". *Skripsi FK UGM Yogyakarta*
- [11] Hasdianah. 2012. *Mengenal Diabetes Melitus*. Yogyakarta. Nuha Medika
- [12] Alexander. 2012. *Diabetes Melitus pada Lanjut Usia*. Modul kesehatan.com. diakses tanggal 19 Juli 2014.

- [13] Wulandari, Retno. 2003. Faktor-Faktor yang Menyebabkan Timbulnya Depresi pada Lanjut Usia yang Tinggal di Pnati Sosial Tresna Werdha Yogyakarta Unit Abiyoso. *Skripsi*. FK UGM Yogyakarta
- [14] Sanusi. 2003. “Merokok Sebagai Faktor Risiko Demensia pada Orang Tua Umur 55-70 Tahun di Kecamatan Mlati Kabupaten Sleman Jogjakarta”. *Skripsi* FK UGM Yogyakarta
- [15] Daryanto. 2013. *Konsep Dasar Manajemen Pendidikan di Sekolah*. Yogyakarta . Gava Media.
- [16] Tamher S. dan Noorkasisiani. 2012. *Kesehatan Usia Lanjut dengan Pendekatan Asuhan Keperawatan*. Jakarta. Salemba Medika
- [17] Usman, Rio. 2011. “Hubungan Tingkat Pendidikan dan Status Ekonomi dengan Kepatuhan Diet pada Pasien Diabetes Melitus di Poliklinik Penyakit Dalam RSUD Dr. Soeradji Tirtonegoro Klaten”. *Skripsi* Fakultas Ilmu Kesehatan Universitas Respati Yogyakarta.
- [18] Putra, Dharma. 2013. *Rahasia Membuat Otak Super*. Yogyakarta. Laksana.
- [19] Mumpuni, Yekti. 2010. “Cara Jitu Mengatasi Stres”. Yogyakarta. Andi.