Why is Education Important to Prevent Cognitive Impairment? A Cross-Sectional Study in Jakarta Indonesia

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Abstract

Background: Cognitive impairment may lead to dementia, which can affect the elderly quality of life. Improving awareness and prevention of dementia risk factors become very essential to prevent cognitive impairment, and one of the effort is through.

Objective: This study aimed at observing the relationship between elderly characteristics as dementia risk factors with cognitive impairment incidence.

Method: Descriptive study with a cross-sectional approach was used. The population was elderly who resided in Special Capital Region of Jakarta, Indonesia. A sample of 341 elderlies, aged 60 years old or above was selected and screened through multistage random sampling. Chi-Square and Fisher's Exact tests used to analyze the data.

Results: The results of dementia screening using CDT found as much as 91.8 %elderly were suffered from cognitive impairments. There was a significant correlation between sex and educational background with cognitive impairment(p=0.003 and p=0.005).

Conclusions: Educational background can affect individual's cognitive level. Elderly is expected to keep stimulating their cognitive, socializing, and maintaining their physical exercise.

Keywords: *Cognitive impairment, education, elderly, prevention, risk factor dementia*

Introduction

The number of older people in Special Capital Region of Jakarta has been raising from 5.13% of a total 9.6 million of population during 2010, and is expected to keep raising to 16.39% of the total 11.5 million of population in 2035. Meanwhile, life expectancy in Jakarta in 2010—2015 is 71.6 years, and it will keep raising to 73.9 years in 2030—2035.[1] This data show that the raising of population is directly proportional with increasing age.

One of main common issues for older people, which also become the main cause of high demand in nursing care, around the globe with the prevalence of fifty million people is dementia or cognitive impairment.[2] The prevalence of dementia incidence in Indonesia during 2015 has reached 1.2 million people. This data are predicted to keep increasing up to 1,9 million people in 2030 and almost hit four million people in 2050.[3,4]

Dementia or cognitive impairment is associated with lower life expectancy, and it is considered to be a terminal disease with mortality as the consequence of the main functional. This issue demonstrates on the increasing demand on palliative care for elderly with severe dementia.[5] Cognitive impairment can also affect the elderly's quality of life.[6] Prevention and caring strategy become crucial in decreasing nursing care demand and increasing health status as well as quality of life of the elderly.[7,8] which are common problems among the elderly people, account for a wide range of aging disorders. Group reminiscence can be used as a profitable therapeutic method for preventing cognitive-

behavioral disorders in older adults. Therefore, we aimed to investigate the effect of group reminiscence on the cognitive status of elderly people. METHOD This study was a non-blinded randomized controlled trial. We enrolled 100 elderly people who were under the support of Ilam Welfare Organization, western Iran in 2013. Balanced block randomization method was used to randomize the participants into intervention and control groups. Elderly people in the intervention group participated in a group reminiscence program consisted of two one-hour sessions per week for 8 consecutive weeks. Data were collected using Mini Mental State Examination (MMSE).

Factors in cognitive impairment prevention must be known in addition to dementia risk factors. One of the factor, which corresponds to cognitive performance, is a long-term formal education.[5] Low level of education is a strong predictor to the cause of dementia in the future.[9] Intervention, and care will vastly improve living and dying for individuals with dementia and their families, and in doing so, will transform the future for society. Dementia is the greatest global challenge for health and social care in the 21st century. It occurs mainly in people older than 65 years, so increases in numbers and costs are driven, worldwide, by increased longevity resulting from the welcome reduction in people dying prematurely. The Lancet Commission on Dementia Prevention, Intervention, and Care met to consolidate the huge strides that have been made and the emerging knowledge as to what we should do to prevent and manage dementia. Globally, about 47 million people were living with dementia in 2015, and this number is projected to triple by 2050. Dementia affects the individuals with the condition, who gradually lose their abilities, as well as their relatives and other supporters, who have to cope with seeing a family member or friend become ill and decline, while responding to their needs, such as increasing dependency and changes in behaviour. Additionally, it affects the wider society because people with dementia also require health and social care. The 2015 global cost of dementia was estimated to be US$818 billion, and this figure will continue to increase as the number of people with dementia rises. Nearly 85% of costs are related to family and social, rather than medical, care. It might be that new medical care in the future, including public health measures, could replace and possibly reduce some of this cost. Dementia is by no means an inevitable consequence of reaching retirement age, or even of entering the ninth Key messages 1 The number of people with dementia is increasing globally Although incidence in some countries has decreased. 2 Be ambitious about prevention We recommend active treatment of hypertension in middle aged (45-65 years. The ability of individuals in understanding and processing information can influence their health literacy in which it corresponds to literacy function and cognitive. However, health literacy concept is still wide and complex, which needs to be understood to decide on health caring, prevention, and health promotion in maintaining and improving the quality of life.[10]

According to some researches there are positive correlation between health literacy proficiency and cognitive function in older adult, yet the longitudinal relationship between level of education and cognitive impairment in Jakarta still remains unobserved. Therefore, this research attempted to observe the relationship between levels of education with cognitive impairment and how to prevent it.

Material and Method

This study was a cross-sectional research conducted in five main regions of Jakarta, Indonesia, using a multistage random sampling. 341 subjects were selected through Rule of Thumbs, while there was a 10% of subject dropouts from the total of estimated sample. The inclusion criteria for the subjects were aged 60 years old or more, living with their family, and signing the informed consent. Subjects were excluded under the following circumstances: lack of communication skill, being critically ill or in bedrest condition, having impaired hearing, and unwilling to participate.

The protocol of this study was approved by the Ethics Committee of Faculty of Nursing, Universitas Indonesia, written in the approval letter number 46/ UN2. F12. D/HKP.02.04/2018. The subjects were informed beforehand about the objectives and method of the study, and the written and signed informed consent was obtained from their caregivers.

The survey was conducted in residence of participants. Computer program was used for data entry and analysis. The demographic information was obtained from subjects and caregivers, including age, sex, education, history of smoking habit, social activity, and doing exercise were summarized using frequencies (percentages).

Tests and scales including Clock Drawing Test

(CDT) was used as dementia screening tests for elderly. CDT consists of 4 commands to draw a circular clock with numbers and hands completely.

Funding:

Table 1. Elderlies characteristics distribution in Jakarta (N=341)

Characteristic(s)	Frequency	Percent(%)
Age		
60 – 65 years old	156	45.7
≥ 66 years old	185	54.3
Sex		
Male	105	30.8
Female	236	69.2
Educational Background		
Poor	297	87.1
High	44	12.9
Social Activity Involvement		
Yes	251	73.6
No	90	26.4
Physical Exercise		
Yes	91	26.7
No	250	73.3
Smoking Habit		
Yes	38	11.1
No	303	88.9

A total of 341 elderlies who reside with their families participated in this research. Most of the elderlies are above 66 years old (54.3 %), female (69.2 %), are have only completed elementary schooling (87.1 %), did not doing routine physical exercise (73.3%), smoking habit (11.1 %), and are not involve in social activities (26.4 %). The demographic characteristic of respondents were showed in Table 1.

Community-based cross-sectional study was conducted to analize relationship between elderly's characteristic with cognitive impairment. Of the 354 subjects in the dataset, 326 subjects were identified as cognitive impairment. More detailed information about cognitive impairment can be seen in table 2.

Table 2. Elderlies distribution based on the incidence of cognitive impairment in Jakarta(N=341)

Cognitive Impairment	Frequency	Percent (%)
Yes	313	91.8
No	28	8.2

Table 3. The correlation of elderlies characteristics and cognitive impairment

Variable(s)	Cognitive Impairment				Total		p value	OR (95% CI)
	Yes		No					
	N	%	N	%	N	%		
Age								
60 – 65 years old	144	92.3	12	7.7	156	100	0,903	0.880 (0.403-1.922)*
≥ 66 years old*	169	91.4	16	8.6	185	100		
Sex								
Male	89	84.8	16	15.2	105	100	0.003	3.356 (1.526-7.377)*
Female*	224	94.9	12	5.1	236	100		
Educational Background								
Poor*	278	93.6	19	6.4	297	100	0,005[a]	3.762 (1.580-8.958)*
High	35	79.5	9	20.5	44	100		
Social Activity								
Yes	230	91.6	21	8.4	251	100	1.000	1.083 (0.444-2.640)*
No*	83	92.2	7	7.8	90	100		
Physical Exercise								
Yes	82	90.1	9	9.9	91	100	0,647	1,334 (0.581-3.067)*
No*	231	92.4	19	7.6	250	100		
Smoking Habit								
Yes*	32	84.2	6	15.8	38	100	0.075[a]	0.418 (0.158-1.106)*
No	281	92.7	22	7.3	303	100		

[a] fishers Exact

The statistical test with CDT's screening tool shows the p-value for gender is 0.003, which means there is a significant correlation between gender and cognitive impairment. The analysis of the correlation between educational background and cognitive impairment shows that the proportion of elderlies with poor education have increased cognitive impairment compared to those who are well-educated. The result of the statistical test shows p-value= 0.005, which means there is a significant correlation between educational background and cognitive impairment.

The findings showed that 313 (91.8%) elderly had cognitive impairment. The impairment took form of changes in cognition, such as perception, counting ability, memory, verbal, executive function or problem-solving ability, and daily activity independency. This finding affected the needs of special caring for elderly.[5]Cognitive function also has a meaningful relationship with the quality of life of elderly.[6]

There are factors affecting cognitive function, which can be modified and left unmodified. For the modified factors, this study had proven that there was an insignificant relationship between smoking habits, social activity, and physical exercise with cognitive function. However the elderly with smoking habits have chances of cognitive impairment 0.4 times higher. Moreover, elderly who do not regularly socialize has a higher chance of cognitive impairment and 1.3 times higher chances of cognitive impairment for elderly who do not do physical exercise regularly. The finding in smoking habits with cognitive impairment is supported by previous research with the same topic of dementia.[11]Meanwhile, other researches show a meaningful relationship between physical exercise and social activity with cognitive impairment.[12,13]

Other factors, such as age and sex, cannot be modified. Moreover, this study has proven that there is a meaningless relationship between age and cognitive impairment. A theory says the aging process, which affects cognitive function, can be physiologic or pathologic in which a deep observation in physical changes, central nerve system, intelligence, memory, and psychologic changes corresponding to cognitive function and aging process.[5]In conclusion, age is not absolutely affecting cognitive function pathologically.

Other data show that the number of female elderly who experience cognitive impairment is 224 elderlies, yet the number of male subjects is 89 elderlies. This data show female elderly outnumber the male subjects as the result of female higher life expectancy than male elderly.[14]This study explained the meaningful relationship between sex and cognitive impairment (p=0.003). Sex types can affect cognitive function because of biological mechanisms such as genetic, different hormones, different brain cells, and external factors, like economic, social, as well as cultural factors.[15]This study is supported by previous research, which explains that female elderly have a chance of 1.158 times to get dementia higher than male elderly.[11]

Other than risk factors of dementia there is also a factor in preventing cognitive impairment. A factor, which continuously affects cognitive performance on the elderly is formal education.[5] Education is a process of learning, training, and educating to enhance knowledge and aptitude as well as to get experience in educating something.[16] Education aims to improve attitude and behavior, which include cognitive and affective aspects of individuals or group.[17]

Low levels of education can be a dominant predictor for the elderlyin getting dementia or cognitive impairment.[9]intervention, and care will vastly improve living and dying for individuals with dementia and their families, and in doing so, will transform the future for society. Dementia is the greatest global challenge for health and social care in the 21st century. It occurs mainly in people older than 65 years, so increases in numbers and costs are driven, worldwide, by increased longevity resulting from the welcome reduction in people dying prematurely. The Lancet Commission on Dementia Prevention, Intervention, and Care met to consolidate the huge strides that have been made and the emerging knowledge as to what we should do to prevent and manage dementia. Globally, about 47 million people were living with dementia in 2015, and this number is projected to triple by 2050. Dementia affects the individuals with the condition, who gradually lose their abilities, as well as their relatives and other supporters, who have to cope with seeing a family member or friend become ill and decline, while responding to their needs, such as increasing dependency and changes in behaviour. Additionally, it affects the wider society because people with dementia also require health and social care. The 2015 global cost of dementia was estimated to be US$818 billion, and this figure will continue to increase as the number of people with dementia rises. Nearly 85% of costs are related to family and social, rather than

medical, care. It might be that new medical care in the future, including public health measures, could replace and possibly reduce some of this cost. Dementia is by no means an inevitable consequence of reaching retirement age, or even of entering the ninth Key messages 1 The number of people with dementia is increasing globally Although incidence in some countries has decreased. 2 Be ambitious about prevention We recommend active treatment of hypertension in middle aged (45-65 years. The data showed a meaningful relationship between levels of education with cognitive impairment for *p-value* 0.005. This is supported by a previous study with the same topic, which showed *p-value* 0.012, that the elderly with a low level of education is 10.831 times higher in getting dementia.[11]Other researches also described education as a risk factor that had a meaningful relationship with cognitive function (p=0.017). The number of elderly who suffers from cognitive impairment reached 75% of elderlies.[18]

A concept of cognitive reserve is assumed to be a healing factor in decreasing the risk of dementia as well as cognitive impairment.[19]Cognitive reserve is defined as the mind's resistance to damage the nerve or neuro-pathologic.[20]Cognitive activities can stimulate cognitive reserve and buffer effect in preventing quick cognitive impairment.[21]individual caregivers, health care professionals and on the use of resources. Existing therapeutic interventions can only help control or reduce symptoms, and slow the disease's progression. Identifying protective factors or effective prevention strategies would result in considerable benefits. Participation in cognitive leisure activities has been implicated as a possible prevention strategy. OBJECTIVE The objective of the review was to establish best practice in relation to cognitive leisure activities in preventing dementia among older adults. INCLUSION CRITERIA Randomised controlled trials (RCTsCognitive stimulation can delay or even prevent impairment as a result of the aging process, Alzheimer-dementia, or MCI.[22]Besides the WHO has recommended cognitive stimulation for older people, whether they already have cognitive impairment or have not yet.[23]

Many studies have proven the link between the level of education with dementia. Exposure to modifiable risk factors such as education levels starting from childhood to old age can reduce the occurrence of cognitive impairment. It can also strengthen the capacity of individuals and populations to be able to make healthier life decisions, adopt healthier lifestyles, and improve health status.[13] This is supported by research there is correlation between information support, appreciation, and emotional support with the activities of elderly hypertension.[24]

Conclusion

Risk factors for cognitive disorders such as age, sex, education, social activities, sports, and smoking should be a concern for the elderly and their accompanying family. For its members to stay active and productive by continuing to do cognitive stimulation, social activities, and exercise according to ability. For families who still have children to make their children pursue the highest level of education, both formal and informal.

Conflict of Interests: The authors have no conflict of interests to declare.

Source of Funding: This research is funded by DRPM Universitas Indonesia through 2019 PITTA B grant with reference number: NKB-0493/UN2.R3.1/HKP.05.00/2019.

Ethical Clearance: This study was approved by the Ethics Committee of Faculty of Nursing, Universitas Indonesia, written in the approval letter number 46/UN2. F12. D/HKP.02.04/2018.

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