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Factors Associated With Dementia Knowledge and Dementia Worry in the South Korean Elderly Population

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Objective South Korea is one of the countries with a very fast aging rate, and the prevalence of dementia is rapidly increasing. However, there are relatively few studies pertaining to sociodemographic and physical health-related factors associated with dementia knowledge and dementia worry.

Methods This was a cross-sectional survey of a community in Seocho-gu, Seoul, Republic of Korea. Overall, 1,869 adults aged 60 years participated. Participants completed an online interview or face-to-face interview. Survey data comprised self-report questions including dementia knowledge, dementia worry, demographic, psychological, exercise, and cognitive activities. We conducted logistic regression analysis.

Results There was a significant positive association between dementia worry and knowledge. Family history of dementia, education, income, sleep problems, depressed mood and loss of volition, chronic diseases, and presence of a past job were associated with dementia knowledge or worry. Reading, art, or social cognitive activities had a significant positive association with dementia knowledge, and writing or musical cognitive activities had a negative association with dementia worry.

Conclusion We found that people with more dementia knowledge and less dementia worry engaged more in cognitive activities that could prevent dementia. Public education should be planned to improve dementia knowledge and reduce dementia worry.

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Keywords Aging; Chronic disease; Dementia.

INTRODUCTION

According to World Health Organization estimates, approximately 50 million people have dementia worldwide and about 10 million new cases occur each year, with the total number of dementia patients projected to reach 82 million in 2,030 and 152 million in 2050.[1] The prevalence of dementia among those aged 65 years or older was 10.33% in 2019 in South Korea,[2] which is one of the countries with a very high aging rate.

There is currently no cure for dementia or a method to change the course of the disease. Notably, approximately 40% of dementia cases are likely to arise from modifiable risk factors.[3] The 2020 Lancet Commission described 12 modifiable risk factors for dementia, including less education, hypertension, hearing impairment, smoking, obesity, depression, physical inactivity, diabetes, infrequent social contact, excessive alcohol consumption, head injury, and air pollution.[3] Modifying these risk factors might prevent or delay the development of dementia. Thus, it is very important for the public to acquire adequate knowledge of dementia, including its risk factors. Moreover, dementia knowledge affects preventive activities and early treatment of the condition.[4,5] Lack of dementia knowledge is a major barrier to behavioral and lifestyle changes that may prevent the disease or hinder its progression.[6] In addition, worry about experiencing dementia (dementia worry) is reported to be a notable hindrance to seeking a timely diagnosis.[5] Therefore, the modifiable nature of risk factors preventing dementia should be fully communicated to the general public.

Current studies have demonstrated poor dementia knowledge in adults,[4,6-10] adolescents,[11] and even healthcare staff.[12] Lack of knowledge regarding risk factors for dementia was a

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common finding in these studies. The correlates of dementia knowledge were age, ethnicity, education, and sex. In a few studies, older age was associated with less knowledge of Alzheimer's disease (AD) or dementia.[5,8,13,14] In contrast, both the youngest and oldest people had more dementia knowledge compared with middle-aged people in an Australian study.[15] Lower levels of knowledge were prevalent among ethnic and racial minority groups.[16-18] People with higher levels of education tended to have higher levels of dementia knowledge,[8,19] and women were more knowledgeable about dementia than men.[14,19,20]

Studies on dementia worry found that dementia is a notably undesired diagnosis, second only to cancer.[21,22] Some studies on the relationship between dementia worry and participant age reported a positive association,[20,23] while another study reported a negative association.[19,24] Bowen et al.[25] reported that dementia worry increased with age from 40 to 70 years and decreased after 70 years of age. Several studies have reported that women have more dementia worry than men.[20,23,26,27] A lower level of education was significantly associated with dementia worry.[23,27,28] Dementia worry was higher in persons living alone[29] and in those belonging to a majority group[30] than in those living with others or in minority populations, respectively. Exposure to AD as a family member, caregiver, or acquaintance was associated with dementia worry in several studies.[26,29,31,32] Perceived deterioration in memory function and in general health was found to be a significant determinant of dementia worry.[24,26,27,29,31] Depression,[28,31] psychological distress,[25,33] and anxiety[27] were significantly associated with dementia worry.

To date, studies on dementia knowledge or dementia worry have predominantly focused on reporting the overall level of dementia knowledge or dementia worry in a population. There are relatively few studies about the sociodemographic characteristics, personal contact with dementia, and physical health-related risk factors associated with dementia knowledge or dementia worry. Furthermore, there are no studies on the relationship between dementia knowledge or dementia worry and cognitive activities, which are important factors in reducing the risk of dementia. Therefore, we aimed to 1) investigate dementia knowledge and dementia worry among 60-year-old persons preparing for elderly life and 2) examine factors associated with dementia knowledge and dementia worry, with a focus on cognitive activities.

METHODS

Participants

A survey of dementia knowledge and worry was conducted by the Seocho Center for Dementia located in Seocho-gu, Seoul, South Korea, from July 20 to September 13, 2020. The target population for this survey were adults aged 60 years living in the community in Seocho-gu, Seoul, Republic of Korea. We sent information regarding the survey through the public health center, via mobile text messages and post. Those who agreed to the online interviews participated in an online sur-

Table 1. Dementia knowledge questionnaire

Category	Questions	True/false	Correct answer	Overall correct answer rate
			N (%)	%
Causes	1. Everyone develops dementia when he or she becomes old	F	1,434 (76.7)	69.7
	2. Alzheimer's disease is the most common cause of dementia	T	1,248 (66.8)	
	3. Stroke may lead to dementia	T	1,224 (65.5)	
Symptoms	4. If a person remembers well what happened a long time ago, he or she does not have dementia	F	1,293 (69.2)	74.7
	5. If a person develops dementia, he or she may experience changes in his or her personality	T	1,222 (65.4)	
	6. Dementia can be diagnosed only when strange behavior appears	F	1,674 (89.6)	
Prevention and treatment	7. There is no way to prevent dementia	F	1,193 (63.8)	64.7
	8. Some types of dementia can be cured completely	T	353 (18.9)	
	9. Drugs are useful in the treatment of dementia	T	1,521 (81.4)	
	10. Regular exercise reduces the risk of dementia	T	1,768 (94.6)	
Caregiving	11. If a person develops dementia, it is impossible for him or her to live together with the family	F	1,036 (55.4)	67.8
	12. Because a dementia patient does not have the ability to judge, the patient does not need to be given any explanation during treatment	F	1,500 (80.3)	

vey with their smart phones, and for those who agreed to the face-to-face interviews, the investigator went to the subject's home and conducted the survey. Online or face-to-face interviews were conducted for 5,640 people, of whom 1,869 (997 online interviews, 872 face-to-face interviews) completed the interview. The survey data consisted of a self-report questionnaire.

Questionnaire

The questionnaire comprised several questions that assigned sociodemographic attributes, including sex, years of education, average monthly household income, family history of dementia, chronic disease, regular health checkup, living with family, and past job. Dementia worry was evaluated as a yes/no to the question "Do you worry about getting dementia?" Dementia knowledge was evaluated with a 12-item questionnaire that was a modification of the Korean version of Dementia Knowledge Questionnaire developed for lay people.[8] The 12-item questionnaire was divided into four parts. Three questions pertained to the causes of dementia, three questions were regarding the symptoms of dementia, four questions were related to the prevention and treatment of dementia, and two questions were about the knowledge of caregiving for dementia (Table 1). Each question could only be answered as true or false. One point was given for each correct answer, and the total score ranged from 0 to 12 points, with a higher score indicating a higher level of dementia knowledge. We assessed whether the participants exercised in the past week. Exercise intensity was measured by the talk test and perceived exertion as follows: low (can talk and sing without puffing at all), moderate (comfortably talk but not sing, breathing quickens but not out of breath, and light sweating), and vigorous (cannot say more than a few words without gasping for breath, deep and rapid breath, and sweating after only a few minutes of activities).[34] This survey also included questionnaires on whether participants engaged in cognitive activities such as writing, reading, art, music, games, or social activities over the past week. The definitions of cognitive activity vary across studies. Most cognitive activities often include effortful tasks to process new information.[35] These activities eventually stimulate various aspects of cognition.

Statistics

All analyses were performed using SPSS version 24 (IBM Corp., Armonk, NY, USA). We used descriptive statistics for the presentation of the subject characteristics. Logistic regression analysis with backward elimination (likelihood ratio) was used to assess the impact of several independent variables on dementia knowledge or dementia worry. Odds ratios (ORs) with 95% confidence intervals (CIs) were used to identify factors associated with dementia knowledge or dementia worry. A p-value of <0.05, was considered indicative of statistical significance.

Ethics Statement

All participants voluntarily participated in this study and provided written informed consent. The Institutional Review Board of the Catholic Medical Center approved the study protocol (KC21ZISI0379).

RESULTS

Table 1 shows the number and proportion of correct answers to questions about dementia knowledge. The mean score for

Table 2. Characteristics of the participants (N=1,869)

Characteristics	Value
Sex	
Male	831 (44.5)
Female	1,038 (55.5)
Years of education	
0−12 years	509 (27.2)
≥13 years	1,360 (72.8)
Income*	
Low	895 (47.9)
High	974 (52.1)
Family history of dementia (yes)	564 (30.2)
Chronic disease (yes)	1,016 (54.4)
Regular health checkup (yes)	1,748 (93.5)
Living with family (yes)	1,783 (95.4)
Past job (yes)	1,651 (88.3)
Cognitive activities†	
Writing	1,758 (94.1)
Reading	1,817 (97.2)
Art	288 (15.4)
Musical	871 (46.6)
Game	864 (46.2)
Social	1,349 (72.2)
Physical activities (yes)	1,737 (92.9)
Dementia worry (yes)	1,584 (84.8)
Dementia knowledge (mean=8.28)	
Low (0−8)	939 (50.2)
High (9−12)	930 (49.8)
Depressed mood within the past 2 weeks	972 (52.0)
Sleep problems within the past 2 weeks	1,082 (57.9)

Data are presented as N (%). *low and high income were defined as <5 and ≥5 million won (about 4,430 dollars), respectively; †multiple answers were allowed

Table 3. Factors associated with dementia knowledge

Variable	Beta	Wald	OR (95% CI)	p-value
Dementia worry	0.787	31.332	2.197 (1.668, 2.994)	<0.001
Family history of dementia	0.235	4.897	1.265 (1.027, 1.558)	0.027
Depressed mood and loss of volition	-0.213	3.990	0.808 (0.656, 0.996)	0.046
Sleep problems	0.254	5.666	1.289 (1.046, 1.590)	0.017
Education	0.643	30.537	1.901 (1.514, 2.388)	<0.001
Income	0.278	7.501	1.321 (1.082, 1.612)	0.006
Cognitive activity-reading	1.160	9.135	3.188 (1.503, 6.763)	0.003
Cognitive activity-art	0.279	4.132	1.321 (1.010, 1.728)	0.042
Cognitive activity-social	0.465	17.122	1.592 (1.277, 1.984)	<0.001

CI, confidence interval; OR, odds ratio

Table 4. Factors associated with dementia worry

Variable	Beta	Wald	OR (95% CI)	p-value
Dementia knowledge	0.818	34.066	2.266 (1.722, 2.982)	<0.001
Family history of dementia	0.357	5.275	1.429 (1.054, 1.937)	0.022
Past job	-0.699	7.228	0.497 (0.298, 0.827)	0.007
Depressed mood and loss of volition	0.501	13.618	1.650 (1.265, 2.152)	<0.001
Chronic disease	0.339	6.495	1.404 (1.082, 1.823)	0.011
Education	0.315	4.231	1.370 (1.015, 1.850)	0.040
Income	-0.292	4.334	0.747 (0.568, 0.983)	0.037
Cognitive activity-writing	-1.204	7.783	0.300 (0.129, 0.699)	0.005
Cognitive activity-musical	-0.334	6.300	0.716 (0.551, 0.929)	0.012

CI, confidence interval; OR, odds ratio

dementia knowledge of the participants was 8.28, and the overall average correct answer rate was 69.0%. The category with the lowest correct rate was 'prevention and treatment' of dementia, while the category with the highest correct rate was 'symptoms' of dementia.

The characteristics of the 1,869 subjects are summarized in Table 2. There were more women (55.5%) than men. The mean score for dementia knowledge was 8.28; 84.8% of participants had dementia worry, and they explained that the reason for their dementia worry was the unpredictability of health.

Table 3 presents the results of the logistic regression analysis of the factors associated with dementia knowledge. Dementia worry had a significant positive association with dementia knowledge. Furthermore, a family history of dementia, higher education, and higher income were associated with higher dementia knowledge. Sleep problems were positively associated with dementia knowledge, whereas depressed mood and loss of volition were negatively associated with dementia knowledge. Persons who engage more in reading, art, or social cognitive activities had more dementia knowledge.

Table 4 presents the results of logistic regression analysis of the factors associated with dementia worry. Family history of dementia, chronic disease, higher education level, and depressed mood and loss of volition were positively associated with dementia worry. Persons who had a job in the past were less worried about getting dementia than those who had no job. The higher the income level, the lower the dementia worry. Persons who engaged in less writing or musical cognitive activities were more worried about dementia.

DISCUSSION

To our knowledge, this is the first study to confirm that dementia knowledge and dementia worry are related to cognitive activities. Our major findings are outlined in the subsequent text. First, dementia worry and dementia knowledge had a significant positive association. Second, a family history of dementia, education, income, sleep problems, depressed mood and loss of volition, chronic diseases, and presence/absence of past job were associated with dementia knowledge or dementia worry. Third, reading, art, or social cognitive activities had a significant positive association with dementia knowledge, and writing or musical cognitive activities had a negative association with dementia worry.

Notably, we found that reading, art, and social cognitive activities had a significant positive association with dementia knowledge, and writing or musical cognitive activities had a negative association with dementia worry. No studies have examined the relationship between cognitive activities, dementia knowledge, and dementia worry. Cognitive activities refer to cognitively demanding mental activities that are considered potential protective factors by building up cognitive reserve. In our study, dementia knowledge and cognitive activities were positively associated; thus, increasing the public's knowledge about dementia may increase cognitive activities, which play an important role in preventing dementia. In addition, because dementia worry negatively affects executive function in older adults,[36] persons who have a high level of dementia worry may engage in fewer cognitive activities. It is expected that people with a pathological level of dementia worry will engage in fewer cognitive activities. Our study did not include information on the level of dementia worry, and further research is needed.

We also found that dementia worry and dementia knowledge had a significant positive association, which is in line with previous studies.[28,37] Sayegh and Knight[38] developed the Sociocultural Health Belief Model for dementia care-seeking. The reason for the positive association between AD knowledge and the perceived threat of AD in this model is that people with more knowledge about AD tend to be aware of the susceptibility and severity associated with this disease, and they may be more concerned about developing AD. In our study, people with more dementia knowledge may have realized that dementia is a disease that can affect anyone, which may have increased their concern about getting dementia.

Our other finding was that higher education and a family history of dementia were associated with higher levels of dementia knowledge and dementia worry. Several studies have shown that higher education is a key correlate of dementia knowledge.[8,14,17,19,20] Highly educated persons may have a greater knowledge of dementia; thus, there is a possibility that the level of dementia worry is higher. In previous studies, personal exposure to dementia was found to be a significant determinant of dementia knowledge[39,40] and dementia worry.[19,26,29-32] Individuals who have family members with the disease may be more educated about risk factors, origins, and genetic connections. In addition, caring for persons with dementia may heighten the reality of the disease and bring a greater level of worry as they experience the struggles of individuals with the condition. We also found that an individual's financial status was associated with dementia knowledge and dementia worry. A higher income was associated with higher dementia knowledge and lower dementia worry. People with higher income levels would have more opportunities to obtain information about dementia. However, more detailed studies are needed to explain why high-income persons are less concerned about dementia.

Finally, we found that physical and psychiatric problems affected dementia knowledge and dementia worry. In this study, sleep problems were positively associated with dementia knowledge. Since information from the mass media or Internet strongly suggests that sleep problems might be the cause of dementia, people with sleep problems are likely to have acquired a lot of knowledge about dementia from these sources. We also found that chronic diseases were associated with dementia worry. Because people with chronic diseases are more concerned about their health than people without chronic diseases, they might be more concerned about dementia than people without chronic diseases. In our cohort, hyperlipidemia was the most common chronic disease (24.5%), followed by hypertension (24.3%) and diabetes (9.5%). Depressed mood and loss of volition were negatively associated with dementia knowledge and positively associated with dementia worry. Emotional symptoms related to depression might negatively affect the cultivation of dementia knowledge and exaggerate dementia worry. In other words, dementia worry might lead to a lower level of psychological well-being.[33]

This study has several limitations. First, the cross-sectional design of this study did not allow us to determine causality but only allowed the determination of associations between knowledge, worry, and cognitive activities. Second, the results of this study might have selection bias, and care is required when generalizing the result to other populations because the subjects of the study were people living in the capital (Seoul); thus, the level of education, dementia knowledge, and income might be higher than in other regions, including residents of both urban and rural areas in South Korea. Third, this study did not use validated instruments of dementia worry. In addition, this study did not assess the intensity or frequency of dementia worry. Therefore, we could not determine whether dementia worry was healthy or pathologic. Despite these limitations, this study has several strengths. This study not only identified the effect of demographic findings on dementia knowledge and worry, but also reported, for the first time, the association between cognitive activities and dementia knowledge and worry. We also found an association between dementia knowledge and dementia worry. Another strength of this study is that it is the first study to focus on a specific participant age (60 years). The age of 60 years is widely regarded as an important point to begin preparing for elderly life. However, there have been no studies on the perception of dementia in this age group among the general population. Furthermore, this study included a large number of participants.

In conclusion, we found that higher dementia knowledge, less dementia worry, and engaging in more cognitive activi-

ties appeared to prevent dementia. These factors should be considered when planning public education to address dementia knowledge and worry. This should lead to an increase in the public's engagement in cognitive activities for dementia prevention. In addition, the design of dementia education programs needs to consider these factors to provide a precise program for people aged 60 years.

Availability of Data and Material

The datasets generated or analyzed during the study are available from the corresponding author on reasonable request.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

Author Contributions

Conceptualization: In Sook Jo. Data curation: Hee Jin Kim. Formal analysis: Chang Uk Lee. Investigation: Soo Hyun Joo. Methodology: In Sook Jo. Resources: Hee Jin Kim. Software: Soo Hyun Joo. Supervision: Chang Uk Lee. Validation: Chang Uk Lee. Visualization: Soo Hyun Joo. Writing—original draft: Soo Hyun Joo. Writing—review & editing: Chang Uk Lee, Soo Hyun Joo.

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