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Analysis of Depression and Stress Trends of Families Receiving Basic Life Support for Dementia Patients: Based on the Community Health Survey in 2015, 2016 and 2017

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Abstract

Background/Objectives: The purpose of this study is to identify the relations between the depression and the stress of the family with low income who are living with the patient with dementia and to utilize it as basic data to develop the health promotion program for the efficient management of the depression and stress in the family with low income.

Method/Statistical Analysis: The subjects of the study were the first analysis of 685,391 people over 45 years-old by requesting raw data from the Community Health Survey from 2015, 2016 and 2017. Trend analysis was conducted.

The statistical software R program was used for data analysis, and frequency analysis and chi-square analysis were conducted for the general characteristics, health behaviors, chronic diseases, depression, and stress according to the dementia patients and their living families. Performed linear to linear coupling were used for the yearly trend analysis. Logistic regression analysis was performed to analysis the factors related to depression as a dependent variable of family members living with dementia.

Findings: The yearly trend analysis showed an increase in hypertension with men over 75 years old, and housewives and smoking decreased ($p<0.05$).Logistic regression analysis showed depression as a dependent variable, and the higher the educational background, the higher the level of education in agriculture, forestry, and fisheries compared to housewife or unemployed ($p<0.05$).

Improvements/Applications: In conclusion, a systematic free counselling program for the management of chronic diseases, depression and stress for the elderly aged of 75 or older who are taking care of low-income and dementia patients is urgently needed.

Keywords: *Depress, Stress, Health behaviors, Dementia, Cohabitation family with dementia patients, Trend analysis.*

Introduction

In 2015, the dementia prevalence of the people having 65 years or older in our country is 9.8% and the population of aged with dementia is estimated to be 648,000 and it is estimated to be increased to 2.71 million corresponded to 15% of entire population of aged in 2050 [1].

According to the announcement of Alzheimer's Disease International (2015), the worldwide dementia population is estimated as 46.8 million, it is expected to be increased to 135 million in 2050.[2]. The dementia prevalence of the people having 65 years or older in Korea is 9.8% and the dementia population is estimated

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to be 648,000 and it is expected to be increased to 2.71 million corresponded to 15% of entire population of aged in 2050[3].

Dementia is a serious geriatric disease that is developed chronically and deteriorated, the social activities, work life, interpersonal relationship, etc. are limited by the cognitive disorder, memory impairment, behavior disorder, change of character, etc, and the wandering behavior or psychotic symptoms, problem behavior are shown[4].

Dementia causes the serious mental, physical and economic burden to the patient with dementia and the family, for which it is reported that 68% of the family caregivers of the patient with dementia feel the high level of care burden[5]and such care burden is related to the physical symptoms, depression, health perception subjective well-being of the primary caregiver[6]. In addition, in the results of performing the stepwise regression analysis to verify the factors having influence on the cumulative stress of family with demented elderly, for the variable having influence on the cumulative stress, the anxiety showed the statistically significant difference out of the mental health condition, and the inclination that the higher the anxiety, the more the cumulative stress is increased was shown[7]. Moreover, the dementia care brings the change in the depression and the stress of the caregiver[8].

For that, it is reported that 68% of the family caregivers feel high level of care burden[5]. and such care burden is related to the physical symptoms, depression, health perception and subjective well-being of the primary caregiver[9].

In addition, the results of performing the stepwise regression analysis to verify the factors having influence on the cumulative stress of family with demented elderly, for the variable having influence on the cumulative stress, the anxiety showed the statistically significant difference out of the mental health condition, and the inclination that the higher the anxiety, the more the cumulative stress is increased was shown[10]. Paid caregiver family with demented elderly vacation system is being implemented from July, 2014 to support the rest (vacation) of family that cares the demented elderly at home. This system allows the family to leave the demented elderly under the short-term protection service of the long-term care institution, etc. for 6 days a year bearing 15% of the cost regardless of the monthly limit but the stress reduction program for the family with demented elderly is not sufficient.

Therefore, this study intended to provide the basic data to develop the program for the health promotion and the health education of the family members who are caring the patient with dementia by identifying the influence on the stress of family member.

Method

The subjects of the study were the first analysis of 685,391 people over 45 years old by requesting raw data from the Community Health Survey from 2015, 2016 and 2017. The yearly trend analysis was conducted.

The statistical software R program was used for data analysis, and frequency analysis and chi-square analysis were conducted for the general characteristics, health lifestyle, chronic diseases, depression, and stress according to cohabitation family with dementia patients s or not. Performed linear by linear coupling were used for the yearly trend analysis. Logistic regression analysis was performed to analysis the factors related to depression as a dependent variable of cohabitation family with dementia patients.

Result and Discussion

1. **General characteristics and trend of cohabitation family with dementia patients by year (2015, 2016 and 2017):** As a result of analyzing general characteristics according to whether they live with dementia patients, the rate of family living together was 1.1%, which was very low. In the age group, 34.9% were significantly higher in the family members over 75 years of age ($p < 0.001$).

The level of education was the highest in elementary school (25.8%) ($p<0.001$). Marital status was significantly higher in the case of spouses (70.7%) ($p < 0.001$). In household income, 3 million won was significant from 1 million won to 3 million won ($p < 0.001$).

In house occupations, housewives and unemployed workers had the most time (47.1%), followed by agriculture, forestry and fisheries (14.4%), simple labor workers, sales service workers, professional administrative workers, office workers, and others ($p < 0.001$).

As a result of analyzing the yearly trends in 2015, 2016 and 2017, the yearly trends in the age group 75

years and older showed a significant increase of 32.2%, 35.3% and 37.0%. On the other hand, 45-64 and 65-74 years of age showed a significant decrease, indicating that no-no-care of the elderly is increasing ($p<0.05$).

In occupational classification, housewives and unemployment decreased significantly to 48.4%, 47.7%, and 45.2%, and the second largest occupational group in agriculture, forestry, and fishery was 15.9%, 14.0%, and 13.3%. There was a decreasing trend ($p <0.001$).

On the other hand, the number of job category showing a yearly increase was professional administrative managers, which increased by 6.1%, 6.4% and 11.7% ($p <0.001$) [Table 1].

Table 1. General characteristics and trend of cohabitation family with dementia patients by year (2015, 2016 and 2017) Unit: N (%)

Categories	Cohabitation family with dementia patients				Trend by year					
	Yes		No		2015		2016		2017	
Gender	p = 0.475				p = 0.920					
Male	3,404	(45.4)	304,942	(45.0)	1,111	(45.8)	1,154	(44.5)	1,139	(49.5)
Female	4,094	(54.6)	372,922	(55.0)	1,315	(54.2)	1,438	(55.5)	1,341	(54.1)
Age	p = 0.000				p = 0.002					
45-64	2,829	(45.0)	259,963	(57.5)	940	(47.1)	965	(44.7)	924	(43.4)
65-74	1,265	(20.1)	106,783	(23.6)	413	(20.7)	433	(20.0)	419	(19.7)
75 or Older	2,193	(34.9)	85,738	(18.9)	642	(32.2)	763	(35.3)	788	(37.0)
Education				p = 0.000	p = 0.748					
Non- education	911	(12.2)	46,397	(6.9)	304	(12.5)	306	(11.8)	301	(12.2)
Elementary School	1,929	(25.8)	120,005	(17.8)	614	(25.3)	654	(25.3)	661	(26.9)
Middle School	962	(12.9)	75,345	(11.1)	311	(12.8)	338	(13.1)	313	(12.7)
High school	1,883	(25.2)	190,642	(28.2)	631	(26.0)	661	(25.5)	591	(24.0)
University and above	1,786	(23.9)	243,492	(36.0)	563	(23.2)	631	(24.4)	592	(24.1)
Marital status				p = 0.000	p = 0.658					
Single	1,006	(13.5)	103,675	(15.4)	322	(13.3)	360	(13.9)	324	(13.5)
Spouse	5,265	(70.7)	457,283	(67.7)	1,723	(71.2)	1,825	(70.4)	1,717	(70.7)
Divorce, bereavement, Separation	1,176	(15.8)	114,357	(16.9)	375	(15.5)	407	(15.7)	394	(15.8)
Household income				p = 0.000	p = 0.330					
Less than 1 million won	2,420	(32.6)	139,361	(20.8)	799	(33.2)	798	(31.2)	823	(33.5)
1 million to less than 3 million won	2,610	(35.1)	231,048	(34.4)	899	(37.3)	837	(32.7)	874	(35.5)
3 million to less than 5 million won	1,500	(20.2)	184,239	(27.4)	435	(18.1)	622	(24.3)	443	(18.0)
More than 5 million won	896	(12.1)	116,627	(17.4)	274	(11.4)	303	(11.8)	319	(13.0)
Job				p = 0.000						p = 0.000
Professional Administration Manager	604	(8.1)	79,401	(11.7)	148	(6.1)	166	(6.4)	290	(11.7)
White collar	323	(4.3)	59,774	(8.8)	89	(3.7)	119	(4.6)	115	(4.6)
Sales service	775	(10.4)	87,245	(12.9)	239	(9.9)	285	(11.0)	251	(10.1)
Agriculture, Forestry and Fisheries	1,075	(14.4)	82,115	(12.1)	384	(15.9)	362	(14.0)	329	(13.3)
Functional labor	1,040	(13.9)	123,176	(18.2)	340	(14.1)	365	(14.1)	335	(13.5)
Housewife unemployed	3,525	(47.1)	222,734	(32.9)	1,170	(48.4)	1,235	(47.7)	1,120	(45.2)
Other(Student,Soldier)	144	(1.9)	22,578	(3.3)	49	(2.0)	56	(2.2)	39	(1.6)
Total	7,498	(1.1)	677,864	(98.9)	2,426	(32.4)	2,592	(34.6)	2,480	(33.1)

p-value calculated by χ^2-test and linear to linear coupling., The silent answer was missing.

2. **Healthbehaviors and trend of cohabitation family with dementia patients by year (2015, 2016 and 2017):** The person who smoked in the past but currently does not smoke was 55.8% showing significantly higher than the persons who smoke very much or smoke sometimes (p<0.001). For the annual drinking trend of the household cohabiting with the dementia patient, the person who is drinking was 72.8% showing significantly high and the proportion of not drinking was high compared to the group not cohabiting with the dementia patient (p<0.001).

For the severe physical activities, the person who does severe physical activities were 67.7% having significantly high(p<0.001). According to the analysis of health behaviors based on cohabitation status with the dementia patients, the annual drinking and severe physical activities did not show the significant trend change. In the currently smoking, which showed the significant trend change, the person who smoked in the past but current does not smoke was 54.3%, 56.5%and 59.7% showing that the subject who stops smoking is being increased significantly (p<0.001) and the subject who stops smoking shows the increasing trend by year (p<0.001) [Table 2].

Table 2. Health behaviors and trend of cohabitation family with dementia patients by year (2015, 2016 and 2017) Unit: N(%)

Categories	Cohabitation family with dementia patients				Trend by year					
	Yes		No		2015		2016		2017	
Current smoking	p = 0.000				p = 0.037					
Very smoke	1,109	(39.7)	111,634	(45.2)	394	(42.8)	372	(39.0)	343	(37.3)
Occasional smoke	98	(3.5)	10,957	(4.4)	27	(2.9)	43	(4.5)	28	(3.0)
I smoked the past but not the present	1,589	(56.8)	124,599	(50.4)	500	(54.3)	540	(56.5)	549	(59.7)
Annual drinking	p = 0.000				p = 0.897					
Yes	4,038	(72.8)	461,133	(82.5)	1,350	(73.1)	1,381	(72.7)	1,307	(72.5)
No	1,511	(27.2)	97,874	(17.5)	496	(26.9)	518	(27.3)	497	(27.5)
Moderate physical activity	p = 0.000				p = 0.819					
Yes	2,419	(32.3)	238,323	(35.2)	794	(32.7)	827	(31.9)	798	(32.2)
No	5,079	(67.7)	439,541	(64.8)	1,632	(67.3)	1,765	(68.1)	1,682	(67.8)
Total	7,498	(1.1)	677,864	(98.9)	2,426	(32.4)	2,592	(34.6)	2,480	(33.1)

p-value calculated by χ^2-test and linear to linear coupling., The silent answer was missing.

3. **Chronic disease, depression, stress and trend of cohabitation family with dementia patients by year(2015, 2016 and 2017):** Results of chronic disease, depression and stress according to dementia patients living together

The percentage of hypertension 33.3%, diabetes 14.0%, arthritis 12.8%, depression, 2.6%, and stress 3.7% were significantly higher than those who did not live together (p <0.001) [Table 3].

Table 3. Chronic disease, depression, stress and trend of cohabitation-family with dementia patients by year (2015, 2016 and 2017) Unit: N(%)

Categories	Cohabitation family with dementia patients				Trend by year					
	Yes		N0		2015		2016		2017	
Hypertension	p = 0.000				p = 0.002					
Yes	2,493	(33.3)	163,103	(24.1)	755	(31.1)	867	(33.5)	871	(35.4)
No	4,987	(66.7)	513,794	(75.9)	1,671	(68.9)	1,724	(66.5)	1,592	(64.6)
Diabetes	p = 0.000				p = 0.306					
Yes	1,047	(14.0)	64,659	(9.5)	337	(13.9)	341	(13.2)	369	(14.9)
No	6,447	(86.0)	613,050	(90.5)	2,089	(86.1)	2,250	(86.8)	2,108	(85.1)
Arthritis			p = 0.000						p = 0.539	
Yes	953	(12.8)	57,234	(8.5)	313	(12.9)	310	(12.0)	330	(13.5)
No	6,507	(87.2)	618,787	(91.5)	2,111	(87.1)	2,281	(88.0)	2,115	(86.5)
Depressed			p = 0.000						p = 0.116	
Yes	197	(2.6)	7,580	(1.1)	61	(2.5)	56	(2.2)	80	(3.2)
No	7,288	(97.4)	669,873	(98.9)	2,360	(97.5)	2,534	(97.8)	2,394	(96.8)
Stress			p = 0.000						p = 0.739	
Yes	278	(3.7)	12,997	(1.9)	94	(3.9)	93	(3.6)	91	(3.7)
No	7,186	(96.3)	663,694	(98.1)	2,326	(96.1)	2,493	(96.4)	2,367	(96.3)
Total	7,498	(1.1)	677,864	(98.9)	2,426	(32.4)	2,592	(34.6)	2,480	(33.1)

p-value calculated by χ^2-test and linear to linear coupling., The silent answer was missing.

4. **Results of logistic regression analysis taking depression as dependent variable:** In the results of logistic regression analysis taking the depression as dependent variable, in case of the 75 years or older, the depression was significantly increased by 6.210 times compared to the age from 45 years to 64 years ($p<0.05$). For the education level, the depression was increased significantly by 4.765 times in the elementary school graduates, by 6.293 times in the high school graduates and by 7.848 times in the college graduates or higher compared to the uneducated ($p<0.05$). The depression was increased significantly by 6.434 times in the agriculture, forestry and fisheries compared to the homemaker or unemployed ($p<0.05$) [Table 4].

Table 4. Results of logistic regression analysis taking depression as dependent variable

Variables	B	S.E,	Exp(B)	95% C.I for Exp(B)	
Gender (ref: Female) Male	.325	.551	1.385	.471	4.074
Age (ref: 45-64)					
65-74	.227	.561	1.255	.418	3.768
75 or Older	1.826	.650	6.210	1.738	22.188
Education (ref: non-education)					
Elementary school	1.561	.677	4.765	1.265	17.949
Middle school	1.259	.717	3.521	.864	14.343
High school	1.839	.755	6.293	1.432	27.659
University and above	2.060	.845	7.848	1.499	41.087
Marital status (ref: single)					
Spouse	.325	.822	1.383	.276	6.932
Divorce, bereavement, separation	.615	.878	1.849	.331	10.324

Variables	B	S.E,	Exp(B)	95% C.I for Exp(B)	
Household income(ref: More than 5 million won)					
Less than 1 million won	.561	.697	1.752	.447	6.874
1 million to less than 3 million won	1.299	.698	3.666	.933	14.412
3 million to less than 5 million won	1.178	.869	3.248	.592	17.829
Job(ref: Housewife, unemployed)					
Professional Administration Manager	.732	.797	2.078	.436	9.909
White collar	16.894	4638.845	2.173	.000	.
Sales service	-.484	.699	.616	.156	2.427
Agriculture, Forestry and Fisheries	1.862	.847	6.434	1.222	33.868
Functional labor	1.307	.866	3.695	.676	20.191
Current smoking(ref:I smoked the past but not the present)					
Very smoke	.153	.460	1.166	.473	2.871
Occasional smoke	-.769	.830	.464	.091	2.356
Annual drinking (ref: No) Yes	.337	.416	1.401	.620	3.166
Moderate physical activity(ref: Yes) No	.457	.494	1.579	.599	4.160
Hypertension(ref: No) Yes	.225	.415	1.252	.555	2.825
Diabetes(ref: No) Yes	.839	.457	2.313	.945	5.664
Arthritis(ref: No) Yes	.503	.592	1.653	.518	5.278
Stress (ref: No) Yes	4.396	.450	81.103	33.606	195.731

Conclusion

Currently, the diverse programs for the caregiver of demented elderly are implemented by the national responsibility system for dementia but the customized regional program to relieve the depression of the family cohabiting with the patient with dementia during the busy time of the farm village, mountain village and the fishing village besides the subjects of low income of 75 years old is not sufficient.

Therefore, the systematic free counselling program for the management of depression and stress in the male elderly of 75 years or older who have low income and cares the patients with dementia is needed desperately.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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