

Analysis of Factors Affecting the Depression and Quality of Life in the Family Taking Care of Dementia Patients

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Abstract

Background/Objectives: This study was intended to identify the factor having influence on the stress, depression and the quality of life in the family who care the patient with dementia.

Method/Statistical Analysis: For this study, raw data were requested to Korea Centers for Disease Control and Prevention and among them, the data for 150,802 citizens of 45 years or older in D Metropolitan City were analyzed. For the analysis, the statistical software R program was used and the significance level was 0.05.

Findings: Out of the factors having influence on the family who are cohabitating with the patient with dementia, the factors having influence on the quality of life were age, benefit of basic living security, lifelong drinking, days of medium level of physical activity, diabetes, arthritis, subjective oral health level, subjective health level, experience of depression, etc..

Improvements/Applications: This study was intended to provide the basic data to develop the programs for the health improvement and the health education of the family who care the patient with dementia

Keywords: *Dementia, Cohabitation, Family, Stress, Depression, Quality of life.*

Introduction

The psychological symptom that shows the highest frequency out of the psychological symptoms experienced by the primary caregivers of the patient with dementia is the depression^[1]. In the United States, it was reported that 30-50% of the caregivers of the patient with dementia have depression^[2]. The factors that deteriorate the depressive symptoms of the family caregiver of the patient with dementia are relationship with family^[3], disease duration, level of problem behavior or functional and cognitive disorder, daily

living activity, existence of assistant caregiver, etc^[4-5]. It has been reported that the greater the dependency of the patient with dementia in the daily living activity and the more severe the level of problem behavior, the higher the level of depression or level of stress in the family caregiver^[6]. As the patient with dementia is increased, for the patient, the quality of life is degraded by diverse irreversible symptoms around the cognitive and behavior disorders^[7] and for the primary caregiver, the quality of life is degraded by the stress in caring the patient^[8]. Since the caregivers are likely to become hidden patient or second patient by experiencing diverse negative emotions together with care burden^[9-10], the problem in the primary caregiver should be considered as a part of the problem of patient with dementia and the effort to support the family of patient with dementia is needed. The caregivers of patient with dementia are complaining of negative perception on the dementia, lack of information on the social support resources related to treatment of dementia and lack of time to taking care

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of their own life due to long-term care of the patient with dementia^[11]. Integrated educational program for the family of caring the patient with dementia should be provided and therefore, this study was intended to provide the basic data to development the program for health improvement and health education of the family members who are taking care of patient with dementia by identifying the factor having influence on the stress, depression and the quality of life in the family members who are taking care of the patient with dementia.

Method

For this study, raw data of the 2015 Community Health Survey were requested to Korea Centers for Disease Control and Prevention and among them, the data for 150,802 citizens of 45 years or older in D Metropolitan City were analyzed. For the analysis, the statistical software R program was used and the significance level was 0.05. The general characteristics of the research subjects were divided by the cohabitation with the patient with dementia and the frequency analysis and Chi-square test were performed for the gender, age, educational level, marital status, household income, beneficiary of basic living security. Chi-square test and independent sample t-test were performed for the factors related to smoking habit, drinking habit, hypertension, diabetes, hyperlipidemia, arthritis, depression, etc, by the stress. For the factors related to the family cohabited with the patient with dementia

and the depression, the logistic regression analysis was performed and for the factors related to the quality of life, multiple linear regression analysis performed. For the quality of life index (EQ-5D index), the index that aggregates the 3 level of technical system for the current state of 5 items (exercise capability, self-management, daily activities, pain/inconvenience, anxiety/depression) of the quality of life related to health. EQ-5D index has the value between 1 and 1 and the closer to 1, the higher the quality of life.

$$=1-(0.0081+0.1140*M2+0.6274*M3+0.0572*SC2 +2073*SC3+0.0615*UA2+.2812*UA3+0.0581*PD2 + 0.2353*PD3+0.0675*AD2+0.2351*AD3).$$

Result and Discussion

- General Characteristics and Healthy Life Behavior:** The family cohabitating with the patient with dementia was average 1.3% showing low cohabitation rate. The cohabitation with the patients with dementia was high in the subjects of 75 years or older (p<0.001), of the graduates of the elementary school or below (1.6%)(p<0.001), of single (2.1%) (p<0.001), from 500,000 won to 1 million won of household income (1.7%) (p<0.001), who did not drink for entire life (1.6%)(p<0.001), and who cannot practice the medium level of physical activity (1.4%) (p<0.001) [Table 1].

Table 1. General Characteristics of Study Subjects Unit: N (%)

Categories	Total		Cohabitation with Patient				Proportion of Cohabiting with Patient (%)		p-value
			Yes	No	Yes	No			
Gender									
Male	66,282	(44.0)	889	(1.3)	65,393	(98.7)	889	(44.6)	0.582
Female	84,520	(56.0)	1,106	(1.3)	83,414	(98.7)	1,106	(55.4)	
Age									
45-64	86,874	(57.6)	940	(1.1)	85,934	(98.9)	940	(47.1)	0.000
65-74	36,521	(24.2)	413	(1.1)	36,108	(98.9)	413	(20.7)	
75 or older	27,407	(18.2)	642	(2.3)	26,765	(97.7)	642	(32.2)	
Education Level ¹⁾									
Elementary school	56,670	(37.6)	915	(1.6)	55,755	(98.4)	915	(45.9)	0.000
Middle school	24,765	(16.5)	295	(1.2)	24,470	(98.8)	295	(14.8)	
High school,	43,068	(28.6)	482	(1.1)	42,586	(98.9)	482	(24.2)	
College or higher	26,030	(17.3)	301	(1.2)	25,729	(98.8)	301	(15.1)	

Categories	Total		Cohabitation with Patient				Proportion of Cohabiting with Patient (%)		p-value
			Yes		No				
Marital Status									
Single	2,958	(2.0)	62	(2.1)	2,896	(97.9)	62	(3.1)	0.000
Has spouse	111,783	(74.2)	1,573	(1.4)	110,210	(98.6)	1,573	(79.0)	
Divorced, Widow, Separated	35,877	(23.8)	356	(1.0)	35,521	(99.0)	356	(17.9)	
Household Income									
0.5-1 million won	45,621	(30.3)	755	(1.7)	44,866	(98.3)	755	(37.8)	0.000
1-3 million won	54,482	(36.1)	734	(1.3)	53,748	(98.7)	734	(36.8)	
3-5 million won	30,878	(20.5)	299	(1.0)	30,579	(99.0)	299	(15.0)	
5 million or more	19,821	(13.1)	207	(1.0)	19,614	(99.0)	207	(10.4)	
Currently Smoking									
Yes	23,518	(15.6)	307	(1.3)	23,211	(98.7)	307	(15.4)	0.979
No	127,281	(84.4)	1,688	(1.3)	125,593	(98.7)	1,688	(84.6)	
Lifelong Drinking									
Yes	116,694	(77.4)	1,447	(1.2)	115,247	(98.8)	1,447	(72.6)	0.000
No	34,093	(22.6)	546	(1.6)	33,547	(98.4)	546	(27.4)	
Medium Level of Physical Activity Practice²⁾									
Yes	50,613	(33.6)	609	(1.2)	50,004	(98.8)	609	(30.5)	0.004
No	100,148	(66.4)	1,385	(1.4)	98,763	(98.6)	1,385	(69.5)	
Total	150,791	(100.0)	1,995	(1.3)	148,796	(98.7)	1,995	(100.0)	

1) Education Level : Include graduates of relevant educational institution or higher those who are studying , completed, dropout and leave of absence

2) Practice rate of medium level of physical activity: (Number of persons who practiced the medium level of physical activity more than 30 minutes a day for more than 5 days a week / Number of subject) ×100

*p-value calculated by x²-test

2. Chronic Disease According to Cohabitation with Patient with Dementia: In case of the family who are cohabitating with the patient with dementia, they were diagnosed with hypertension (1.4%), diabetes (1.7%), arthritis (1.6%) asthma (1.9%) and depression (2.8%) (p<0.001). In the results of

analyzing the diagnosis of chronic diseases in the subjects within the group that is cohabitating with the patient with dementia, the hypertension was 39.8%, arthritis was 25.6%, diabetes was 18.6%, depression was 14.6%, asthma was 4.9%, in order [Table 2].

Table 2. Chronic Disease Unit: N(%)

Categories	Total		Cohabitation with Patient				Proportion of Cohabiting with Patient (%)		p-value
			Yes		No				
Hypertension									
Yes	55,273	(36.7)	794	(1.4)	54,479	(98.6)	794	(39.8)	0.003
No	95,502	(63.3)	1,201	(1.3)	94,301	(98.7)	1,201	(60.2)	
Diabetes									
Yes	21,806	(14.5)	372	(1.7)	21,434	(98.3)	372	(18.6)	0.000
No	128,973	(85.5)	1,623	(1.3)	127,350	(98.7)	1,623	(81.4)	
Hyperlipidemia									
Yes	28,626	(19.0)	362	(1.3)	28,264	(98.7)	362	(18.2)	0.375
No	121,854	(81.0)	1,622	(1.3)	120,232	(98.7)	1,622	(81.8)	

Categories	Total		Cohabitation with Patient				Proportion of Cohabiting with Patient (%)		p-value
			Yes		No				
Arthritis									
Yes	31,229	(20.7)	510	(1.6)	30,719	(98.4)	510	(25.6)	0.000
No	119,518	(79.3)	1,483	(1.2)	118,035	(98.8)	1,483	(74.4)	
Asthma									
Yes	5,284	(3.5)	98	(1.9)	5,186	(98.1)	98	(4.9)	0.001
No	145,502	(96.5)	1,897	(1.3)	143,605	(98.7)	1,897	(95.1)	
Depression									
Yes	10,318	(6.8)	290	(2.8)	10,028	(97.2)	290	(14.6)	0.000
No	140,411	(93.2)	1,700	(1.2)	138,711	(98.8)	1,700	(85.4)	
Total	150,791	(100.0)	1,995	(1.3)	148,796	(98.7)	1,995	(100.0)	

*p-value calculated by χ^2 -test

3. Subjective Stress, Subjective Oral Health Level and Subjective Health Level According to Cohabitation with Patient with Dementia:

In case if the family who are cohabitating with the patient with dementia, the case of feeling high subjective stress level was 2.2%, the case of poor subjective oral health level was 1.5%, the case of poor subjective health level was 2.0%. The case that feels little subjective stress level was 40.6%, the case of poor subjective oral health level was 55.5%,

the case of poor subjective health level was 44.2%, shown relatively higher proportion in the relevant group [Table 3].

4. Happiness Index and Quality of Life according to Cohabitation with Patient with Dementia:

In case of family who do not live together with the patient with dementia, the happiness index was $7.22 \pm .897$, not significant but high and the quality of life was 0.8946 ± 0.17497 , significantly high ($p < 0.001$) [Table 4].

Table 3. Subjective Stress, Subjective Oral Health Level and Subjective Health Level Unit: N(%)

Categories	Total		Cohabitation with Patient				Proportion of Cohabiting with Patient(%)		p-value
			Yes		No				
Subjective Stress Level									
Feel a lot	33,822	(22.4)	743	(2.2)	33,079	(97.8)	743	(37.4)	0.000
Feel a little	76,001	(50.4)	807	(1.1)	75,194	(98.9)	807	(40.6)	
do not feel	40,849	(27.1)	439	(1.1)	40,410	(98.9)	439	(22.1)	
Subjective oral health level									
Good,	28,428	(18.9)	328	(1.2)	28,100	(98.8)	328	(16.4)	0.000
Fair	50,693	(33.6)	559	(1.1)	50,134	(98.9)	559	(28.0)	
Poor	71,670	(47.5)	1,108	(1.5)	70,562	(98.5)	1,108	(55.5)	
Subjective Health Level									
Good,	43,995	(29.2)	443	(1.0)	43,552	(99.0)	443	(22.2)	0.000
Fair	62,467	(41.4)	670	(1.1)	61,797	(98.9)	670	(33.6)	
Poor	44,333	(29.4)	882	(2.0)	43,451	(98.0)	882	(44.2)	
Total	150,791	(100.0)	1,995	(1.3)	148,796	(98.7)	1,995	(100.0)	

*p-value calculated by χ^2 -test

Table 4. Happiness Index and Quality of Life

Categories			N Average		Standard Deviation	p-value
Happiness Index						
Cohabitation with Patient	Yes	1,995	7.08	±	10.217	0.558
	No	148,807	7.22	±	7.897	
EQ5D						
Cohabitation with Patient	Yes	1,995	0.8063	±	0.28794	0.000
	No	148,807	0.8946	±	0.17497	

5. Multiple Logistic Regression Analysis according to Depression in Family who Cohabitate with Patient with Dementia: For the variable having significant influence on the depression, the female showed 1.918 times significantly higher than the male, the age group of 45 to 64 years old showed 1.706 times significantly higher than the group of 74 years or older. (p<0.001). For the subjective periodontal tissue health level, ‘Poor’ was shown 1.573 times than ‘Good’, for the subjective stress level, ‘Case that feels a little’ was shown 2.371 times and ‘Case that feels a lot’ was shown 8.991 times higher than ‘Case that does not feel’ and for the subjective health level, ‘Fair’ was shown 2.253

times and ‘Poor’ was shown 2.553 times higher than ‘Good’ (p<0.001) [Table 5].

6. Factors having Influence on Quality of Life of Family Who are Cohabiting with Patient with Dementia: The factors having influence on the quality of life were age (p<0.001), recipient of basic living security benefit (p<0.05), lifelong drinking (p<0.05), Days of medium level of physical activity (p<0.05), doctor’s diagnosis of diabetes (p<0.05), doctor’s diagnosis of arthritis (p<0.05), subjective oral health level (p<0.05), subjective health level (p<0.001) and experience of depression (p<0.001) and the explanation power was 25.1% [Table 6].

Table 5. Multiple Logistic Regression Analysis according to Depression

Variables	B	S.E.	Sig. Level	Exp(B)	95% of EXP(B) C.I.	
					Lower Limit	Upper Limit
Gender (Male)	.652	.203	.001	1.918	1.288	2.856
Age (45~64)	.534	.229	.020	1.706	1.089	2.671
Age (65~74)	.194	.239	.418	1.214	.759	1.941
Recipient of basic living security benefit (No)	.270	.244	.269	1.309	.812	2.112
Currently Smoking (No)	.433	.250	.083	1.543	.945	2.517
Lifelong Drinking (No)	.145	.197	.460	1.156	.787	1.700
Medium Level of Physical Activity Practice (No)	.134	.175	.445	1.143	.811	1.612
Hypertension (Yes)	.091	.181	.615	1.095	.768	1.561
Diabetes (No)	.067	.211	.752	1.069	.707	1.615
hyperlipidemia (No)	.209	.202	.301	1.233	.829	1.832
Arthritis (Yes)	.034	.193	.858	1.035	.709	1.512
Asthma (Yes)	.172	.366	.637	1.188	.580	2.433
Subjective oral health (Poor)	.453	.167	.007	1.573	1.135	2.181
Subjective Stress (Feel a little)	.863	.175	.000	2.371	1.681	3.343
Subjective Stress (Feel a lot)	2.196	.364	.000	8.991	4.407	18.344
Subjective Health (Fair)	.812	.251	.001	2.253	1.377	3.686
Subjective Health (Poor)	.937	.205	.000	2.553	1.706	3.818
Constant	-1.083	.506	.032	.339		

p-value calculated by multiple logistic regression

Table 6. Multiple linear Regression Analysis of Causal Factors having Influence on the Quality of Life

Variable	B	b	t	p-value
Constant	.966		6.698	.000
Gender ¹	-.020	-.030	-.932	.351
Age ²	-.103	-.150	-5.155	.000
Recipient of basic living security benefit ³	.042	.075	2.733	.006
Currently Smoking ⁴	.001	.001	.018	.985
Lifelong Drinking ⁵	-.049	-.070	-2.363	.018
Medium Level of Physical Activity Practice ⁶	-.075	-.096	-3.391	.001
Hypertension ⁷	-.008	-.012	-.428	.669
Diabetes ⁸	.047	.060	2.136	.033
hyperlipidemia ⁹	.000	.000	.017	.987
Arthritis ¹⁰	.054	.077	2.683	.007
Asthma ¹¹	-.017	-.013	-.457	.648
Subjective Stress ¹²	.021	.049	1.675	.094
Subjective oral health ¹³	-.035	-.071	-2.518	.012
Subjective Health ¹⁴	-.132	-.280	-9.514	.000
Depression ¹⁵	.147	.164	5.662	.000
F = 22.724 p<0.001 R ² = 0.251 Adjust R ² = 0.240 Durbin-Watson = 1.931				

1) Male, Female. 2) 45-64, 65-74, 75 or older. 3)~15) Yes, No., p-value calculated by Multiple Regression Analysis.

Conclusion

The influence on the depression in the family who are cohabitating with the patient with dementia was significant high in the male, age group of 45 - 64 years old, when the periodontal tissue health level is poor, when feeling the stress a lot, and when the health level is poor (p<0.001). Out of the factors having influence on the family who are cohabitating with the patient with dementia, the factors having influence on the quality of life were age, benefit of basic living security, lifelong drinking, days of medium level of physical activity, diabetes, arthritis, subjective oral health level, subjective health level, experience of depression, etc.. In conclusion, when developing the health improvement program to prevent the depression in the family who are living with the patient with dementia, the quality of life will be improved if it is developed for the age from 45-65 years old, married couple of family type together with development of the lifestyle improvement program for drinking and oral health management of the spouse without dementia and the prevention program for alleviation of overstress. It is deemed that these results can contribute to providing the basic data to develop the program for health improvement and health education of the family who are caring the patient with dementia when establishing the policy on the dementia.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: None of the authors of this study has any financial interest or conflict with industries or parties.

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