

## **Risk factors, depression, quality of life and relevance of Korean adults**

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### **Abstract**

*This study aimed that certain risk factors are linked to the risk of developing depression and decreasing quality of life. This study was implemented using data from the 6th and 7th Korea National Health and Nutritional Examination Survey. The National Health and Nutrition Survey consist of health surveys, screenings, and nutrition surveys. Among the risk factors, data on adult diseases such as depression, hypertension, arthritis, diabetes, cataract, glaucoma, and macular degeneration were used. In total, 12,768 adults over 20 years of age were selected, of whom 520 were diagnosed with depression. The most common risk factors in adults over 20 years of age were hypertension, arthritis, cataract, diabetes, depression, glaucoma, and macular degeneration. Their risk factors were analyzed if these were associated with depression and quality of life. The results revealed that hypertension, arthritis, diabetes, cataract, glaucoma, and macular degeneration were predictors for the occurrence of depression in adults. The factors associated with the highest risk for depression were arthritis and glaucoma. Furthermore, the study investigated the effect of certain factors on the quality of life; the factor associated with the greatest impact on quality of life was arthritis. This study verified that the aforementioned factors were related to the risk of developing depression and decreasing quality of life.*

**Keywords:** *Adults, Depression, Risk Factors, Quality of Life*

## **1. INTRODUCTION**

The World Health Organization says that depression is a well-known mental health problem. Between 2005 and 2015 more than 300 million people worldwide were diagnosed with depression and 18% of the world population has depression [1]. Depression does not always occur only once but can occur in lifecycle-related events throughout a person's lifetime. Mental illnesses such as depression can be caused by experiencing stress. Although not everyone who experiences stress suffers from depression, stressful events across the life span, involving threat, loss, humiliation, or defeat, can influence the onset and course of depression [2]. Mental healthcare should address not only individually important but also socially important health issues. Continuous mental healthcare is needed to prevent depression from adolescence to old age. Depression is also affected by gender in a variety of incidents and situations. Park and Lee [3] studied adults

over 20 years of age and found that the incidence of depression increased among women with a lower education level and who had lost their partner. Oppositely, an important factor for men for the transition from a depressed state to depression was found to be satisfaction with health or family relationships.

Risk factors increase the likelihood of getting a disease or developing a condition. The further risk factors a person has, the bigger is their risk of developing depression. A risk factor for depression may be related to a combination of genetic, physical, psychological, and environmental factors. Studies in adults have found that depression-related complications are hypertension [4], diabetes [5], stroke and cardiovascular disease [6], and cancer [7]. The risk of diabetes in men with depression was about twice as high [8]. Thus, there is a need to manage and control risk factors that can affect the onset of depression, and people at risk should be managed to prevent depression. In addition, diseases associated with these risk factors can affect the quality of life.

Consequently, this study aimed the factors associated between depressions and to identify risk factors that affect depression and quality of life using the 6th and 7th National Health and Nutrition Examination Surveys (NHANES), which are systematic surveys conducted using health questionnaires.

## **2. METHODS**

### **2.1 Data source and participants**

This is a secondary analysis using data from the NHANES. This study was implemented using data from the 6th and 7th NHANES. The raw data were received from the homepage after internal review and approval. Among the risk factors, data on adult diseases such as depression, hypertension, arthritis, diabetes, cataract, glaucoma, and macular degeneration were used. The degree of quality of life was used score of EuroQol-5 Dimension as the study data. The NHANES respondents included 12,768 Korean adults aged  $\geq 20$  years.

### **2.2 Research variables**

We examined participants' demographics and characteristics including age, gender, marital status, education status, economic activity, and health insurance, which were divided as follows: marital status = married or single, education status = from elementary school to university, economic activity = participation or non-participation, and health insurance = local insurance or work insurance or medical benefit.

The more risk factors an individual has, the greater the individual's risk and the greater the risk of developing depression. In this study, risk factors for depression, such as hypertension, arthritis, diabetes, cataract, glaucoma, and macular degeneration, were selected through a literature review. The NHANES data, we identified the risks associated with these factors for the development of depression and identified their impact on quality of life.

This study examined the quality of life via the EuroQol-5 Dimensions Questionnaire in the NHANES data to determine whether the risk factors affecting quality of life were influenced by depression. The EQ-5D was introduced at the EuroQol Group in 2009 to increase the sensitivity of the instrument and reduce the ceiling effect. The EQ-5D classification describes health conditions according to five attributes; mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Each attribute has three levels: "1 point = no problem", "2 points = some problems", and "3 points = serious problems" [9].

### **2.3 Data analysis**

All data analysis used the IBM SPSS Statistics version 24.0 (IBM Co., Armonk, NY, USA) software

package. Odds ratios were used to examine the risk of depression onset and onset of risk factors. Regression analysis was executed to examine the effect of the diagnosis of risk factors on the quality of life. The significance level was set as 0.05 in all analyses.

### 3. RESULTS

The number of adult participants in the study population was 12,768, the mean participant age was  $51.54 \pm 16.63$  years, and the gender ratio was 5,627 (44.1 %) males to 7,141 (55.9 %) females. The number of participants with education status was the highest in University (33.7%), followed by High school (27.6%), Elementary school (19.6%), and Middle school (9.2%)(Table 1).

Among participants aged >20 years, 520 (4.0 %) were diagnosed with depression while 11,056 (86.6 %) were not diagnosed with depression. Of the aged above 20 years, 3,044 (23.8%) were diagnosed with hypertension, 1,563 (12.2%) were diagnosed with arthritis, 1,220 (9.6%) were diagnosed with diabetes, 1,523 (11.9%) were diagnosed with cataract, 214 (1.7%) were diagnosed with glaucoma, and 77 (0.6%) were diagnosed with macular degeneration (Table 2).

In adults over 20 years of age diagnosis with depression, the risk of being diagnosed with arthritis was 3.2 times higher than that for adults not diagnosed with depression (OR, 3.276). The second is 2.9 times more likely to be diagnosed with glaucoma (OR, 2.904), and the third is 2.2 times more probable be diagnosed with cataract (OR, 2.261), followed by the risk of being diagnosed with diabetes was 1.7 times (OR, 1.787) and hypertension was 1.6 times (OR, 1.645). The risk of being diagnosed with macular degeneration among risk factors was not statistically significant (Table 3).

The risk factor with the greatest impact on the quality of life was arthritis ( $\beta=-.326$ ,  $p>.05$ ). The next major risk factor for quality of life was cataract ( $\beta=-.274$ ,  $p>.05$ ), followed by hypertension ( $\beta=-.229$ ,  $p>.05$ )(Table 4).

### 4. DISCUSSION

The most common risk factors in adults over 20 years of age were hypertension, arthritis, cataract, diabetes, depression, glaucoma, and macular degeneration. Adults over 20 years of age diagnosed with depression, the risk of diagnosis with arthritis was the highest, followed by the risk of diagnosis with glaucoma, cataract, diabetes, or hypertension. The risk factor with the greatest impact on the quality of life was arthritis, followed by cataract, hypertension, diabetes, glaucoma, and macular degeneration. Arthritis is a chronic disease but it also results in physical inactivity [9]. Previous studies have shown that people with arthritis and depression have greater levels of dysfunction and lower quality of life related of health than people without arthritis and depression [10]. Patients with arthritis and depression have additional disadvantages; for example, in arthritis patients, depression can aggravate pain [11]. Moreover, the results of this study demonstrate that people with arthritis have the greatest risk of developing depression.

In particular, the arthritic pain has a negative impact on depression onset and quality of life related with health. According to this study, the risk factor with the greatest impact on the quality of life was arthritis. The World Health Organization defines a term of quality of life by means of an individual's perception of the location of an individual's life in the context of the belief, value, and culture system in which they livelihood and in relation to their concerns, standards, expectations, and goals.

Among the risk factors selected in this study, the risk factor with the next greatest impact on quality of life and for the onset of depression is cataracts. Vision loss due to cataracts is related with depression and anxiety in the elderly. Patients with cataracts have more depressive symptoms than patients without cataracts [12].

Palagyi and colleagues showed a high frequency of depressive symptoms in older adults with cataracts [13]. In addition, there has been study on the effects of cataracts on depression and anxiety [14]. However, there is little research showing that the occurrence of anxiety and depression is related to the incidence of cataract in Korean individuals. Therefore, this study provides important insights because it proves that cataracts increase the risk of developing depression in adults and affect quality of life.

Because this study comprises a secondary data analysis, we could not include variables other than those used to compare depressive health behavior and psychological status in adults. In subsequent studies, it is necessary to research the effects of depression and quality of life on subjects at risk using tools to assess specific areas of daily life.

## 5. CONCLUSION

This study was to inspect the hypothesis that confident risk factors are linked to the risk of depression and a decrease in the quality of life. Future research will improve the understanding of the health-related risk factors for depression status and quality of life in adults.

**Table 1. General characteristics of participants (N=12,768)**

Characteristics		Frequency (%)	Mean±SD
Age (years)			51.54±16.63
Gender	Male	5,627 (44.1)	
	Female	7,141 (55.9)	
Marital status	Married	10,758 (84.3)	
	Single	2,009 (15.7)	
Education status	Elementary school	2,498 (19.6)	
	Middle school	1,181 (9.2)	
	High school	3,518 (27.6)	
	University	4,309 (33.7)	
	Non-response	1,262 (9.9)	

**Table 2. Overview of health condition with adults (N=12,768)**

Characteristic	Frequency (%)	
	Yes	No
Depression	520 (4.1)	11,056 (86.6)
Hypertension	3,044 (23.8)	9,148 (71.6)
Arthritis	1,563 (12.2)	10,014 (78.4)
Diabetes	1,220 (9.6)	10,970 (85.9)
Cataract	1,523 (11.9)	10,052 (78.7)
Glaucoma	214 (1.7)	11,361 (89.0)
Macular degeneration	77 (0.6)	11,498 (90.1)

Exclude missing values among characteristics.

**Table 3. Risk factors of depression among adults (N=520)**

Risk factors	Diagnosis of depression	n (%)	OR (95% CI)
Hypertension	Yes	182 (35.0)	1.645 (1.367~1.980)
	No	338 (65.0)	
Arthritis	Yes	167 (32.1)	3.276 (2.703~3.972)
	No	353 (67.9)	
Diabetes	Yes	84 (16.2)	1.787 (1.403~2.276)
	No	436 (83.8)	
Cataract	Yes	128 (24.6)	2.261 (1.838~2.782)
	No	392 (75.4)	
Glaucoma	Yes	25 (4.8)	2.904 (1.895~4.449)
	No	495 (95.2)	
Macular degeneration	Yes	7 (9.1)	2.141 (0.980~4.681)
	No	513 (98.7)	

**Table 4. Effects of quality of life on the diagnosis of risk factors (N=11,533)**

Independent variable	R <sup>2</sup>	B	SE	$\beta$	p
Hypertension	.053	-.061	.002	-.229	.000
Arthritis	.106	-.110	.003	-.326	.000
Diabetes	.025	-.061	.004	-.160	.000
Cataract	.075	-.093	.003	-.274	.000
Glaucoma	.009	-.081	.008	-.094	.000
Macular degeneration	.002	-.058	.013	-.041	.000

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