Factors Related to Problem Drinking in Korean Elderly

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Abstract

Background/Objectives: The purpose of this study is to evaluate the prevalence and related risk factors of problem drinking in the Korean elderly population.

Method/Statistical Analysis: Participants (n=817) aged 65 years or older were selected from the Korea National Health and Nutrition Examination Survey [KNHANES] of 2018. Sociodemographic characteristics and AUDIT-C score were obtained from the KNHANES dataset. AUDIT-C scores were categorized into two groups, including low risk, high-risk alcohol drinking according to WHO guidelines. Data analysis was performed using SPSS WIN 25.0 program.

Findings: In this study, the prevalence of high-risk alcohol drinking was 31.9%, respectively. Adjusted mean AUDIT score was higher in men, younger elderly individuals, as well as those with lower education levels and those that smoked. Results revealed that demographic variables, including sex, age, education level, and smoking, were important factors affected high-risk drinking. In particular, since family number and smoking were the most significant risk factor, the odds ratio for high-risk drinking among participants that smoked was 2.49 [(95% confidence interval (CI)=1.31-4.71)].

Improvements/Applications: This study suggests that men, younger age, low educational level, and smoking are the risk factors for a high-risk alcohol drinking

Keywords: *Elderly, AUDIT score, Demographic factor, High risk alcohol drinking, Problem drinking.*

Introduction

Problem drinking in Korea has become a serious social issue. Reportedly, 158 of 2,657 elderly men and 48 of 2,080 elderly women in Korea have demonstrated problem drinking in a study[1]. Considering that the elderly do not live with their children or engage in social activities after retirement, the reported number might be lower than the actual number. Furthermore, as they show a characteristic tendency to lie about their drinking because of the negative stigma attached to this problem[2-3], the actual magnitude of problem drinking among the elderly could be more serious than what studies have indicated. In fact, a study examining 5,102 Korean adults showed that the percentage of the elderly diagnosed with alcoholism was lower than that of young or middle-aged adults with problem drinking[4]. Moreover, the pattern of drinking among the elderly was such that while the overall drinking quantity was low, the frequency was high as they favored aperitifs or relied on alcohol as a sleep aid. They also habitually drank stashed alcohol, a fact often neglected as a problem by the elderly and family members, which poses a challenge in improving the condition[3,5,6].

As drinking leads to serious social consequences, there is an urgent need to develop response measures against it. Drinking causes physical [7] and psychological [8]problems, and may lead to impulsive crime or accidents [9]. The problems related to drinking often cause a tremendous social loss. The blood alcohol concentration of the elderly rises more rapidly than in young individuals because of reduced metabolic functions and body fluids. In addition, if they have a chronic disease,

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the interaction between the currently administered drug and even a small quantity of alcohol may change the drug efficacy or induce side effects [10,11].

Therefore, a social need to find solutions to problem drinking among the elderly has been highlighted. Thus far, many studies have investigated diverse factors related to problem drinking among the elderly. Problem drinking is associated with biological factors such as age and gender [12], psychological problems such as stress and depression [4], and family type such as living with a family member or not [13]. Previous studies in Korea and overseas have described the relationship between problem drinking and various factors; however, identifying the correlation between problem drinking and socio-demographic and health-related factors has remained a challenge based on the latest dataset.

Thus, this study set out to determine the factors related to problem drinking among the Korean elderly to provide basic data for advancing practical measures to improve health among the elderly. To this end, the status of problem drinking in the Korean elderly population is analyzed, and related factors are identified based on socio-demographic and health-related data. Specifically, this study set out to:

- Examine the differences between low-risk and high-risk groups regarding problem drinking according to the socio-demographic and health-related characteristics of the Korean elderly population, and
- Analyze the factors related to high-risk problem drinking among the elderly in Korea.

Method

1. **Research Method:** This is a secondary data analysis study that identifies factors related to High-Risk Drinking in Korean Elderly by employing the 7th Korea National Health and Nutrition Examination Survey (KNHAES) conducted nationwide in 2018.
2. **Data Collection:** The KNHAES was conducted under approval by the Institutional Review Board (IRB) of KCDC (No. 2018-01-03-P-A). On April 5, 2020, the present study's researcher received approval for data use and downloaded them via the link on the KCDC's website(https://knhanes.cdc.go.kr), which releases and provides the KNHAES's raw data. In addition, this study underwent a review for an examination exemption (IRB No. SMU-EX-2020-02-001) at the IRB of the organization to which the research belongs. The 2018 KNHAES involved 7,992 respondents in total. In the present study, 817 individuals without missing values were selected as final subjects from elderly people aged 65 or above.

Reasearch Tools:

Sociodemographic Characteristics: As the subjects' general characteristics, gender, age, areas of residence, education levels, marital status, income levels, and occupations were used. Of these variables, areas of residence were divided into "urban" and "rural". The current marital status was reclassified into "having a spouse" and "living together", and occupations were also reclassified into "having" and "not having."

Health Behavior: Health behaviors include smoking, drinking, engaging in exercise or not, subjective health conditions, suicidal thoughts, and perceived stress. The number of comorbidities means the number of diseases from which one suffers after doctors' confirmation. For smoking, those who had smoked at least five packs in their lifetime and were currently smoking were classified as answering "yes". For drinking, those who had drunk at least one glass of alcohol over the past one year were classified as answering "yes." In addition, those who performed at least one of 1) strenuous physical activities that cause severe shortness of breath, 2) moderate physical activities that cause moderate shortness of breath, and 3) walking were classified as engaging in regular exercise. Subjective health conditions were reclassified into "good", "average", and "poor." For suicidal thoughts, the original survey's answers were used without change. In addition, perceived stress was reclassified into "high" and "low."

Problem Drinking: For problem drinking, the AUDIT-C(Alcohol Use Disorders Identification Test-Consumption)score of three questions on drinking frequency, typical drinking quantity, and binge drinking frequency was used. Each question was categorized as follows: (i) Drinking frequency: None, less than once a month, two to four times a month, two to three times a week, four times a week or more; (ii) Typical drinking quantity per week: ≤ 1–2 glasses, 3–4 glasses, 5–6 glasses, 7–9 glasses, ≥ 10 glasses; and (iii) Binge drinking frequency: None, less than once a month, once a month, once a week, almost every day. The total score for AUDIT-C is 12, and items are scored on a 4-point Likert scale. In addition, in this research, the criteria for problem drinking were based on the control point

reported in a study examining Korean adults regarding the trimmed mean of the assessment tool on high-risk drinking. Thus, an AUDIT-C score of ≥ 6 for men and ≥ 5 for women was considered to indicate problem drinking.

Data Analysis: The study's data were analyzed using SPSS 25.0, and differences in general characteristics and health related characteristics between low risk alcohol drinking and high risk alcohol drinking were identified using descriptive statistics and χ^2-test. To identify the factors that influence high risk alcohol drinking, a logistic regression analysis was conducted using a concurrent input method by applying the significant variables resulting from an univariable analysis as independent variables.

Result

Differences in problem drinking according to socio-demographic and health-related characteristics in the Korean elderly population: The differences in problem drinking according to socio-demographic and health-related characteristics were analyzed after subjects were categorized into the low-risk (n=556) and high-risk (n-261) problem drinking groups based on their AUDIT-C score [Table 1]. The high-risk group comprised a higher percentage of men (χ^2=147.295, p<.001), higher number of elderly aged 65–70 years than those aged > 70 years (χ^2=32.67, p=.017), more subjects with a low level of education (χ^2=4.684, p=.030), more subjects with ≤ elementary school graduation than those with ≥ high school or college/university graduation (χ^2=29.32, p<.001), more people living in urban rather than rural areas, more married individuals (χ^2=16.882, p<.001), more unemployed individuals, and a higher number of individuals living with two family members (χ^2=5.931, p=.029). For health-related characteristics, statistically significant differences between the low-risk and high-risk groups were found for subjective health status (χ^2=18.379, p<.001), smoking status (χ^2=119.272, p<.001), physical discomfort for ≥ two weeks (χ^2=10.242, p<.001), rheumatoid arthritis (χ^2=28.735, p<.001), osteoporosis (χ^2=49.958, p<.001), cataracts (χ^2=10.518, p=.001), limited activity (χ^2=5.090, p=.024), exercise ability (χ^2=12.584, p<.001), self-discipline (χ^2=1.309, p=.253), daily activity (χ^2=6.559, p=.010), pain (χ^2=15.651, p<.001), anxiety/depression (χ^2=4.001, p<.001), and fatigue (χ^2=10.766, p<.001).

Table 1. Comparison of General and Health-related Characteristics of Low risk alcohol drinking and High risk alcohol drinking (N=817)

	Problem drinking		χ^2 (p)
	Low risk alcohol drinking N (%) N=556	High risk alcohol drinking N (%) N=261	
Gender			
Male	230 (41.4)	226 (86.6)	147.295
Female	326 (58.6)	35 (13.4)	(<0.001)
Age			
65-70	239 (43.0)	139(53.3)	8.167
70-75	142 (25.5)	60 (23.0)	(0.017)
75-80	175 (31.5)	62 (23.8)	
Income			
Low	256 (46.2)	99(37.9)	17.182
Middle low	156 (28.2)	67(25.7)	(0.001)
Middle high	92 (16.6)	46 (17.6)	
High	50 (9.0)	49 (18.8)	
Living Area Urban Rural	 411 (73.9) 145 (26.1)	 211 (80.8) 50 (19.2)	 4.684 (0.030)

	Problem drinking		χ^2 (p)
	Low risk alcohol drinking N (%) N=556	**High risk alcohol drinking N (%) N=261**	
Education			
Elementary school	297 (55.2)	101 (40.1)	21.138
Middle school	93 (17.3)	43 (17.1)	(<0.001)
High school	93 (17.3)	62 (24.6)	
College/university	55 (10.2)	46 (18.3)	
Marital Status			
Never married	2 (0.4)	4 (1.5)	16.882
Spouse(have)	382 (68.7)	209 (80.1)	(<0.001)
Others	172 (30.9)	48 (18.4)	
Occupational status			
No	329 (61.2)	131 (52.0)	5.931
Yes	209 (38.8)	121 (48.0)	(0.015)
Family number			
1	129 (23.2)	37 (14.2)	9.036
2	286 (51.4)	150 (57.5)	(0.029)
3	75 (13.5)	41 (15.7)	
4 or over	66 (11.9)	33 (12.6)	
Health related status Subjective health status			
Good	162 (30.0)	48 (18.8)	18.379
Average	267 (49.4)	125 (48.8)	(<0.001)
Poor	111 (20.6)	83 (32.4)	
Sleeping (Day) <7 hours 7~8 hours >8 hours	 201 (36.2) 237 (42.6) 118 (21.2)	 100 (38.3) 116 (44.4) 45 (17.2)	 1.773 (0.412)
Suicidal ideation No Yes	 548 (98.6) 8 (1.4)	 254 (97.3) 7 (2.7)	 1.523 (0.217)
Perceived Stress			
No	455 (81.8)	226 (86.6)	2.895
Yes	101 (18.2)	35 (13.4)	(0.089)
Depressive mood			
No	543 (97.7)	255 (97.7)	0.001
Yes	13 (2.3)	6 (2.3)	(0.972)
BMI (kg/m^2) <18.5 18.5–22.9 23.0–24.9 ≥25.0	 8 (1.5) 183 (33.4) 152 (27.7) 205 (37.4)	 3 (1.2) 70 (27.2) 78 (30.4) 106 (41.2)	 3.304 (0.347)
Smoking status Non-smoker* Ex-smoker† Current smoker‡	 358 (64.4) 157 (28.2) 41 (7.4)	 62 (23.8) 147 (56.3) 52 (19.9)	 119.272(<0.001)

	Problem drinking		χ^2 (p)
	Low risk alcohol drinking N (%) N=556	**High risk alcohol drinking N (%) N=261**	
Physical activity			
No	235 (42.3)	96 (36.8) 165(63.2)	2.217
Yes	321 (57.5)		(0.137)
Physical discomfort for ≥ two weeks			
No	381(68.5)	207(79.3)	10.242
Yes	175(31.5)	54(20.4)	(<0.001)
Rheumatoid arthritis			
No	336(62.3)	208(81.3)	28.735
Yes	203(37.7)	48(18.8)	(<0.001)
Osteoporosis			
No	419(75.4)	250(95.8)	49.958
Yes	137(24.6)	11(4.2)	(<0.001)
Cataracts			
No	282(50.7)	164(62.8)	10.518
Yes	274(49.3)	97(37.2)	(0.001)
Limited activity			
No	468(84.2)	235(90.0)	5.090(0.024)
Yes	88(15.8)	26(10.0)	
Exercise ability			
No	345(63.5)	194(76.1)	12.584
Yes	197(36.5)	61(23.9)	(<0.001)
Dily activity			
No	439(81.4)	226(88.6)	6.559
Yes	100(18.6)	29(11.4)	(0.010)
Pain			
No	343(63.6)	198(77.6)	15.651
Yes	196(36.4)	57(22.4)	(<0.001)
Anxiety/depression No	471(87.4)	235(92.2)	4.001
Yes	68(12.6)	20(7.8)	(0.045)
Fatigue			
No	369(69.0)	202(80.2)	10.766
Yes	166(31.0)	50(19.8)	(0.001)

Factors related to problem drinking in the Korean elderly population examined in this study: To determine the influence of socio-demographic and health-related characteristics on the high-risk problem drinking group, a logistic regression analysis was performed. Table 2 presents the results. For socio-demographic characteristics, a significant influence was found for gender, age, income level, residential area, education level, marital status, occupation, and number of family members. For health-related characteristics, subjective health status, smoking status, rheumatoid arthritis, osteoporosis, cataracts, exercise ability, daily activity, pain/discomfort, fatigue, and anxiety/depression were found to significantly influence the high-risk group. Among the socio-demographic factors, the odds ratio of high-risk problem drinking was 0.144 times lower for women (95% CI: 0.07–0.27) than men; 0.639 times lower for subjects aged 70–75 years (95% CI: 0.40–1.00) than those aged 65–70 years, and 0.499 times lower for subjects aged 75–80 years (95% CI: 0.30–0.81); 0.968 times lower for subjects with a middle-low income level (95% CI: 0.600–1.56) than those with a low level, 0.769 times lower for subjects with a middle-high level (95% CI: 0.44–1.34), and 1.586 times lower for those with a

high level of income (95% CI: 0.84–3.00); 0.780 times lower for subjects living in a rural area (95% CI: 0.49–1.24) than those living in an urban area; and 0.650 times lower for subjects who graduated from middle school (95% CI: 0.38–1.09) than those who graduated with ≤ elementary school, and 0.831 times lower for subjects who graduated with ≥ high school or from college/ university (95% CI: 0.46–1.49). In addition, the odds ratio of high-risk problem drinking was 1.037 times higher for employed individuals (95% CI: 0.71–1.51) than for unemployed individuals and 2.542 times higher for individuals living with two family members than those living alone (95% CI: 1.24–5.21).

Of the health-related factors, the odds ratio of high-risk problem drinking was 1.438 times higher for subjects with poor subjective health status (95% CI: 0.79–2.61) than for those with good subjective health status, and 1.325 times higher for ex-smokers (95% CI: 0.79–2.22) than non-smokers and 2.492 times higher for current-smokers (95% CI: 1.31–4.71). In addition, the odds ratio of high-risk problem drinking was 1.306 times higher for subjects with rheumatoid arthritis (95% CI: 0.35–4.75), 1.114 times higher for subjects with cataracts (95% CI: 0.76–1.62), 1.688 times higher for subjects experiencing pain or discomfort (95% CI: 0.35–4.75), 1.267 times higher for subjects with anxiety or depression (95% CI: 0.63–2.56), and 1.783 times higher for subjects with fatigue (95% CI: 0.50–1.22).

Table 2. Odds ratios(ORs) for high risk drinking, stratified by demographic characteristics (N=817)

	Problem drinking : High risk alcohol drinking	
	OR	**95% CI**
Gender		
Male	1	
Female	0.144	0.076~0.274
Age		
65-70	1	
70-75	0.639	0.408~1.002
75-80	0.499	0.307~0.811
Income		
Low	1	
Middle low	0.968	0.600~1.561
Middle high	0.769	0.441~1.340
High	1.586	0.837~3.004
Living Area		
Urban	1	0.491-1.241
Rural	0.780	
Education		
Elementary school	1	
Middle school	0.650	0.386~1.093
High school	0.704	0.427~1.161
College/university	0.831	0.461~1.497
Marital Status		
Never married	1	
Spouse(have)	0.048	0.005~0.438
Others	0.118	0.013~1.044
Occupational Status		
No	1	
Yes	1.037	0.711~1.511
Family Number		
1	1	
2	2.542	1.240~5.211
3	2.061	0.907~4.683
4 or over	2.352	1.044~5.301
Health related status Subjective health status		
Good	1	
Average	1.100	0.657~1.840
Poor	1.438	0.791~2.612
Smoking Status		
Non-smoker	1	0.790~2.221
Ex-smoker	1.325	1.318~4.710
Current smoker	2.492	
Rheumatoid Arthritis		
No	1	0.358~4.756
Yes	1.306	
Arthritis		
No	1	0.170~2.421
Yes	1.642	
Osteoporosis		
No	1	0.185~0.834
Yes	1.393	
Cataracts		
No	1	0.765~1.622
Yes	1.114	

	Problem drinking : High risk alcohol drinking	
	OR	**95% CI**
Exercise Ability		
No	1	0.638~1.722
Yes	0.048	
Dily Activity		
No	1	0.580~2.275
Yes	0.148	
Pain		
No	1	0.420~1.128
Yes	1.688	
Anxiety/Depression		
No	1	0.630~2.564
Yes	1.267	
Fatigue		
No	1	0.500~1.226
Yes	1.783	

Discussion

This study examined the elderly aged ≥ 65 years to determine the influence of socio-demographic and health-related factors on problem drinking. The following discussion is based on the results of the study.

First, among the socio-demographic characteristics that influence problem drinking, the risk of problem drinking was higher for men than women. This gender difference is consistent with the results of a previous study on problem drinking in Korea [1]. In addition, an overseas study has also found a higher level of problem drinking among men than women in terms of both drinking quantity and frequency [14]. This implies that problem drinking is more serious among the male elderly in Korea and overseas. The finding may be attributed to the traditional gender norms that seem to favor drinking among men [15]. Regarding age, the risk of problem drinking increased as age decreased. This supports previous studies reporting a decrease in the drinking quantity and number of drinkers due to the early death of individuals who had been drinking excessively since their youth or middle-aged adulthood, or decreased alcohol consumption caused by aging-related physical disability or reduced metabolic ability [16,17]. For income, the highest risk of problem drinking was evident for individuals with the lowest income level. In addition, individuals living with two family members showed a higher risk of problem drinking than other cases. These findings imply the need to consider the quality or satisfaction of family relationships as an influencing factor. The results support those of previous studies reporting a high risk of problem drinking among the elderly with a low-income level who have unsatisfactory family relationships [12].

The risk of problem drinking was higher for individuals living in urban areas than those in rural areas. Noteworthy is that a previous study found that problem drinking deteriorated the quality of life of the elderly regardless of residential area [18]. This means that future research should focus on problem drinking among the elderly in both urban and rural areas. Regarding education level, a high risk of problem drinking was found for those who graduated ≤ elementary school, which supports the results of a previous study that showed the influence of education level on problem drinking among the elderly[19]. However, this result contrasts that of a previous study that showed the influence of education level on problem drinking among young and middle-aged adults, but not among the elderly [20], thus indicating a need for replication studies. The risk of problem drinking was also higher for employed individuals, contradicting a previous study conducted in Korea reporting a higher risk for unemployed individuals[16].

Second, among the health-related characteristics that influence problem drinking, the risk was high for individuals diagnosed with rheumatoid arthritis or cataracts, and for those experiencing pain/discomfort, anxiety/depression, or fatigue. These results contrast those of a previous study reporting that a physical or psychological condition had no influence on problem drinking, thus indicating a need for replication studies. In addition, the risk was high for individuals with poor subjective health status, contradicting a previous study that found a higher subjective health status among individuals with problem drinking as they viewed themselves as healthy and thus drank more [21]. Therefore, replication studies are needed. The risk of problem drinking was higher for ex- or current-smokers than for non-smokers, and smoking was the most influential factor related to drinking. This is aligned with a previous study on Korean adults that identified smoking as the most significant risk factor as it increased the risk of problem drinking 4.78 times [22].

Conclusion

This study is significant as it analyzed data collected through a nationwide survey to determine the general

factors related to problem drinking among the entire Korean elderly population. The research was conducted at a time when relevant studies are lacking despite the growing social concerns regarding problem drinking among the elderly and the increase in the elderly population. For the interpretation and application of the findings of this study, which re-analyzed the KNHANES dataset, the limitations and recommendations are presented as follows.

First, this study used a previously collected dataset; thus, potential errors in the process of subject interviews and data collection could not be identified. Second, the data used in this study was secondary data, which led to the limited use of the completed survey questionnaires. Furthermore, the variables used in evaluating the factors that influence problem drinking among the elderly could not be diversified. Third, this study found no significant correlations with problem drinking among the elderly for the variables reported in previous studies. This is likely because of the limitation of using secondary data, as mentioned, which prevented evaluating relevant variables such as the family function, social support, satisfaction with family relationships, and friendship. Further studies should use a larger set of samples that contain more diverse variables for reinvestigation. Finally, note that as a cross-sectional study, only the correlations among relevant variables were analyzed in this research, while cause-effect relationships could not be described. In future, a longitudinal study should analyze cause-effect relationships among the factors related to problem drinking among the Korean elderly in a more systematic way.

Ethical Clearance: For ethical consideration of the study subjects, data was collected after approval through the deliberation(IRB No. SMU-EX-2020-02-001) of Institutional Review Board (IRB) of S university. The informed consent was obtained from the subjects before data collection. Confidentiality of data collected was ensured.

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Conflict of Interest: Nothing specific-can use the study findings with proper citation of authors name.

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