Prevalence of Loneliness and Its Association with Marital Status in Korean Adults: Analysis of the Korean Welfare Panel Study Data in 2021

Inmyung Song

Professor, College of Nursing and Health, Kongju National University, Gongju, Korea

Objectives: Loneliness poses a serious health risk. However, little is known about the state of loneliness in the Korean population. This study analyzes the prevalence of and risk factors for loneliness with a particular focus on marriage status in Korean adults using nationwide survey data. **Methods:** Using individual-level data from the 16th Korean Welfare Panel Study in 2021, this study analyzed 9,422 participants aged 30 years and older, who responded to a question, "how many days during the past week did you feel lonely as if you were alone in the world?". Multiple logistic regression analysis was conducted to examine the likelihood of feeling lonely at least once a week according to marital status and other sociodemographic characteristics (gender, education level, household income status, employment status). Multivariate-adjusted odds ratio (OR) and 95% confidence intervals (CI) were calculated. Subgroup analysis was conducted by sex. **Results:** 20.2% of the study population were estimated to have felt lonely at least one day a week. 52.4% of widowed individuals and 47.6% of the divorced reported being lonely. Widowed and single people were more than two times as likely to feel lonely as the married (OR = 2.60 for the widowed; OR = 2.43 for the single; $p < 0.001$). Divorce and separation increased the odds of feeling lonely (OR = 4.02; 95% CI, 3.20-5.04; $p < 0.001$). ORs for loneliness for all non-married statuses (widowed, divorced/separated, single) were greater in men than in women. **Conclusions:** Loneliness is a highly prevalent public health problem in Korean adults. Marital status was strongly associated with increased risk for loneliness. Public health policies should consider targeting individuals who are more susceptible to the risk of loneliness.

Key words: Loneliness, Marital status, Prevalence, Risk factor

INTRODUCTION

Unlike aloneness that is perceived as an emotionally neutral state, loneliness is often accompanied by negative feelings, such as sadness and hopelessness [1]. Loneliness, if chronic, carries a serious health risk, both physically and mentally [2]. There is ample evidence on negative health effects of loneliness [3]. Loneliness was associated with increased risks of cardiovascular disease [4], coronary heart disease, stroke [3], worse physical functioning, mental health [5,6], and suicidal ideation [7]. Furthermore, loneliness was linked with increased risk for all-cause mortality [6,8-11]. Given the clinical significance of the loneliness problem, its prevalence and risk factors will merit a close examination [12].

The prevalence of loneliness varied widely across countries and age groups [13]. It was 10.5% in German adults aged 35-74 years [14] and 39% among people aged 75 years and older in Finland with 5% feeling lonely, either often or always [15]. Moreover, loneliness appears to have become an issue of great magnitude during the 2019 coronavirus disease (COVID-19) pandemic due to restrictions imposed on social contact; a survey of a large, nationally representative sample in April-May 2020 revealed that 35.9% of residents in the United Kingdom (UK) sometimes or often felt lonely [16]. Another study estimated that 27% of UK adults were lonely in early 2020 [17].

Loneliness is such a highly prevalent condition in many countries that researchers termed it a growing public health problem [18] and suggested

that it should be incorporated as part of general health surveillance [13]. Unlike these assessments in other developed countries, the prevalence of loneliness in Korea was estimated to be just 4.1%, according to a 2019 study based in two cities (Paju city, Daegu Metropolitan City) and the Gangnam district of Seoul [19]. In this context, there is an urgent need to understand the magnitude of loneliness in Korea based on a nationally representative sample.

To help address the growing problem of loneliness, numerous studies have documented its risk factors [20,21]. Loneliness either increased [15] or decreased [17] with advancing age. In addition, the risk of loneliness is known to increase with low level of education and poor financial situation [15]. Another significant predictor of loneliness based on data from around the world was marital status [22,23]. Single adults were more stressed due to loneliness [24]. In addition, negative changes in marital status were associated with increased risk of loneliness [15,20]. Death of a spouse was a common cause of loneliness and was linked to more depressive symptoms for older adults [25,26]. There is some indication in the literature that the deleterious impact of dissolution of marriage on loneliness may differ between men and women [21]. However, understanding is limited, especially in the Korean population. Therefore, this cross-sectional study aims to estimate the prevalence of loneliness in Korean adults aged 30 years and older and to examine risk factors for loneliness with a particular focus on marital status using publicly available nationwide survey data. The results of this study will help develop social support measures to ameliorate loneliness in the general population.

METHODS

Data

This cross-sectional study used individual-level survey data from the 16th Korean Welfare Panel Study (KOWEPS), which were conducted between March 15 and June 24, 2021. The KOWEPS has been conducted by the Korea Institute for Health and Social Affairs since 2005. The KOWEPS surveys all members aged 15 years and older excluding high school students in a nationally representative sample of families in Korea selected using a stratified random sampling [27]. The 16th wave of KOWEPS surveyed a total of 5,996 households. This study analyzed 9,326 participants aged 30 years and older who responded to a question regarding loneliness, after excluding the youngest age group for whom

marital status is not associated with loneliness [28]. This present study exploited the KOWEPS database, because it collected data on loneliness and therefore offered a rare opportunity to fill a gap in loneliness research in Korea.

Loneliness

In the KOWEPS, loneliness was measured by asking the participant, "how many days during the past week did you feel lonely as if you were alone in the world?". The respondent was asked to select one of the following response categories; very rarely (less than 1 day), occasionally (1 or 2 days), frequently (3 or 4 days), and mostly (5 days or more). For analysis, the respondents were recategorized into two groups: lonely and not-lonely groups. The lonely group consists of respondents who felt lonely at least once a week (inclusive of occasionally, frequently, and mostly). The not-lonely group consists of respondents who rarely felt lonely.

Explanatory variables

The variable of interest in this study was marital status. Marital status was categorized into married, widowed, divorced/separated, and single. Based on a review of the literature, this study included sex [22,29], age [15,17], educational level, household income [21], employment status [16]. Age was grouped into 30-39, 40-49, 50-59, 60-69, 70-79, and ≥80 years. Educational level was divided into up to primary education, middle school, high school, and at least junior college education. Respondents were divided into two groups based on household income level; general income household and low income household. The low income household was defined as one that earns the equalized income of less than 60% of the median income in Korea. Employment status was categorized into salaried, self-employed, and economically inactive.

Statistical analysis

The sociodemographic characteristics of study subjects were described in terms of the number of respondents in the sample and the estimated percentage of the population according to each variable. Population estimates were obtained by adjusting for sampling weights to account for the complex sampling design of the KOWEPS. For univariate analysis, the Rao-Scott χ^2 (chi-square) test was used to test the relationship between loneliness and each of sociodemographic characteristics based on complex survey data [30]. Multiple logistic regression analysis was conducted to examine the likelihood of feeling lonely at least once a week by so-

ciodemographic characteristics. Adjusted odds ratio (OR) and 95% confidence intervals (CI) were calculated. Subgroup analysis was conducted by sex. All statistical analyses were performed by using SAS version 9.4 (SAS Institute Inc., Cary, NC, USA). The Institutional Review Board of Kongju National University approved the study protocol and waived the requirement for informed consent (IRB No.: KNU_IRB_2022-037).

RESULTS

In the 2021 KOWEPS, a total of 9,442 participants (4,066 males and 5,376 females) answered to the question of how many days they felt they were lonely as if they were alone in the world during the past week (Table 1). 20.2% of the study population were estimated to have felt lonely at least occasionally (one day a week). 51.7% of the study population were female and 24.3% were aged 50-59 years old. 43.8% attained junior college or higher levels of education. 71.1% were married. 18.8% were from low income households. 52.5% were salaried workers and 35.6% economically inactive.

31.2% of women in the study sample felt lonely at least one day a week compared to 21.4% of men (Table 2). The proportion of respondents who were lonely increased with advancing age and 46.8% of respondents aged 80 years and older reported being lonely. 42.6% of people with no or only primary education were lonely. 52.4% of widowed individuals were lonely and so were 47.6% of the divorced. 44.1% of people from low income household were lonely. So were 37.3% of economically inactive individuals and 21.7% of the self-employed. All variables were significantly associated with loneliness ($p < 0.001$).

Marital status was a significant risk factor for loneliness (Table 3). Widowed and single people were more than two times as likely to feel lonely as the married (OR = 2.60 for the widowed; OR = 2.43 for the single; $p < 0.001$). Divorce/separation increased the odds of feeling lonely even more (OR = 4.02; 95% CI, 3.20-5.04; $p < 0.001$). The results of subgroup analyses indicate that ORs for all non-married statuses were greater in men than in women (Table 4). In particular, divorced/separated men were 5.24 time more likely to feel lonely, whereas divorced/separated women were 3.05 times more likely to feel lonely than their married counterparts ($p < 0.001$).

In addition to marital status, age was shown to influence the risk of loneliness. The risk of loneliness was greatest for individuals aged 80 years and older (OR = 1.81; 95% CI, 1.21-2.69, $p < 0.01$). However, the increased risk of loneliness for old groups was significant only among men, ac-

Table 1. Characteristics of study subjects (n=9,442)

Variables	Category	n	% (weighted)
Lonely (days/week)	Mostly (≥5)	111	1.0
	Frequently (3-4)	495	3.4
	Occasionally (1-2)	1,941	15.8
	Very rarely (<1)	6,895	79.8
Sex	Male	4,066	48.3
	Female	5,376	51.7
Age (y)	30-39	1,054	19.0
	40-49	1,563	22.4
	50-59	1,621	23.7
	60-69	1,721	19.4
	70-79	1,893	10.1
	≥80	1,590	5.3
Education level	≤Primary education	2,860	14.2
	Middle school	1,193	8.6
	High school	2,816	33.3
	≥College	2,573	43.8
Marital status	Married	6,147	71.1
	Widowed	1,741	8.1
	Divorced/Separated	718	6.7
	Single	836	14.1
Household income level	General household	6,156	81.5
	Low income household	3,286	18.8
Employment status	Salaried	3,882	52.5
	Self-employed	1,345	11.9
	Economically inactive	4,215	35.6

The low income household is one that earns the equalized income of less than 60% of the median income in Korea. The number of respondents was obtained from the sample and the percentage was adjusted for the population.

cording to the results of subgroup analyses by gender (OR = 2.11; 95% CI, 1.11-4.03, $p < 0.05$ for men aged 80 years and older). People from low income households were more likely to feel lonely as those from general households (OR = 1.72; 95% CI, 1.44-2.04, $p < 0.001$). So were economically inactive people than salaried people (OR = 1.60; 95% CI, 1.33-1.92, $p < 0.001$). Based on the Akaike information criterion (AIC) and -2 Log L measures, the model selected fit data for males better than for females (Table 4).

DISCUSSION

This study showed that loneliness is a highly prevalent problem in Korea. Based on nationwide survey data, approximately 20% of Koreans aged 30 year and older were estimated to feel lonely at least one day a week as if they were alone in the world. The prevalence of loneliness is higher than previously observed at 4.1% based on data from three cities

Table 2. The proportion of people who are lonely by sociodemographic characteristics (n=9,442)

Variables	Category	Lonely (n)	%	Not lonely (n)	%	*p*-value
Sex	Male	872	21.4	3,194	78.6	<0.001
	Female	1,675	31.2	3,701	68.8	
Age (y)	30-39	152	14.4	902	85.6	<0.001
	40-49	241	15.4	1,322	84.6	
	50-59	297	18.3	1,324	81.7	
	60-69	445	25.9	1,276	74.1	
	70-79	668	35.3	1,225	64.7	
	≥80	744	46.8	846	53.2	
Education level	≤Primary education	1,218	42.6	1,642	57.4	<0.001
	Middle school	365	30.6	828	69.4	
	High school	598	21.2	2,218	78.8	
	≥College	366	14.2	2,207	85.8	
Marital status	Married	1,074	17.5	5,073	82.5	<0.001
	Widowed	912	52.4	829	47.6	
	Divorced/Separated	342	47.6	376	52.4	
	Single	219	26.2	617	73.8	
Household income level	General household	1,097	17.8	5,059	82.2	<0.001
	Low income household	1,450	44.1	1,836	55.9	
Employment status	Salaried	681	17.5	3,201	82.5	<0.001
	Self-employed	292	21.7	1,053	78.3	
	Economically inactive	1,574	37.3	2,641	62.7	

*p-values were obtained by using the Rao-Scott χ^2 (chi-square) test.

Table 3. Odds of feeling lonely according to sociodemographic characteristics

Variables (reference)	Category	Adjusted OR	95% CI	*p*-value
Sex (male)	Female	1.06	0.90-1.25	0.460
Age (y, 30-39)	40-49	1.36	1.00-1.85	0.050
	50-59	1.21	0.88-1.68	0.239
	60-69	1.36	0.96-1.93	0.089
	70-79	1.28	0.88-1.85	0.191
	≥80	1.81	1.21-2.69	<0.01
Educational level (≤primary education)	Middle school	1.51	1.15-1.98	<0.01
	High school	1.53	1.15-2.03	<0.01
	≥College	1.35	1.10-1.66	<0.01
Marital status (married)	Widowed	2.60	2.10-3.22	<0.001
	Divorced/separated	4.02	3.20-5.04	<0.001
	Single	2.43	1.86-3.17	<0.001
Household income status (general household)	Low income household	1.72	1.44-2.04	<0.001
Employment status (salaried)	Self-employed	1.12	0.88-1.42	0.315
	Economically inactive	1.60	1.33-1.92	<0.001
Observations		9,442		
AIC		31,409,173		
-2 Log L		31,409,141		

OR, odds ratio; CI, confidence intervals; AIC, Akaike information criterion.

in Korea [19]. Moreover, the prevalence estimated in this present study are, in general, higher than in other developed countries [13]. Specifically, the prevalence of loneliness measured using a single-item question varied widely across European countries; it ranged from 2.7% to 9.6% for middle-aged adults (30-59 years) and from 5.2% to 21.3% for older adults (≥60 years) [13]. The prevalence of loneliness using a 3-item scale was 19.3% in community-dwelling U.S. adults aged 65 years and older [22]. However, the prevalence (20.2%) observed in this current study was lower than that in the United Kingdom where 35.9% of residents sometimes or often felt lonely, according to a study based on data collected during the initial phase of the COVID-19 pandemic in early 2020 [16].

Overall, the high prevalence of loneliness calls for actions to identify risk factors. This current study showed that marital status was significantly associated with risk of loneliness in Korean adults aged 30 years and older. Compared to the currently married, all other non-married statuses increased the odds of feeling lonely. Consistent with the finding of this study, stable marriage appears to play a protective role in loneliness, according to a study based on data from 30 countries [23] as well as a study in Dutch adults [31]. The findings of the current and previous studied suggest that loneliness may be attributable to a change from be-

Table 4. Results of subgroup analyses for men and women

Variables (reference)	Category	Male			Female		
		Adjusted OR	95% CI	*p*-value	Adjusted OR	95% CI	*p*-value
Age (y, 30-39)	40-49	1.82	1.13-2.91	<0.05	1.06	0.71-1.59	0.776
	50-59	1.72	1.06-2.81	<0.05	0.90	0.58-1.38	0.623
	60-69	2.05	1.20-3.50	<0.01	0.96	0.60-1.54	0.874
	70-79	1.71	0.95-3.07	0.074	0.94	0.58-1.54	0.816
	≥80	2.12	1.11-4.03	<0.05	1.44	0.85-2.43	0.178
Educational level (≤primary education)	Middle school	1.50	1.00-2.23	<0.05	1.59	1.07-2.37	<0.05
	High school	1.62	1.08-2.43	<0.05	1.54	1.02-2.35	<0.05
	≥College	1.32	1.99-1.76	0.057	1.38	1.02-1.88	<0.05
Marital status (married)	Widowed	3.92	2.47-6.22	<0.001	2.38	1.85-3.07	<0.001
	Divorced/Separated	5.24	3.68-7.47	<0.001	3.05	2.26-4.11	<0.001
	Single	2.99	2.05-4.34	<0.001	1.92	1.26-2.90	<0.01
Household income status (general household)	Low income household	1.53	1.13-2.08	<0.01	1.85	1.50-2.29	<0.001
Employment status (salaried)	Self-employed	1.28	0.93-1.77	0.128	0.94	0.66-1.36	0.755
	Economically inactive	2.07	1.50-2.87	<0.001	1.32	1.06-1.65	<0.05
Observations		4,066			5,376		
AIC		13,775,525			17,485,355		
-2 Log L		13,775,493			17,485,325		

OR, odds ratio; CI, confidence intervals; AIC, Akaike information criterion.

ing married to non-married state. However, there appears to be a difference in the risk of loneliness among non-married statuses. The cause of transitioning to non-married state seems to play a role in loneliness. In this current study, divorced and separated people were at greatest risk of feeling lonely among all marital statuses. Similarly, in U.S. adults aged 65 years and older, being married with a spouse that is nonetheless absent increased the risk of loneliness than being widowed [22].

The role of gender in the risk of loneliness is unclear, because there are mixed reports on the relationship between gender and loneliness [19,22,29]. After adjusting for other covariates, gender was not associated with increased risk of being lonely in this present study. However, gender seems to have a differential effect on the relationship between other sociodemographic variables and loneliness. For example, in the subgroup analysis, the relationship between age and risk of loneliness was significant only in men. More importantly, compared to the currently married status, divorce/separation increased the risk of loneliness more in men than in women, while all non-married statuses (divorce/separation, widowhood, and singlehood) were stronger predictors of loneliness in men than in women. The gender differences concur with the existing evidence [32,33]. Among older Koreans, not being married was positively associated with loneliness in men but not in women [33]. Similarly, loneliness is more strongly influenced by partner status among Dutch men

than among women [34]. Pathway to dissolution of marriage appears to have a differential influence in loneliness between men and women [32]; among U.S. men, divorce was a stronger predictor of loneliness than death of a spouse, perhaps due to deteriorations in relations between divorced father and child.

In addition to marital status, age was identified as a risk factor for loneliness in the analysis of both men and women. People in the oldest age category of 80 years and older had an increased risk of loneliness compared to those in their 30s. Loneliness in older adults is likely to result from deteriorations in physical functioning and poorer health [22] and social life changes after retirement [15]. However, the association between old age and increased loneliness observed in this present is not universal [35,36]. Contrary to the current finding, old age was associated with decreased risk of loneliness in the United States [35] and in the United Kingdom during the COVID-19 pandemic [16]. Loneliness had a U-shaped association with age in the United Kingdom such that the levels of loneliness were highest in people under 25 years and over 65 years [36].

Compared to no or primary education, middle or higher education levels were associated with increased risk of feeling lonely. This is in part because learning is a lonesome endeavor in many instances. However, the role of education in loneliness is not straightforward, because schools provide an opportunity to socialize with other people and a means to

make financial resources later in life [21]. Financial situation indeed seems to play a role in loneliness. In this current study, economically inactive people were more likely to be lonely than people earning salaries, which was consistent with the findings in the United Kingdome [16]. This occurs because unemployment means a lack of the setting and financial resources with which to socialize with other people. In addition to employment status, the financial situation of the household appears to be associated with loneliness. In this present study, people from low income households had a greater likelihood of feeling lonely than people from general households. These findings suggest that we as a society should pay a close attention to the economic needs of the vulnerable populations and that social support measures to address the loneliness epidemic may enhance the mental and emotional health of the economically disadvantaged people.

To summarize, this study showed that loneliness is a highly prevalent problem in Korean adults and it is strongly associated with marital status, based on nationwide survey data. Given the paucity of research on loneliness in Korea, this study fills the gap in the domain knowledge. The findings will inform public health policies and social support measures that focus on subjective feelings of loneliness in the vulnerable populations. Despite the values added, the finding of this study should be interpreted with caution in light of the following limitations. First, this study used a cross-sectional design, which may preclude causality inference from being drawn between marital status and loneliness. Second, data were self-reported. The prevalence of loneliness may have been underreported due to stigma attached as some researchers have suggested [22]. Third, this study did not account for the severity of loneliness by categorizing individuals into either the lonely or the not-lonely groups. Future research should consider not just the existence of loneliness but also the degree of loneliness as an outcome variable. Fourth, this study is based on a single-item measure of loneliness, which may have less sensitivity than multiple-item measures. Nonetheless, a single-item measure has been used in loneliness research [13]. Future research should consider using multiple item measures of loneliness. Lastly, this study examined only sociodemographic variables as potential risk factors for loneliness. However, the literature indicates that subjective health status, supportive family relationship, and functional limitations play a role in the risk of feeling lonely [37], which should be examined in the future study.

In conclusion, using nationwide survey data, this study showed that loneliness is a highly prevalent public health problem in Korean adults

aged 30 years and older, and that marital status was strongly associated with increased risk for loneliness, after adjusting for other sociodemographic variables. The pathway to dissolution of marriage matters to the risk of loneliness. The odds of loneliness increased more for divorced/separated individuals than for widowed ones. Men were more susceptible than women to loneliness by transitioning from married to non-married status. The findings will help identify vulnerable populations who are in most need of social and psychological support and thus would be appropriate targets for preventive intervention measures.

ORCID

Inmyung Song   *https://orcid.org/0000-0001-7772-6617*

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국문초록

외로움의 유병률과 혼인상태와의 연관성: 2021년 한국복지패널조사자료 분석

송인명

공주대학교 간호보건대학 교수

목적: 외로움은 건강을 심각하게 위협하는 것으로 알려져 있으나, 한국인에서 외로움의 상태에 대해서는 알려진 것이 많지 않다. 본 연구는 한국인에서 외로움의 유병률과 위험요인과의 관련성을 혼인상태에 초점을 맞추어 분석하였다.

방법: 제16차 한국복지패널조사(2021) 자료를 이용하여 "지난 1주일간 얼마나 자주 세상에 홀로 있는 듯한 외로움을 느꼈습니까?"의 질문에 응답한 30세 이상 9,422명을 대상으로 분석하였다. 혼인상태와 기타 사회인구학적 특성에 따라 1일 이상 외로움을 느낄 가능성을 확인하기 위해서 다중로지스틱회귀분석을 수행하여 교차비(odds ratio, OR)와 95% 신뢰구간(confidence interval, CI)을 산출하였다.

결과: 분석 결과 30세 이상 성인의 20.2%가 외로움을 느끼는 것으로 분석되었다. 사별한 자의 52.4%와 이혼한 자의 47.7%가 외로움을 느끼는 것으로 분석되었다. 기혼자에 비해 사별자(OR=2.60)나 미혼자(OR=2.43)가 외로움을 느낄 가능성이 더 높았다($p<0.001$). 기혼에 비해 이혼과 별거는 교차비가 4.02이었다(95% CI, 3.20-5.04; $p<0.001$). 남성이 이혼/별거, 사별, 미혼으로 인해 외로움을 느낄 가능성이 여성에 비해서 더 높았다.

결론: 결론적으로 외로움은 한국성인에서 매우 유병률이 높은 공중보건학적 문제이며 혼인상태는 외로움의 위험과 강한 연관성이 있는 것으로 분석되었다. 공중보건정책은 외로움에 좀 더 민감한 개인들을 대상으로 할 것을 고려해야 할 것이다.

주제어: 외로움, 고독, 혼인상태, 유병률, 위험요인