Factors Related to Dementia Worry
Comparing Middle-Aged and Older Adults in South Korea

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ABSTRACT
As the number of individuals with dementia and exposure to dementia increases, worrying about dementia may threaten individuals’ health and lifestyle. This cross-sectional study compared dementia worry and related factors between middle-aged and older adults in South Korea. A self-reported descriptive survey or face-to-face interview was conducted with 154 middle-aged adults (mean age = 55.8 years; 64.3% women) and 51 older adults (mean age = 71.3 years; 52.9% women) in South Korea. Older adults were more worried about dementia than middle-aged adults. For middle-aged adults, compared to their counterparts, being a female, having less than a high school education, and having lower family function was associated with more dementia worry. Contrastingly, for older adults, having more diseases, having lower family function, and being economically dependent was associated with more dementia worry. Health care providers should consider individuals’ age and family function to develop a program that addresses dementia worry in Asian cultures. [Research in Gerontological Nursing, 12(6), 299-310.]

As people live longer, the number of individuals with dementia is increasing rapidly. The number of people with dementia worldwide was approximately 46.8 million in 2015 and is expected to increase to 74.7 and 131.5 million by 2030 and 2050, respectively (Prince et al., 2015). South Korea is the second-fastest aging country in the world (Prince, Comas-Herrera, Knapp, Guerchet, & Karagiannidou, 2016). The number of individuals with dementia among older adults in South Korea in 2017 was approximately 705,000 and is expected to increase to 1.37 and 3.03 million by 2030 and 2050, respectively (Nam, Hwang, Kim, & Kim, 2018).

As dementia leads to an increase in caregiver burden and social costs, the World Health Organization (2016) has emphasized early diagnosis and the appropriate treatment of dementia. The Korean government enforced a nationwide system of early dementia detection through public health centers, and they encouraged older adults...
to get checkups. The early diagnosis of dementia can contribute to minimizing harm, risks, and social costs due to dementia, as well as improving patient quality of life through pharmacological and nonpharmacological interventions (Prince et al., 2016). However, the fact that there is no medication or treatment to prevent or cure dementia causes rather vague public anxiety concerning the onset of this disease.

The phenomena of worrying about dementia were first named “anticipatory dementia” (Cutler & Hodgson, 1996). Later, Kessler, Bowen, Baer, Froelich, and Wahl (2012) introduced the term “dementia worry” to address the threat of all types of dementia for all age groups. In Germany, 41.1% of adults reported worrying about developing dementia (3.2% were very worried; Bowen, Kessler, & Segler, 2018). In South Korea, 36.5% of older adults reported worrying about the onset of dementia (8.6% were very worried; Park, Park, Yoon, Kim, & Chun, 2017). Worrying about dementia, beyond mere emotional reaction, can influence individuals’ lifestyle and health behavior according to the level of worry (Kim, Sargent-Cox, & Anstey, 2015).

According to previous studies reporting mental health factors affecting dementia worry, worry level is significantly positively associated with depressive symptoms (Kinzer & Suhr, 2015; Ostergren, Heeringa, Leon, Connell, & Roberts, 2017). However, objective factors related to physical health such as heart attack, stroke, and high-blood pressure were not found to be related to dementia worry (Bowen et al., 2018). Personal exposure to dementia (genetic or nongenetic) is one of the most influential factors related to dementia worry (Cutler & Hodgson, 2001; Kinzer & Suhr, 2015). Furthermore, lower subjective memory status (i.e., self-rated memory) is related to increased dementia worry (Bowen et al., 2018; Cutler & Hodgson, 1996, 2001; Kinzer & Suhr, 2015). Some studies have reported that women worried more about the onset of dementia than men (Bowen et al., 2018; Cantegreil-Kallen & Pin, 2012; Cutler & Hodgson, 2001), whereas others did not (Kinzer & Suhr, 2015). One study suggested gender differences interact with whether respondents live with parents who have Alzheimer’s disease (AD)—that females experience more worry than males—although gender as a single factor was not a significant predictor (Cutler & Hodgson, 1996).

Regarding age, its influence on dementia worry remains controversial. Some studies have revealed that dementia worry level was significantly greater among middle-aged adults than older adults, and a moderating effect of AD experience was found (Ostergren et al., 2017). In contrast, one study examined fear of developing AD over a wide range of ages (individuals aged >18 years) and revealed a strong linear association between age and fear of AD. Individuals who were older than 65 were most afraid of AD (Cantegreil-Kallen & Pin, 2012). However, another study reported no difference in dementia worry levels regarding age (Low & Anstey, 2009).

Many factors, such as sociodemographic variables, health, and memory-related factors (Mogle, Hill, & McDermott, 2017), may inevitably differ between middle-aged and older adults. These differences could affect dementia worry in different ways; however, no previous study has examined the predictive factors and their differences in middle-aged and older adults.

Korean society is influenced by Confucianism (Lee & Jones, 2017), which is a traditional philosophy that encompasses East Asia (e.g., Korea, China, Japan, Vietnam) and emphasizes family-centered values as a core idea (Lee & Jones, 2017), as well as the promotion of family harmony and filial piety in all aspects of social life, politics, and health (Lee & Jones, 2017; Lee et al., 2018). In addition, the Sociocultural Health Belief Model, which identifies dementia care-seeking behavior considering social and cultural variables, posits that family-centered values affect cultural beliefs and knowledge about dementia, which, in turn, influence the perceived threat of dementia (Sayegh & Knight, 2013). In the model, however, family-centered cultural values are ambiguous, and scant research has explored filial piety, familism, shame, and stigma as collectivistic barriers to care-seeking behavior (Sayegh & Knight, 2013). Thus, it is necessary to clarify how and what aspects of family-centered values affect the threat of dementia in Asian cultures, especially in South Korea.

Familism comprises three factors: familial interconnectedness, familial obligations, and extended family support, which are attributes of family function and support (Losada et al., 2019). One study of Chinese American and Asian immigrant participants revealed an inverse correlation between family function and belief in family support, especially concerning intergenerational support for dementia worry (Sun, Gao, & Coon, 2015). However, that study only explored a fragment of the dimensions of family function and family support; therefore, family function and support—predictive factors as family-centered value for dementia worry—require further analysis.

METHOD
Aim, Design, and Participants
The aim of the current study was to identify and compare dementia worry and its related factors between
middle-aged and older adults, especially focusing on family function and support.

A cross-sectional, descriptive design was used. Participants were South Korean adults, aged ≥45 years, and without cognitive impairment or depression. Those aged ≥65 years were classified as older adults, whereas those aged <65 years were classified as middle-aged. To assess cognitive impairment, the short form of the Korean version of the Mini-Mental Status Examination for Dementia Screening (SMMSE-DS) was used; scoring followed prior instructions concerning age and education level (Kim et al., 2010). Depression was screened with the Korean version of the Geriatric Depression Scale Short Form; participants who scored ≥5 were excluded.

The power analysis was calculated with G*Power 3.1.9. Concerning power, the sample size was calculated considering the use of t tests (two-way, \( \alpha = 0.05, \beta = 0.20, \) and effect size \( d = 0.47 \)) and a regression analysis (one-way, \( \alpha = 0.05, \beta = 0.20, \) and effect size \( R^2 = 0.56 \)). The effect sizes were calculated based on previous studies: a study of older adults in the United States for the effect size for a regression analysis (Cutler & Hodgson, 2001). The power analysis was calculated with G*Power 3.1.9. Concerning power, the sample size was calculated considering the use of t tests (two-way, \( \alpha = 0.05, \beta = 0.20, \) and effect size \( d = 0.47 \)) and a regression analysis (one-way, \( \alpha = 0.05, \beta = 0.20, \) and effect size \( R^2 = 0.56 \)).

Reflecting Korea's population composition ratio (approximately 70% middle-aged adults and 30% older adults; Bureau of Statistics Korea, 2016), 192 participants (144 middle-aged adults and 48 older adults) were needed to compare the two groups. The authors planned to recruit 233 participants (163 middle-aged adults and 70 older adults), considering a screening-out ratio of approximately 33.1%, which is the ratio of older adults with depressive symptoms in South Korea (Korea Institute for Health and Social Affairs, 2015).

A total of 230 participants were recruited through convenience sampling; however, 25 participants were excluded (seven and 18 for cognitive impairment and depression, respectively). Consequently, 205 adults (154 middle-aged and 51 older adults) participated.

**Instruments**

**Cognitive Impairment.** Cognitive impairment was screened using the SMMSE-DS (Kim et al., 2010), which is also used in a National Dementia Early Diagnosis Program. The SMMSE-DS is 13-item tool that addresses time orientation, place orientation, verbal memory, naming, and praxis. Total scores range from 0 to 20, with lower scores indicating lower cognitive function, which are adjusted for age and education level. The cut-off point indicated in the guidelines was used (Kim et al., 2010).

**Depression.** The Korean version (Kee, 1996) of the Geriatric Depression Scale Short Form (Sheikh & Yesavage, 1986) was used to screen for depressive symptoms. The scale comprises 15 dichotomous (yes/no) items, and total scores range from 0 to 15, with higher scores indicating more depression symptoms. The cut-off point is 5.

**Dementia Worry.** The Korean version (Moon, Kim, Choi, Oh, & Han, 2014) of the Fear of AD scale (French et al., 2012) was used to evaluate participants’ level of dementia worry. This 30-item scale comprises three factors: general fear, physical symptoms, and catastrophic attitude. Each statement is responded to using a 5-point Likert scale (0 = never to 4 = always). Total scores range from 0 to 120, with higher scores indicating higher worry. Cronbach’s alpha of the Korean version of the scale (Moon et al., 2014) was 0.96; in the current study, it was 0.94.

**Family Function.** The Korean Family Function Scale (Lee et al., 2002) was used to measure the characteristics of a Korean family's functions. This 24-item instrument comprises six dimensions: affective bonding, external relationship, family norm, roles and responsibilities, communication, and financial resources. Each item is measured with a 4-point Likert scale (0 = not at all to 4 = very likely); total scores range from 0 to 72, with higher scores indicating higher family function. In both the original (Lee et al., 2002) and the current study, Cronbach’s alpha was 0.87.

**Family Support.** The Medical Outcome Study Social Support Survey (Sherbourne & Stewart, 1991) was used to evaluate social support, and the translated and standardized Korean instrument was used (Lim, Kim, Shin, Yoo, & Min, 2003). This 19-item instrument comprises four subscales: emotional/informational support, tangible support, affectionate support, and positive social interaction. All items are self-reported on a 5-point Likert scale, and scores are calculated and transformed to a standardized score based on the calculating protocol used to compare other published means (using the calculating formula \( 100 \times \frac{[\text{observed score} - \text{minimum possible score}]}{[\text{maximum possible score} - \text{minimum possible score}]} \) of the Social Support Survey Instrument scoring instructions). Total scores range from 0 to 100 (standardized score), and higher scores indicate a greater possibility of social support. Cronbach’s alpha of a previous study (Lim et al., 2003) was 0.97 (all four subscales > 0.91). Cronbach’s alpha in the current study was 0.98.

**Data Collection**

The current study was approved by the Institutional Review Board of the authors’ university. All participants provided written consent prior to participating.
Data were collected via self-report; however, if participants could not read, face-to-face interview surveys were conducted. A researcher (S.I.R.) and an assistant, who had worked as a nurse, collected data from January 1, 2017 to April 30, 2017 at two senior centers and one marketplace in a city and a rural area in South Korea. To protect participants’ privacy, surveys were conducted in a private room at the centers. At the marketplace, surveys were conducted in places where participants were comfortable. The assistant was trained concerning the overall research, questions, and ethical considerations.

Data Analyses

Participants’ sociodemographic characteristics were presented as means (standard deviations) for descriptive statistics. To determine the homogeneity of sociodemographic characteristics between middle-aged and older adults, chi-square tests, Fisher’s exact tests, and Freeman-Halton tests (an extension of Fisher’s exact test for $r \times c$ tables) were used. To examine differences in dementia worry per group, $t$ tests, analysis of variance, and Kruskal-Wallis tests (for variables that did not follow a normal distribution) were conducted. Pearson’s correlation and Spearman’s correlation analyses were used to explore the relationships between ordinal predictors. To evaluate the predictors of dementia worry, stepwise multiple linear regression analyses were performed. Predictors with a $p < 0.05$ in univariate and bivariate analyses were chosen to construct a fit model. All statistical analyses were performed using SPSS version 22.

RESULTS

Differences in Participants’ Sociodemographic Characteristics

Participants’ sociodemographic characteristics are summarized in Table 1. Korean older adults were involved more in blue-collar occupations and more often were not married or divorced. Most participants had less than a high school education, had lower subjective socioeconomic status, and earned less money by themselves.

Differences in Health and AD-Associated Characteristics Between Middle-Aged and Older Adults

Participants’ clinical and AD-associated characteristics are shown in Table 1. Older adults reported significantly worse subjective health (19.6% vs. 5.2% of middle-aged adults) and self-rated memory (13.7% vs. 3.9% of middle-aged adults). Older adults also had significantly more friends with dementia (13.6% vs. 0% of middle-aged adults). Lastly, regarding the number of comorbidities, older adults had more illnesses than middle-aged participants (66.7% vs. 43.5%).

Differences in Dementia Worry, Family Function, and Family Support Between Middle-Aged and Older Adults

The differences in dementia worry, family function, and family support between middle-aged and older adults are shown in Table 2. Older adults reported significantly higher dementia worry levels than middle-aged adults. Concerning overall family function, there was no significant difference between groups; however, middle-aged adults reported significantly more affective bonding with family members than older adults. Concerning overall family support, there was no significant difference between groups; however, middle-aged adults reported significantly more positive social interactions than older adults.

Differences in Factors Affecting Dementia Worry Between Middle-Aged and Older Adults

Table 3 shows the differences in dementia worry level between the categorical independent variables, including sociodemographic characteristics. In the middle-aged group, gender and education level significantly affected dementia worry. Middle-aged women were more worried about acquiring dementia than men. Less-educated middle-aged participants were also more worried than those who had at least a university education. However, for older adults, no factors affecting dementia worry were found.

Correlations among the ordinal independent variables and dementia worry are shown in Table 4. For middle-aged adults, family function was inversely associated with dementia worry, especially for three subscales—affective bonding, external relationship, and family norm. Comorbidity and dementia worry were positively correlated, and subjective memory status was inversely correlated with dementia worry. For older adults, although overall family function was not significantly associated with dementia worry, two subscales—affective bonding and financial resources—were significantly inversely and positively correlated with dementia worry, respectively. Comorbidity was positively correlated with dementia worry. Family support failed to show any significant associations.

Differences in Predictors Affecting Dementia Worry Between Middle-Aged and Older Adults

To assess multicollinearity between the predictor factors, the variance inflation factor (VIF) was used. The VIF ranged between 1.001 and 1.506, indicating that there were
no intercorrelations among the independent variables in either group. The value of the Durbin-Watson statistic was 1.801 for middle-aged adults and 1.961 for older adults, indicating that there was no statistical evidence of autocorrelation (i.e., within a range of 1 to 3). Thus, the authors confirmed that the basic assumption of regression analyses was satisfied.

Based on the results of the t tests and correlation analyses, variables that showed significant differences were selected as variables for the regression model. For middle-aged adults, gender, education level, affective bonding, external relationship, family norm, number of comorbidities, and subjective memory status were included in the regression analysis. In the final regression model for middle-aged adults, the following variables were included:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Middle-Aged Adults (n = 154)</th>
<th>Older Adults (n = 51)</th>
<th>X² (p Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>126 (61.5)</td>
<td>27 (52.9)</td>
<td>2.082 (0.149)</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td>15.375 (&lt;0.001)*</td>
</tr>
<tr>
<td>Blue-collar</td>
<td>76 (37.1)</td>
<td>24 (47.1)</td>
<td></td>
</tr>
<tr>
<td>White-collar</td>
<td>37 (18)</td>
<td>1 (2)</td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>40 (19.5)</td>
<td>15 (29.4)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>52 (25.4)</td>
<td>11 (21.6)</td>
<td></td>
</tr>
<tr>
<td>Not married/divorced</td>
<td>18 (8.8)</td>
<td>10 (19.6)</td>
<td>9.937 (0.002)</td>
</tr>
<tr>
<td>Educated above university</td>
<td>46 (22.4)</td>
<td>4 (7.8)</td>
<td>8.310 (0.004)</td>
</tr>
<tr>
<td>Low subjective socioeconomic status</td>
<td>33 (16.1)</td>
<td>14 (27.5)</td>
<td>6.479 (0.011)</td>
</tr>
<tr>
<td>Earn money by oneself</td>
<td>140 (68.3)</td>
<td>29 (56.9)</td>
<td>4.096 (0.043)</td>
</tr>
<tr>
<td>Subjective health status</td>
<td></td>
<td></td>
<td>9.937 (0.007)</td>
</tr>
<tr>
<td>Bad</td>
<td>18 (8.8)</td>
<td>10 (19.6)</td>
<td></td>
</tr>
<tr>
<td>So-so</td>
<td>155 (75.6)</td>
<td>34 (66.7)</td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>32 (15.6)</td>
<td>7 (13.7)</td>
<td></td>
</tr>
<tr>
<td>Subjective memory status</td>
<td></td>
<td></td>
<td>7.144 (0.028)</td>
</tr>
<tr>
<td>Bad</td>
<td>13 (6.3)</td>
<td>7 (13.7)</td>
<td></td>
</tr>
<tr>
<td>So-so</td>
<td>161 (78.5)</td>
<td>39 (76.5)</td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>31 (15.2)</td>
<td>5 (9.8)</td>
<td></td>
</tr>
<tr>
<td>Memory change over past 1 year</td>
<td></td>
<td></td>
<td>0.333 (&gt;0.999)*</td>
</tr>
<tr>
<td>Better</td>
<td>1 (0.5)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td>Same</td>
<td>76 (37.1)</td>
<td>19 (37.3)</td>
<td></td>
</tr>
<tr>
<td>Worse</td>
<td>128 (62.4)</td>
<td>32 (62.7)</td>
<td></td>
</tr>
<tr>
<td>Close friend with AD (yes)</td>
<td>7 (3.4)</td>
<td>7 (13.6)</td>
<td>21.885 (&lt;0.001)*</td>
</tr>
<tr>
<td>Family history with AD (yes)</td>
<td>34 (16.6)</td>
<td>11 (21.6)</td>
<td>1.219 (0.270)</td>
</tr>
<tr>
<td>Experience of caring for person with AD (yes)</td>
<td>30 (14.6)</td>
<td>11 (21.6)</td>
<td>2.613 (0.106)</td>
</tr>
<tr>
<td>Comorbidities (yes)</td>
<td>101 (49.3)</td>
<td>34 (66.7)</td>
<td>8.222 (0.004)</td>
</tr>
</tbody>
</table>

* Fisher’s exact test.
adults, gender, education level, and family norm were selected as predictive factors for dementia worry \((p < 0.05)\). For older adults, affective bonding, financial resources, and the number of comorbidities were included in the regression analysis, and all three variables were selected as predictive factors for the final regression model \((p < 0.05)\) (Table 5).

**DISCUSSION**

The current study compared middle-aged and older adults’ levels of dementia worry and identified differences between factors affecting dementia worry in South Korea, especially focusing on family function and support, which are essential characteristics of Eastern individuals. The results elucidate distinct factors that affect dementia worry for middle-aged and older adults. For middle-aged adults, gender, education level, and family norm were significant predictive factors of dementia worry; for older adults, affective bonding, financial resources, and the number of comorbidities were predictive factors.

The dementia worry levels of older adults in the previous literature, in which the Fear of AD Scale (mean score = 29.28) was developed, were similar to those of the older adults in the current study (mean score = 28.47). However, because most of the literature has not used structured and validated tools to measure dementia worry, direct comparisons of dementia levels in the current and previous studies are limited. Therefore, it is necessary to measure dementia worry levels using structured measurements.

The levels of dementia worry of older adults were significantly higher than those of middle-aged adults in South Korea. This result is consistent with that of a previous study, which found that people age ≥65 feared the onset of dementia more compared to their younger (18 to 34 years) and middle-aged (35 to 64 years) counterparts \((p < 0.001;\) Cantegreil-Kallen & Pin, 2012). However, this finding differs from some other prior research, which revealed that dementia worry level decreases as age increases (Ostergren et al., 2017). This difference may be explained by exposure to people with dementia (Ostergren et al., 2017).

**TABLE 2**

Differences in Dementia Worry, Family Function, and Family Support Between Middle-Aged and Older Adults \((N = 205)\)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD)</th>
<th>Total ((N = 205))</th>
<th>Middle-Aged Adults ((n = 154))</th>
<th>Older Adults ((n = 51))</th>
<th>(t) ((p) Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dementia worry*</td>
<td>24.00 (11.64)</td>
<td>22.51 (10.04)</td>
<td>28.47 (14.78)</td>
<td>2.686 (0.009)</td>
<td></td>
</tr>
<tr>
<td>Family function*</td>
<td>67.13 (4.93)</td>
<td>67.50 (4.09)</td>
<td>66.02 (6.80)</td>
<td>1.870 (0.063)</td>
<td></td>
</tr>
<tr>
<td>Affective bonding</td>
<td>22.22 (2.41)</td>
<td>22.60 (2.30)</td>
<td>21.10 (2.38)</td>
<td>3.999 (&lt;0.001)</td>
<td></td>
</tr>
<tr>
<td>External relationship</td>
<td>10.94 (1.11)</td>
<td>11.03 (0.85)</td>
<td>10.69 (1.66)</td>
<td>1.406 (0.165)</td>
<td></td>
</tr>
<tr>
<td>Family norm</td>
<td>11.75 (0.95)</td>
<td>11.72 (0.88)</td>
<td>11.82 (1.13)</td>
<td>0.671 (0.503)</td>
<td></td>
</tr>
<tr>
<td>Roles and responsibilities</td>
<td>11.37 (0.94)</td>
<td>11.36 (0.77)</td>
<td>11.41 (1.33)</td>
<td>0.278 (0.782)</td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>8.46 (0.91)</td>
<td>8.46 (0.85)</td>
<td>8.49 (1.08)</td>
<td>0.242 (0.809)</td>
<td></td>
</tr>
<tr>
<td>Financial resources</td>
<td>2.39 (0.98)</td>
<td>2.34 (0.90)</td>
<td>2.51 (1.21)</td>
<td>0.902 (0.370)</td>
<td></td>
</tr>
<tr>
<td>Family support*</td>
<td>48.31 (18.70)</td>
<td>49.55 (17.70)</td>
<td>44.58 (21.19)</td>
<td>1.650 (0.100)</td>
<td></td>
</tr>
<tr>
<td>Tangible support</td>
<td>48.83 (18.38)</td>
<td>49.31 (17.61)</td>
<td>47.30 (20.63)</td>
<td>0.675 (0.500)</td>
<td></td>
</tr>
<tr>
<td>Emotional/informational support</td>
<td>47.15 (18.86)</td>
<td>48.24 (17.86)</td>
<td>43.87 (21.47)</td>
<td>1.435 (0.153)</td>
<td></td>
</tr>
<tr>
<td>Affectionate support</td>
<td>38.00 (24.34)</td>
<td>39.34 (23.43)</td>
<td>34.64 (25.84)</td>
<td>1.210 (0.228)</td>
<td></td>
</tr>
<tr>
<td>Positive social interaction</td>
<td>61.10 (18.24)</td>
<td>63.80 (16.60)</td>
<td>52.94 (20.60)</td>
<td>3.804 (&lt;0.001)</td>
<td></td>
</tr>
<tr>
<td>Additional questions</td>
<td>48.20 (19.48)</td>
<td>48.86 (19.03)</td>
<td>46.08 (20.84)</td>
<td>0.884 (0.378)</td>
<td></td>
</tr>
</tbody>
</table>

* Measured with the Korean version of the Fear of Alzheimer’s Disease Scale, where total score ranges from 0 to 120, with higher scores indicating greater fear.

* Measured with the Korean Family Function Scale, where total score ranges from 0 to 72, with higher scores indicating greater function.

* Measured with the Medical Outcome Study Social Support Survey, where total scores range from 0 to 100, with higher scores indicating greater possibility of social support.
Prior research that revealed inverse correlations with age and dementia worry have examined participants who had cared for a family member with dementia. In contrast to prior research, the current study population, especially Korean middle-aged adults, had little exposure to people with dementia; therefore, perhaps the lack of experience caused the middle-aged adults to worry less. Thus, as well as age, the extent that individuals are exposed to people with dementia is a vital factor for dementia worry. Moreover, most people get information about dementia from internet sources (Allen, Cain, & Meyer, 2018); thus, further research is needed concerning the effects of indirect exposure to dementia worry through mass media and the internet.

### TABLE 3

**Differences in Dementia Worry According to Participant Characteristics**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Dementia Worry</th>
<th>Middle-Aged Adults (n = 154)</th>
<th>Older Adults (n = 51)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD) t or Χ² (p Value)</td>
<td>Mean (SD) t or Χ² (p Value)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>23.85 (11.24)</td>
<td>27.85 (13.03)</td>
<td>0.315 (0.754)</td>
</tr>
<tr>
<td>Male</td>
<td>20.11 (6.80)</td>
<td>29.17 (16.74)</td>
<td></td>
</tr>
<tr>
<td>Occupation*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue-collar</td>
<td>21.62 (8.80)</td>
<td>30.63 (18.42)</td>
<td></td>
</tr>
<tr>
<td>White-collar</td>
<td>21.14 (7.92)</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>21.12 (3.82)</td>
<td>26.93 (13.78)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>25.71 (14.44)</td>
<td>26.18 (4.42)</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td>1.090 (0.277)</td>
<td>1.208 (0.252)</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>22.72 (10.12)</td>
<td>26.95 (13.30)</td>
<td></td>
</tr>
<tr>
<td>Not married/divorced</td>
<td>18.75 (7.92)</td>
<td>34.70 (19.20)</td>
<td></td>
</tr>
<tr>
<td>Education level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than or equal to high school</td>
<td>23.74 (10.60)</td>
<td>28.85 (15.26)</td>
<td>0.628 (0.533)</td>
</tr>
<tr>
<td>University or higher</td>
<td>19.24 (7.51)</td>
<td>24.00 (4.97)</td>
<td></td>
</tr>
<tr>
<td>Subjective socioeconomic status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle or higher</td>
<td>22.53 (9.20)</td>
<td>27.05 (14.22)</td>
<td>1.060 (0.301)</td>
</tr>
<tr>
<td>Low</td>
<td>22.42 (15.02)</td>
<td>32.24 (15.98)</td>
<td></td>
</tr>
<tr>
<td>Source of income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oneself</td>
<td>22.55 (11.30)</td>
<td>28.90 (16.42)</td>
<td>0.235 (0.816)</td>
</tr>
<tr>
<td>Other routes</td>
<td>22.42 (5.69)</td>
<td>27.91 (12.57)</td>
<td></td>
</tr>
<tr>
<td>Has a close friend with AD*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One or more person</td>
<td>—</td>
<td>32.43 (19.69)</td>
<td>0.761 (0.450)</td>
</tr>
<tr>
<td>No one</td>
<td>22.51 (10.04)</td>
<td>27.84 (14.00)</td>
<td></td>
</tr>
<tr>
<td>Family history of AD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One or more person</td>
<td>23.78 (12.22)</td>
<td>29.91 (16.17)</td>
<td>0.362 (0.719)</td>
</tr>
<tr>
<td>No one</td>
<td>22.29 (9.64)</td>
<td>28.08 (14.53)</td>
<td></td>
</tr>
<tr>
<td>Experience of caring for a person with AD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>24.95 (13.69)</td>
<td>31.27 (16.04)</td>
<td>0.708 (0.482)</td>
</tr>
<tr>
<td>No</td>
<td>22.17 (9.43)</td>
<td>27.70 (14.49)</td>
<td></td>
</tr>
</tbody>
</table>

* Kruskal-Wallis test.  
* No middle-aged adult had a close friend with AD.
### TABLE 4

**Correlations Between Dementia Worry and Other Variables (N = 205)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Dementia Worry</th>
<th>Middle-Aged Adults (n = 154)</th>
<th>Older Adults (n = 51)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>R or rho</td>
<td>p Value</td>
</tr>
<tr>
<td>Family function</td>
<td></td>
<td>-0.166</td>
<td>0.040</td>
</tr>
<tr>
<td>Affective bonding</td>
<td></td>
<td>-0.214</td>
<td>0.008</td>
</tr>
<tr>
<td>External relationship</td>
<td></td>
<td>-0.161</td>
<td>0.047</td>
</tr>
<tr>
<td>Family norm</td>
<td></td>
<td>-0.221</td>
<td>0.006</td>
</tr>
<tr>
<td>Roles and responsibilities</td>
<td></td>
<td>0.093</td>
<td>0.254</td>
</tr>
<tr>
<td>Communication</td>
<td></td>
<td>-0.006</td>
<td>0.940</td>
</tr>
<tr>
<td>Financial resources</td>
<td></td>
<td>0.086</td>
<td>0.287</td>
</tr>
<tr>
<td>Family support</td>
<td></td>
<td>-0.051</td>
<td>0.528</td>
</tr>
<tr>
<td>Tangible support</td>
<td></td>
<td>-0.056</td>
<td>0.494</td>
</tr>
<tr>
<td>Emotional/informational support</td>
<td></td>
<td>-0.025</td>
<td>0.757</td>
</tr>
<tr>
<td>Affectionate support</td>
<td></td>
<td>-0.036</td>
<td>0.661</td>
</tr>
<tr>
<td>Positive social interaction</td>
<td></td>
<td>-0.151</td>
<td>0.062</td>
</tr>
<tr>
<td>Number of comorbidities</td>
<td></td>
<td>0.203</td>
<td>0.012</td>
</tr>
<tr>
<td>Subjective health status*</td>
<td></td>
<td>-0.145</td>
<td>0.073</td>
</tr>
<tr>
<td>Subjective memory status*</td>
<td></td>
<td>-0.162</td>
<td>0.045</td>
</tr>
<tr>
<td>Memory change over past 1 year*</td>
<td></td>
<td>-0.048</td>
<td>0.554</td>
</tr>
</tbody>
</table>

* Spearman’s correlation analysis.

### TABLE 5

**Predictive Factors Affecting Dementia Worry Among Participants (N = 205)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>SE</th>
<th>β</th>
<th>t (p Value)</th>
<th>r²</th>
<th>Adjusted R²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Middle-aged adults (n = 154)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>56.415</td>
<td>10.481</td>
<td>5.383 (&lt;0.001)</td>
<td>0.094</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-3.304</td>
<td>1.614</td>
<td>-0.158</td>
<td>-2.047 (0.042)</td>
<td>0.027</td>
<td></td>
</tr>
<tr>
<td>Education level</td>
<td>-4.042</td>
<td>1.737</td>
<td>-0.180</td>
<td>-2.327 (0.021)</td>
<td>0.035</td>
<td></td>
</tr>
<tr>
<td>Family norm</td>
<td>-2.416</td>
<td>0.876</td>
<td>-0.212</td>
<td>-2.575 (0.007)</td>
<td>0.048</td>
<td></td>
</tr>
<tr>
<td><strong>Older adults (n = 51)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>56.287</td>
<td>14.627</td>
<td>3.848 (&lt;0.001)</td>
<td>0.439</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affective bonding</td>
<td>-2.334</td>
<td>0.679</td>
<td>-0.376</td>
<td>-3.438 (&lt;0.001)</td>
<td>0.201</td>
<td></td>
</tr>
<tr>
<td>Financial resources</td>
<td>6.928</td>
<td>1.316</td>
<td>0.567</td>
<td>5.264 (&lt;0.001)</td>
<td>0.371</td>
<td></td>
</tr>
<tr>
<td>Number of comorbidities</td>
<td>3.811</td>
<td>1.678</td>
<td>0.245</td>
<td>2.272 (0.028)</td>
<td>0.099</td>
<td></td>
</tr>
</tbody>
</table>

Note: SE = standard error.
For Korean middle-aged and older adults, family function was a significant factor affecting dementia worry; however, the influencing sub-concepts differed for each group. Most Korean individuals (70%) would consider a family member as their primary caregiver if they acquired dementia (Korea Institute for Health and Social Affairs, 2018b). Most Korean individuals regard themselves as abandoned by their family if their children do not want to take care of them when they have dementia (i.e., goryeojang—the ancient Korean practice of carrying away older adults to the mountains when they are a certain age or ill). This is supported by a recent study that reported that many older adults with dementia refused to use care facilities (Park & Kim, 2018).

According to one study that explored caregiving patterns of Asian, Hispanic, and non-Hispanic White American individuals, Asian caregivers showed the highest percentages of familial relationships with care recipients among the three racial groups (Miyawaki, 2016). That is, the concept of family is a key feature of Asian culture that differs from Western culture. The current results are consistent with the propositions of the Sociocultural Health Model concerning the reflection of Korean family-centered values. Campos and Kim (2017) emphasized the importance of family as a protective factor for health in East Asian cultures, while insisting that it could harm health if family relations deteriorate; therefore, overall family function should be evaluated prior to planning interventions to identify obstacles or protective factors.

Family norm, among the family function sub-concepts, was a predictive factor for Korean middle-aged adults’ dementia worry. Most Korean middle-aged adults are usually central to the family and feel an obligation to protect and not destroy the family in the face of a great event such as dementia. Most place emphasis on in-home rules and consider the interests of the entire family, rather than their own interests. However, owing to Westernization and urbanization, the family structure of Korean society has been getting smaller, and family values and norms are continuously weakened, thus resulting in family conflicts (Kim, 2015). Future research is necessary to evaluate the effects of generational conflicts on dementia worry levels.

Contrary to the results of the middle-aged adults, affective bonding and financial resources are chief factors for Korean older adults. According to statistics related to the living conditions of Korean older adults (Korea Institute for Health and Social Affairs, 2018a), 67.5% of older adults lived alone or lived together with an elderly couple in 2014; this increased by 2.5% to 72% in 2017. Because family members do not live together, it is conjectured that affective bonding that can increase love and faith between family members became important as family norms weakened.

Financial resources ($r^2 = 37.1%)$, one of the sub-factors of family function, was a stronger predictor than affective bonding ($r^2 = 20.1%$) for explaining dementia worry of Korean older adults. Financial resources represent receiving financial support from family members and relatives. Specifically, 56.8% and 73.2% of Korean older adults receive regular and irregular cash support from their adult children, respectively (Korea Institute for Health and Social Affairs, 2018a). Especially regarding hospital expenses, 83.1% of older adults were supported by family members or relatives; only 8% of older adults paid themselves (Kim & Kim, 2014). Interestingly, in the current study, 72.5% of older adults responded with a higher, rather than a moderate, economic level. Thus, for Korean older adults, rather than current economic satisfaction or subjective economic level, whether the source of economic power is from oneself or from other family members more strongly affects dementia worry. Thus, in the case of older adults who are not economically independent, regardless of subjective socioeconomic status, it is presumed that they feel the economic burden of treatment cost and facility entrance costs due to dementia. These cultural contexts are important not only for domestic Korean individuals but also immigrant Korean families who are living in other countries (Lee Casado, Lee, Hong, & Hong, 2015). Thus, when assessing subjective economic status as a factor of dementia worry, source of income should be assessed for Korean individuals and Korean immigrants.

Unlike the results associated with family function, family support was not significantly associated with dementia worry in either group. This finding contrasts with the results of a previous study that revealed that belief in intergenerational support was a factor of perceived threat of dementia (Sun et al., 2015). Perhaps an individuals’ trust or conviction that family members will support them when they are ill is more important than current familial support within the East Asian culture.

Concerning socioeconomic and health characteristics, factors affecting dementia worry between two age groups differed. In the middle-aged group, gender and education level were predictive factors of dementia worry, but not among Korean older adults. This finding coincides with previous studies. One prior study (MacSwain et al., 2009) identified differences in health anxiety and the fact that women are more concerned than men. Another study also revealed inverse correlations between education level and dementia worry (Sun et al., 2015).
The number of comorbidities was critical, but only for older adults, which contrasts a prior result showing no age differences in comorbidities (Moon et al., 2014). The differences in participants’ characteristics and in the previous study can be deduced to produce the different results. Participants in the previous study were recruited from university (i.e., tertiary) hospitals; whereas, the current participants were recruited from the community. It can be assumed that individuals visiting a hospital are likely to be patients, and that a visit to a university hospital is likely to result from a serious illness; therefore, they may consider the severity of their disease as being more critical than the number of comorbidities.

Overall, when compared to the adjusted coefficient of determination, the dementia worry of Korean older adults ($R^2 = 43.9\%$) was more explained than the worry of Korean middle-aged adults ($R^2 = 9.4\%$) in the regression model. However, sub-concepts of family function were influencing predictive factors for both age groups, and the results imply that family function and actual health status (e.g., the number of diseases) became stronger predictive factors as age increased. The current regression model of Korean middle-aged adults insufficiently explained dementia worry. It is assumed that factors such as exposure to people with dementia or information other than family function could be vital to explaining the dementia worry of Korea’s middle-aged population. Future research needs to identify the critical influencing factors that affect dementia worry among Korean middle-aged adults. Therefore, it is necessary to evaluate the family function and health status of Korean older adults when conducting education or intervention programs related to dementia. In clinical settings, the results may reflect the engagement of the family in the treatment or intervention process. Furthermore, Korean American individuals believe they lack services related to dementia that consider their cultural differences (Lee Casado et al., 2015). The current study suggests that social support and systems related to dementia need to consider individuals’ cultural background and the importance of family-centered values and family function among Korean American individuals.

**LIMITATIONS AND STRENGTHS**

The current study had several limitations. First, although the number of participants was calculated by a power analysis and the ratio of the population was considered, generalization is limited owing to the convenience sampling in specific regions. Hence, future studies need to use randomized sampling. Second, because the effects specific to the Korean culture were examined, there is a limit to how well direct comparisons can be made with other cultures. Therefore, further evaluation is needed concerning dementia worry across other cultural contexts.

Despite these limitations, the current study has several strengths. First, standardized reliable and valid scales were used to precisely explain key concepts. When measuring multidimensional and abstract concepts such as “dementia worry” and “family function,” validated instruments should be used; therefore, the authors extended the results of prior studies that used simple questionnaires. Second, by screening for participants with dementia and depression, which affect dementia worry, and other independent variables as potential confounding factors, the authors minimized errors and increased the reliability of the results.

**CONCLUSION**

Older adults were more worried about the onset of dementia than middle-aged adults, and each group revealed distinct factors that affected dementia worry. For middle-aged adults, gender, education level, and family norm were predictive factors for dementia worry; for older adults, number of comorbidities, affective bonding, and financial resources were predictive factors.

The findings provide evidence that health care providers should consider Korean individuals’ age and family function to decrease their dementia worry. It is necessary to provide information to help Korean individuals adequately cope with symptoms of dementia, and educational programs need to reflect the age-related differences in predictors. Because family function is a key factor for middle-aged and older adults in South Korea, the current study also suggests that assessing family function prior to planning interventions would be valuable.

**REFERENCES**


