

〔原 著〕

Relationships Among Age, Gender, and Religiosity in Elderly Japanese

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Abstract

This study evaluated relationships among religiosity, age, and gender in elderly Japanese, through a secondary analysis of an existing data set from a study of Japanese elders (Principal Investigator: Dr. Jersey Liang, University of Michigan School of Public Health). A descriptive, cross-sectional, correlational design was used to examine study hypotheses. A weighted-sample of 1,897 community-dwelling Japanese men and women (age 65+) was employed. ANOVA models supported significant associations between elders' levels of religiosity and their age ($F [2,1745] = 13.381, p < .001$). A Post-Hoc pairwise comparison among three age groups revealed that Japanese elders in the age group 75-84 professed significantly higher levels of religiosity than did those in the group 65-74 ($p < .001$). A T-test found significantly greater levels of religiosity in females than in males within each age group ($p < .001$). An age-by-gender interaction was not significant ($p = .153$), suggested that the gender difference in religiosity does not depend on age categories. A 2-Way ANOVA model with two main effects was fit to the data; for all age groups, females had higher religiosity scores than did males ($B = 2.129, p < .001$). A qualitative analysis regarding the religious beliefs and practices of Japanese elders in different age groups is required to further comprehend and support the study findings.

Key Words : Elderly Japanese adults, religiosity, age, gender

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要 旨

米国では、スピリチュアリティの類義概念である「宗教性 (religiosity)」が、高齢者の年齢や性別と有意に関係し健康増進に寄与することが多くの研究により報告されている (例: 若年層より高齢者層の方が、また男性より女性の方が、宗教性が高い; 宗教性の高い高齢者はより能動的な健康行動をとる傾向がある)。しかし日本では研究の不足によりこれらの関係は十分に解明されていない。本研究の目的は、日本人高齢者の宗教性と年齢、性別との関係を分析し、今後の高齢者ヘルスプロモーションへの宗教性介入について示唆を得ることである。本研究では、日本人高齢者の健康・生活に関する縦断調査のデータを二次的分析し、探索的・記述的横断調査を実施した (データ: ミシガン大学・東京都健康長寿医療センター研究所・東京大学「高齢者の健康と生活: 長寿社会における暮らし方の調査」, 研究代表者・ミシガン大学公衆衛生学部 Jersey Liang 教授)。地域在住の日本人高齢者 1,897 人 (65 歳以上男女) に対し、一元配置分散分析・T 検定・二元配置分散分析等により仮説検定を行った (有意水準 $p < .05$)。その結果、高齢者の宗教性と年齢との間に有意な正相関が示され ($F [2, 1745] = 13.381, p < .001$)、特に中期高齢者 (75-84 歳) の前期高齢者 (65-74 歳) に比する宗教性の高さが確認された ($p < .001$)。また、性別では女性が男性に比して宗教性が高く ($p < .001$)、これは年齢の影響を受けず ($p = .153$)、各年齢層において確認された ($\beta = 2.129, p < .001$)。これらの結果の背景をより詳細に理解し高齢者への効果的なヘルスプロモーション・プログラムに繋げるために、高齢者の宗教性に関する質的研究が今度の課題として求められる。

Key Words : 日本人高齢者, 宗教性, 年齢, 性別

Background and Significance

The purpose of this study was to examine the relationships among age, gender, and religiosity in elderly Japanese. For the purpose of this study, we define religiosity as individuals' religious beliefs and their use of religious practices in accordance with these beliefs to cope with daily life situations and stresses ¹⁾.

To heal a client as a whole person and provide the client with a holistic health care program, nurses need to acknowledge individuals' health not only from physical, mental, and social aspects, but also from spiritual viewpoints ¹⁾. Spirituality can be a significant factor in recovering from illness and promoting health for older adults due to their deeper appreciation of fragility ¹⁾. In Western countries, including England and the United States (U.S.), the higher being of spirituality is signified by religion ²⁾, and the concept of spirituality often connotes religiosity for many elders ³⁾.

The number of Japanese elders who suffer acute and chronic diseases has increased annually ⁴⁾. In 2000, the Japanese Government announced *Healthy Japan 21* within the national health promotion movement in the 21st century. This health promotion policy includes a focused

area of promoting *Kokoro no Kenkou*, the well-being of mind and spirit ⁴⁾. *Kokoro* is not defined in Japanese health policy documents, likely because officials assume that the expression is readily understood. *Kokoro* is a Japanese expression that refers to the state of a person's spirit (*Ki*), deep inner mind (*Seishin*), will (*Ishi*), and feelings/emotions (*Kanjou*) ⁵⁾. *Kokoro* is often used in statements that relate to religion (e.g., *Kokoro-no-Shuuyou*, or training or discipline of mind that is associated with religious practices). Thus, we propose *Kokoro* to be inherent to the Japanese people's religiosity.

Older adults' religiosity has been studied mostly in Christian societies, such as the U.S. ⁶⁾ U.S. studies report that religiosity has a positive influence on older American adults' health ⁷⁾ and their health promoting behaviors, including increased physical activities ⁸⁾, reduced tobacco usage ⁸⁾, and decreased alcohol consumption ⁹⁾. Likewise, significant relationships have been identified between elders' religiosity and their demographic characteristics of age and gender. A study ¹⁰⁾ reports positive associations between older adults' religiosity and increased age. Another study ¹¹⁾ also explains gender differences in religiosity with elderly women more involved in religious practices and more

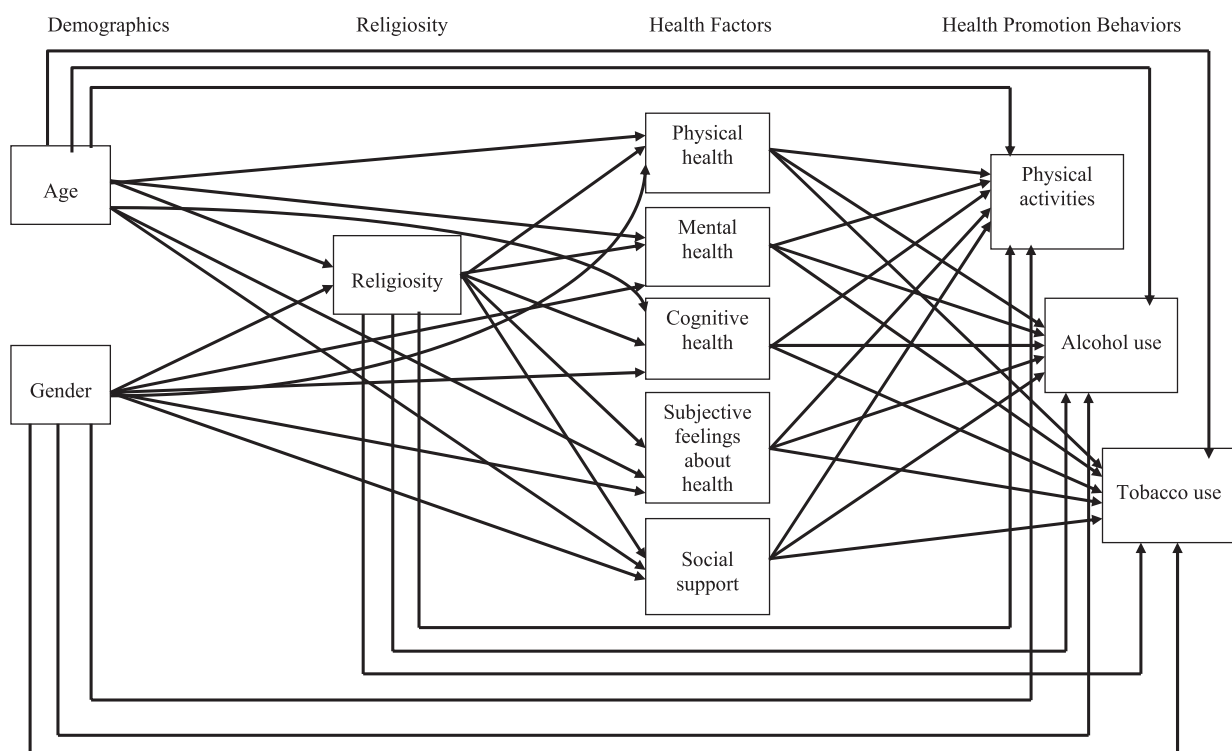
likely to have stronger religious beliefs than elderly men. Based on these study findings, health professionals in the U.S. have developed and provided health promotion programs that incorporate spirituality and religiosity. In contrast, spirituality and religiosity are rarely included in health promotion programs for elders in Japan.

In Japan, as in other countries, older people are likely to have more chronic health conditions than younger people, and elderly women tend to have greater issues in their physical, mental, and cognitive health status than elderly men⁴⁾. Due to declining health conditions, older people are inclined to disengage in health promotion behaviors, including exercise⁴⁾. Compared to elderly men, elderly women are less likely to engage in exercise because of greater deterioration of health¹²⁾. Despite the negative effects of advanced age and female gender, elderly Americans who report greater religiosity tend to engage in more physical activities⁸⁾. Increased religiosity may positively influence elderly Christian Americans' health promotional behaviors regardless of their age and gender. In

the Shinto-Buddhism country of Japan³⁾, however, such relationships among religiosity, age, and gender in older adults have not been fully explored in extant health research. In fact, as a result of literature search carried out on December 4, 2015 through both CINAHL and Ichushi (the Japan Medical Abstracts Society), only 24 Japanese studies were detected with the terms of *religiosity* and *shukyosei* (i.e., religiosity in Japanese), whereas 774 U. S. studies were identified with the term of *religiosity*, in the past ten years from 2005 through 2015.

Based on an extensive review of religious and health literature in Japan and elsewhere, we identified variables—religiosity; age; gender; physical, mental, cognitive, and social health status; and subjective health—associated with Japanese elders' health promotion activities¹⁾. Incorporating these variables and coordinating them with the relationships identified from the literature review, we proposed a conceptual model (Figure 1). Using this conceptual framework, we intend to examine the mediating effects of religiosity on the health and health promotion behaviors of Japanese elders. As seen in Figure 1, religiosity relates to multiple

Figure 1. Conceptual Model of Religiosity



dimensions; before the complex associations between religiosity and health promotion behaviors are explored, their basic content dimensions have to be carefully examined and described⁶⁾. Therefore, prior to mediation tests or evaluating the entire model depicted in Figure 1, in the current study we examined the relationships between age and religiosity and gender and religiosity of elderly Japanese.

The positive effects of religiosity identified in elderly Christians may or may not be found in Japanese elders, due to their different belief systems. Should religiosity be found to be significantly related to age and gender in Japanese elders as described in Figure 1, positive effects of religiosity on their health promotion would be expected, and inclusion of religiosity in health promotion programs for older people becomes significant for Japan. It is thus essential to examine such relationships for elderly Japanese.

To explore the above assumption, we proposed two primary hypotheses that examine differences in religiosity levels among different age and gender groups of Japanese elders. The findings from this study help to clarify the relevance of religiosity for Japanese elders' health promotion.

H 1. Among three age groups of Japanese elders (65 to 74 years old, 75 to 84 years old, and 85 years old and over), those who are in the oldest age group report greater religiosity than those in the younger age groups.

H2. Elderly Japanese women report greater religiosity than elderly Japanese men within each age group and across all age groups.

Method

Research Design

A descriptive, cross-sectional, correlational design was used to examine the hypotheses for the study. The current study was a secondary analysis of a data set from a longitudinal cross-cultural survey entitled "Health and Well-Being among Older Old in U.S. and Japan," designed by the University of Michigan (UM), the Tokyo Metropolitan Institute of Gerontology, and the University of Tokyo (Principal Investigator: Dr.

Jersey Liang, the UM School of Public Health).

Sample

Sampling procedure. The survey was designed to develop a panel data set regarding the health and lifestyle of older Japanese and American adults. The survey has been conducted every three years since 1987. For sampling, the first survey, or Wave 1, in 1987 selected 192 sampling units (including cities, towns, and villages) stratified by geographical region and city size in Japan. Japanese individuals age 60 years or older were then systematically selected from the resident register of the 192 sampling units.

Data for the current study came from the fifth survey, or Wave 5, carried out in 1999. A total of 3,482 including 2,077 initial subjects who had participated in at least one of the earlier waves of interviews and 1,405 new supplemental subjects aged 70 years old and older, participated in the Wave 5 survey. To address the over-sampling of 1,405 Japanese adults age 70 years and older, and to more accurately represent the age structure of Japanese population, the sample was weighted for the current study.

Further, the 2,077 initial subjects included 288 subjects age 63 years and older, whereas the current study focused on subjects only age 65 years or older. To meet the age categories of the Japanese health statistics⁴⁾, only individuals age 65 years and older were included and those age 63 and 64 years old were excluded in the current study.

As a result of weighting and exclusion of those age 64 years and younger, a total of 1,897 subjects age 65 years and older were considered for data analyses. In addition, in the 1,897 weighted subjects the percentage of people age 65 to 74 years old, 75 to 84 years old, and 85 years and older became 55.6% ($n = 1,054$), 38.0% ($n = 721$), and 6.4% ($n = 122$), respectively (Table 1) and was considered mostly similar to that reported in the Japanese Census in 2000 (59.1%, 30.7%, and 10.2%, respectively)⁴⁾.

According to a 2007 Japanese government survey, 51.2% and 43.3% of the population reported to be Shintoists or Buddhists,

respectively¹³⁾. The religious orientation of the 1,897 subjects was not reported in Wave 5 data. Regardless of religious affiliations, however, the religiosity—religious beliefs and practices—of these subjects would be identified in data analyses.

Additionally, there was a technical issue using the SPSS software: The univariate procedure only used integer weights and did not handle decimal weights, which we used in this study. To address this technical issue, as well as the issue of standard error, which can be increased because of a smaller sample size with weighted data, un-weighted analyses were performed to test H2. The distribution of the un-weighted sample is shown for males and females across all age groups in Table 1.

Sample size and statistical power. To statistically confirm the sample size for the current study, power analysis was conducted using an nQuery Advisor 6.0 Pearson correlation module. With a 2-sided test, a power of 80%, and alpha of .05, a minimum sample size of 194 was required for this study to detect a weak correlation of .20. Based on these results, the sample size of 1,879 was considered adequate to conduct this study. In addition, to handle missing data of study variables, listwise deletion was used. Subjects were included in analyses if they answered all items.

Participants. Subjects used in this study were community-residing Japanese men and women. Individuals age 65 years and older were included and those age 64 and younger were excluded. Of 1,879 subjects, 57.8% ($n = 1,096$)

Table 1.
Demographics of Samples

	Population ^a	Samples	Weighted ^b	Un-weighted ^c
	<i>N (%)</i>	<i>n (%)</i>	<i>M (SD)</i>	<i>n (%)</i>
Age			74.46 (5.90)	
65-74	12,981,583 (59.1)	1,054 (55.6)		1,837 (56.5)
75-84	6,749,006 (30.7)	721 (38.0)		1,210 (37.2)
85 +	2,230,772 (10.2)	122 (6.4)		207 (6.4)
Gender				
Male	9,206,524 (41.9)	801 (42.2)		1,373 (42.2)
Female	12,754,897 (58.1)	1,096 (57.8)		1,881 (57.8)
Religion ^d				
Shintoist	105,824,798 (51.2)	na		
Buddhist	89,540,834 (43.3)	na		
Christian	2,143,710 (1.0)	na		
Other	9,086,268 (4.4)	na		

Note. ^a $N = 21,961,421$; ^b $n = 1,897$; ^c $n = 3,254$. na = not available.

^a Census data are from “Kokumin eisei no doko [Health and welfare statistics],” by Health and Welfare Statistics Association, 2004, *Journal of Health and Welfare Statistics*, 51(9), p.360. Copyright 2004 by Kosaido CO., LTD.

^d Adapted from “Shukyo nenkan [Religious yearbook 2008]” by Ministry of Education Culture Sports Science and Technology, 2008, *Gyosei*, p.31. Copyright 2009 by Gyosei Digital CO., LTD.

were women (Table 1), similar to 58.1% for the elderly Japanese population in 2000⁴⁾. Based on the similarities in sample demographic characteristics, the sample for the current study was considered to be representative of the elderly Japanese population.

Data Collection: Interviews

To collect data of Japanese subjects in Wave 5 of the longitudinal study, face-to-face structured interviews were conducted by professional interviewers provided by a company specialized in survey. Through the register of study subjects, every three years interviewers identified and contacted study subjects and visited their home for the interview. Each interview took 30-40 minutes to ask 96 questions, including religiosity items.

Measures

Items from the questionnaire used in the Wave 5 survey were used to construct the measures of the study variables. Items from the questionnaire corresponding to each of the variables are described in Table 2. An older Japanese adult's religiosity was measured by six items that ask about religious beliefs and private religious practices (Table 2). The six items were considered appropriate to measure religiosity, which we define as "individuals' religious beliefs and their use of religious practices in accordance with these beliefs to

cope with daily life situations and stresses¹⁾." The response categories of this Likert scale are: 1) never think so, 2) don't usually think so, 3) sometimes think so, 4) always think so, or 5) don't know. The scaling level of this item is interval. For response categories 1) to 4), 1 to 4 points are assigned, respectively. Data that indicated 5) don't know were excluded from the analysis. The values of the six items of religiosity were summed; a higher score signifies greater religiosity. The reliability of religiosity scale has a Cronbach's alpha of .783.

Data Analysis

For data analysis, the sample was stratified by gender and into three age groups: 1 (65-74 years), 2 (75-84 years), and 3 (85 years and older). Descriptive statistics for the relevant study variables were calculated for study participants (Table 2). To analyze relationships between Japanese elders' religiosity and their age in H1, one-way analysis of variance (ANOVA) and multiple comparisons (i.e., Tukey's honestly significant difference test) were used. To examine gender differences of religiosity in H2, a t-test was used for each age group and 2-way ANOVA was performed for all age groups combined. SPSS software version 16.0 was used to analyze the hypotheses. Throughout the hypotheses testing, the acceptable significance level of $p < .05$ was

Table 2
Properties of Measures of the Study Variables

Variable/Measure	Item(s)	Response categories	<i>M</i> (<i>SD</i>)	<i>α</i>	# of items	Range	Skew
Age	"How old are you?"	1. 65-74 2. 75-84 3. 85+	74.5(5.9)		1	65-96	.528
Gender	(observed and determined by the interviewer)	0. Male 1. Female			1		-.315
Religiosity	1. "At your home, do you pray and offer prayers for your ancestors? Also include offerings of water, incense, and rice." 2. "How often do you read Buddhism scripts or the Bible in your home?" 3. "How often do you watch or listen to religious programs on the TV or radio?" 4. "Praying to God or Buddha helps me overcome my stress and worries." 5. Wishes can come true by praying God or Buddha." 6. "Punishment or curse will be offered toward bad behavior or action."	1. Never think so 2. Don't usually think so 3. Sometimes think so 4. Always think so 5. Don't know	14.7(4.5)	.783	6	6-24	-.018

employed. These data analyses were considered validated as they were undertaken by a similar study which examined religiosity in relation to age and gender among older Japanese adults⁶⁾.

Human Subjects Protection

The current study was approved by IRB Health Sciences at the University of Michigan through an expedited review (HUM00020215, July 11, 2008). The secondary data analysis was conducted with the permission of Dr. Jersey Liang, Professor at the UM School of Public

Health.

Results

A significant relationship was found between Japanese elders' levels of religiosity and their age, $F(2,1745) = 13.381$, $p < .001$ (Table 3). A Post-Hoc pairwise comparison among the three age groups revealed that Japanese elders in the age group 75-84 reported significantly higher levels of religiosity than did those in the group 65-74 ($p < .001$; Table 4). Japanese adults in the

Table 3

One-Way Analysis of Variance Summary for Age-Group Differences in Religiosity

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Between-group	2	532.540	266.270	13.381	< .001
Within-group	1,745	34,724.352	19.899		
Total	1,747	35,256.892			

Table 4

Multiple Comparison of Religiosity Among Three Age Groups

		Mean		<i>p</i>	95% CI	
		Difference	<i>SE</i>		<i>LL</i>	<i>UL</i>
65-74	75-84	-1.148	0.224	< .001	-1.67	-0.62
	85 +	-0.801	0.462	.193	-1.89	0.28
75-84	65-74	1.148	0.224	< .001	0.62	1.67
	85 +	0.346	0.473	.744	-0.76	1.46
85 +	65-74	0.801	0.462	.193	-0.28	1.89
	75-84	-0.346	0.473	.744	-1.46	0.76

Note. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

Table 5

Gender Differences in Religiosity in Each Age Group

Age group	Female	Male	<i>p</i> (2-tailed)
65-74	15.21 ± 4.2	13.05 ± 4.4	< .001
75-84	15.96 ± 4.1	14.26 ± 4.8	< .001
85+	16.13 ± 3.6	13.17 ± 5.2	< .001

group 85+ (i.e., 85 years and older) also indicated greater religiosity than did those in the group 65-74; however, the mean difference was not statistically significant ($p = .193$). The level of religiosity between Japanese adults in the group 75-84 and those in the group 85+ was not significantly different ($p = .744$). H1 was partially supported.

Significantly greater levels of religiosity were reported by females than males within each age group (Table 5). The mean religiosity score also was evaluated combining age and gender effects. A model with age-by-gender interaction was tested first. However, the interaction was not significant ($p = .153$; Table 6), which suggested that the gender difference in religiosity does not depend on age categories. The differences in religiosity between females and males are considered consistent for the age groups 65-74, 75-84, and 85+. A 2-Way ANOVA

model with two main effects was fit to the data (Table 7). For all age groups, females had higher religiosity scores than did males ($\beta = 2.129$, $p < .001$). H2 was supported.

Discussion

Religiosity in Different Age Groups of Japanese Elders

Japanese elders' levels of religiosity varied across age groups (Table 3). Both Japanese men and women in the group 75-84 and 85+ had higher religiosity scores than their counterparts in the 65-74 age group (Table 4). However, a significant difference for the level of religiosity was not found between people in the group 75-84 and those in the group 85+ (Table 4). It is possible to hypothesize that the religiosity of Japanese adults aged 75-84 years and those aged 85 years and older are similar, and that the religiosity of these older generations are

Table 6

Analysis of Variance Results With Religiosity Being the Dependent Variable and Age-by-Gender Interaction

	<i>df</i>	<i>F</i>	<i>p</i>
Intercept	1	13,828.064	<.001
Age group	2	16.926	<.001
Gender	1	87.547	<.001
Age group by gender interaction	2	1.881	.153

Table 7

Analysis of Variance Results With Religiosity Being the Dependent Variable and Main Effects Only

	<i>df</i>	β	<i>SE</i>	<i>F</i>	<i>p</i>
Intercept	1	12.995	0.135	14198.289	<.001
Age group	2				<.001
75-84 vs. 65-74		0.921***	0.167	16.024	
85+ vs. 65-74		0.786*	0.342		
Gender	1				<.001
Females vs. males		2.129***	0.160	177.080	

Note. * $p < .05$. *** $p < .001$.

different from that of people aged 65-74 years because of the differences in religious beliefs and practices and life experiences. Japanese people who were 75 years old and those who were 85 years old at the time of the Wave 5 survey in 1999 were born between 1914 to 1924. This cohort group was born during World War I (1914-1918) and a large number of the males served as troops in World War II (1939-1945). At that time, these older age groups were taught to refuse cultures and values from other countries such as the U.S. thereby increasing their faith in their own traditional religious beliefs and disciplines. Japanese adults who were 65 to 74 years old in the survey period of 1999 were born around 1925 to 1934. They were only 4 to 11 years old at the time of WWII; after the war, these younger generations grew up under the influence of Western cultures and life styles. Consequently, these younger people's belief and value systems, religious entities in which they believe, level of religious beliefs and way of religious practices may be different from older people's. These differences may be reflected in the findings of the current study. To comprehend the differences in the religious beliefs and practices of Japanese elders in different age groups, a qualitative analysis needs to be conducted in the future study. Health promotion programs for elderly Japanese should be provided based on the understanding of the unique belief and value systems of the elderly in each specific age group.

Religiosity as a Coping Response to Declining Health

For all three age groups, Japanese women reported greater religiosity than did Japanese men (Table 7). It is possible that elderly Japanese women tend to be more religious than elderly Japanese men because older Japanese women report greater deteriorations of health status compared to older Japanese men.

Older women report more chronic health problems and depressive symptoms than do older men⁴⁾. Older women also indicate greater religiosity than older men. Greater health concerns may account for women reporting higher religiosity as adverse health conditions

may increase older women's fear of illness and death. To cope with fear of illness and death, physical discomfort and pain, and to enhance their inner strength, elderly women may cultivate their religiosity by praying to or connecting with higher powers to petition for help in healing pain, recovering from illness, and promoting their health. A U.S. study¹⁴⁾ found that religiosity was more likely to manifest and became greater when a person experienced difficult life events, such as pain and illness, than when he/she was not exposed by these difficulties. The current study supported their findings. Religiosity—religious beliefs and practices¹⁾—should be encompassed in health promotion programs to help fragile elderly women cope with and overcome stress and difficulties and promote their quality of life.

Conclusions and Nursing Implications

The findings of this study provide new knowledge for nurses, researchers, and health policy makers regarding the relationships of religiosity relating to Japanese elders' age and gender. This can support health policy makers' emphasis of Healthy Japan 21, or the effectiveness of *Kokoro*, religiosity on elders' health. The limited knowledge relating religiosity to demographic factors, including age, gender and health, may have discouraged nurses from developing evidence-based health care programs on religiosity for their older clients. In the current study, religiosity's significant associations with age and gender were identified in Japanese elders. It may be possible to supplement medical care through nursing care encouraging the pursuit of existing religiosity in patients. Based on these empirical findings, nurses need to aware of the benefits of religiosity and increase awareness in their clients. Building on the findings, researchers should conduct additional qualitative and quantitative studies to explore and confirm the impact of religiosity, *Kokoro*, on the health promotion of Japanese elderly. Once confirmed, culture-sensitive health promotion programs could be developed, evaluated, and implemented in order to holistically enhance and energize

physical, mental, social, and spiritual well-being of elderly Japanese.

Limitations

The main limitation for the current study was the use of secondary data analysis. The data set provided substantial information regarding elderly Japanese adults' religiosity, age, and gender. However, important information—such as lived experiences of religiosity depicted by elderly Japanese adults—was not included in the data set. Qualitative understanding of elderly Japanese adults' religiosity was not available for further data interpretation. Another limitation lies on the fact that the analyses were done using cross-sectional methods, although the data were originally collected in multiple waves. This limited our ability to ascertain cause and effect. Cause and effect interpretations await longitudinal studies.

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Declaration of Conflicting Interests

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this manuscript.

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