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Aging and Sexuality: Knowledge, Attitudes, and Image of Care Staff in Nursing Homes

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ABSTRACT

In this descriptive study, I examined the nursing home care staffs' knowledge, attitudes, and image of elderly sexuality and the determination of a possible relationship among them. Nurses and care workers from five nursing homes in Okinawa, Japan volunteered to participate the study. One hundred fifty-two care staffs answered and returned the self-administered packet for a response rate of 74.5%, with 126 of the respondents completing the questions appropriately. The packet included questionnaires containing demographic characteristics, institutional factors, the Japanese version of Aging Sexuality Attitudes and Knowledge Scale (ASKAS-J) and a Semantic Differential (SD) technique for assessment of respondents' image of elderly sexuality. A computer software package, the SPSS, statistically examined average scores of knowledge, attitudes, and image on elderly sexuality. Additionally, a multiple regression analysis examined variables related to the knowledge, attitudes, and image. Pearson's correlation coefficient was utilized for further assessment of the relationship among them. The study found that "experience of learning elderly sexuality" was significantly related to knowledge, attitudes, and image of elderly sexuality. In addition, there were significant positive correlations between knowledge and attitude scores ($r=0.51$), knowledge and image scores ($r=0.48$), and attitude and image scores ($r=0.38$). These findings indicate that education is a key to increasing care staffs' knowledge, positive image and attitudes on elderly sexuality. However, only 31.7% of the respondents received education related to elderly sexuality, mostly from sources outside the school setting. I point out the importance of incorporating the topic of elderly sexuality in educational programs. Japanese gerontological nursing educators need to encourage formal inservice programs for care staff and develop school curriculums for nursing students on sexuality in the aged. *Ryukyu Med. J., 25(3,4) 71~83, 2006*

Key words: elderly sexuality, nursing home care staff, knowledge, attitude, image

INTRODUCTION

One of the most important quality of life (QOL) issues observed by gerontological nurses is the necessity of improving the understanding of elderly sexuality^{1,2)}. Studies indicate that negative attitudes from society and health care institutions toward elderly sexuality can potentially decrease the health of older persons. Negative attitudes toward sexuality in older persons lead the elderly themselves, their families and caregivers to believe sexuality in the elderly as abnormal. Studies on the sexuality of nursing home residents²⁻⁵⁾ noted that residents remain sexual despite of institutionalization. In recognition of this, healthcare

professionals need to be attentive to elderly individuals' feelings regarding sexual issues. Studies demonstrate, however, that nurses are uncomfortable discussing sexual issues with the elderly. The reports note that nurses feel incapable of understanding sexuality concerns in aged patients^{2,4,5)}. This lack of understanding has the potential to create negative attitudes with subsequent unfavorable care giving.

In Japan, research on sexuality in the elderly is limited compared to Western countries. Japanese health care professionals tend to ignore or devalue the sexual aspects of personhood in their interactions with elderly individuals^{5,6)}. There are few studies in Japan that demonstrate knowledge and

attitudes of care staff toward elderly sexuality, and no Japanese study looked at the issue from the comprehensive three-point view of knowledge, attitudes, and image.

The primary objectives of this study include: (a) examination of nursing home care staff's knowledge, attitudes, and image toward elderly sexuality; and (b) determination of a possible relationship among knowledge, attitudes, and image on elderly sexuality.

1 . Significance of nursing

Clarifying care staff's knowledge, attitudes, and image about sexuality in the aged is useful when determining the care staff's need for education on elderly sexuality. The discussion of knowledge, attitudes and image about elderly sexuality enhances care staff awareness and comfort with the topic. Ultimately, this study hopes to assist residents and their significant others in understanding the normalcy of sexual feelings and actions in the aged, thus improving the QOL of elderly nursing home residents.

2 . Literature review

Historically, stereotypes and misconceptions surrounded the subject of aging sexuality^{1,4,5}. In recent years researchers studying staff impressions on elderly sexuality utilized a variety of perspectives. Several studies^{7,8} reported that a lack of knowledge corresponded with negative attitudes while other studies focused on attitudes toward sexual expression of the elderly⁹. White¹ developed the Aging Sexuality Knowledge and Attitudes Scale (ASKAS). Research on the validity and the reliability of the scale demonstrated its adequacy to evaluate knowledge about, and attitudes toward elderly sexuality. In the U.S., the ASKAS is a popular tool for investigators. Quinn-Krach and Hoozer¹⁰, using the ASKAS questionnaire, reported a positive relationship between knowledge and attitudes. The study noted that an increase in knowledge resulted in a more positive attitude toward aging sexuality. Studies^{10,11} noted that educational interventions addressing elderly sexuality created a positive change in the knowledge and attitudes of elderly care nurses, nursing students, family members and the aged persons themselves. The studies¹²⁻¹⁴ also supported the development of educational programs on sexuality

in the elderly for nurses, residents and care staffs in long term care facilities by noting significant post-education improvements in understanding.

In Japan, the disciplines of sociology and psychology normally investigate issues related to elderly sexuality. Research on the topic in Japanese populations from a geriatric nursing viewpoint is a recent occurrence¹⁵⁻¹⁸. However, none of the Japanese studies utilized an objective, reliable scale to evaluate knowledge and attitudes toward aging sexuality. Akamine *et al.*¹⁹ developed the Japanese version of ASKAS (ASKAS-J) based on the original ASKAS¹. At that time the ASKAS-J demonstrated its reliability as a suitable scale for assessing the knowledge and attitudes on elderly sexuality in Japanese nursing home care staffs and healthcare students. In addition, there was a significant positive relationship between knowledge and attitudes on the care staffs and nursing students.

Mizutani *et al.*²⁰ investigated the image of elderly sexuality in a population of health care givers. The 160 nurse volunteers worked in an outpatient ward of a Japanese general hospital. The study examined the nurses' experience of living with the aged, interest and education in elderly sexuality, and demographic characteristics. Akamine *et al.*²¹ conducted a similar survey of 191 nursing home care staffs. The two studies yielded similar results. Nurses had a relatively positive image and registered nurses had more positive image compared to that of licensed vocational nurses and care workers. Demographically, older nurses and those who had learned about elderly sexuality had more positive image toward sexuality in aged populations^{20,21}.

MATERIALS AND METHODS

1 . Subjects and Procedures

This study utilized a convenience sample of 204 care staffs (nurses and care workers) working in five nursing homes in urban areas of Okinawa Prefecture, Japan. These five sites were selected from a total of 54 nursing homes in the prefecture. The nursing homes were classified as "tokubetsu-yogo-rojin-homu," and their major purposes were to manage elderly residents' health care and rehabilitate and assist residents with activities of daily living, including toileting, bathing, and feeding²². The management in the five nursing homes did

not specifically encourage nor discourage sexual activities among elder residents, and none of them had educational programs on elderly sexuality for nursing staffs.

The willingness of the nursing homes' administrators to participate in the study was the foundation for site selection. The care staffs that volunteered to contribute to the study received information pertaining to the purpose of the research, anonymity, confidentiality, and the fact they could withdraw at any time. Each care staff member received a packet containing a cover letter explaining the study, a demographic data sheet, the ASKAS-J, and a questionnaire on the image of elderly sexuality using a semantic differential (SD) technique. Each volunteer was instructed to complete the packet in their free time without discussing probable answers with other care staff. After completion, care staff placed the questionnaires into a secured box designated for the study. The study was conducted from September 2000 to March 2001. Those who did not wish to participate in the study could decline to complete the questionnaire packet. One hundred fifty-two care staffs answered and returned the self-administered packet for a response rate of 74.5%. One hundred twenty-six care staffs, consisting of 36 licensed nurses and 90 care workers appropriately completed the survey. The data from the 126 questionnaires provided data for the study's statistical analyses.

2. Instruments

1) ASKAS-J: A study involving 167 volunteers examined the validity and reliability of the tool. A total of 110 college students majoring in Health Sciences and 57 care staffs for the elderly volunteered to complete the ASKAS-J. The construct validity of the scale, using factor analysis, displayed two factors and a test-retest measured the reliability. Pearson's correlation coefficient by test-retest (2-3 weeks) was 0.82 in knowledge and 0.76 in attitudes. Cronbach's α was 0.90 in knowledge, 0.85 in attitudes. The contents and the scoring of ASKAS-J are exactly the same as the original ASKAS¹⁾ as noted in Table 1. The tool consists of 61 questions, with 35 "true-false" or "don't know," that measure knowledge on sexuality in the aged. Using a 7-point Likert scale, the remaining 26 questions are categorized as agree/disagree ratings with the item statement relating to attitudes

towards elderly sexuality. The possible range of ASKAS-J scores are as follows: Knowledge=35-105; Attitudes=26-182. Lower scores demonstrate higher knowledge and a more permissive attitude toward sexuality in aged persons¹⁹⁾. Cronbach's α in this study was 0.89 in knowledge, 0.83 in attitudes.

2) Semantic differential (SD) technique: The instrument measured stereotypic attitudes and determined the content or dimensions of such attitudes. Osgood *et al.*²³⁾ recommended that the SD technique is to be used as a projective technique in research. The SD technique to measure image of old age was modified in this study based on Mizutani *et al.*²⁰⁾ and Sasaki *et al.*²⁴⁾ to incorporate a series of eight polar adjectives (correlative words). The polar adjectives included natural-unnatural, light-dark, healthy-unhealthy, lovely-unlovely, open-close, elegant-inelegant, clean-dirty, and acceptable-unacceptable. Using a 5-point Likert scale, the researcher assigned 1 point for the most positive adjectives, 5 for the most negative ones. For example, the "natural-unnatural" correlation had 1 point assigned to "very natural," 2 points to "some natural," 3 to "neutral," 4 to "some unnatural," 5 to "very unnatural." The total score of this technique ranges from 8 to 40 points. A lower score indicates a more positive image and a higher score indicates a more negative image on elderly sexuality.

3. Data Analysis

The study computed the mean scores of knowledge, attitudes, and image of elderly sexuality to the demographic data of the participants. The seven demographic items included gender, age, marital status, occupation, years of work with the elderly, experience of living with the elderly, and experience of learning elderly sexuality. A Mann-Whitney U test examined the significance of four independent variables, including gender, occupation, experience of living with the elderly, and experience of learning elderly sexuality. The Kruskal Wallis test measured the significance of the remaining three independent variables, age, marital status, and years of work with the elderly. A multiple regression analysis examined variables related to knowledge, attitudes, and image on elderly sexuality. The final assessment included exploring the correlation among knowledge, attitudes,

and image on elderly sexuality with an applied criterion of $p < 0.05$ for significance.

RESULTS

1 . Demographic Characteristics

The respondents consisted of 51 males and 75 females. Their ages ranged from 21 to 56 years (mean age; 34.2 ± 9.24). Of the 126 volunteers completing the questionnaire, 49.2% were married, 38.9% single, and rest were divorced or widowed. Vocational care workers were the primary respondents, with 71.4% of the total, with nurses comprising the remaining 28.6%. Period of work at the facilities ranged from 2 to 19 years (mean years; 5.1 ± 4.3). Among the respondents, 48.4% had experience living with the elderly and 31.7% had education in elderly sexuality.

2 . Knowledge, Attitudes, and Image toward Elderly Sexuality (Table 1, Table 2)

Table 1 shows the contents of ASKAS and the mean scores of 61 questions. In knowledge the mean score ranged from 1.63 (#24 "There is a decrease in frequency of sexual activity with older age in males") to 2.63 (#33 "Impotence in aged males may literally be effectively treated and cured in many instances"). A lower score indicates high knowledge. In attitude the mean score ranged from 2.61 (#51 "I would support sex education courses for the staff of nursing homes") to 4.65 (#53 "Masturbation is an acceptable sexual activity for older females"). A lower score indicates permissive attitudes.

Table 2 displays means of the total scores for knowledge, attitudes, and image on sociodemographic and institutional factors with statistical comparisons. The mean of the combined knowledge scores was 76.2 ± 17.6 . Three variables including gender, years of work with the elderly, and experience of learning elderly sexuality demonstrated significant differences in knowledge. The mean score in the male gender (71.1 ± 13.9) was lower than in the female gender (81.2 ± 19.0) ($p < 0.01$). The mean score of the variable examining years of work with the elderly was significantly lower in the care staff working "5-10" years (68.2 ± 19.7) and "over 10" years (70.0 ± 15.5) than the care staff who worked "Under 5" years (80.6 ± 15.4) ($p < 0.01$). There was also a significant difference

in staff reporting the learning experience of elderly sexuality. The Mann Whitney U test analysis of the staff who stated "Yes" (67.6 ± 16.9) and "No" (84.7 ± 15.5) demonstrated a statistically significant ($p < 0.001$). The attitude mean score was 91.0 ± 19.1 , with only one variable, the experience of learning about sexuality in the aged, demonstrating statistical significance. The mean score of care staffs who had experienced learning elderly sexuality (81.2 ± 18.9) was lower than those of who had not (100.8 ± 16.9) ($p < 0.001$).

The mean of the total image score was 21.0 ± 3.7 . The variables of age, years of working with an elder population, and experience of learning elderly sexuality demonstrated significant differences in elderly sexuality image. The mean score analysis in staff members reporting their ages as "50-59" years (18.0 ± 1.2) was lower than any age group ($p < 0.05$). The variable relating to years of work with the elderly showed the mean score of the "5-10" years (19.9 ± 4.6) and "over 10" years (20.1 ± 2.6) were lower than in "under 5" years group (22.1 ± 3.2) ($p < 0.05$). Care staff that reported learning elderly sexuality had a lower mean score (19.5 ± 3.5) than those of who did not (22.5 ± 3.6) ($p < 0.01$). "Experience of learning elderly sexuality" was the variable demonstrating the most significant differences in knowledge, attitudes, and image of sexuality of the aged.

3 . Image of the Elderly Sexuality (Fig.1)

Fig.1 compares the image of participants who received education on elderly sexuality to those who did not. The mean scores of every series of polar adjectives in the subjects reporting learning about elderly sexuality were lower than the non-educated group. The mean scores demonstrated significant differences in the adjective, "acceptable-unacceptable" ($p < 0.001$) and in the total of the eight items ($p < 0.01$).

4 . Multiple Regression Analysis of Factors Related to the Knowledge, Attitudes, and Image on Elderly Sexuality (Table 3)

Table 3 demonstrates Spearman's rank correlation coefficients on sociodemographic and institutional factors. Knowledge showed a positive significant correlation with the factors of gender ($r = 0.3$, $p < 0.01$) and experience of learning elderly sexuality ($r = 0.43$, $p < 0.001$). Attitudes showed significant

Table 1 Aging sexual knowledge and attitudes scale (ASKAS)* and mean scores

Knowledge questions (35 items: 1. True 2. False 3. Don't know)	Mean score(SD)
^a 1. Sexual activity in aged persons is often dangerous to their health. (F:False)	1.77 (.95)
2. Males over the age of 65 typically take longer to attain an erection of their penis than do younger males. (T:True)	1.70 (.97)
3. Males over the age of 65 usually experience a reduction in intensity of orgasm relative to younger males. (T)	2.30 (.89)
4. The firmness of erection in aged males is often less than that of younger persons. (T)	1.88 (.99)
5. The older female (65+years of age) has reduced vaginal lubrication secretion relative to younger females. (T)	1.92 (.99)
6. The aged female takes longer to achieve adequate vaginal lubrication relative to younger females. (T)	1.91 (1.00)
7. The older female may experience painful intercourse due to reduced elasticity of the vagina and reduced vaginal lubrication. (T)	2.30 (.95)
8. Sexuality is typically a life-long need. (T)	1.94 (.98)
^a 9. Sexual behavior in older people (65+) increases the risk of heart attack. (F)	2.35 (.66)
^a 10. Most males over the age of 65 are unable to engage in sexual intercourse. (F)	2.30 (.86)
11. The relatively most sexually active younger people tend to become the relatively most sexually active older people. (T)	2.23 (.90)
12. There is evidence that sexual activity in older persons has beneficial physical effects on the participants. (T)	2.44 (.86)
13. Sexual activity may be psychologically beneficial to older persons. (T)	2.22 (.95)
^a 14. Most older females are sexually unresponsive. (F)	1.96 (.94)
^a 15. The sex urge typically increases with age in males over 65. (F)	2.27 (.84)
16. Prescription drugs may alter a person's sex drive. (T)	2.34 (.91)
^a 17. Females after menopause, have a physiologically induced need for sexual activity. (F)	2.46 (.87)
18. Basically, changes with advanced age (65+) in sexually involve a slowing of response time rather than a reduction of interest in sex. (T)	2.27 (.93)
19. Older males typically experience a reduced need to ejaculate and hence may maintain an erection of the penis for a longer time than younger males. (T)	2.50 (.60)
^a 20. Older males and females cannot act as sex partners as both need younger partners for stimulation. (T)	1.87 (.93)
21. The most common determinant of the frequency of sexual activity in older couples is the interest or lack of interest of the husband in a sexual relationship with his wife. (T)	1.87 (.90)
22. Barbiturates, tranquilizers, and alcohol may lower the sexual arousal levels of aged persons and interfere with sexual responsiveness. (T)	2.03 (.97)
23. Sexual disinterest in aged persons may be a reflection of a psychological state of depression. (T)	2.50 (.80)
24. There is a decrease in frequency of sexual activity with older age in males. (T)	1.63 (.91)
25. There is a greater decrease in male sexuality with age than there is in female sexuality. (T)	2.36 (.75)
26. Heavy consumption of cigarettes may diminish sexual desire. (T)	2.36 (.84)
27. An important factor in the maintenance of sexual responsiveness in the aging male is the consistency of sexual activity throughout his life. (T)	2.55 (.78)
28. Fear of the inability to perform sexually may bring about an inability to perform sexually in older males. (T)	2.15 (.98)
29. The ending of sexual activity in old age is most likely and primarily due to social and psychological causes rather than biological and physical causes. (T)	2.06 (.96)
^a 30. Excessive masturbation may bring about an early onset of mental confusion and dementia in the aged. (F)	2.25 (.94)
^a 31. There is an inevitable loss of sexual satisfaction in postmenopausal women. (F)	2.25 (.95)
32. Secondary impotence (nonphysiologically caused) increases in males over the age of 60 relative to younger males. (T)	2.39 (.83)
33. Impotence in aged males may literally be effectively treated and cured in many instances. (T)	2.63 (.64)
34. In the absence of severe physical disability, males and females may maintain sexual interest and activity well into their 80's and 90's. (T)	1.82 (.93)
35. Masturbation in older males and females has beneficial effects on the maintenance of sexual responsiveness. (T)	2.43 (.86)

Table 1 Continued

Attitude questions (26 items: 7-point Likert scale, disagree=1, agree=7)	Mean score(SD)
36. Aged people have little interest in sexually (aged=65+years of age).	2.71 (1.24)
37. An aged person who shows sexual interest brings disgrace to himself/herself.	3.55 (1.19)
38. Institutions such as nursing homes ought not to encourage or support sexual activity of any sort in its residents.	3.71 (1.28)
39. Male and female residents of nursing homes ought to live on separate floors or in separate wings of the nursing home.	3.88 (1.69)
40. Nursing homes have no obligation to provide adequate privacy for residents who desire to be alone, either by themselves or as a couple.	3.23 (1.66)
41. As one becomes older (say past 65) interest in sexuality inevitably disappears.	2.88 (1.36)
For items 42, 43, and 44: If a relative of mine, living in a nursing home, was to have a sexual relationship with another resident I would:	
42. Complain to the management.	3.31 (1.47)
43. Move my relative from this institution.	3.54 (1.43)
^b 44. Stay out of it as it is not my concern.	3.51 (1.22)
45. If I knew that a particular nursing home permitted and supported sexual activity in residents who desired such, I would not place a relative in that nursing home.	3.73 (1.66)
46. It is immoral for older persons to engage in recreational sex.	3.03 (1.41)
^b 47. I would like to know more about the changes in sexual functioning in older years.	3.03 (1.43)
^b 48. I feel I know all I need to know about sexually in the aged.	3.45 (1.95)
49. I would complain to the management if I knew of sexual activity between any residents of a nursing home.	3.37 (1.50)
^b 50. I would support sex education courses for aged residents of nursing homes.	3.66 (1.53)
^b 51. I would support sex education courses for the staff of nursing homes.	2.61 (1.30)
^b 52. Masturbation is an acceptable sexual activity for older males.	4.37 (1.58)
^b 53. Masturbation is an acceptable sexual activity for older females.	4.65 (1.48)
^b 54. Institutions such as nursing homes, ought to provide large enough beds for couples who desire such to sleep together.	4.35 (1.38)
^b 55. Staff of nursing homes ought to be trained or educated with regard to sexually in the aged and/or disabled.	2.68 (1.21)
56. Residents of nursing homes ought not to engage in sexual activity of any sort.	3.31 (1.61)
^b 57. Institutions such as nursing homes should provide opportunities for the social interaction of men and women	3.56 (1.35)
58. Masturbation is harmful and ought to be avoided.	3.00 (1.33)
^b 59. Institutions such as nursing homes should provide privacy so as to allow residents to engage in sexual behavior without fear of intrusion or observation.	4.17 (1.61)
60. If family members object to a widowed relative engaging in sexual relations with another resident of a nursing home, it is the obligation of the management and staff to make certain that such sexual activity is prevented.	3.54 (1.51)
61. Sexual relations outside the context of marriage are always wrong.	4.27 (1.55)

Knowledge: ^aThe scores in these items should be reversed, such that 1=2points, 2=1point, 3=3points. Each score ranges from 1 to 3. A low score indicates high knowledge.

Attitudes: ^bThe scores in these items should be reversed, such that 1=7points, 7=1point; 2=6points, 6=2points; 3=5points, 5=3points; 4=4points.

Each score ranges from 1 to 7. A low score indicates a permissive attitude.

*ASKAS was originally developed by White. Japanese version of the ASKAS (ASKAS-J) was used to measure sexual knowledge and attitudes in the present study.

Table 2 Mean of the knowledge, attitudes, and image scores on elderly sexuality

N=126

Variables	n	Knowledge ^a	Attitudes ^b	Image ^c
		Mean (SD)	Mean (SD)	Mean (SD)
Whole		76.2 (17.6)	91.0 (19.1)	21.0 (3.7)
Gender				
Male	51	71.1 (13.9) **	89.4 (16.6) NS	20.3 (3.5) NS
Female	75	81.2 (19.0)	92.7 (20.6)	21.5 (3.8)
Age				
20-29	51	77.0 (17.4) NS	91.1 (19.4) NS	23.4 (3.9) *
30-39	33	75.5 (19.2)	88.3 (17.7)	20.7 (3.3)
40-49	37	73.2 (17.2)	92.3 (21.5)	21.1 (3.4)
50-59	5	80.2 (9.2)	93.0 (3.5)	18.0 (1.2)
Marital status				
Married	62	72.6 (15.3) NS	86.1 (16.1) NS	20.8 (3.3) NS
Single	49	79.0 (16.8)	92.9 (19.3)	22.0 (4.0)
Divorced/Widowed	15	77.0 (27.2)	94.5 (25.8)	20.2 (4.1)
Occupation				
Nurse	36	74.7 (23.3) NS	91.9 (22.3) NS	20.8 (3.4) NS
Care worker	90	77.7 (14.9)	90.1 (17.9)	21.2 (3.8)
Years of work with the elderly				
Under 5	69	80.6 (15.4) **	95.7 (16.6) NS	22.1 (3.2) *
5-10	38	68.2 (19.7)	88.4 (21.8)	19.9 (4.6)
Over10	19	70.0 (15.5)	89.0 (21.2)	20.1 (2.6)
Experience of living with the elderly				
Yes	61	72.9 (18.1) NS	90.4 (21.4) NS	20.0 (4.1) NS
No	65	79.5 (16.6)	91.7 (16.8)	21.9 (3.0)
Experience of learning elderly sexualiy				
Yes	40	67.6 (16.9) ***	81.2 (18.9) ***	19.5 (3.5) **
No	86	84.7 (15.5)	100.8 (16.9)	22.5 (3.6)

^a Possible range of knowledge score (35-105), ^b Possible range of attitude score (26-182), ^c Possible range of image score (8-40) Gender, Occupation, Experience of living with the elderly, Experience of learning elderly sexuality: Mann-Whitney U test Age, Marital status, Years of work with the elderly: Kruskal Wallis test
 *P<0.05, **P<0.01, ***P<0.001 NS: Not Significant

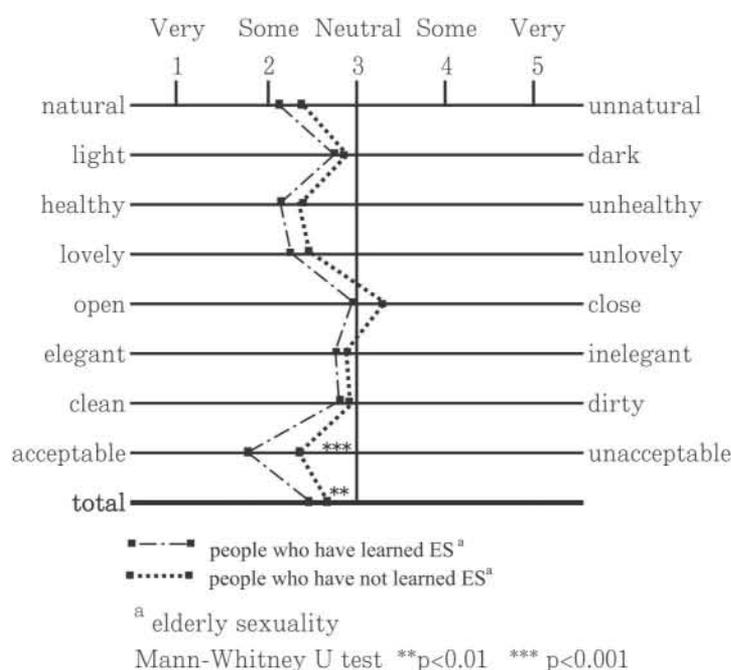


Fig. 1 Image comparison between ES knowledgeable and unknowledgeable populations

Table 3 Multiple regression analysis of factors related to the knowledge, attitudes, and image on elderly sexuality

Variables	Knowledge		Attitudes		Image	
	r	Beta	r	Beta	r	Beta
Gender	0.30**	0.30**	0.07	0.13	0.17	0.24*
Age	-0.10	-0.06	-0.05	0.11	-0.22*	-0.10
Marital status	-0.13	-0.08	-0.11	-0.11	-0.25*	-0.17
Occupation	0.05	0.09	-0.11	-0.04	0.05	0.04
Years of work for the elderly	-0.16	-0.06	-0.18	-0.09	-0.18	-0.03
Experience of living with the elderly	0.15	0.16	0.06	0.06	0.20*	0.24*
Experience of learning elderly sexuality	0.43***	0.40***	0.40***	0.44***	0.26**	0.22*
	R	0.55***		0.49***		0.48*
	R ²	0.30		0.23		0.23

N=126

r=Spearman's correlation coefficients

Beta: Standardized coefficients

*p<0.05

**p<0.01

***p<0.001

Gender: 0. Male 1. Female

Marital status: 0. Single 1. Married 2. Divorced/Widowed

Occupation: 0. Nurse 1. Care worker

Years of work with the elderly: 0. Under 5 (yrs) 1. 5-10 (yrs) 2. Over 10 (yrs)

Experience of work with the elderly: 0. Yes 1. No

Experience of learning elderly sexuality: 0. Yes 1. No

positive correlation with the factor of experience of learning elderly sexuality ($r=0.4$, $p<0.001$). Image showed a positive correlation with the factors of experience of living with the elderly ($r=0.2$, $p<0.05$) and elderly sexuality education ($r=0.26$, $p<0.01$), but a negative correlation with the factors of age ($r=0.22$, $p<0.05$) and marital status ($r=0.25$, $p<0.05$).

Based on these findings, a multiple regression analysis measured significance using seven background factors as independent variables and knowledge, attitudes, and image toward elderly sexuality as dependent variables. The multiple regression analysis is based on the Spearman's rank correlation coefficients. Knowledge showed a significant positive correlation with the factors of gender ($p<0.01$) and experience of learning elderly sexuality ($p<0.001$). Attitudes demonstrated a significant positive correlation with the factor of experience of learning elderly sexuality ($p<0.001$). Image showed a significant positive correlation with the factors of gender ($p<0.05$), experience of living with the elderly ($p<0.05$), and experience of learning elderly sexuality ($p<0.05$).

Table 4 Correlation among the knowledge, attitudes, and image on elderly sexuality

	Knowledge			Attitudes			Image		
Knowledge	1.0	0.512**	0.480**						
Attitudes	0.512**	1.0	0.380**						
Image	0.480**	0.380**	1.0						
Pearson's correlation coefficient								**p<0.01	

N=126

5. Correlation among Knowledge, Attitudes, and Image on Elderly Sexuality (Table 4)

One of the objectives of the study was to determine if there was a relationship among health care staff's knowledge, attitudes, and image of elderly sexuality. The results of the study indicated a significant positive correlation between knowledge and attitude ($r=0.51$, $p<0.01$), knowledge and image ($r=0.48$, $p<0.01$), and attitude and image ($r=0.38$, $p<0.01$).

Table 5 Educational background and primary method of elderly sexuality education

		n=40 ^a
		n (%)
Educational background	• College (nursing, other than nursing)	4 (10.0)
	• Vocational nursing school	23 (57.5)
	• High school	13 (32.5)
	• Others	0 (0.0)
		<hr/> 40 (100.0)
Primary method of elderly sexuality education	• College class	0 (0.0)
	• Vocational nursing class	7 (17.5)
	• Outside seminar	12 (30.0)
	• Others (Books, TV, Radio, etc.)	21 (52.5)
		<hr/> 40 (100.0)

^a Respondents who experienced learning elderly sexuality

6. Educational Background and Primary Method of Elderly Sexuality Education (Table 5)

Forty care staffs, which is 31.7% of total respondents indicated that they had received elderly sexuality education. The educational background of the groups included college graduates (10%), vocational nursing school graduates (57.5%), and high school graduates (32.5%). As presented in the table, the largest percentage (52.5%) indicated books and mass media, such as special programs on TV and radio, as the foundation of their elderly sexuality learning. Thirty percent received training in an outside seminar and 17.5% obtained education in vocational nursing class. No respondent documented learning about elderly sexuality in a college class.

DISCUSSION

1. Knowledge and Attitudes toward Elderly Sexuality

In comparison to the mean scores of subjects reported by previous studies^{11,25,26)}, the nursing home staff in this study demonstrated a mean of 76.2 ± 17.6 in knowledge and 91.0 ± 19.1 in attitudes, which indicated less knowledgeable, negative attitude than those of previous studies. In knowledge scores, White and Catania²⁵⁾ reported means of 62.5 ± 12.5 for nursing home staff and 73.7 ± 12.5 for elderly persons not residing in nursing homes. Luketich¹¹⁾ noted a 51.2 ± 9.7 knowledge score for graduate nursing students. In addition, Akamine *et al.*²⁶⁾ found a mean knowledge score of 68.7 ± 14.8 for senior students majoring in health sciences.

In attitude scores, White and Catania²⁵⁾ reported means of 76.0 ± 17.0 for nursing home staff and 75.0 ± 22.7 for non-residential elderly. Luketich's study¹¹⁾ noted a mean of 51.0 ± 22.8 for graduate nursing students. Additionally, Akamine *et al.*²⁶⁾ demonstrated a mean of 80.8 ± 16.1 for senior students majoring in health sciences.

This study's differences in knowledge and attitudes may in part be explained by Quinn-Krach and Hoozer's study¹⁰⁾ of the knowledge and attitudes toward elderly sexuality in Asian and Caucasian students attending a US college. They found Asian students in the study were less knowledgeable and had a more negative attitude about aged sexuality than Caucasian students. The result might be explained by the cultural shock that Asian students experience in US-based nursing education.

In Japan people tend to view residents' sexual interests as "behavioural problems" rather than a normal expression of need for human contact^{18,27,28)}. As this study's respondents are Japanese, it is a reasonable to infer that the findings of a less permissive attitude may be due to a cultural indifference toward elderly sexuality. According to Glass *et al.*²⁹⁾, age, gender, marital status, and religious denomination did not significantly impact knowledge and attitudes towards elderly sexuality. Unlike Glass's research, this study did not compare religious denominations. This study noted however, the gender, years of work with the elderly, and experience of learning elderly sexuality affected the knowledge of respondents. The mean score in knowledge of the educated group was 67.6 ± 16.9 , higher than 51.2 ± 9.7 for graduate nursing students

in Luketich's study¹¹, but slightly lower than 68.7 ± 14.8 for senior students majoring in health sciences.

In attitudes, there was a significant difference in one variable of learning elderly sexuality. The mean score in attitudes of the educated group in this study, 81.2 ± 18.9 , was higher than most of the mean scores reported by White and Catania²⁵, and was significantly higher than 51.0 ± 22.8 for graduate nursing students in Luketich's study¹¹. The analysis demonstrates that education regarding sexuality in the aged creates significant differences in knowledge and attitudes toward the subjects. Care staffs who had received elderly sexual education were more knowledgeable and had a more positive attitude toward the subject than the care staffs that lacked training.

2. Image of Elderly Sexuality

Until recently, there were limited studies on the image of elderly sexuality using the SD technique. Sasaki *et al.*²⁴ examined image of sexuality in young adults, middle aged adults, and older adults. In their study each aggregate answered questions about the image of sexuality in their own age group and that in the other two age groups. They found that older age resulted in negative images of sexuality in the items related to physical activity, but more positive images in matters pertaining to psychological feeling. According to Akamine *et al.*²¹, profession, age, and experience of learning elderly sexuality were significantly related to image of elderly sexuality. Their study supports Mizutani *et al.*'s findings²⁰ that increased age tends to result in a more positive image of sexuality.

In the present study, experience of learning elderly sexuality is the most influential variable on image. This analysis concurs with a study using the SD technique³⁰ with college students as a population base. Students with more education on aging form a more positive image of elderly populations³¹.

3. Multiple Regression Analysis of Factors Related to the Knowledge, Attitudes, and Image on Elderly Sexuality

Multiple regression analysis utilized sociodemographic and institutional factors as independent variables and knowledge, attitudes, and image of elderly sexuality as dependent variables. The ra-

tionale for using this statistical procedure is to support the understanding of the simultaneous effects of two or more independent variables on a dependent variable³². The study analyzed the simultaneous effects of seven variables. Analysis included studying the effect of gender, age, marital status, occupation, years of work with the elderly, experience of living with the elderly, and experience of learning elderly sexuality on knowledge, attitudes, and image of elderly sexuality. The most statistically significant independent variable was the experience of learning elderly sexuality.

4. Correlation between the Knowledge, Attitudes, and Image on Elderly Sexuality

The positive relationship between knowledge and attitudes in this study supports the deductions of previous^{1,11-13}. This study concurred with the finding of Mizutani *et al.*²⁰ establishing the fact that the more knowledge nurses possess about elderly sexuality, the more positive image they had toward the subject. In spite of the demonstrated positive relationships among knowledge, attitudes, and image, the question about the causality still remains. A possible explanation to nursing staff's higher knowledge, positive attitudes, and image scores is that the group sought to expand their knowledge of elderly sexuality on their own time. Examining the contents and technique of elderly sexuality education is a way for gerontological nursing educators to improve the quality of elderly nursing care. The effectiveness of educational interventions about sexuality in the aged should be a focus of future nursing studies in Japan.

Boulding³³ noted that human behaviors and attitudes depend upon their image and the image is altered by increased knowledge. Obtaining knowledge by education can alter a person's attitudes or perception by shifting an emotionally based image to a more knowledge-based image^{30,34}. Without adequate knowledge and an affirmative image of elderly sexuality, how can nurses assess an older adult's feelings and concerns regarding sex or the desire for intimate relations with peers? Nurses have an excellent opportunity to provide sexual education not only to care workers but also to older adults and their families. Nurses can also evaluate their elder patients' level of knowledge related to normal physical changes occurring in his/her body, and be prepared to offer suggestions

as needed. Nurses should encourage elders to engage in open communication with their partners regarding their feelings, needs, and likings and to enjoy rather than repress their own sexual desires³⁵.

5. Educational Background and Primary Method of Elderly Sexuality Education

In the present study 31.7% care staffs received elderly sexuality education through multiple sources. The primary source of education on elderly sexuality occurred through outside seminars, books and mass media. Educational background of the respondents with elderly sexuality training noted nearly 60% had completed vocational nursing school and 10% were college graduates. None of the college graduate respondents listed a college class as the source of their elderly sexuality education. In addition, not every vocational nursing school taught elderly sexuality.

Takamura *et al.*³⁶ in their study consisted of 116 Japanese nursing schools and colleges found that all of the responded schools had at least one course with a unit on "sexuality" in their school curriculum. Most of the courses were Mental Health, with less than 10% originating in fundamental nursing, maternal nursing, or gerontological nursing tracks. This finding suggests that the discussion of elderly sexuality in gerontological nursing courses is not common, even though knowledge and attitudes in aged sexuality can have a direct impact upon elderly care. Inadequate knowledge and negative attitudes in one aspect of elderly personhood can adversely affect a nurse's interest in caring for older people and potentially decrease the quality of nursing care. Japanese gerontological nursing educators should include formal inservice programs for care staff and develop school curriculums for nursing students on the topic of elderly sexuality. Educational programs need to incorporate discussions of the myths and taboos regarding the sexuality of nursing home residents, sexuality and the aging process, and mechanisms for compensating for physical disabilities. It is the responsibility of health care professionals in Japan to provide holistic, meaningful information on all aspects of healthy living to elders and their families in this expanding population.

CONCLUSION

This study found that "experience of learning elderly sexuality" significantly impacted knowledge, attitudes, and images of elderly sexuality. Statistical comparisons demonstrated significant positive correlations between knowledge and attitude scores ($r=0.51$), knowledge and image scores ($r=0.48$), and attitude and image scores ($r=0.38$). However, only 31.7% of the respondents received elderly sexuality education and most of their learning occurred outside a school setting. The present findings indicate that education is a key to increase care staffs' knowledge, positive image, and attitude on elderly sexuality.

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