

ORIGINAL**Determinants of life satisfaction among Japanese elderly women attending health care and welfare service facilities**

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Abstract : Prolonged life expectancy must be recognized as an excellent achievement of modern medicine, but not all the elderly people are satisfied with their lives. Life satisfaction is a multi-dimensional issue that depends on many objective and subjective characteristics. In this study, we aimed at investigating the factors affecting life satisfaction of 314 elderly Japanese women attending in 28 elderly-care and welfare facilities at Tokushima Prefecture, Japan. Our results indicated that elderly subjects with depression tendencies always show significantly lower degrees of life satisfaction than others who are not depressed ($p < 0.001$) regardless of their cognitive status. Furthermore, elderly women who shared decision for their living place and whose opinions were considered for daily life decisions reported significantly more life satisfaction levels than others. We conclude that elderly life satisfaction is affected by various determinants however, with different influencing weight. Life satisfaction of elderly people, with or without dementia, is greatly affected by their mood status and share in decision making. Avoiding elderly people depressive mood, sharing them in various daily decisions, considering their opinions, and allowing them to decide their elderly-care facility placement are crucial determinants for their life satisfaction and essential for their coping, adaptation, well-being and successful aging. *J. Med. Invest.* 57 : 69-80, February, 2010

Keywords : *life satisfaction, decision making, depression, dementia, elderly women*

INTRODUCTION

Recent demographic changes that have been occurring in the developed societies with increased longevity have given a specific weight of the elderly as a social and vulnerable group. Japanese population tends to grow increasingly older ; and it

is expected on the year 2025, that more than 30% of the Japanese people will be 65 years or older. The official international comparisons have shown that Japanese women have the highest life expectancies among all the world populations (1).

However, increasing the life expectancy and having prolonged life must be recognized as an excellent achievement of the modern medicine, but not all the elderly people are satisfied with the quality of their lives (2, 3). Life satisfaction is a multi-dimensional issue that depends on many objective and subjective characteristics including the cognitive

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functions, emotional status, social support, physical condition and independence as well as sociodemographic variables. For instance, impaired health have shown a low correlation with life satisfaction, however, personality (4), satisfaction with friends (5), independent life in the community (6) and physical activities (7) were reported as strongly correlated variables with life satisfaction.

Therefore, besides the traditional medical goals of the nursing homes that always concentrate on prevention, identification and treatment of chronic, subacute or acute medical conditions affecting the elderly, these nursing homes take into consideration and focus simultaneously on the functional independence, autonomy, quality of life (QOL), comfort, and life satisfaction of the old residents (7-9).

Yet, the presence of several factors that contribute to life satisfaction of the elderly and the interactions between these factors as well as their relative weight may vary with changes in the life conditions of the old people.

Among the factors that affect life satisfaction of the elderly are alterations in their cognitive functions and memory complaints, i.e. dementia. Different studies have reported that the prevalence of memory complaints among the elderly populations ranges from 25% to 50% ; and alterations of the memory including dementia are usually associated with older ages, low educational level and female gender (10, 11). Clare et al., (2008) reported that 89% of participants in their study who suffered from moderate to severe dementia were psychologically suffering and they expressed distressful life with feelings of uncertainty, loss, isolation and loneliness, fear and worthlessness. These results indicate the unhappiness and the very low level of life satisfaction of the people with moderate to severe (12) and even with mild dementia (13).

Different investigations have also shown that physical activity is an important determinant of elderly life satisfaction. Maintaining the physical functions will increase the capacity of the elderly person for moving independently, using daily instruments, toileting, clothing and performing other self-care activities (14, 15). Fulfilling these functions independently, indicate autonomy which is always reflected on the older person's satisfaction with his/her life.

Another factor that affects life satisfaction of the elderly is sharing in the decision making and consideration of one's decision regarding his/her move to a health or day care facility (16). The decision to move an elderly to a health or day care facility is one of the most difficult processes that can greatly affect his/her satisfaction with life. The decision to move is usually associated with conflicting feelings of stress, shock, anxiety, fear and resistance regardless of the level of necessity for a caring facility placement (17-19). Although the task of living of an elderly person with dementia in a care facility could often be managed, it could at times be experienced as deeply frustrating and annoying, provoking an emotional resistance (20, 21). Achieving an acceptable level of comfort with such a decision and maintaining life satisfaction of the elderly people with their coping and adaptation with the new environment is a difficult challenge.

Therefore, detailed studies and deeper knowledge are required about these factors contributing to the life satisfaction of elderly people.

In the present study, we aimed at investigating the factors affecting life satisfaction of the elderly Japanese women attending elderly-care and welfare facilities, at Tokushima Prefecture, Japan. Our ultimate goal of such studies is to propose, evidence-based intervention approaches to improve the quality of life of the elderly people and modify the variables that affect their life satisfaction and lead to pathological patterns of life.

SUBJECTS AND METHODS

Subjects :

The sample of the present study is made up of Japanese elderly women who attend and receive some health care and/or welfare service at different facilities for the elderly in Tokushima Prefecture, Japan. A total of 422 elderly subjects, eligible for this research, were informed about the study and requested to participate by the directors of the 28 different facilities that offer health care and/or welfare services for elderly people in Tokushima Prefecture. Amongst them, 360 subjects agreed to answer the study questionnaires and have the interview survey ; however, 62 subjects did not consent to participate in the study. Additionally, 42 subjects were excluded because they could not offer complete data and their questionnaires had high internal dropouts. Also, we excluded the data of the

remaining 4 males, since their number was too few to yield any statistically reasonable results.

Therefore, our study was based on analyzing data collected from the eligible 314 women only, who could respond fully to the interview and offered complete data to the questionnaires. The participating women ages ranged from 66-100 years with a mean age of 83.5 ± 6.7 years. All the elderly women belong to Tokushima Prefecture, Japan and they were distributed to homes or other facilities i.e., hospitals or nursing homes ; their sociodemographic characteristics and the means of the descriptive analyses of the tests applied are shown in Table 1.

Procedure and data collection :

We prepared the questionnaires and measuring instruments, examined their application feasibility in a separate pilot study on a group of elderly people whose data are not included in the analysis of the study sample. Data collection process was conducted between June and August, 2004.

The elderly people often have sensory difficulties and functional disabilities that make it difficult to answer the questionnaires by themselves, or respond properly to the interviewers. To improve this handicap, the interviewers were well-trained for the application of the different tests and questionnaires

Table 1 : Characteristics of the studied Japanese elderly women, classified into non-demented and demented groups by Hasegawa Dementia Scale-Revised.

Variable		Total n (%)	Not dementia n(%)	Dementia n(%)	p-value
Total		314 (100)	149(100)	165(100)	
Age	65~74 y	34 (10.8)	20 (13.4)	14 (8.5)	0.014
	75~84 y	131 (41.7)	71 (47.7)	60 (36.4)	
	85 y~	149 (47.5)	58 (38.9)	91 (55.2)	
		(Mean± SD) 83.5± 6.7	(Mean± SD) 82.2± 6.4	(Mean± SD) 84.6± 6.7	0.002
Living place	In-home	54 (17.2)	38(25.5)	16(9.7)	< 0.001
	Health care facility	91 (29.0)	40(26.8)	51(30.9)	
	Nursing home	88 (28.0)	32(21.5)	56(33.9)	
	Hospital	30 (9.6)	3(2.0)	27(16.4)	
	Group home	35 (11.1)	25(16.8)	10(6.1)	
	Care house	16 (5.1)	11(7.4)	5(3.0)	
Care level in long-term care insurance	Class-0	19 (6.1)	13(8.7)	6(3.6)	< 0.001
	Pre-class-1	25 (8.0)	21(14.1)	4(2.4)	
	Class-1	94 (29.9)	57(38.3)	37(22.4)	
	Class-2	87 (27.7)	38(25.5)	49(29.7)	
	Class-3	47 (15.0)	11(7.4)	36(21.8)	
	Class-4	34 (10.8)	7(4.7)	27(16.4)	
	Class-5	8 (2.5)	2(1.3)	6(3.6)	
Degree of bedridden	Independent	17 (5.4)	15(10.1)	2(1.2)	< 0.001
	Class-J1	21 (6.7)	17(11.4)	4(2.4)	
	Class-J2	37 (11.8)	24(16.1)	13(7.9)	
	Class-A1	97 (30.9)	45(30.2)	52(31.5)	
	Class-A2	63 (20.1)	26(17.4)	37(22.4)	
	Class-B1	47 (15.0)	15(10.1)	32(19.4)	
	Class-B2	26 (8.3)	5(3.4)	21(12.7)	
	Class-C1	3 (1.0)	1(0.7)	2(1.2)	
	Class-C2	3 (1.0)	1(0.7)	2(1.2)	
ADL	(Mean± SD) 76.8±21.5	(Mean± SD) 82.2±19.3	(Mean± SD) 72.0±22.4	< 0.001	
IADL	(Mean± SD) 2.6±2.2	(Mean± SD) 3.8±2.3	(Mean± SD) 1.57±1.6	< 0.001	
GDS-15	(Mean± SD) 4.9±3.2	(Mean± SD) 4.6±3.1	(Mean± SD) 5.2±3.3	0.106	

p-value : Mann-Whitney U test, Chi-square test

ADL : Activities of daily living using Barthel Index(0-100)

IADL : The Lawton instrumental activities of daily living scale.(0-8)

GDS-15 : The 15-item geriatric depression scale (0-15)

that were administered in this study.

Moreover, the interviewers got training to apply and record data and practiced how to communicate and deal with the defective articulation of the elderly people.

Instruments, tests and measures :

The measurements consisted of subject characteristics including care level, dependence, daily life activities, cognitive functions, mood status, measuring the elderly women life satisfaction and evaluating the process of decision making for care facility placement and for one's opinion consideration in daily life decisions.

(1) Subject characteristics

a) For the following subjects' data were obtained from the medical records :

- Age, living places (in-home, health service facility for the aged, special nursing home for the aged, group home, care houses).
- Care level was determined according to questionnaire of the Japanese long-term care insurance system ; and the elderly women were classified according to the level of care they required : low care level (class 0 and pre-class 1), moderate care level (class 1 and class 2) or high care level (classes 3, 4 and 5).
- Degree of bedridden (independent, class-J, class-A, class-B, class-C) was obtained from the medical records. Global assessment of independence was performed and the elderly people were evaluated to be one of three levels ; Independent (~J), Moderate bedridden (class-A), and Bedridden (class-B and C).

b) For the following items the interviewers assessed or measured them using the instruments and study questionnaires :

- Activities of daily living (ADL) was assessed by the interviewers using Barthel Index (0-100) (22).
- IADL : The Lawton instrumental activities of daily living (IADL) scale (0-8) (23) was applied by the interviewers.
- The 15-item geriatric depression scale (GDS-15) (0-15) (24) was applied by the interviewers.
- Level of dementia- using HDS-R (Hasegawa Dementia Scale-Revised) (25) (0-30) was applied by the interviewers ; and the dementia status was defined as individuals with HDR-R score of 20 or less.

(2) Life satisfaction

Life satisfaction was measured by applying a visual analog scale (VAS) to evaluate five aspects of satisfaction (health status, economic status, relationship with family, relationship with friends, and daily living). The scale is 100 mm long ; where 0 indicates dissatisfaction and 100 mm indicates full or complete satisfaction. Life satisfaction level was measured by the participant's pointing or checking a point on the VAS scale between 0 and 100 mm. The level of total satisfaction of each participant was calculated by summing up her 5 VAS scales.

(3) State of decision making

Decision making for placement in an elderly care facility and opinions in general daily life were investigated by checking the 3 following aspects, with multiple responses.

- Decision maker for the elderly person living place,
- Degree of the elderly participant's acceptance of decision for living place, and
- Degree of consideration for one's decision in general facets of daily life.

Data analysis :

The collected data were analyzed and presented either as frequencies or as means with standard deviation. In order to investigate the influence of the subject characteristics on the life satisfaction, we used Mann-Whitney U test for two categorical variables-subject characteristics, and used Kruskal-Wallis test for over three categorical variables-subject characteristics (subject age, living place, care level, degree of bedridden, and depression level). Chi squared test was used to analyze the effect of decision making on the life satisfaction of elderly women. Correlation analysis was used to investigate the relations among the variables in this study by Spearman correlation coefficients.

A recent study by Konagaya et al. (2009) investigated the relationship between QOL and cognitive function among community-dwelling elderly and reported that the cognitive function was considered to have more influence on the elderly people's QOL scores than age or gender (26). Since dementia can comprise a confounding factor in our study, therefore, we classified the studied sample into demented and non-demented groups by Hasegawa scale for dementia-revised.

Additionally, structural equation modeling (SEM) was used to test the research hypotheses. SEM is

a multivariate statistical methodology that allows for a confirmatory or hypothesis-testing approach of analyzing theoretically linked relationships between constructs relative to certain phenomenon. Independently, in the dementia and non-dementia elderly women groups we investigated the associations among subjects' characteristics variables and life satisfaction.

Analysis of Moment Structures (AMOS) version 18.0 software (SPSS Corp., Tokyo) was used for SEM approach analysis ; and a Statistical Package for Social Sciences (SPSS version 10.0 for Windows) software was used for other descriptive and correlation data analyses. P-values less than 0.05 were considered significant.

Ethical considerations :

Informed consents were obtained from directors of the facilities after they were given detailed explanation about the research purposes and confirmations about confidentiality of the data and privacy protection of the institutions and residents. Then, prior to the interview and questionnaire survey, informed consent was obtained from each participant. This research was conducted after being approved by the ethical committee of Tokushima University Hospital.

RESULTS

Our study included 314 Japanese elderly women who completed the questionnaires and the interviews. Those participating women aged above 65 years old with a mean of 83.5 ± 6.7 years. Among them 10.8% aged 65~74 years, 41.7% aged 75~84 years and 47.5% aged 85 years or more. The participants usual living places were their own homes (17.2%), health care facility (29%), nursing home

(28%), hospitals (9.6%) and group home or care house (11.1% and 5.1%), respectively. As for the care level, 14.1% of the elderly women lived independently or with low care, and 57.6% needed moderate care but 28.3% needed high care levels. By applying the test for the memory status, HDS-R, and by taking the cut-point of 20/21, the results showed that 52.5% of the elderly women had dementia while the other 47.5% did not have dementia. The degree of bedridden and other subjects' characteristics as well as the means of activities of daily life, instrumental activities of daily life as well as geriatric depression scale testing among the participating elderly women are presented in Table 1. The elderly women with dementia had significantly older ages, needing high care levels, moderately to completely-bedridden, hospitalized or living in nursing or health care facilities, with lower means of ADL and IADL than those who have no dementia (Table 1).

The mean and standard deviation of the VAS for the five aspects of life satisfaction investigated in our study are shown in Table 2. Generally, the participants reported the highest score of satisfaction for the "relationship with family" however ; they were dissatisfied with their "health status". Table 2 also indicates that the participants who have no dementia were significantly more satisfied with their "relationship with friends" than those with dementia ($p=0.027$). In contrast, elderly women with no dementia were significantly dissatisfied with their "health status" ($p=0.016$).

There were no significant differences between total life satisfaction of the elderly women with dementia and those with no dementia as regards to their living place, care level, degree or being bed ridden. Using Mann-Whitney U test and Kruskal-Wallis test to compare the total life satisfactions within and between the dementia and non-dementia groups could not reveal any significant difference in the

Table 2 : Visual Analogue Scale "Mean and SD" for the five aspects of life satisfaction among Japanese non-demented and demented elderly women.

Variable	Total (n=314)	Not dementia (n=149)	Dementia (n=165)	p-value
Satisfaction with :				
Health status (0-100)	55.6± 26.4	51.2± 25.7	59.5± 26.5	0.016
Economic status (0-100)	64.2± 29.5	65.8± 28.7	62.8± 30.3	0.441
Relationship with family (0-100)	72.8± 30.0	76.3± 28.3	69.7± 31.2	0.085
Relationship with friends (0-100)	66.4± 31.6	70.9± 30.4	62.4± 32.2	0.027
Daily living (0-100)	71.0± 27.4	71.6± 27.1	70.5± 27.8	0.900
Total life satisfaction (0-500)	330.0± 103.2	335.7± 95.0	324.9± 110.1	0.393

p-value : Mann-Whitney U test

subjects' characteristics except for the GDS-15 ; where subjects with depression tendencies always show significantly lower degrees of life satisfaction than others who are not depressed ($p < 0.001$) (Table 3).

Comparing the means of life satisfaction among the different age groups within and between the dementia and non-dementia elderly women resulted in a significant higher satisfaction levels of dementia and non dementia women whose ages are 85 y and

above compared to the 65~74 age group. Table 3 shows that the elderly women in the higher age groups had higher total life satisfaction.

To investigate the effect of decision making on the participants total life satisfaction, we used Mann Whitney U test to find the relationship between each of three items related to decision making with the mean total life satisfaction in the elderly women with dementia or without dementia (Table 4). Acceptance of the living place decision by the

Table 3 : Comparisons of total life satisfactions within and between the groups of non-demented and demented Japanese elderly women, as regards to selected characteristics.

Variable	Total life satisfaction, Mean \pm SD (n)			p-value	
	Total (n)	Not dementia (n)	Dementia (n)		
Total	314	149	165		
Age	65~74 y	282.9 \pm 98.5(34)	281.7 \pm 101.2(20)	284.6 \pm 98.3(14)	0.891
	75~84 y	316.2 \pm 114.6(131)	343.6 \pm 98.2(71)	283.8 \pm 124.6(60)	0.003
	85 y~	352.9 \pm 87.2(149)	344.8 \pm 83.6(58)	358.1 \pm 89.5(91)	0.368
	p-value	< 0.001	0.034	< 0.001	
Living place	In-home	353.1 \pm 86.4(54)	351.4 \pm 86.3(38)	357.2 \pm 89.5(16)	0.880
	In-facility	325.2 \pm 105.8(260)	330.4 \pm 97.6(111)	321.4 \pm 111.7(149)	0.513
	p-value	0.080	0.273	0.221	
Care level in long-term care insurance	Low-care revel	330.5 \pm 94.8(44)	321.6 \pm 86.1(34)	360.9 \pm 120.1(10)	0.130
	Moderately care revel	335.8 \pm 101.9(181)	343.4 \pm 98.7(95)	327.4 \pm 105.2(86)	0.284
	High care revel	318.0 \pm 109.7(89)	323.6 \pm 91.9(20)	316.4 \pm 114.9(69)	0.727
	p-value	0.385	0.280	0.341	
Degree of bedridden	Independent	334.3 \pm 101.6(75)	329.8 \pm 94.9(56)	347.3 \pm 121.3(19)	0.377
	Moderately bedridden	337.2 \pm 100.8(160)	349.0 \pm 94.3(71)	327.9 \pm 105.2(89)	0.189
	Bedridden	311.4 \pm 108.4(79)	308.2 \pm 94.5(22)	312.7 \pm 114.0(57)	0.865
	p-value	0.134	0.098	0.393	
GDS-15	Not depression (0-4)	368.6 \pm 88.2(158)	362.2 \pm 81.2(80)	375.2 \pm 95.3(78)	0.249
	Depression (5-15)	290.9 \pm 102.5(156)	305.0 \pm 101.0(69)	279.7 \pm 102.9(87)	0.131
	p-value	< 0.001	0.001	< 0.001	

p-value : Mann-Whitney U test, Kuruskal Wallis test
GDS-15 : The 15-item geriatric depression scale (0-15)

Table 4 : Comparison between different items of decision making and total life satisfaction within and between non-demented and demented Japanese elderly women groups.

Items of decision making	Total life satisfaction (n) Maen \pm SD			p-value
	Total (314)	Not dementia (149)	Dementia (165)	
Decision maker for living place				
Oneself	338.0 \pm 101.0(149)	337.3 \pm 92.6(77)	338.1 \pm 110.0(72)	0.779
Family or others	322.8 \pm 104.9(165)	334.0 \pm 98.2(72)	314.0 \pm 109.5(93)	0.213
p-value	0.160	0.894	0.101	
Acceptance of decision for living place				
Almost accepted	339.3 \pm 97.9(277)	344.1 \pm 92.1(129)	335.2 \pm 102.9(148)	0.362
Poorly or not accepted	260.3 \pm 115.5(37)	281.8 \pm 98.3(20)	235.0 \pm 131.5(17)	0.357
p-value	< 0.001	0.004	0.003	
Consideration for one's decision				
Almost considered	340.7 \pm 96.2(251)	340.6 \pm 89.0(123)	340.8 \pm 102.9(128)	0.942
Poorly or not considered	287.5 \pm 119.0(63)	312.8 \pm 118.9(26)	269.7 \pm 117.3(37)	0.192
p-value	0.002	0.327	0.002	

p-value : Mann-Whitney U test

elderly participants themselves is important for their feelings of satisfaction with their lives. Those who accepted the decision of living place were significantly more satisfied than those who did not accept it (p=0.001). Regarding the consideration of one's decision for the daily life, the elderly women whose opinions were considered in the general daily life aspects reported significantly more satisfaction with their lives than those whose opinions were poorly or not considered (p=0.002).

Table 5 shows correlation matrices among the 5 aspects of life satisfaction, total life satisfaction, subjects characteristics as well as participants functions of ADL and IADL and GDS-15 in participants with no dementia (Table 5-a) and in those who had dementia (Table 5-b).

Total life satisfaction was significantly correlated with each of the studied 5 aspects of life satisfaction, individually ; and each life satisfaction aspect was significantly correlated with the other 4 aspects

Table 5-a : Spearman correlation coefficients among life satisfaction items and subjects' characteristics of non-demented Japanese elderly women (n=149).

	Age	ADL	IADL	GDS-15	Health status	Financial status	Relationship with family	Relation with friends	Daily living	Total life satisfaction
Age	1.000	-0.009	-0.182 *	-0.054	0.104	0.052	-0.036	0.041	0.223 **	0.112
ADL	-	1.000	0.654 **	-0.196 *	0.247 **	0.171 *	-0.149	0.071	0.013	0.144
IADL	-	-	1.000	-0.208 **	0.010	0.070	-0.122	0.114	-0.081	0.024
GDS-15	-	-	-	1.000	-0.276 **	-0.178 *	-0.134	-0.179 *	-0.295 **	-0.350 **
Health status	-	-	-	-	1.000	0.212 **	0.106	0.124	0.382 **	0.528 **
Financial status	-	-	-	-	-	1.000	0.494 **	0.271 **	0.455 **	0.719 **
Relationship with family	-	-	-	-	-	-	1.000	0.313 **	0.366 **	0.636 **
Relation with friends	-	-	-	-	-	-	-	1.000	0.315 **	0.594 **
Daily living	-	-	-	-	-	-	-	-	1.000	0.746 **
Total life satisfaction	-	-	-	-	-	-	-	-	-	1.000

* : p< 0.05, ** : p< 0.01

Table 5-b : Spearman correlation coefficients among life satisfaction items and subjects' characteristics of demented Japanese elderly women (n=165).

	Age	ADL	IADL	GDS-15	Health status	Financial status	Relationship with family	Relation with friends	Daily living	Total life satisfaction
Age	1.000	0.066	-0.041	-0.180 *	0.178 *	0.037	0.221 **	0.280 **	0.257 **	0.277 **
ADL	-	1.000	0.506 **	-0.105	0.268 **	0.159 *	0.058	0.130	0.050	0.186 *
IADL	-	-	1.000	-0.064	0.138	0.140	0.041	0.027	0.055	0.113
GDS-15	-	-	-	1.000	-0.361 **	-0.333 **	-0.348 **	-0.366 **	-0.381 **	-0.509 **
Health status	-	-	-	-	1.000	0.490 **	0.308 **	0.414 **	0.352 **	0.669 **
Financial status	-	-	-	-	-	1.000	0.477 **	0.445 **	0.443 **	0.754 **
Relationship with family	-	-	-	-	-	-	1.000	0.464 **	0.539 **	0.746 **
Relation with friends	-	-	-	-	-	-	-	1.000	0.517 **	0.761 **
Daily living	-	-	-	-	-	-	-	-	1.000	0.734 **
Total life satisfaction	-	-	-	-	-	-	-	-	-	1.000

* : p< 0.05, ** : p< 0.01

except for the correlation coefficient between health status and “relationship with family or friends” in the non-demented group. Nonetheless, in both groups of demented and non-demented participants, GDS-15 showed significantly negative correlations with total life satisfaction as well as with each of the life satisfaction aspects but not with “relationship with family or friends” in the non-demented group. In the elderly women with no dementia, the satisfaction with one’s health was significantly correlated with total ADL ($r=0.25, p<0.01$); and the GDS-15 was negatively correlated with the ADL and IADL ($r=-0.20, p<0.05$ and $r=-0.21, p<0.01$), respectively.

In the elderly women with dementia, total ADL was significantly correlated with satisfaction with one’s health status ($r=0.27, p<0.01$) and with total life satisfaction ($r=0.2, p<0.05$); moreover, they tend to have more satisfaction with health, family, friends and daily living as they grow older.

We developed a statistical model using AMOS software to understand the interactions and weight of effects of different determinants on the total life satisfaction. We got a model graph for dementia group and another one for the non-dementia group, independently (Figures 1 and 2). The model explained approximately 21% (R square) and 36% of variance in total life satisfaction of the non-demented and demented elderly women, respectively. In this path model, entirely, the goodness of fit index (GFI) was above the recommended level (>0.90), but the root mean square error of approximation (RMSEA) was greater than the recommended value of 0.05 in both groups.

Degree of depression showed a significantly negative effect on total life satisfaction ($\beta=-0.32, p<0.001$ and $\beta=-0.35, p=0.001$) for non-dementia and dementia groups, respectively. Moreover, the parameter estimates from [Acceptance of one’s decision] (latent variable : concerning decision making) to degree of depression was significantly correlated ($\beta=-0.46, p=0.005$ and $\beta=-0.64, p=0.025$) for both the non-dementia and dementia groups, respectively.

On the other hand, the path coefficients from [Ability of daily living] (latent variable : concerning care level, bedridden level, ADL, and IADL) were not statistically significant in either group. As regards to age, the path coefficient was not significant in the non-demented elderly women ($\beta=0.12$ and $p=0.10$) but showed a significant relationship in the demented group with a $\beta=0.17$ and $p=0.01$, Figure 2.

Degree of depression was the most influential

factor affecting life satisfaction of the elderly women followed by the [Acceptance of one’s decision] that had a significant indirect effect on life satisfaction through negatively affecting the mood status and elevating the GDS-15.

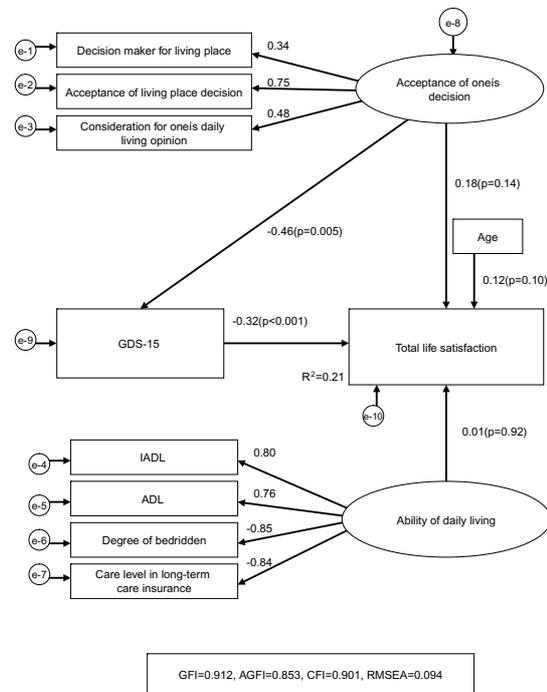


Figure 1 Structural equation model for factors influenced total life satisfaction of not demented Japanese elderly women (n = 149).

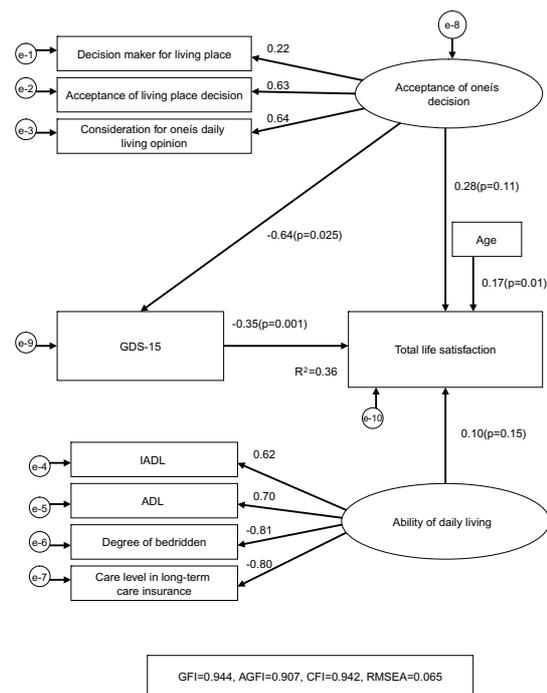


Figure 2 Structural equation model for factors influenced total life satisfaction of demented elderly women (n = 165).

DISCUSSION

Studies focusing on the elderly people are intended to improve their quality of life and to help them live a successful aging. The presence of high levels of well-being and life satisfaction is among the main criteria that are mentioned as components of successful aging (27). Therefore, improving our knowledge about the determinants and factors affecting the levels of life satisfaction of elderly people is essential for the nursing staff and policy makers as well as other care providers to help older people live while being satisfied with their lives instead of infirmities.

For investigating the determinants of life satisfaction among the elderly, we designed our questionnaire and used instruments and interviewed Japanese elderly women who are attending the health care and welfare services at the 28 available elderly-care facilities in Tokushima Prefecture, Japan. Then we carried out statistical analyses to describe the correlations between life satisfaction and subjects' characteristics, together with decision making, memory status, depression and other variables related to the functionality of those elderly Japanese women.

Our sample is mostly formed by women, since a very few number of the males who attend the elderly care and welfare facilities, agreed to fill out the study questionnaires and to be interviewed. Thus, men's number was too few to yield any reliable statistical results for conclusions, applications or generalization.

Among the eligible 314 Japanese elderly women included in our study 52.5% had dementia while 47.5% had no dementia. Statistical comparisons between the two groups (demented and non-demented participants) showed that the demented elderly had significantly older ages than non-demented ; where 55.2% of the demented versus 38.9% of the non-demented participating women aged 85 years or more. Furthermore, the demented elderly women were significantly requiring higher care levels, moderately to completely-bedridden, hospitalized or living in nursing or health care facilities, with lower means of ADL and IADL than the non-demented. However, the mean of total life satisfaction of both demented and non-demented groups did not significantly vary. Generally, the correlation coefficients among different variables with total or individual life satisfaction aspects were higher in

demented than non-demented participants.

Unexpectedly, there were no significant differences in the total life satisfaction within or between the demented and non-demented groups regarding their living place, degrees of dependence or the required care levels. The comparable total life satisfaction levels among the demented and non-demented groups can be explained by the high levels of coping and adaptation that are demonstrated by the elderly people. This coping strategy helps the elderly people to accept their health conditions, adapt themselves to the changed physical abilities and acknowledge receiving assistance from nursing staffs and care givers (28-30). Another explanation is that subjects of our study were women only ; and women at all ages are projected to have substantially higher dependency rates than men, therefore, they showed adaptation and satisfaction. Other studies reported that the greater dependence, the greater the satisfaction ; explaining their findings from the socioemotional theory of Carstensen on considering that elderly persons accept help better with age. Additionally, their results showed greater correlations between life satisfaction and mood state especially with oldest age groups. (31-33).

In this study we investigated the effect of decision making on the participants total life satisfaction. Elderly women who shared and accepted the decision for their living place were significantly more satisfied than those who neither shared nor accepted it. Further, in regard to consideration of one's decision for the general daily life activities, the elderly women whose opinions were considered in the various daily life aspects reported significantly more total life satisfaction than those whose opinions were poorly considered or totally neglected. The effect of decision making on life satisfaction was similar in the demented and non-demented groups indicating that the demented people can reliably report their self-determination, needs and wishes (34, 35). Therefore, sharing decision and acceptance of the living place by the elderly participants themselves and consideration of their opinions in daily life aspects are crucial for their feelings of life satisfaction. In previous studies, Andersson and colleagues stated that when residents are able to make choices in their lives, including choosing their activities and communicating with others, they can experience power and control, which is of great importance for their well-being and adjustment. They concluded that concerning self-determination and

opinions of the residents, nursing staff and care-givers must take responsibility for identifying residents' wishes and respecting them (36-38).

Among the determinants of life satisfaction of the elderly people is their mood status. It is said that aging itself causes changes in the brain function that leads to depression ; and in many elderly subjects, depression is connected with variable stages of dementia, decrease of individual's activities and decrease of the elderly's quality of life (39, 40). Among nursing home patients, prevalence of 11%~50% for minor depression and 30%~48% for depressive symptoms, as measured by symptom rating scales (41). In our study, the prevalence of depression as measured by the instrument of GDS-15 scale was 46.3% among the non-demented and 52.7% among the demented elderly women and it was correlated with low levels of life satisfaction of the elderly women.

A recent study by Clare et al., (2008) affirms that the mood state, non-isolation and social relationships have the most significant correlations with satisfaction with life ; and that those are the variables that best defines successful aging (12). Stek et al., (2006) found that poor daily functioning and institutionalization were risk factors for incidence of depression (42) ; and depressive symptoms were found correlated with dissatisfaction (43). Our results shows that in demented as well as in non-demented elderly women, the levels of depression, measured by the GDS-15, were significant-negatively correlated with each aspect of life satisfaction, individually, and with the total life satisfaction of the participating elderly women (Tables 5a and 5b).

For investigating the interactions among these determinants and their effects on the elderly women's life satisfaction, we used AMOS software and developed a statistical model for demented and another model for the non-demented group. In both models' graphs, degree of depression was the main determinant factor that showed significantly negative effects on total life satisfaction. Other factors related to decision making for placement in a health care facility and consideration of one's opinion in daily life also, affected life satisfaction, however, mainly indirectly by being significantly correlated with depression status (Figures 1 and 2).

Our as well as others' findings indicate that elderly people with variable degrees of dementia retain the capacity for emotional expression and can reliably report aspects of their own experience,

feelings such as mood, satisfaction or quality of life. Thus, however, the elderly people have high coping, adaptation and acceptance for their life changes, it is very essential to avoid depressive status and to care about and guard against their mood deterioration. Besides the general measures that are taken by the elderly care facilities to guard the elderly residents against depression, our study emphasizes decision making as an important item to be concerned about for protecting their moods. We recommend the nursing staffs and care-givers to respect the elderly residents' wishes and consider their opinions in daily living decisions and to ensure their acceptance of the living place decision before placing them into an elderly care facility. Considering the elderly people's opinions and decisions and respecting their wishes and self-determination will be of great help to avoid depression and keep or even improve their life satisfaction.

CONCLUSIONS

We conclude that life satisfaction of the elderly people is a multi-dimensional issue and it is affected by various determinants. Elderly people's life satisfaction is greatly affected by their mood status and consideration of their opinions and share in decision making, whether they have dementia or not. Avoiding depressive mood is essential for keeping high levels of the elderly people's life satisfaction. Furthermore, to share the elderly people in various daily decisions, consider their opinions and consult with them while making a decision of their placement in an elderly-care facility are crucial elements that can directly elevate their feelings of life satisfaction or indirectly, through improving their mood status. Therefore, the elderly people's mood status, decision making and total satisfaction with their lives are inter-correlated and essential for their coping, adaptation, well-being and successful aging.

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