

Psychological Well-Being and Associated Factors among Elderly Hansen's Disease Patients in Leprosaria

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Abstract

Objectives: We investigated psychological well-being and associated factors among elderly Hansen's Disease (HD) patients in three national leprosaria in Japan.

Methods: Three questionnaires on physical and social factors, and psychological well-being based on the 12-item of General Health Questionnaire (GHQ-12) were used to survey all HD patients admitted to three leprosaria in Japan. The number of respondents over 65 years old who completed all 12 items of GHQ-12 was 754 (459 men and 295 women) with a response rate of 80.9%. Data were analyzed by t-test and analysis of covariance (ANCOVA) to determine factors associated with psychological well-being.

Results: The impairment in 8 physical functions, walking, eating, and toileting for both men and women, bathing for men, and vision, dressing and grooming for women, were significantly related to high GHQ-12 scores by t-test and ANCOVA. Having no close friends, less frequent contact with neighbors, and no or less frequent participation in group activities in men, and inactive daily life style in male and female HD patients, were related to high GHQ-12 scores by both analyses.

Conclusion: The present results showed that physical factors and inactive daily life style were related to psychological well-being for both men and women. Social factors were related to psychological well-being among elderly male HD patients in Japan. Further follow-up study is necessary to examine the causal relationships among psychological well-being and associated factors.

Key words: elderly patient, Hansen's Disease sanatorium, questionnaire survey, physical health, GHQ-12

Introduction

In Japan, Hansen's Disease (HD) patients were compulsorily isolated to leprosy sanatoria by the Leprosy Prevention Law enacted in 1953. Prior to that date, examinations for conscription of 21-year-old males between 1897 and 1937 had clearly demonstrated a rapid decrease in the prevalence of HD. Nationwide surveys conducted four times between 1919 and 1935 indicated that the number of aged patients had increased, while the number of youths and young adults with HD had decreased. Epidemiological studies showed that HD in Japan had decreased, but without correlation with the segregation of patients since the establishment of the isolation policy (1).

After a long campaign against the Leprosy Prevention

Law, the law was abolished in April 1996. Moreover, in 1998, patients won a lawsuit against the Japanese government for neglect due to the isolation policy. However, there are still 3,733 patients remaining in 15 leprosaria in Japan. Most of the patients cannot be discharged due to advanced age, which was over 76 on average as of May 2003 (2), development of age-related functional disabilities and after-effects of HD, as well as limited social experience and lack of social networks after prolonged estrangement (3). Therefore, each leprosarium is caring for patients using several means to provide comfort in their remaining years by identifying their health status, especially from an objective perspective.

Although a considerable amount of research has dealt with the diagnosis and treatment of HD, few studies have focused on the mental/psychological aspects of HD patients. The limited amount of research (4–10) on the mental/psychological aspects of HD has focused on patients with mental/psychological problems, which are considered to be more serious among HD patients than among patients with other diseases. Since HD patients with a mean age of over 65 years comprise the largest subpopulation in Japan, we investigated the psychological well-

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being of elderly HD patients (2). Our previous study (7) showed that physical factors, such as disabilities in ADL, were not related to low life satisfaction in patients with HD disease, although there were inconsistent results regarding ADL in elderly people in long-term institutions (11, 12) and in community residents (13, 14). Taken together with the involvement of ADL in psychological well-being (11–14), the associated factors of psychological well-being in HD patients may differ between institutionalized and community-dwelling elderly. We previously demonstrated (7) that high life satisfaction among elderly HD patients was related to social factors such as having relatives, close friends, attending club activities with their close relations, and spending the day actively. Similarly, research (15–18) on psychological health in community-dwelling elderly has shown the relationship between life satisfaction and social factors such as numbers of friends, having close friends, club activities, pursuing hobbies, and joining social activities.

Therefore, we investigated the psychological well-being among elderly HD patients to identify physical and social factors related to psychological well-being using the 12-item General Health Questionnaire (GHQ-12).

Materials and Methods

Subjects

We conducted three self-administered questionnaire surveys on lifestyle and health status to examine psychological well-being using the GHQ-12 among patients admitted to three national leprosy sanatoriums in Kagawa Prefecture, Okayama Prefecture, and Tokyo (hereafter leprosaria A, B, and C) between June 21 and July 23, 1995. The numbers of male respondents who completed all items of the GHQ-12 (response rate of the subjects) were 141 (87.0%), 188 (83.3%), and 269 (77.5%) for leprosaria A, B, and C, respectively, while the numbers of female respondents were 93 (85.5%), 124 (75.2%), and 173 (81.2%), respectively. Among the respondents, the number of subjects over 65 years old (response rate of the respondents) were 104 (96.3%), 150 (91.5%), and 205 (90.3%) for leprosaria A, B, and C for males, respectively, and 69 (89.6%), 101 (87.8%), and 124 (91.8%) for females, respectively, as well as one woman whose leprosarium was unidentified.

The mean GHQ-12 scores ranged from 2.25 to 2.50 in men and from 2.45 to 2.72 in women in the three leprosaria, as shown in Table 1. Among both men and women, the highest scores were found in patients receiving medical treatment in the three leprosaria. Three-way analysis of variance (ANOVA) showed significant differences in the GHQ-12 scores among the wards, but not among the leprosaria or by sex (Table 1).

Therefore, we combined the data of the three leprosaria together according to gender. Ultimately, we analyzed 459 men and 295 women.

Procedure for the questionnaire survey

Before starting the questionnaire survey on life style and health status, which consisted of items regarding physical and social factors, we received an approval from ethical concern member in Kochi Medical School to contact each patients'

Table 1 Age, GHQ-12 score, and distribution of belonging to the wards in the subjects over 65 years old, according to leprosarium and sex

Sex	Leprosarium	Wards	Number (%) of subjects	GHQ, Score (mean±SD)
Men	A	Medical treatment	15 (14.4)	3.33±3.34
		Disabled	66 (63.5)	2.30±2.37
		Independent	23 (22.1)	1.87±2.53
		Ward unidentified	0	
		Total	104 (100)	2.36±2.59
	B	Medical treatment	8 (5.3)	3.25±3.28
		Disabled	101 (67.3)	2.19±2.39
		Independent	38 (25.3)	2.29±2.63
		Ward unidentified	3 (2.0)	1.33±0.58
		Total	150 (100)	2.25±2.48
	C	Medical treatment	18 (8.8)	5.83±3.73
		Disabled	106 (51.7)	2.51±2.71
		Independent	80 (39.0)	1.76±2.48
		Ward unidentified	1 (0.5)	1
		Total	205 (100)	2.50±2.92
Total	Medical treatment	41 (8.9)	4.41±3.68	
	Disabled	273 (59.5)	2.34±2.51	
	Independent	141 (30.7)	1.92±2.52	
	Ward unidentified	4 (0.9)	1.25±0.50	
	Total	459 (100)	2.39±2.71	
Women	A	Medical treatment	6 (8.7)	3.33±2.34
		Disabled	45 (65.2)	2.49±2.63
		Independent	18 (26.1)	2.06±3.23
		Ward unidentified	0	
		Total	69 (100)	2.45±2.76
	B	Medical treatment	4 (4.0)	4.75±4.27
		Disabled	70 (69.3)	2.67±2.47
		Independent	26 (25.7)	2.65±2.71
		Ward unidentified	1 (1.0)	1
		Total	101 (100)	2.72±2.62
	C	Medical treatment	7 (5.7)	5.71±2.75
		Disabled	68 (54.8)	2.79±3.08
		Independent	49 (39.5)	1.86±2.33
		Ward unidentified	0	
		Total	124 (100)	2.59±2.91
Total	Medical treatment	17 (5.8)	4.65±3.02	
	Disabled	183 (62.0)	2.67±2.74	
	Independent	94 (31.9)	2.13±2.61	
	Ward unidentified	1 (0.3)	1	
	Leprosarium unidentified	1 (0.3)	3	
Total	295 (100)	2.60±2.76		

The three-way analysis of variance (ANOVA) showed a significant difference in the GHQ-12 score among the wards (p=0.000), but not among age or sex.

association by telephone to explain the purpose and method of the survey. Then we sent letters requesting the approval of the survey to each patients' association, president of the leprosarium, social welfare section, general affairs section, and nursing department. After receiving approval, we visited each section of the three leprosaria to explain the details of the survey. The day prior to the survey, we introduced ourselves and explained the details of the survey, including the purpose and the method of

the survey, and how the privacy of each patient would be protected, using the official announcement system of each leprosarium with the assistance of the patients' association.

After the explanation, the researchers, including nursing students who were hired as investigators and trained by the researchers in the method of delivering and collecting the questionnaires, delivered the questionnaire directly to each patient with taking informed consent. If patients could not read or write due to their disabilities, the investigators filled out the questionnaires by interviewing the patient. The questionnaires were collected 6 to 8 days after delivery. We requested that the subjects fill in their names and the ward to which they were assigned so that we could survey them again if we found any items with no response. After counting the total number of collected questionnaires and reconfirming the blank items, we cut off the portions with the names and the wards to maintain the privacy of patients. This action was witnessed by a representative of the patients' association.

Assessment of variables

The scale we used to identify psychological well-being and its associated factors was the GHQ-12, which was devised as a short version of the original 60-item questionnaire. The GHQ was developed by Goldberg in England to screen for minor psychiatric disorders (19, 20). The GHQ-12 is a reliable and convenient self-rated questionnaire with adequate sensitivity and specificity, and has been frequently used to assess the psychological well-being of older people in Japan (21, 22) and other countries (23).

We selected the short version of the GHQ since some participants had vision impairment and writing difficulties. The scoring system we applied was GHQ scoring, in which each item response category was coded 0-0-1-1, with a total score ranging from 0 to 12 points (20). Higher scores indicate lower psychological well-being.

The items regarding physical factors investigated were abilities of vision, hearing, and ADL such as walking, eating, bathing, toileting, dressing, and grooming, as drawn from the Older Americans Resources and Services Multidimensional Functional Assessment Questionnaire developed by Duke University in the U.S.A. (24). One response was chosen from the following 3 answers: 1) can function without help, 2) can function with assistance or assisting devices, or 3) cannot function by themselves, which were indicated as 1, 2, and 3, respectively. In a similar way, 4 answers for walking were prepared, i.e., 1) can function without help, 2) can function with cane or handrail, 3) can function with assistance or crutch, or 4) cannot walk by themselves, which were indicated as 1, 2, 3, and 4, respectively. The response to each question was coded as no impairment (1) when rated 1, and impairment (0) when rated ≥ 2 .

The items on social factors asked about presence of a spouse, relatives, and close friends and attending group activities, and about the frequencies of contact with close friends, relatives, and neighbors and frequencies of attending group activities, and inactive daily life style as cited in The Rand Social Health Battery (25), and Noguchi and Sugisawa (26). Questions regarding presence of spouse and relatives asked as

"do you have a spouse in or outside the leprosarium?", and "do you have any relatives such as father, mother, siblings, children, cousins, nieces, or nephews or so on?" The question about close friends was "do you have a close friend in or outside of the leprosarium?" and that about group activities was "do you participate in any group activities such as karaoke, gate ball, haiku or so on?" The participants responded to these questions by indicating "yes" or "no" and the response was coded (0) for "no" and (1) for "yes".

The question about frequencies of contact with close friends was asked by "how often do you have contact your close friends in person by meeting or by telephone or writing letters?" using a 5-point rating system in which "more than once a week"=1, "a couple of times a month"=2, "less than once a month"=3, "once every couple of months"=4, and "less than a couple of times a year"=5. The response was coded as (0) when rated ≥ 4 in person by meeting or by telephone or writing letters, which implied "sparse" contact and coded as (1) when rated 1 to 3, which implied "dense" contact. The question about relatives was asked as "how often do you have contact with your relatives in person by meeting or by telephone or writing letters?" using a 6-point rating system, in which frequency ranged from "more than once a week"=1, "a couple of times a month"=2, "less than once a month"=3, "once a couple of months"=4, "less than a couple of times a year"=5, and "not at all"=6. The response was coded as (0) when rated 6 for meeting or rated ≥ 5 by telephone or writing letters in person, which implied "sparse" contact. When the response was rated 1 to 5 for meeting or 1 to 4 by telephone or writing letters, it was coded as (1), which implied "dense" contact. The question about neighbors was asked as "how would you rate your relations with your neighbors?" using a 4-point system from "poor"=1, "just greeting"=2, "close"=3 to "very close"=4. The response was coded as (0) when rated 1 or 2, which implied "sparse" relations and was coded as (1) when rated over 3 points, which implied "dense" relations. The question about frequencies of attending group activities was asked as "how often do you participate in group activities?" using a 5-point rating system in which "more than once a week"=1, "a couple of times a month"=2, "less than once a month"=3, "once a couple of months"=4, and "less than a couple of times a year"=5. The response was coded as (0) when rated ≥ 2 , which implied "sparse" while response was coded as (1) when rated 1, which implied "dense". In addition to social factors, the way the patient usually spent a day was asked as "how do you spend your day? Please choose the three items indicating the way you most often spend your day among these 7 items: 1) going to the hospital to receive treatment, 2) watching television or listening to the radio at home, 3) spending the day idly, 4) sleeping most of the day, 5) participating in group activities, 6) going out to visit friends, going for a walk, or doing hobbies outside, and 7) doing hobbies at home". The response was coded as (0), which implied "inactive", when the subject chose only one of the behaviors and did not choose any of the "active" items. The "inactive" items were as follows: going to the hospital to receive treatment, watching television or listening to radio at home, spending the day idly, and sleeping most of the day. The response was coded as (1), which implied "active", when the

subject chose one of the following behaviors: participating in group activities, going out to visit friends or doing hobbies outside, or at home.

Statistical analyses

The means of GHQ-12 scores between two categories according to impairment and no impairment for each of 8 physical factors, two categories for presence of spouse, relatives, and close friends and attending group activities, and two categories according to the density and sparseness of contact in each of 4 social factors, and inactive daily life style, were compared using the two-tailed Student-t-test when the variance was equal or Welch-t-test when the variance was not equal. Simultaneously, we set two categories regarding the impairment of the total of 8 physical and 4 social factors, and the frequencies of 4 overall social contact factors, and compared them to the GHQ scores. In addition to t-test, analysis of covariance (ANCOVA) was applied to determine whether there were differences in the level of GHQ-12 score between each category of factors recognized as independent variables, while GHQ-12 scores were dependent variables with a covariant of age.

A probability value of $p < 0.05$ was considered significant. Calculations were performed using a software package for the personal computer, SPSS 11.0J for Windows (27).

Results

Non-respondents and their reasons

The overall number of non-respondents in the three lepro-

saria was 232 men and women, including 93 subjects with incomplete GHQ-12 items and 3 whose gender was not identified. The reasons for non-response were as follows: 72 declined to respond, 26 could not be contacted despite 3 to 5 attempts, 18 were hospitalized outside of the leprosaria, 14 could not respond due to health problems including dementia, acute or sub-acute disease under surgical treatment, or aggravated disease symptoms, 5 were unable to complete the questionnaire due to serious deafness, dumbness, or vision or hearing problems, or serious difficulty in writing, 2 were transferred to another leprosaria, and 2 were on a trip.

GHQ-12 score and associated factors

The GHQ score by two categories of 8 physical factors in men and women are shown in Table 2. Analyses of the two-tailed t-test and ANCOVA after adjusting for age showed significantly higher GHQ scores among patients with impairment than no impairment in the total 8 physical factors, walking, eating, and toileting for both men and women, and bathing for men or vision, grooming, and dressing for women.

The results regarding the 4 social factors regarding presence of spouse, relatives, and close friends, and attending group activities and frequencies of contact with each social relation and attending group activities, and inactive daily life style in men and women are shown in Table 3. Significantly higher GHQ-12 scores were identified in patients who had fewer social factors, no close friends, and no participation in group activities, only in men by both t-test and ANCOVA.

Significantly higher GHQ-12 scores were observed among

Table 2 GHQ-12 score according to impairment of physical factors and results of t-test and ANCOVA by gender

Variable	Category	Men				Women			
		Number	GHQ score	Age-adjusted		Number	GHQ score	Age-adjusted	
			Mean±SD	F-value	95% C.I.		Mean±SD	F-value	95% C.I.
Total number of physical impairment	1-8	220	2.79±2.81 [†]	11.01 [†]	0.353-1.377	133	3.20±2.91 [†]	11.27 [†]	0.461-1.767
	0	239	2.02±2.55			162	2.11±2.54		
Vision	Impairment	93	2.24±2.41	0.27	-0.799-0.463	64	3.44±2.63 [†]	7.05 [†]	0.272-1.833
	No impairment	366	2.43±2.78			231	2.37±2.76		
Hearing	Impairment	10	2.00±3.20	0.23	-2.119-1.290	8	3.50±2.88	0.79	-1.070-2.838
	No impairment	449	2.40±2.70			287	2.58±2.76		
Walking	Impairment	163	2.84±2.75 [†]	8.56 [†]	0.262-1.335	103	3.15±3.03*	5.62*	0.142-1.528
	No impairment	296	2.14±2.65			192	2.31±2.57		
Eating	Impairment	78	3.29±2.91 [†]	11.47 [†]	0.478-1.800	48	3.77±2.86 [†]	9.96 [†]	0.523-2.255
	No impairment	381	2.20±2.63			247	2.38±2.69		
Toileting	Impairment	34	3.91±3.30 [†]	12.92 [§]	0.789-2.691	15	4.20±3.26*	4.89*	0.180-3.094
	No impairment	425	2.27±2.62			280	2.52±2.71		
Bathing	Impairment	116	2.98±2.99 [†]	8.83 [†]	0.300-1.470	75	3.15±2.97*	3.36	-0.054-1.511
	No impairment	343	2.19±2.58			220	2.42±2.67		
Dressing	Impairment	114	2.75±2.85	3.36	-0.039-1.142	58	3.47±2.97 [†]	6.59*	0.249-1.887
	No impairment	345	2.27±2.65			237	2.39±2.67		
Grooming	Impairment	123	2.63±2.73	1.74	-0.189-0.961	68	3.54±3.06 [†]	10.01*	0.471-2.019
	No impairment	336	2.30±2.69			227	2.32±2.61		

Significant difference in GHQ scores as compared with the opposite category of physical factors; * $p < 0.05$, [†] $p < 0.01$, [§] $p < 0.001$ by the two-tailed Student-t test and by ANCOVA.

C.I.: confidence interval.

Table 3 GHQ-12 score according to social factors and results of t-test and ANCOVA by gender

Variable	Category	Men				Women			
		Number	GHQ score	Age-adjusted		Number	GHQ score	Age-adjusted	
			Mean±SD	F-value	95% C.I.		Mean±SD	F-value	95% C.I.
Total number of presence of spouse, relatives, and close friends and attending group activities									
	0-2	238	2.87±2.90 [†]	17.22 [†]	0.547-1.532	157	2.65±2.76	0.01	-0.623-0.698
	3-4	221	1.86±2.38			138	2.55±2.78		
Spouse presence	(-)	232	2.57±2.74	2.48	-0.099-0.905	141	2.52±2.63	0.58	-0.920-0.408
	(+)	227	2.20±2.66			154	2.68±2.88		
Relatives ^a presence	(-)	101	2.60±2.83	0.96	-0.303-0.908	70	2.71±2.95	0.06	-0.667-0.854
	(+)	358	2.33±2.67			225	2.57±2.71		
Close friends presence	(-)	99	3.33±2.93	15.78 [‡]	0.608-1.797	36	2.81±2.47	0.23	-0.733-1.206
	(+)	360	2.13±2.58 [‡]			259	2.57±2.80		
Group activities participation	(-)	308	2.69±2.88	12.07 [†]	0.402-1.449	217	2.72±2.86	1.22	-0.138-1.132
	(+)	151	1.77±2.21 [†]			78	2.28±2.47		
Total frequencies of contacting with cose friends, relatives, neighbors and participating in group activities									
	0-1	342	2.64±2.81 [‡]	12.98 [‡]	0.474-1.611	225	2.72±2.73	0.37	-0.444-0.838
	2-4	117	1.64±2.23			70	2.40±2.74		
Close friends frequencies of contact	Sparse ^b	347	2.52±2.70*	3.65	-0.016-1.141	211	2.33±2.71	0.91	-0.372-1.069
	Dense ^c	112	1.97±2.70			84	2.70±2.78		
Relatives ^a frequencies of contact	Sparse ^d	244	2.53±2.82	1.53	-0.186-0.813	139	2.45±2.56	0.96	-0.957-0.322
	Dense ^e	215	2.23±2.57			156	2.74±2.94		
Neighbors frequencies of contact	Sparse ^f	241	2.65±2.88*	4.88*	0.061-1.055	124	2.92±2.88	2.47	-0.131-1.169
	Dense ^g	218	2.10±2.48			171	2.37±2.66		
Group activities frequencies of participation	Sparse ^h	362	2.60±2.81 [‡]	11.43 [†]	0.436-1.646	254	2.64±2.79	0.19	-0.716-1.121
	Dense ⁱ	97	1.59±2.11			41	2.41±2.62		
Inactive daily life style	Inactive ^j	103	4.36±3.38 [‡]	85.37 [‡]	2.042-3.145	75	3.68±3.03 [‡]	15.42 [‡]	0.719-2.164
	Active ^k	355	1.83±2.17			220	3.23±2.57		

Significant difference in GHQ score as compared with the opposite category of social factors; * p<0.05, † p<0.01, ‡ p<0.001 by the two-tailed Student t-test and by ANCOVA.

^a Father, mother, siblings, children, cousins, nieces, or nephews, ^b in person or by telephone or writing letters ≤1/2-3 months, ^c in person or by telephone or writing letters ≥ once a months, ^d does not meet, telephone or write letters ≤1-2/year, ^e meeting ≥1-2/year or telephone or writing letters ≥1/2-3 months, ^f poor or just greeting, ^g close to very close, ^h ≥1/week, ⁱ ≤2-3/month, those who responded to at least one of the following items: ^j attending club activities, visiting friends or doing hobbies outside or at home, ^k going to the hospital to have treatment, watching television or listening to the radio at home, spending the day idly, and sleeping, without indicating any of the items on the "active" list.

C.I.: confidence interval.

male subjects with sparse frequency of contact with neighbors and sparse participation in group activities than among those who had dense frequencies of social contact by t-test and ANCOVA. Both male and female patients who spent inactive daily lives had significantly higher GHQ-12 scores than those who had active daily lives.

Discussion

Although this questionnaire survey was performed in 1995, before the Leprosy Prevention Law was abolished, the present results seemed to reflect conditions that have continued after that time for the following reasons: first, there has been very little movement of patients, i.e., few newly admitted cases; second, patients have organized their own society in the isolated leprosaria, as each HD patient has had long-term treatment at

the same leprosarium; third, most of the patients demonstrate after-effects of HD, although there are very few carriers of leprosy and; fourth many of the patients lost their family ties when they entered the leprosarium because HD was stigmatized and social prejudice against the disease was strong. This research has advanced several significant issues compared to the limitations of our previous research (7). This research focused on the psychological well-being of subjects from 3 leprosaria by GHQ-12 survey, and achieved a higher response rate.

Regarding the physical factors, impaired physical functions were associated with low psychological well-being for both male and female elderly HD patients even after adjusting age. Some studies among community elderly people in Japan showed that low ADL was related to scales corresponding to low QOL based on subjective well-being (13), morale (14), life

satisfaction index (LSI) (17), or GHQ (28). As a result, there were similar relationships between the level of physical disability and psychological well-being among elderly HD patients in the leprosaria and elderly people in the community. It was notable that some of the factors associated with psychological well-being differed by gender. Disabilities in bathing was an associated factor for men, while vision, grooming, and dressing were factors for women. Further research would be needed to clarify this different association by gender.

Regarding social factors for men, subjects who did not have a close friend or did not attend group activities showed lower psychological well-being, and this remained significant even after adjusting for age. Studies of psychological well-being measured by scales of QOL among community residents in Japan have reported a close relationship between good psychological well-being and larger networks such as participation in club activities, having hobbies, having interaction with neighbors and friends, and having relatives (13, 16, 17, 29, 30). Overseas there have been studies that noted the relationship between psychological well-being and numbers of social networks, measured by CES-D in the U.S. (31) and DSM-III in Finland (18), as an indicator of depression. In our study, it is very noteworthy that having a close friend and attending club activities were identified as related to psychological well-being only in men. Tamano et al. (29) reported a difference toward social networks between men and women, pointing out that women were more adaptable to the lack of a social network than men. The possible explanation for the lack of a relationship between any of the social factors except for inactive daily life style and psychological well-being among female HD patients in our study is that women tend to maintain their psychological well-being through higher adaptability even when their social network is reduced.

Subjects who had inactive daily lives for both men and women showed low psychological well-being. This finding was similar to our previous study (7) among HD patients, a study

(15) that reported a survey of Japanese elderly, and a study (32) of disabled elderly adults who were admitted for medical rehabilitation in the U.S. Therefore, spending the day actively may be associated with increased psychological well-being among HD patients as it is in elderly people dwelling in the community or in institutions. However, it is necessary to consider the impact of the confounding factor of health status to identify the relationship between social networks and psychological well-being (33). We could not examine the validity using our items, especially physical and social factors. To analyze each category in a factor, other indicators might be devised in another category. Re-estimation might lead to clarification of the relationship between the factors and the GHQ-12 scores among HD patients in Japan.

In conclusion, physical factors and inactive daily life style were closely associated with psychological well-being in male and female HD patients, results which seemed to be similar to those in community-dwelling elderly. There were gender differences in social factors associated with low psychological well-being. The presence of social relations and frequencies of contact with them were more associated with psychological well-being in men than in women among older HD patients in leprosaria in Japan. Further follow-up study is necessary to examine the causal relationships among psychological well-being and associated factors.

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