Cumulative Fatigue Symptoms among Caregivers in Japan

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Abstract

Objective: To investigate the relationship of cumulative fatigue symptoms among caregivers in Japan with work environment issues and lifestyle behaviors.

Methods: The subjects were 376 women (mean age, 54 years) attending professional seminars for caregivers held between 1999 and 2002. After obtaining informed consent, a survey was conducted to ascertain work environment issues, lifestyle behaviors and fatigue levels. Fatigue was quantitatively assessed using the Cumulative Fatigue Symptoms Index (CFSI) developed by Kosugoh et al. Factors related to caregiver fatigue were identified using Pearson's correlation coefficient, the Mann-Whitney U-test and multiple regression analysis.

Results: Caregivers who felt anxiety or concern regarding care techniques, care content, personal relationships, work conditions, and physical fitness showed higher CFSI scores, while caregivers who exercised regularly and had proper eating behavior displayed lower CFSI scores. Anxiety/concern regarding physical fitness and proper eating behaviors were identified as significant predictors for all CFSI category scores ($P<0.001$). Regular exercise behavior ($P<0.001$), age ($P<0.001$), and years of work experience ($P<0.001$) also represented significant independent variables for some CFSI categories.

Conclusion: Our results suggest that upgrading the knowledge and skills of care and nursing and modifying lifestyle behaviors could reduce the level of fatigue experienced by caregivers.

Key words: caregivers, fatigue, Cumulative Fatigue Symptoms Index, lifestyle behaviors

Introduction

Under the healthcare system in Japan, professional home-helpers (housekeepers) were for many years employed by home-helper agencies as so-called "nursing attendants" who supplemented the work of hospital nurses or provided care to patients in the place of family members (the nursing attendant system). Since the abolition of the nursing attendant system in 1994 through a revision to the Health Insurance Law, there has been a transformation of professional home-helpers into caregivers who predominantly help patients with daily life activities. Besides professional home-helpers, those who have a national license, called "care workers", are engaged in the caregiving system in Japan. While caregivers, who were once called professional home-helpers, do not require a national license,

together with care workers they play an important role in nursing care services in hospitals and homes.

Fatigue among workers causes emotional and physical stress, and has been identified as one of several factors that induce work accidents and occupational health disorders (1-3). Various types of studies on fatigue have been conducted, and the results have been used for worker health management. One such study was the Cumulative Fatigue Symptoms Index (CFSI) Study by Kosugoh et al. (4-6). The CFSI is a self-administered survey comprising 81 questions about mental and physical disorders in workers, as well as about their work and home environments. Factor analysis had been used to categorize the questions into eight categories: irritability; general fatigue; chronic tiredness; physical disorders; decreased willingness to work; decreased vitality; anxiety; and depressive feelings. These categories are further divided into clusters indicating mental ailments (decreased vitality, anxiety, and depressive feelings), physical ailments (general fatigue, chronic tiredness, and physical disorders), and workplace environment dissatisfaction (irritability, and decreased willingness to work). These classifications make it possible to accurately ascertain fatigue levels in groups that complete the survey.

Received Dec. 26, 2003/Accepted May. 12, 2004

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This study examined levels of fatigue in caregivers using the CFSI to provide basic information for the development of strategies to relieve caregiver fatigue. We also examined the relationship of fatigue with work environment issues and lifestyle behaviors, and identified factors that affected levels of caregiver fatigue.

Materials and Methods

The subjects comprised 495 women affiliated with professional home-helper agencies in Aichi Prefecture who had attended professional seminars for caregivers (a total of 16 seminars) held between June 1999 and March 2002. We informed the subjects of the purposes of this study and obtained written informed consent to participate in the survey. Questionnaire sheets were distributed to attendees at the end of each seminar, then collected after they had been completed.

The questionnaire sheets included age, years of work experience, problems associated with work environments, lifestyle behaviors, and CFSI. Using parts of the “Study of caregiving by home-helpers who work through the Private Placement Services Association of Japan and care for victims of occupational accidents (1992)” (7) and the “Study of the care of victims of occupational accidents (1994)” (8) conducted by the Private Placement Services Association of Japan, we prepared 19 questions regarding problems associated with work environments that required “yes” or “no” answers. These 19 questions were divided into five symptom groups based on question content. If the respondent answered “yes” to any question in a symptom group, they were classified as having that symptom (i.e., “being with”). If the respondent answered “no” to all questions in a symptom group, they were classified as not having that symptom (i.e., “being without”). The following five symptom groups were used in this study: anxiety/concern regarding care techniques; anxiety/concern regarding care content; anxiety/concern regarding personal relationships; anxiety/concern regarding work conditions; and anxiety/concern regarding physical fitness.

In the CFSI, the number of questions under each of the eight categories to which the respondent answered, “I’ve recently experienced this condition”, was used as the number of responses for that category in aggregate CFSI calculations. We also calculated the complaint rate for each category by dividing the number of responses by the number of questions for each CFSI category.

To extract the factors shown in the CFSI exerting an impact on levels of fatigue, we first examined the relationship of the number of responses for each CFSI category with age and years of work experience by calculating Pearson’s correlation coefficient. Next, we calculated the mean number of responses (complaint rate) for each CFSI category among subjects who did or did not report anxiety/concern associated with work environments, as well as among those who did or did not report having regular exercise and proper eating behaviors. We then compared the two groups using the Mann-Whitney U test. In addition, we used stepwise multiple regression analysis to identify factors impacting each CFSI category. The factors examined here were age, years of work experience, workplace,

anxiety/concern associated with work environments, and lifestyle behaviors. Finally, we compared the results of this CFSI with the results of studies conducted on other occupations (9).

The above calculations were performed using Stat View Ver. 5.0 software (SAS Institute, Inc., Tokyo). Values of $P < 0.05$ were considered significant. The study protocol was approved by the Institutional Review Board of The Japanese Red Cross Toyota College of Nursing.

Results

1. Characteristics of participants

Responses were collected from 425 of the 495 individuals to whom questionnaire sheets were distributed (a collection rate of 85.9%). Responses from the 376 individuals (54 ± 12 years, mean age $\pm$ standard deviation) who answered the CFSI and reported that they were currently working (valid response rate, 76.0%) were analyzed. Of the respondents, 126 were in the 60–69 year age group (33.5%) and 125 were in the 50–59 year age group (33.2%). Individuals aged 50–69 years accounted for about 70% of respondents. The mean years of work experience among caregivers was 6 ± 7 years. The answer “1–5 years” was selected by 112 respondents (32.1%) and the answer “5 years or more” was selected by 150 respondents (43.0%). Regarding mean daily caregiving hours, 87 respondents answered that they work “6–8 hours” (34.4%) and 55 answered “12 hours or more” (21.7%). Thus, about 70% of respondents worked 6 hours/day. Of the respondents, 143 (37.1%) worked in homes only, 87 (25.6%) worked in hospitals only, 96 (25.5%) worked both in homes and hospitals, and 18 worked in healthcare facilities (4.8%).

2. Problems associated with work environments and lifestyle behaviors

Table 1 shows the number of subjects displaying anxiety/concern regarding problems associated with work environments and the number of subjects exhibiting good lifestyle behaviors. Of the five symptom groups, anxiety/concern regarding care content had the highest response rate, with 172 respondents (45.7%), followed by anxiety/concern regarding personal relationships with patients and family members, with 101 respondents (26.8%). In the area of lifestyle behaviors, 129 respondents (34.3%) exercised regularly (including walking), and 153 (40.7%) usually ate at fixed times (proper eating behavior).

Table 1 Problems associated with work environments and lifestyle behaviors in 376 caregivers

Problems associated with work environments	
Care techniques	92 (24.5)
Care content	172 (45.7)
Personal relationships	101 (26.8)
Work conditions	53 (14.1)
Physical fitness	37 (9.8)
Lifestyle behaviors	
Regular exercise	129 (34.3)
Proper eating behavior	153 (40.7)

Values are n (%).

Table 2 Number of responses to each CFSI question (top 15 questions) in 376 caregivers

Questions	n (%)
1. My eyes get tired.	225 (59.8)
2. I often get stiff shoulders.	195 (51.9)
3. I worry about my health.	170 (45.2)
4. I get backaches.	161 (42.8)
5. I have blurred vision.	158 (42.0)
6. I want to be alone.	152 (40.4)
7. I have something on my mind.	133 (35.4)
8. I'd like to take my mind off my worries.	121 (32.2)
9. I often feel tired when I wake up in the morning.	120 (31.9)
10. I don't sleep well and often dream.	112 (29.8)
11. Recently, I can't fall asleep easily.	103 (27.4)
12. My legs feel heavy.	101 (26.9)
13. I can't shake off my work-related fatigue.	90 (23.9)
14. I don't have time to relax.	89 (23.7)
15. I've felt sleepy every day lately.	85 (22.6)

Table 3 Number of responses and complaint rates for each CFSI category in 376 caregivers

Categories (number of questions)	Number of responses (Complaint rates, %)
Irritability (7)	0.6±1.3 (9.3)
General fatigue (10)	3.1±2.2 (30.7)
Chronic tiredness (8)	1.6±1.9 (20.5)
Physical disorders (7)	1.2±1.2 (18.2)
Decreased willingness to work (13)	1.3±2.1 (10.1)
Decreased vitality (9)	1.2±1.9 (13.1)
Anxiety (11)	1.8±2.2 (16.4)
Depressive feelings (9)	1.5±1.8 (16.8)

Values are means±SD.

3. CFSI scores

Table 2 shows the top 15 CFSI questions to which respondents answered, "I've recently experienced these conditions." Numerous complaints involved such physical issues as "My eyes get tired" and "I often get stiff shoulders", followed by mental complaints and complaints about sleeping.

Table 3 shows the number of responses and complaint rates for each CFSI category. The complaint rate was highest for "general fatigue", at 30.7%, followed by "chronic tiredness" at 20.5%. Complaint rates for "irritability" and "decreased willingness to work", implying dissatisfaction with work environments, were relatively low compared with other categories.

4. Factors that impact the number of responses for each CFSI category

Table 4 shows the relationships between each CFSI category and age and years of work experience. A negative correlation was identified between "irritability" and age (n=376,

Table 4 Relationship of CFSI category scores with age and years of work experience in 376 caregivers

	Age	Years of work experience
Irritability	-0.138*	-0.021
General fatigue	0.045	0.032
Chronic tiredness	-0.072	0.012
Physical disorders	0.013	0.038
Decreased willingness to work	0.019	0.135*
Decreased vitality	-0.009	0.018
Anxiety	-0.001	0.028
Depressive feelings	-0.072	0.034

Values are Pearson's correlation coefficients. * P<0.01.

$r=-0.138$, $P<0.01$), while a positive correlation was found between "decreased willingness to work" and years of work experience (n=376, $r=0.135$, $P<0.01$).

Table 5 shows the relationship of the number of responses for each CFSI category with problems associated with work and lifestyle behaviors. Caregivers who felt anxiety or concern regarding issues classified as problems associated with work environments showed relatively higher CFSI scores compared to subjects who did not. Among the eight CFSI categories, "chronic tiredness", "decreased willingness to work", "anxiety", and "depressive feelings" displayed significantly large numbers of respondents who had anxiety/concern regarding four of the five symptom groups. With regard to lifestyle behaviors, respondents who exercised regularly reported lower CFSI scores than respondents who did not. In particular, "general fatigue", "chronic tiredness", "physical disorders", "decreased willingness to work", "decreased vitality", and "depressive feelings" were significantly lower. The number of complaints reported among respondents who usually ate at fixed times was significantly lower on all CFSI categories than among those who did not.

Table 6 shows factors detected as significant independent variables by stepwise multiple regression analysis. Anxiety/concern regarding physical fitness and proper eating behaviors represented significant independent variables for all CFSI categories. In the case of physical fitness, beta values were always positive, while beta values for proper eating behaviors were always negative. Regular exercise was also detected as a significant predictor for "general fatigue" and "chronic tiredness" (both negative beta values). In addition, age for "irritability" (negative beta value) and years of work experience for "decreased willingness to work" (positive beta value) were identified as significant independent variables.

5. Comparison of CFSI results for caregivers with those of workers in other fields

The radar chart depicted in Figure 1 compares CFSI complaint rates among caregivers targeted in this study with the results obtained by Kosugoh et al. from 23,835 general female Japanese laborers and 6,010 female Japanese healthcare workers (9). The right side of the radar chart shows the cluster displaying physical ailments, with the vertical line depicting the cluster reporting workplace environment dissatisfaction, while the left side shows the cluster displaying mental ailments (10). Among caregivers, physical complaints on the right side of the chart are more prevalent than the mental complaints on the left.

Table 5 Relationship of CFSI category scores with the problems associated with work environments and lifestyle behaviors

		n	Irritability	General fatigue	Chronic tiredness	Physical disorders	Decreased willingness to work	Decreased vitality	Anxiety	Depressive feelings
Problems associated with work environments										
Care techniques	with	92	0.8 (1.4)	3.3 (2.4)	1.9 (2.1)	1.5 (1.2)	1.6 (1.9)	1.4 (1.7)	2.3 (2.4)	1.9 (2.1)
	without	284	0.5 (1.1)	2.8 (2.1)	1.5 (1.9)	1.1 (1.3)	1.1 (2.4)	1.0 (2.0)	1.6 (2.1)	1.3 (1.9)
	P		0.105	0.245	0.043	0.023	0.015	0.345	0.002	0.006
Care content	with	172	0.6 (1.1)	3.3 (2.2)	1.9 (2.0)	1.3 (1.2)	1.6 (2.2)	1.1 (1.8)	2.0 (2.3)	1.6 (1.8)
	without	204	0.6 (1.3)	2.8 (2.0)	1.4 (1.9)	1.2 (1.3)	0.9 (1.8)	1.1 (1.8)	1.6 (2.1)	1.3 (1.7)
	P		0.105	0.111	0.004	0.225	0.001	0.688	0.034	0.029
Personal relationships	with	101	0.7 (1.2)	3.2 (2.4)	1.8 (2.0)	1.5 (1.3)	1.8 (2.4)	1.4 (2.0)	2.3 (2.5)	1.8 (1.7)
	without	275	0.6 (1.2)	3.0 (2.1)	1.5 (1.9)	1.1 (1.2)	1.0 (1.9)	1.0 (1.7)	1.6 (2.0)	1.3 (1.7)
	P		0.520	0.577	0.090	0.012	0.001	0.065	0.003	0.003
Work conditions	with	53	0.7 (1.3)	3.8 (2.6)	2.2 (2.1)	1.4 (1.4)	1.8 (2.7)	1.4 (2.2)	1.8 (2.7)	1.9 (2.5)
	without	323	0.6 (1.2)	2.9 (2.0)	1.5 (1.9)	1.2 (1.2)	1.2 (1.9)	1.1 (1.7)	1.2 (1.9)	1.4 (1.7)
	P		0.807	0.032	0.013	0.807	0.078	0.501	0.078	0.070
Physical fitness	with	37	1.0 (1.6)	4.1 (2.9)	3.1 (1.7)	1.9 (1.6)	2.3 (3.0)	2.2 (2.6)	2.3 (1.9)	2.3 (1.7)
	without	339	0.6 (1.1)	2.9 (2.0)	1.3 (2.2)	1.2 (1.2)	1.1 (1.9)	1.0 (1.7)	1.1 (3.0)	1.3 (2.2)
	P		0.037	0.030	0.001	0.005	0.006	0.003	0.008	0.003
Lifestyle behaviors										
Regular exercise	with	129	0.5 (1.0)	2.5 (1.8)	1.0 (1.5)	1.0 (1.4)	0.9 (1.7)	0.8 (1.5)	1.7 (2.0)	1.2 (1.7)
	without	203	1.0 (1.4)	3.3 (2.3)	2.0 (2.2)	1.4 (1.3)	1.5 (2.3)	1.4 (2.0)	1.9 (2.4)	1.5 (1.9)
	P		0.076	0.006	0.001	0.001	0.008	0.028	0.200	0.020
Proper eating behavior	with	153	0.4 (1.1)	2.2 (2.0)	1.3 (1.8)	0.9 (1.2)	0.9 (2.0)	0.8 (1.6)	1.3 (1.9)	1.0 (1.8)
	without	185	0.8 (1.3)	3.3 (2.3)	1.9 (2.1)	1.5 (1.2)	1.5 (2.0)	1.4 (2.0)	2.1 (2.3)	1.8 (1.9)
	P		<0.001	0.010	0.005	<0.001	<0.001	0.001	0.003	0.001

P values were determined by the Mann-Whitney U test. Values are means (SD).

Table 6 Predictors for CFSI category scores as identified by stepwise multiple regression analysis

	Predictors	Beta	P	Adjusted R ²
Irritability	Proper eating behavior	-0.165	<0.001	0.069
	Anxiety/concern regarding physical fitness	0.135	<0.001	
	Age	-0.122	<0.001	
General fatigue	Anxiety/concern regarding physical fitness	0.170	<0.001	0.073
	Regular exercise	-0.128	<0.001	
	Proper eating behavior	-0.125	<0.001	
Chronic tiredness	Anxiety/concern regarding physical fitness	0.218	<0.001	0.120
	Regular exercise	-0.181	<0.001	
	Proper eating behavior	-0.138	<0.001	
Physical disorders	Proper eating behavior	-0.238	<0.001	0.099
	Anxiety/concern regarding physical fitness	0.204	<0.001	
Decreased willingness to work	Years of work experience	0.146	0.043	0.100
	Proper eating behavior	-0.200	<0.001	
	Anxiety/concern regarding physical fitness	0.205	<0.001	
Decreased vitality	Proper eating behavior	-0.210	<0.001	0.077
	Anxiety/concern regarding physical fitness	0.195	<0.001	
Anxiety	Proper eating behavior	-0.184	<0.001	0.060
	Anxiety/concern regarding physical fitness	0.177	<0.001	
Depressive feelings	Proper eating behavior	-0.246	<0.001	0.093
	Anxiety/concern regarding physical fitness	0.176	<0.001

Fig. 1 Comparison of CFSI results for caregivers with those for general female Japanese laborers (n=23,835) and female Japanese healthcare workers (n=6,010) reported by Kosugoh et al. (9)

The same trend is evident for the CFSI conducted among general laborers and healthcare workers. Rates of CFSI complaints in the clusters indicating workplace environment dissatisfaction and mental ailments were lower among caregivers than among laborers in other occupations. In the cluster indicating physical ailments, complaint rates of “general fatigue” and “physical disorders” were about the same as in other occupations, while those of “chronic tiredness” were lower than in other occupations.

Discussion

Several studies on fatigue among healthcare workers have shown strong relationships between physical and emotional stresses and fatigue symptoms. For example, fatigue in nurses was more severe among those who felt physical pain or emotional issues (11). Shortage of sleep and irregular eating behaviors, which are characteristic of the shift-work system of nurses, were associated with fatigue symptoms and adverse health conditions (12). On the other hand, a study of fatigue among family caregivers for cancer patients indicated that the length of the caregiving period did not influence fatigue, but the daily schedule became a burden that increased feelings of fatigue (13). However, little is known about the caregivers targeted in this study, due to the scarcity of research on those who are neither nurses nor family members.

The CFSI results of caregivers who participated in this study showed that physical complaints were relatively severe compared to emotional complaints or complaints about the workplace environment. These results are consistent with the findings of Kosugoh (14), which revealed that the CFSI among caregivers in healthcare facilities indicated more serious physical complaints and less serious emotional complaints. A comparison of caregivers in this study with other workers, including general female employees and female healthcare service personnel, indicated not only the same trend toward strong physical complaints, but also the interesting finding of a small number of workplace environment complaints among caregivers. One

reason for this might be that the nature of the work performed by caregivers, which consists primarily of one-on-one care for a patient, is fairly independent work that does not involve relationships with superiors, subordinates, or other colleagues that might be likely to cause problems in workplace environments. In addition, caregivers reported similar levels of general fatigue and physical disorders as general laborers and healthcare workers, but had lower complaint rates in other categories. Caregiving work is characterized by relatively long restricted hours of working, and a relatively low workload per unit of time. As those patients who receive care are individuals who have problems taking care of themselves, most of the labor provided by caregivers involves helping patients with activities of daily life, and does not require the same high level of knowledge and skill possessed by professional nurses. In other words, patients expect caregivers to provide the support that they might receive from their family members, including emotional support (15). These characteristics may partially explain why caregivers experience less fatigue than workers in other professions.

Univariate analyses showed that anxiety/concern regarding problems associated with work environments influenced the level of fatigue experienced by caregivers. Caregivers have traditionally provided only very basic care for patients since they were called professional home-helpers. In recent years, caregivers have begun to play roles in the provision of team-based healthcare as professional caregiving workers, and are thus now experiencing greater feelings of anxiety and concern regarding problems associated with their work environments. As result, caregivers may now be experiencing more severe fatigue. In order to alleviate fatigue in caregivers, periodic seminars are needed to improve professional knowledge and skills. For example, nationally licensed nurses and care workers hold lectures to discuss case studies and allow caregivers to exchange their opinions. An attitude of wanting to further professional knowledge and skills is also important for caregivers.

In addition, univariate analyses revealed that a lack of exercise and improper eating behaviors were also associated with fatigue. Multivariate analyses showed that anxieties and

concerns about physical fitness and improper eating behaviors represented factors that lowered all CFSI category scores. Many caregivers who participated in this study were older women, with more than 70% aged 50 years and over. This suggests a reduction in the level of physical fitness that occurs with age, which may promote a greater sense of fatigue. A survey on fatigue among family caregivers also showed that aged caregivers felt higher levels of fatigue (16-18). While modifying lifestyle habits, such as regular exercise and proper eating habits, is useful in promoting health, it is difficult to accomplish. Compared to that for other workers, health management for caregivers is insufficient due to their employment system. Periodic provision of health check-ups to caregivers is thus necessary to modify poor lifestyle habits. In order to solve this problem, both caregivers and the agencies that send them should

recognize the importance of health management.

In conclusion, our results suggest that upgrading the knowledge and skills of care and nursing through improvements in the education system for caregivers, and modifying lifestyle behaviors could reduce the levels of fatigue experienced by caregivers. Further studies such as longitudinal or experimental (intervention) studies should be conducted to confirm our results.

Acknowledgements

Extensive assistance with this study was provided by the entire staff of the Aichi Prefecture Care Worker Support Center. I would like to extend my sincere thanks to all who helped with this study.

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