

Coping strategies, care manager support and mental health outcome among Japanese family caregivers

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Abstract

Coping and social support are regarded as major modifiers of the caregiving stress and negative mental health effects experienced by caregivers. Under Japan's Long-term Care Insurance (LTCI) system, care managers have played a major role in providing psychosocial support for family caregivers while coordinating formal and informal care resources for elderly people. However, since the launch of the LTCI system in 2000, no evaluation has examined the role care managers play in buffering the negative effects of the caregiver burden among family caregivers in Japan. This study examined the direct and buffering effects of stress-coping strategies and care manager support on caregiver burden and depression among Japanese family caregivers ($n = 371$) caring for community-dwelling persons aged 65 or over who were having difficulties with the activities of daily living. A self-administrated questionnaire survey was conducted between February and March 2005 in a rural suburb in south-western Japan. Hierarchical regression analyses revealed the following. (i) Coping strategies and 'social talk' by care managers had direct effects on caregiver burden and depression. (ii) 'Avoidant' coping and 'social talk' by care managers had buffering effects on the care needs–depression relationship. (iii) 'Information giving' by care managers had no significant direct effect, but it had a negative effect on the care needs–depression relationship. Overall, results concerning 'approaching' coping were in line with those of previous studies, while findings concerning 'avoidant' coping were not consistent with findings in Western countries. The type of care manager support appeared to have a variable influence on caregiver burden and depression.

Keywords: caregiver burden, coping, depression, Japan, social support

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Introduction

Japan has the fastest ageing population in the world. Currently, 19.5% of the total population is 65 years old or more, a 5% increase from the 1996 figure of 14.5% (Cabinet Office Japan 2005). Research over the past two decades has shown that caring for elderly people is stressful for family caregivers and leads to a higher prevalence of mental health problems (Schulz & Martire 2004). To counter problems related to an ageing society, the Long-term Care Insurance (LTCI) system

was launched in April 2000. Under the LTCI system, care delivery in Japan has changed dramatically. New healthcare professionals called 'care managers' have been introduced, whose task is to coordinate formal and informal care resources for elderly people and to provide psychosocial support for family caregivers. To evaluate the effectiveness of the LTCI system, it is important to assess the extent to which the care manager support, as a new social support resource, has contributed to reducing the caregiving stress experienced by family caregivers.

Coping is defined as a process involving cognitive and behavioural efforts to manage stressful events or environments (Lazarus & Folkman 1984). Social support refers to psychological and material resources in stressful situations and is often classified into three types: instrumental, informational and emotional (Cohen 2004). Coping and social support have been cited as major factors influencing the care needs–stress relationship (Wake 1993, Ell 1996, Gottlieb & Wolfe 2002, Schulz & Martire 2004). However, significant variability exists in appraisals of the mental health impacts among family caregivers, even when the caregivers' social status, the type of care they provide and the time they spend providing care are quite similar (Wake 1993, Schulz & Martire 2004). In addition, although many studies have identified certain buffering effects of coping strategies on caregiving stress, there are a number of technical problems with these studies, such as inconsistencies in conceptualisation and divergent outcome measures (Gottlieb & Wolfe 2002). Thus, no consensus has been reached with respect to the stress-buffering effects of coping strategies. As for the stress-buffering effects of social support, research has suggested that social support interventions help caregivers manage stressful life events by allowing them to express their feelings and identify their needs (Spiegel & Kimerling 2001, Roth *et al.* 2005). However, a recent review concerning informational and psychological support intervention for family caregivers indicated that these interventions were not consistently effective (Thompson *et al.* 2007).

In addition, most past studies have focused mainly on Caucasian subjects (Haley *et al.* 1996, Shaw *et al.* 1997, Janevic & Connell 2001, Abe *et al.* 2003). In recent years, racial, ethnic and cultural diversities have received increasing attention as relevant factors with respect to caregiving stress, coping strategies and social support resources among family caregivers (Janevic & Connell 2001). These studies have suggested that findings based on subjects who are healthcare professionals providing services to family caregivers in Western countries are not necessarily applicable in the Japanese setting.

To date, few studies have examined the buffering effects of coping strategies and social support on family caregivers' mental health in Japan (Wake 1993, Wake *et al.* 1994, Okabayashi *et al.* 1999, 2003, Abe *et al.* 2003). Since the introduction of the LTCI system in 2000, no assessment has been made of the stress-buffering effect of interaction with a care manager. Most studies in Japan concerning the relationship between social support and family caregivers' mental health have been exploratory. As a measure of social support, numerous studies have used the degree of utilisation or type of

formal support, and no studies have included the type of support provided by care managers.

Therefore, it is necessary to examine the relationship between care manager support and family caregivers' burden and mental health in relation to their cultural context. This finding would be beneficial in improving the Japanese care delivery system in the future. The aim of the current study was twofold: (i) to determine which types of coping and support provided by care managers affect family caregivers' burden and incidence of depression, and (ii) to examine the buffering effects of coping and support provided by care managers on caregiving stress. To examine these points, we conducted a questionnaire survey of family caregivers in Japan.

Methods

Participants, that is, those most responsible for providing home-based care to elderly relatives needing some help, were recruited with the assistance of care managers in local care-management service agencies in a rural suburb in south-western Japan. First, researchers explained the objectives and procedures of the study to 45 agencies, and 30 of them agreed to participate. Next, care managers in those agencies explained the objectives of the study to all eligible family caregivers during their routine home visits and distributed the questionnaires with stamped, self-addressed envelopes. Family caregivers who agreed to participate answered the questionnaires and mailed them directly to the researchers. The self-administrated questionnaire survey was conducted between February and March 2005.

Ethical consideration

To assure participants that their privacy would be protected, we indicated the following in the questionnaire: (i) data would be used solely for study purposes, (ii) participation in the study was completely voluntary and (iii) the questionnaire was anonymous to ensure confidentiality. The questionnaire items were answered by checking the correct answer or filling in the corresponding number. Furthermore, because the questionnaire was returned directly from the participants to the researchers with stamped, self-addressed envelopes, the participant could not be identified. Thus, the study was performed using anonymous and unidentified data. Participants' informed consent was regarded as being given when participants returned a fully or partially completed questionnaire.

Appraisals of burden and depression

To assess appraisals of the burden of caregiving tasks among family caregivers, the short version of the Zarit

Burden Interview (ZBI) (J-ZBI_8; Japanese version) was used. The ZBI has been most widely used in North America and European countries (Bédard *et al.* 2001, Arai *et al.* 2004). Arai *et al.* (1997) developed the Japanese version of the ZBI (J-ZBI), which has been validated. Recently, the J-ZBI_8 has been developed, and its strong correlations to the J-ZBI and reliability and validity have been established (Arai *et al.* 2003a, Kumamoto *et al.* 2003). Eight items, relating to personal or role strains because of caregiving tasks, were scored on a 5-point scale (0 = 'never' to 4 = 'always'), with the higher scores reflecting greater appraisals of burden by family caregivers. The internal consistency (Cronbach's α) of the data was 0.88.

Depression of family caregivers was assessed using the Japanese version of the Zung Self-rating Depression Scale (ZSDS) (Zung 1965). The ZSDS is a well-known self-rating scale, and has been used worldwide to measure depression. Higher scores on this scale indicate more severe depression. The ZSDS consists of 20 items covering affective, psychological and somatic symptoms. Family caregivers rated themselves on a 4-point scale (1 = 'a little' to 4 = 'most of the time') based on how often they experienced each symptom, with a potential range of 20–80. The internal consistency (Cronbach's α) of the data was 0.86.

Care needs of the elderly persons

The levels of care needs of the elderly persons were identified using the Government-certified Disability Index (GCDI). The GCDI was developed for the LTCI system. The GCDI scores were computed based on the assessment of 'level of care needs' for 85 items for elderly persons. Because the 85 items consist mainly of activities of daily living (ADLs), the GCDI may not adequately reflect care needs relating to problem behaviours in elderly people (Nandi 2001). To overcome the limitations of the GCDI, scoring was finalised by a committee assigned by the local government, in which health and welfare professionals discussed the validity of the score, based on medical conditions reported by primary physicians and detailed information on care needs. The final GCDI scores ranged from 0 ('frailty, slight impairment') to 5 ('bedridden with special needs'). The present study only included elderly persons with GCDI scores above 1 ('have some difficulties in their ADLs') (Arai *et al.* 2003b, Social Insurance Research Institute 2003).

To assess how often family caregivers dealt with behaviours associated with dementia symptoms of the elderly persons, a modified version of the revised memory and behavioural problems (MBPs) checklist was used (Teri *et al.* 1992). The checklist omitted items

concerning the depressive effect on the relative because some family caregivers objected to these items in a pilot study by Gottlieb & Rooney (2004). The modified checklist maintained high internal consistency, with a Cronbach's α of 0.85. To reflect behavioural problems frequently reported by family caregivers in Japan, the checklist added three items from the dementia screening and severity checklist for elderly people (Honma 1996). The internal consistency (Cronbach's α) of those data was 0.88.

Coping strategies

Lack of contextual specificity has been a major technical problem in determining the validity of coping scales in previous studies (Williamson & Schulz 1993, Okabayashi *et al.* 1999, Gottlieb & Wolfe 2002). In Japan, Wake (1993, 1996) developed a coping scale based on stress-coping theory (Lazarus & Folkman 1984) that focused on caregiving stress in community dwellings. Okabayashi *et al.* (1999) amended this scale to identify coping strategies used by family caregivers to alleviate caregiving stress. To obtain coping subscales for this study, a factor analysis by the unweighted least-squares method with promax rotation was conducted using 11 items from Okabayashi *et al.* (1999). Two categories, 'approaching' and 'avoidant', were identified, and the reliability (Cronbach's α) of each category was 0.83 and 0.78, respectively (Table 1). Each item was scored on 4 points (1 = 'cannot do it at all' to 4 = 'can do it well').

Care manager support

In the present study, perceived support provided to family caregivers by their care managers was measured as a form of social support. There is no standardised scale to measure the specific functions of support provided by care managers. Thus, we selected 11 items that correspond to care manager–caregiver interaction in Japan from the classification of Wills (1985) concerning the supportive functions of interpersonal relationships. Scale items were finalised after a pretest among 35 care managers and an expert review by three care managers. Two subscales of the care managers' support variables, 'social talk' and 'information giving', were derived from factor analysis by the unweighted least-squares method with promax rotation (Table 2). The same factors were also derived using maximum likelihood extraction with promax rotation. Respondents rated the extent to which they received each type of support from their care managers on a 4-point scale (0 = 'never', 1 = 'hardly ever', 2 = 'often', 3 = 'always'). The reliability of each category (Cronbach's α) was 0.84, and 0.79, respectively.

Table 1 Factor analysis: factor loadings, internal consistency and correlations for coping strategies ($n = 371$)

Item	Abbreviated item label	Factor 1 Approaching	Factor 2 Avoidant
4	Try to understand and respect the feelings of the elderly person	0.81	0.03
5	Take care of the elderly person with kindness	0.79	0.02
7	Try my best to take good care of the elderly person	0.69	-0.09
6	Do not put off responding to the requests of the elderly person	0.65	0.03
9	Try to take time for myself	-0.16	0.86
8	Meet friends or pursue hobbies to change my mood	-0.19	0.85
2	Always pay attention to my health	0.20	0.60
3	Try to be active and positive all the time	0.38	0.44
10	Encourage one another by sharing concerns with other caregivers	0.08	0.34
1	Do not push myself too hard in taking care of the elderly person	0.28	0.33
11	Use home-care services frequently	0.05	0.16
Internal consistency (Cronbach's α)		0.83	0.78
Correlation			
Factor 1 Approaching		-	0.26
Factor 2 Avoidant		0.26	-

The extraction method was unweighted least-squares with promax rotation.

Factor loadings > 0.40 are in bold text.

Data analysis

To isolate the direct effects of coping strategies and care manager support, and to examine the buffering effects of the coping strategies and support given, hierarchical regression analyses were conducted using ordinary least-squares methods. In the analyses, two types of linear models with 'caregiver burden' and 'depression' as dependent variables were calculated. Independent variables were entered according to stress-coping theory (Lazarus & Folkman 1984) and a previous study (Gottlieb & Rooney 2004). Specifically, 'gender', 'age' and 'living status' (live together or not) of family caregivers were entered to control for differences in the caregivers' characteristics in step 1. In step 2, care demands (i.e. 'level of care needs' and 'MBPs') were entered. In step 3, buffering factors (i.e. coping strategies and care manager support) were entered.

In addition, to predict the interaction effects of care demands and buffering factors on caregiver burden and depression, interaction terms were entered in step 4. Prior to the construction of the interaction terms, factors related to care demands and buffering factors were

Table 2 Factor analysis: factor loadings, internal consistency and correlations for care manager support ($n = 371$)

Item	Abbreviated item label	Factor 1 Social talk	Factor 2 Information giving
11	Talked about television and news	0.79	0.00
10	Talked about hobbies	0.75	-0.02
5	Talked about community topics	0.74	0.03
8	Talked about caregiver's good memories from long ago	0.74	-0.11
9	Talked about caregiver's health and everyday life	0.57	0.12
7	Spent time without talking	0.32	0.03
6	Talked about complaints regarding family members	0.30	0.00
3	Talked about caregiver's opinions or requests for care services	-0.08	0.75
1	Obtained information about care services	-0.01	0.74
2	Obtained information about caregiving techniques	0.10	0.70
4	Talked about caregiver's opinions or requests regarding other care providers	0.01	0.59
Internal consistency (Cronbach's α)		0.84	0.79
Correlation			
Factor 1 Social talk		-	0.34
Factor 2 Information giving		0.34	-

The extraction method was unweighted least-squares with promax rotation.

Factor loadings > 0.40 are in bold text.

centred by subtracting the average score of the sample from each person's score on the variables. Once a significant interaction was obtained, we plotted slopes of depression on the level of care needs at the mean and ± 1 standard deviation (SD) of the buffering factor (Z) to interpret the interaction effects (Figures 1–3). Posthoc analyses were conducted to probe the significance of each slope (Aiken & West 1996). These analyses were performed using the SPSS statistical software package for Windows (version 11.0, SPSS, Inc., Chicago, IL, USA).

Results

Description of the participants

Of 923 questionnaires initially distributed by the care managers, 618 were returned (response rate was 67.0%).

Table 3 Descriptive statistics of the study variables (*n* = 588)

	Analysed sample (<i>n</i> = 371)			Excluded sample (<i>n</i> = 188)			<i>P</i> value*
	No. (%)	Mean (SD)	Range	No. (%)	Mean (SD)	Range	
Caregivers' gender							0.107
Male	54 (14.6%)			37 (19.7%)			
Female	317 (85.4%)			150 (79.8%)			
Caregivers' age		59.1 (11.5)	22–90		65.4 (14.1)	35–93	< 0.0001
Living status							0.240
Living together	327 (88.1%)			161 (91.5%)			
Living separately	44 (11.9%)			15 (8.5%)			
Level of care needs		2.1 (1.2)	1–5		2.2 (1.3)	1–5	0.345
Memory and behavioural problems		21.8 (10.0)	0–58		–		
Approaching		12.5 (2.4)	4–6		–		
Avoidant		11.6 (2.6)	4–16		–		
Social talk		9.3 (3.2)	3–19		–		
Information giving		11.0 (2.6)	3–16		–		
Caregiver burden (J-ZBI_8)		12.8 (7.6)	0–32		–		
Depression (ZSDS)		42.8 (9.8)	23–72		–		

ZSDS, Zung Self-rating Depression Scale.

* χ^2 test or *t*-test was used for comparison.**Table 4** Correlations (*n* = 371)

Correlations (<i>n</i> = 371)	1	2	3	4	5	6	7	8	9	10
1. Caregivers' gender†	–									
2. Caregivers' age	–0.24***	–								
3. Living status‡	0.03	–0.14**	–							
4. Level of care needs	0.11*	0.01	–0.05	–						
5. Memory and behavioural problems	0.07	–0.01	–0.01	–0.15**	–					
6. Approaching	–0.06	0.2***	0.08	0.04	–0.09	–				
7. Avoidant	–0.11*	–0.04	0.2***	–0.18**	–0.09	0.26***	–			
8. Social talk	–0.04	0.19***	–0.05	0.08	0	0.03	–0.01	–		
9. Information giving	–0.01	0.04	0.07	0.06	0.05	0.01	0.03	0.31***	–	
10. Caregiver burden (J-ZBI_8)	0.21***	0.03	–0.18**	0.25***	0.21***	–0.26***	–0.49***	–0.11*	–0.02	–
11. Depression (ZSDS)	0.17**	0.03	–0.12*	0.11*	0.14**	–0.27***	–0.5***	0.02	–0.02	0.55***

ZSDS, Zung Self-rating Depression Scale.

* *P* < 0.5; ** *P* < 0.01; *** *P* < 0.001.

† Male coded as 0; female coded as 1.

‡ Living together coded as 0; living separately coded as 1.

Of these, 35 were excluded because the people being cared for were 65 years or older, and 24 were excluded because the GCDI score for the elderly person being cared for was above 1, indicating some difficulty in the ADLs or more severe impairment. A further 188 were excluded from the main analyses because of missing values in study variables.

Table 3 shows descriptive statistics of the analysed sample (*n* = 371) and the samples excluded because of missing values (*n* = 188). In the analysed sample, the mean age of respondents was 59.1 years (85.4% women, 14.6% men; range = 22–90; SD = 11.5), and the majority

(88.1%) were living with elderly persons. Although the age of respondents in the excluded sample was significantly older than in the analysed sample, there were no differences in other descriptive characteristics (i.e. gender, living status and level of care needs of the elderly persons).

Correlations of study variables

Table 4 shows the correlations of the study variables. Specifically, 'living status' was correlated with caregiver burden (*P* = 0.001) and depression (*P* = 0.02), showing

Table 5 Hierarchical regression analyses predicting factors related to burden and depression ($n = 371$)

Variable	Caregiver burden (J-ZBI_8)				Depression (ZSDS)			
	Coefficient*	95 CI	ΔR^2	<i>P</i> value	Coefficient*	95 CI	ΔR^2	<i>P</i> value
Step 1: caregivers' characteristics			0.08	< 0.0001			0.05	< 0.001
Gender†	4.77	2.60, 6.93		< 0.0001	5.25	2.38, 8.12		< 0.001
Age	0.03	-0.03, 0.10		0.310	0.05	-0.04, 0.14		0.297
Living status‡	-4.16	-6.48, -1.84		< 0.001	-3.57	-6.64, -0.50		0.023
Step 2: care demands			0.10	< 0.0001			0.03	0.005
Level of care needs	1.54	0.95, 2.12		< 0.0001	0.87	0.06, 1.68		0.035
Memory and behavioural problems (MBP)	0.17	0.10, 0.24		< 0.0001	0.14	0.04, 0.24		0.006
Step 3: coping and care manager support			0.19	< 0.0001			0.22	< 0.0001
Approaching	-0.50	-0.77, -0.22		< 0.001	-0.66	-1.03, -0.28		< 0.001
Avoidant	-1.03	-1.29, -0.77		< 0.0001	-1.55	-1.91, -1.20		< 0.0001
Social talk	-0.33	-0.53, -0.12		0.002	0.03	-0.25, 0.32		0.820
Information giving	0.05	-0.20, 0.31		0.679	-0.07	-0.43, 0.28		0.677
Step 4: interaction terms			0.02	0.200			0.04	0.015
Level of care needs \times approaching	0.00	-0.22, 0.22		0.970	0.10	-0.19, 0.40		0.494
Level of care needs \times avoidant	-0.13	-0.32, 0.05		0.153	-0.38	-0.63, -0.1		0.003
Level of care needs \times social talk	0.00	-0.17, 0.18		0.957	-0.33	-0.56, -0.10		0.005
Level of care needs \times information giving	0.10	-0.10, 0.31		0.312	0.30	0.03, 0.57		0.031
MBP \times approaching	-0.01	-0.04, 0.02		0.455	-0.02	-0.06, 0.02		0.250
MBP \times avoidant	0.02	0.00, 0.04		0.112	0.00	-0.03, 0.03		0.883
MBP \times social talk	0.02	0.00, 0.05		0.021	-0.01	-0.04, 0.02		0.409
MBP \times information giving	-0.01	-0.03, 0.02		0.689	0.00	-0.04, 0.04		0.960
R^2 total			0.38	< 0.0001			0.33	< 0.0001
Adjusted R^2			0.35	< 0.0001			0.30	< 0.0001

ZSDS, Zung Self-rating Depression Scale.

* Unstandardised coefficient.

† Male coded as 0; female coded as 1.

‡ Living together coded as 0; living separately coded as 1.

that living with an elderly person in the same house was likely to lead to increased caregiver burden and depression. 'Level of care needs' and 'MBPs' were also highly correlated with caregiver burden (both $P < 0.001$) and depression ($P = 0.03, 0.008$, respectively). This indicates that a higher GCDI score, and frequent MBPs lead to increased caregiver burden and aggravated stress. 'Approaching' or 'avoidant' coping strategies were negatively related to caregiver burden and depression (all $P < 0.001$). 'Social talk' was also negatively correlated with caregiver burden ($P = 0.04$). In addition, 'approaching' and 'avoidant' coping strategies correlated with each other ($P < 0.001$), implying that a caregiver who uses one of these coping strategies also uses the other.

Stability of the hierarchical linear regression models

Table 5 shows the results of hierarchical linear regression analyses. The analyses were preformed for the 371 subjects. As a formula concerning the sample size for multiple linear regression, Tabachnick & Fidell (2007) recommended a larger value when calculating by $N \geq 50 + 8m$ or $N \geq 104 + m$, where 'm' is the number of

explanatory variables. In our case, the required sample size was 186, indicating that the sample size used ($n = 371$) fulfils the criterion. The adjusted R^2 values of the two regression models were 0.35 and 0.30, respectively. Cohen (1992) suggested that a value of $f^2 = R^2/(1 - R^2)$ of 0.35 or higher indicates a large effect size for a regression model, which is equivalent to a value of R^2 of 0.26 or higher. Both models had a large effect size according to Cohen's suggestion.

Direct effects of coping and care manager support

Step 3 of the regression equation indicated the influential role of coping strategies and care manager support, which independently added significant incremental validity to the predictive equations (i.e. change in R^2 was 19% for caregiver burden and 22% for depression) (Table 5). Specifically, 'approaching' and 'avoidant' coping strategies predicted lower caregiver burden and depression. An increase in 'approaching' coping strategies by 1 unit led to a decrease of 0.50 units in caregiver burden or depression. An increase in 'avoidant' coping by 1 unit led to a decrease by 1.03 or 1.55 in caregiver burden or depression (all $P < 0.001$). 'Social talk'

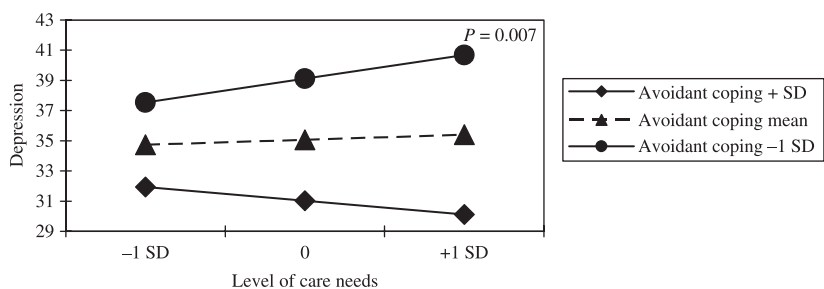


Figure 1 Interaction effect of avoidant coping and level of care needs on depression.

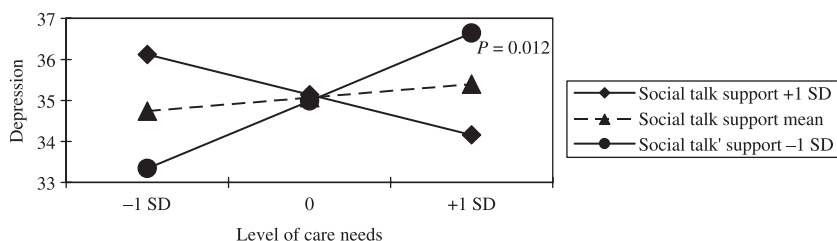


Figure 2 Interaction effect of social talk support and level of care needs on depression.

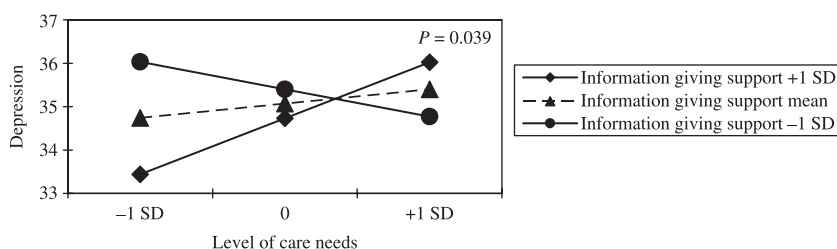


Figure 3 Interaction effect of information giving support and level of care needs on depression.

support by the care manager predicted a positive effect on caregiver burden. An increase in ‘social talk’ support by 1 unit led to a decrease by 0.33 in caregiver burden ($P = 0.002$).

Buffering effects of coping and care manager support

Next, analyses were conducted to determine the buffering effects of coping strategies and care manager support on caregiving stress. The block of interaction terms included in step 4 of the equations accounted only for increases in variables of depression (Table 5). Two of the eight interactions showed moderating effects on depression. Those between ‘level of care needs’ and ‘avoidant’ coping strategies ($P = 0.003$) and ‘social talk’ ($P = 0.005$) were significantly related to decreased depressive symptoms. Among the eight interactions, interaction between ‘level of care needs’ and ‘information giving’ predicted negative effects on depression ($P = 0.031$). There were no other significant effects of the interaction on caregiver burden or depression.

Figure 1 displays relations between ‘level of care needs’ and depression as buffered by ‘avoidant’ coping

strategies. The simple slope for the low (–1 SD) ‘avoidant’ coping strategies indicated a significant increase of depression at higher ‘level of care needs’ when ‘avoidant’ coping strategies were low (–1 SD) (coefficient = 1.28; $P = 0.007$). There was no significant relationship between ‘level of care needs’ and depression when the ‘avoidant’ coping strategies had mean (0) or high (+1 SD) values. The effect of ‘level of care needs’ on depression as buffered by ‘social talk’ support is shown in Figure 2. The simple slope for the low (–1 SD) ‘social talk’ support indicated that depression increased significantly at higher ‘level of care needs’ when ‘social talk’ support was low (–1 SD) (coefficient = 1.34; $P = 0.012$). No significant relationship between ‘level of care needs’ and depression was observed when ‘social talk’ support was mean (0) or high (+1 SD). Figure 3 displays relations between ‘level of care needs’ and depression as buffered by ‘information giving’ support. The simple slope for the high (+1 SD) ‘information giving’ support indicated that depression increased significantly at higher ‘level of care needs’ when the caregiver perceived more information support (+1 SD) (coefficient = 1.05; $P = 0.039$). There was no significant relationship

between 'level of care needs' and depression when 'information giving' support was at mean (0) or low (-1 SD) values.

Discussion

Although previous studies have reported the stress-buffering effects of coping behaviours on the part of caregivers in Japan, no findings have been obtained with respect to the buffering effects of care manager support (Wake 1993, Wake *et al.* 1994, Okabayashi *et al.* 1999, 2003, Abe *et al.* 2003). In addition, since the launch of the LTCI in 2000, no studies have evaluated the stress-buffering effects of caregiver coping behaviours or of care manager support. Therefore, this is the first study examining the 'direct effects' and 'buffering effects' of coping strategies and care manager support on caregiving stress among Japanese family caregivers under the LTCI system. Coping strategies had a direct effect on caregiver burden and depression (all $P < 0.001$) (Table 5). The results were consistent with those of previous studies, implying that 'approaching' coping strategies are beneficial for family caregivers in coping with caregiving stress (Borden & Berlin 1990, Williamson & Schulz 1993, Okabayashi *et al.* 2003). Regarding 'avoidant' coping strategies, our finding was similar to those previously observed among Asian populations (Shaw *et al.* 1997, Okabayashi *et al.* 1999, 2003), but inconsistent with findings observed in Western countries (Borden & Berlin 1990, Wright *et al.* 1991, Haley *et al.* 1996, Powers *et al.* 2002). These differing findings may result from cultural differences. In rural Japan, many still believe that elderly people should be taken care of at home by their family members. When caregiving is long term, family caregivers often feel mental stress. The results confirm that distancing themselves from caregiving tasks, and spending time on their own pursuits are effective for Japanese caregivers to maintain their mental health (Okabayashi *et al.* 2003).

'Social talk' had a significant direct effect on caregiver burden ($P = 0.002$) but not on depression. 'Information giving' was not related to either caregiver burden or depression (Table 5). Levinson *et al.* (1997) reported that 'social' and 'emotional' communication in doctor-patient relationships significantly predicted malpractice claim status for primary care physicians, while communication regarding medical information made no such contribution. Those researchers indicated that 'social' communication is important for the maintenance of good doctor-patient relationships because this type of communication helps to fulfil a patient's need to be treated as an individual person, rather than as a disease. In care manager-caregiver interactions, the role of a care manager might be similar to that of a doctor in

doctor-patient interactions. For family caregivers, the care manager is equivalent to the doctor in doctor-patient interactions. Thus, in agreement with the findings by Levinson *et al.* (1997), in care manager-caregiver interactions, 'social talk' may be effective in relieving feelings of caregiver burden because it fulfils a family caregiver's need for recognition and understanding. The insignificant association of 'information giving' with caregiver burden and depression indicates that providing information is not in itself effective in reducing caregiver burden. A possible reason for this is that family caregivers may find it difficult to implement suggestions made by care managers, as they are already doing all they can to relieve the burden of long-term care. Furthermore, our result is similar to the finding of Drentea *et al.* (2006), which indicated that more emotional support for spouse-caregivers predicted higher satisfaction with social support, while instrumental and informational support was not a significant predictor. Psychological respite that allows family caregivers to share news and discuss problems and feelings may provide family caregivers with some temporary relief from caregiving stress.

As for the 'buffering effect', we found that 'avoidant' coping and 'social talk' buffered the effects of 'level of care needs' on depression ($P = 0.003, 0.005$, respectively) (Table 5). Of the possible coping strategies available, it may be that 'avoidant' coping is most effective because family caregivers can easily implement it (i.e. independently and instantaneously) when they feel stressed in a persistent and unchangeable caregiving situation. For family caregivers who spend the majority of their time on caregiving tasks, 'social talk' with care managers may help them to take a break and fulfil their own needs. The findings suggest that 'social talk' is effective in supporting family caregivers. It is surprising that 'information giving' was adversely associated with depression. Although information is generally useful for family caregivers in managing their caregiving situation, care managers need to consider carefully the amount and timing of their 'information giving'.

The current study indicated that family caregivers are able to cope with caregiving stress effectively by accepting their role and actively involving themselves in caregiving ('approaching' coping), as well as by distancing themselves from caregiving tasks when necessary ('avoidant' coping). However, lack of formal/informal support or social norms may sometimes prevent family caregivers from taking advantage of these coping strategies (Asahara *et al.* 2001, Okabayashi *et al.* 2003). Thus, it may be necessary for care managers to assess not only the level of care needs of elderly people but also the mental health of their caregivers. As the 'level of care needs' increases, care managers may

attempt to provide more educational information to help family caregivers reduce their burdens. However, the current study found that providing more information might induce adverse effects on family caregivers' mental health. Thus, it is necessary for care managers to determine the amount and timing of 'information giving' according to the needs of family caregivers, not the 'level of care needs'.

The current study has several limitations. First, the study was conducted with a small sample in a rural area of Japan. Of 618 returned responses, only 371 responses had no missing values with respect to the study variables. Thus, these 371 samples were used for analysis. Similar experiences were reported in studies that mailed surveys to family caregivers of impaired elderly people (Asahara *et al.* 2001, Abe *et al.* 2003). Some research has suggested that family caregivers of impaired elderly persons in rural communities are more likely to be unwilling to participate in research (Rapp *et al.* 1998, DiBartolo & Soeken 2003). Although the descriptive characteristics, including the level of care needs of elderly people, from the excluded sample, owing to missing values, were not different from the analysed sample, the caregivers were significantly older than those in the 371 samples. Thus, our findings may not be fully valid for family caregivers who are 65 years or older. However, the results of a crude sensitivity analysis mostly agreed with those in Table 5. Moreover, our sample was in line with national figures in terms of family caregiver gender, and relationship to and residency with elderly persons (Cabinet Office Japan 2005). Similarly, the proportion of elderly people (i.e. 65 years or older) living in the research area agreed with the national average (Ministry of Internal Affairs and Communication 2000). However, caregiving situations and social norms concerning the care of elderly people at home by family members may vary according to area and community resources. Thus, the applicability of the findings may be limited to family caregivers in rural areas in Japan and not to family caregivers in metropolitan areas such as Tokyo, Osaka and Nagoya. Further research is necessary to obtain information on family caregivers in metropolitan areas in Japan.

Second, the current study used the 'level of care needs', which is an ordinal measure, as a stressor (independent variable). Arai *et al.* (2003b) reported the association of this index and the ADLs and cognitive impairment of the elderly people. We also believe that 'level of care needs' is a highly objective scale because the level is determined based on the assessment of care-needs level for 85 items relating to elderly care, using professional consultation. It also is considered to indicate the care needs of elderly persons and to serve as a guideline when using formal care services under

the LTCI system (Abe *et al.* 2003). Therefore, it was appropriate that we used 'level of care needs' as an independent variable in the analysis.

In the present study, we demonstrated the following. (1) 'Approaching' and 'avoidant' coping strategies and 'social talk' support by care managers had a 'direct effect' on relieving caregiver burden and depression. (2) 'Avoidant' coping strategies and 'social talk' support by care managers had a 'buffering effect' on the relationship between care needs and depression. (3) 'Information giving' support by care managers had no significant 'direct effect', but contributed negatively to the relationship between care needs and depression. Given that this is the first study to examine this area, further research is necessary to verify the present findings.

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