


ORIGINAL ARTICLE

Factors affecting negative and positive emotions among spouses caring for patients with psychotic or bipolar disorder

Haruka Ogawa MD¹ | Nao Shiraishi MD, PhD, MPH¹  | Hiroko Yatsu RN, PhD² | Tatsuo Akechi MD, PhD¹ 

¹Department of Psychiatry and Cognitive-Behavioral Medicine, Graduate School of Medical Sciences, Nagoya City University, Nagoya, Japan

²Graduate School of Nursing, Miyagi University, Sendai, Japan

Correspondence

Nao Shiraishi, MD, PhD, MPH, Department of Psychiatry and Cognitive-Behavioral Medicine, Graduate School of Medical Sciences, Nagoya City University, 1 Kawasumi, Mizuho-cho, Mizuho-ku, Nagoya 467-8601, Japan.
Email: nao-shiraishi@umin.ac.jp

Funding information

Japan Society for the Promotion of Science, Grant/Award Number: 19K14420

Abstract

Aim: Spouses experience conflicting emotions when caring for partners with severe mental illnesses. They can have negative emotions while also regarding caregiving as positive and may develop a better marital relationship through the caregiving process. This study investigated factors affecting the negative and positive emotions of husbands and wives acting as caregivers of their spouses with severe mental illnesses.

Methods: An online nationwide survey of 166 spouses caring for partners diagnosed with schizophrenia, schizoaffective disorder, or bipolar disorder was conducted. Caregivers' negative and positive emotions, personal and role strains in the care burden, sense of coherence, and patients' disabilities in family communication were assessed. We conducted a series of hierarchical multiple regression analyses to evaluate the effects of these factors on the emotions of husbands and wives separately.

Results: Among the 166 spouses, 112 (67%) were husbands and 54 (33%) were wives. Husbands were caregivers to 1.4 times as many individuals diagnosed with psychotic disorder as were wives. The negative emotions of husbands were linked to personal strain, whereas those of wives were associated with patient disability in family communication. Sense of coherence was the only factor predicting positive emotions for both sexes.

Conclusion: Support for spousal caregivers should be adjusted according to sex. A reduction in husbands' personal strain can alleviate their negative emotions, whereas wives' negative emotions can be relieved by improving communication within their families. Regardless of sex, a higher sense of coherence level has the potential to suppress negative emotions and enhance positive emotions.

KEYWORDS

caregiver burden, family relations, mood disorder, psychotic disorder, spouses

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial](https://creativecommons.org/licenses/by-nc/4.0/) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

© 2024 The Author(s). *Psychiatry and Clinical Neurosciences Reports* published by John Wiley & Sons Australia, Ltd on behalf of Japanese Society of Psychiatry and Neurology.

INTRODUCTION

Severe mental illnesses, such as psychotic disorder and bipolar disorder, require lifelong treatment and caregiving due to their pathological nature. Improving the mental conditions of spouses caring for patients with such illnesses is a critical challenge. Spouses of mentally ill patients are two to three times more likely to be diagnosed with a mental illness, including depression, than spouses of healthy individuals. Furthermore, the rate of diagnosis of depression among spouses of patients with schizophrenia was reported to be four times higher than that among spouses of patients with other mental illnesses.¹ Additionally, spouses or partners with bipolar disorder are more likely to be diagnosed with Axis I disorders (e.g., mood disorder, anxiety disorder, and psychotic disorder) than blood-related caregivers, such as parents or siblings.² Individuals with mental illnesses have a lower quality of life than the general population does in terms of psychological well-being and social relationships.³ Spouses providing care for patients with severe mental illnesses tend to experience difficult emotions. Thus, the improvement of spousal caregivers' conditions is considered an important issue. To the best of our knowledge, few studies have investigated the emotions of spousal caregivers of patients with severe mental illnesses.

The emotional experiences of spouses involved in caregiving differ according to sex. Generally, female individuals are known to experience higher levels of depression, anxiety, and stress than male individuals do. Depression is approximately twice as common in women as in men.⁴ Female caregivers have been reported to have higher levels of burden and depression and lower levels of subjective well-being and physical health than male caregivers do. In particular, sex differences in caregivers' depression and physical health have surpassed those observed in the general adult population.⁵ The lifetime prevalence of depression among spouses of individuals with mental illnesses has been reported to be 30.3%, with the strongest predictor being female sex.⁶ Additionally, one of the factors contributing to the sex differences in caregivers' emotions was found to be the role difference between male and female individuals. Generally, female individuals provide informal caregiving for family members with chronic medical conditions, including mental illnesses.⁷ This can be explained by the social expectation that female individuals would serve as caregivers, whereas male individuals are not typically expected to become caregivers.⁸ However, some studies^{9,10} have reported that the number of male caregivers has increased in recent years. Male individuals tend to find it difficult to balance their work responsibilities and caregiving roles, particularly because male roles in caregiving are not sufficiently understood at work.⁸ These sex differences make it reasonable to examine the factors related to spousal caregiving, focusing on husbands and wives separately.

Spousal caregivers' emotions are related to known factors, including care burden, family communication, and sense of coherence (SOC). Zarit et al.¹¹ defined care burden as "the extent to which caregivers perceived their emotional or physical health, social life, and financial status as suffering as a result of caring for their relatives." Care burden has been identified as a predictor of depressive

symptoms in caregivers of individuals with severe mental illnesses.¹² Spousal caregivers experience a greater care burden than non-spousal family caregivers do.^{13,14} Family communication affects emotions, particularly among spousal caregivers. Spousal caregivers are more likely to experience difficulties in relationships with care recipients, compared with non-spousal caregivers.¹⁵ Poor-quality family relationships contribute to feelings of burden and depression in spousal caregivers.¹⁶

Finally, SOC can protect the emotional conditions of spousal caregivers of individuals with severe mental illnesses. This concept is characterized by styles of coping with stress to maintain physical and psychological health.¹⁷ A longitudinal study¹⁸ demonstrated that caregivers' SOC is a protective factor against depression and anxiety. Another study¹⁹ indicated that a higher SOC can help individuals to cope better with caregiving situations. Valimaki et al.²⁰ investigated spousal caregivers of patients with dementia. They found that husbands had a higher SOC than wives did and that higher levels were inversely correlated with depressive symptoms. Although these factors are related to caregivers' emotional conditions, it remains unclear how they affect spousal caregivers' negative and positive emotions.

This study aimed to investigate sex differences in the effects of factors related to the positive and negative emotions of spousal caregivers of individuals with severe mental illnesses. We focused on husbands and wives separately with the aim of providing effective support for their respective emotional burdens.

METHODS

Participants and procedures

This study was conducted in compliance with the provisions of the Declaration of Helsinki and approved by the Institutional Review Boards of Nagoya City University Graduate School of Medical Sciences and Nagoya City University Hospital (no. 60-19-0123). Informed consent was obtained from all study participants via a web-based platform.

Participants were screened and recruited using an online survey panel in November 2021. The inclusion criteria were as follows: (1) age between 18 and 74 years; (2) individuals whose spouses had been diagnosed with schizophrenia, schizoaffective disorder, or bipolar disorder; and (3) individuals whose ill spouses had regularly attended outpatient treatment, visited medical facilities in the past year, or were receiving inpatient treatment. Participants responded to assessment measures in Japanese and provided demographic information, including sex, age, occupation, and educational background. The online survey panel was administered by Rakuten Insight (Tokyo, Japan), an online survey company. The panel comprised 2.2 million participants, with a sex distribution of 45% male individuals and 55% female individuals. Its composition closely mirrored recent census data from Japan.²¹ For the present study, a sample size of 180 participants was established, maintaining a 2:1 ratio of husbands to wives, based on preliminary data collected from the countrywide panel.

Assessment measures

Negative and positive emotions

The Profile of Mood States Second Edition Adult Short Form (POMS2-AS) assesses seven mood states experienced within the past week. This self-report questionnaire consists of 35 items measuring anger–hostility (AH), confusion–bewilderment (CB), depression–dejection (DD), fatigue–inertia (FI), tension–anxiety (TA), vigor–activity (VA), and friendliness (F) on a 5-point Likert scale (0 = *not at all*; 4 = *extremely*).²² The total mood disturbance (TMD) score is calculated as AH + CB + DD + FI + TA – VA. A higher TMD score indicates stronger negative mood states. TMD scores have been standardized for the adult Japanese population.²³ As a positive mood state, friendliness (F) consists of five items, with scores ranging from 0 to 20, which represent feeling useful to others, being kind to others, and trusting others. A higher F-score indicates a more robust positive mood state. The reliability and validity of the Japanese version of the POMS2-AS have been confirmed.²³

Care burden

The Japanese Version of the Zarit Burden Interview Short Version (J-ZBI_8) examines care burden. The Zarit Burden Interview (ZBI) is a 22-item self-report measure of burden among caregivers of older patients.²⁴ The ZBI scores are associated with care burden levels among patients with dementia and psychosis.²⁵ A higher score indicates a greater level of self-perceived burden. This measure comprises two subscales: Personal Strain (PS) and Role Strain (RS).²⁶ PS relates to the burden directly experienced by caregivers, whereas RS pertains to the burden caused when caregivers are unable to live as they were accustomed. Arai et al.^{27,28} confirmed the reliability and validity of the Japanese version and developed a short version of the ZBI. The J-ZBI_8 consists of eight items scored on a 5-point scale (0 = *never*; 4 = *nearly always*), with a total score ranging from 0 to 32. PS and RS were evaluated using questions such as, “Do you feel helpless in being with care recipients?” and “Do you feel that your social life has suffered because you are caring for your relative?,” respectively. Kumamoto and Arai confirmed the validity of both subscales in the short version of the J-ZBI_8.²⁹

SOC

The idea of SOC originates from the salutogenesis theory.³⁰ This theory posits that people can maintain and improve their health by strengthening salutary factors. The Sense of Coherence Scale 13-Item Version (SOC-13) was developed to evaluate salutary factors that allow individuals exposed to high stress to maintain good health.^{30,31} The SOC-13 is scored on a 7-point scale, with total scores ranging from 13 to 91. The self-report scale encompasses three dimensions: comprehensibility (e.g., “Do you find your feelings and

thoughts very confusing?”), manageability (e.g., “Do you feel you have no confidence to keep self-control?”), and meaningfulness (e.g., “What do you do every day that gives you pleasure and satisfaction?”). The reliability and validity of the SOC-13 were reviewed by Eriksson and Lindström.¹⁷ Yamazaki³² and Togari et al.³³ examined the psychometric properties of the Japanese version of the SOC-13. However, the factorial validity of the SOC-13 has not been consistently confirmed. Hittner³⁴ and Bernabé et al.³⁵ conducted a confirmatory factor analysis of the SOC-13 and suggested a single-factor model that was better fitted than a three-factor model. Endo et al.³⁶ reported that a single-factor model was the best solution for the Japanese version of the SOC-13.

Patient's disability in family communication

The participants were asked one question regarding their disability, as in a previous study.³⁷ This question, “To what extent has any mental problem disrupted his/her communication within the family?,” assessed the degree of disability in family communication during the past month, using an 11-point scale (0 = *not at all*, 10 = *extremely*). A higher score signifies greater difficulty in family communication. This question significantly predicted both negative and positive emotions in individuals who had siblings with psychosis in a study by Shiraishi et al.³⁷

Data analysis

Descriptive statistics were used to examine the sociodemographic and clinical characteristics of the participating spouses and patients. Chi-squared tests were used to analyze differences in categorical variables between husbands and wives. The means and standard deviations (SDs) of the scores of the POMS2-AS, J-ZBI_8, SOC-13, and patients' disability in family communication were calculated. Pearson's correlation coefficients between all the variables were also calculated. A series of hierarchical multiple regression analyses was then performed for husbands and wives to evaluate the impact of caregiving on their negative and positive emotions.

We regarded the SOC-13 score as a single factor, consistent with previous studies.^{34–36} The SOC-13 scores were entered into the regression model before the patients' disability and J-ZBI_8 score. The reason for this order was that SOC, as an individual's natural ability, was considered to surpass the influence of the patient's disability and care burden. Additionally, we assumed that the patient's disability would affect the degree of care burden. Therefore, we first entered caregiver's age, as young caregivers were reported to have higher rates of depression, compared with older caregivers³⁸; second, we entered the total score of the SOC-13; third, the score of the patient's disability; and finally, the subscale scores of care burden (PS and RS). We adopted a two-tailed *p*-value of <0.05 to denote statistical significance. All statistical analyses were performed using SPSS Statistics Version 28 (IBM).



RESULTS

Participant characteristics

Table 1 shows the participants' sociodemographic and clinical characteristics. Of the 166 spouses, 112 (67%) were husbands and 54 (33%) were wives. The mean age of husbands was 50.7 (SD 10.9) years and that of wives was 46.4 (SD 10.3) years. The mean TMD score was 55.4 (SD 12.1) for husbands and 59.9 (SD 13.7) for wives. Most husbands (56.3%) and wives (61.1%) were caregivers for their spouses who were diagnosed with psychotic disorder and bipolar disorder. A chi-squared test indicated that the proportion of husbands caring for individuals with psychotic disorders was 1.4 times higher than that of wives ($\chi^2(1) = 4.393$, $p < 0.05$). Regarding occupational status, 67.9% of husbands were regularly employed, whereas only 0.9% were househusbands. Among wives, 27.8% were regular employees and 22.2% were housewives.

Correlations

Tables 2 and 3 show the correlation coefficients between all variables used in this study, alongside their means and SDs. For both husbands and wives, the POMS2-AS TMD scores were positively correlated with the patients' disability scores, and PS and RS scores on the J-ZBI-8. The POMS2-AS TMD scores were negatively correlated with the POMS2-AS F and SOC-13 scores. Additionally, the POMS2-AS F scores were positively correlated with the SOC-13 scores (husbands: $r = 0.38$, $p < 0.01$; wives: $r = 0.41$, $p < 0.01$). For husbands, the POMS2-AS F scores were negatively correlated with the PS ($r = -0.14$, $p < 0.01$) and RS ($r = -0.09$, $p < 0.01$) scores. However, for wives, the POMS2-AS F-score did not demonstrate a significant correlation with either the PS or RS scores.

Hierarchical multiple regression analyses

Tables 4 and 5 illustrate the results of the hierarchical multiple regression analyses performed separately for husbands and wives. For husbands, after adjusting for age, the POMS2-AS TMD score was negatively associated with the SOC-13 score ($F[1, 109] = 120.04$, $p < 0.001$) and positively associated with the patients' disability score ($F[1, 108] = 42.13$, $p < 0.001$). Moreover, in the last model, the POMS2-AS TMD score was positively associated with the PS score ($F[2, 106] = 9.90$, $p < 0.001$). For wives, after adjusting for age, the POMS2-AS TMD score was inversely related to the SOC-13 score ($F[1, 51] = 69.95$, $p < 0.001$) and positively related to the patients' disability score ($F[1, 50] = 7.71$, $p < 0.01$). However, in the last model, the POMS2-AS TMD score did not show a significant association with the SOC-13 score, patients' disability score, or either the PS or RS score ($F[2, 48] = 0.19$, $p = 0.83$). The POMS2-AS F score was significantly related solely to the SOC-13 score for husbands ($F[1, 109] = 21.08$, $p < 0.001$) as well as wives ($F[1, 51] = 9.85$, $p < 0.01$).

DISCUSSION

The findings of our analyses suggest a sex-specific impact of PS on spouses' emotions when caring for patients with severe mental illnesses. Husbands' negative emotions appeared to be influenced by PS; however, wives' negative emotions did not show this association. However, for both sexes, negative emotions were inversely associated with SOC and positively related to disabilities that the patients had in family communication. Among the variables used in this study, only SOC had a significant impact on the positive emotions developed by husbands and wives. This suggests that, regardless of sex, a robust SOC can alleviate negative emotions, whereas an elevated level of patient disability may intensify these emotions.

The relationship between husbands' negative emotions and PS can be explained by the nature of the patients' illnesses and sex-specific differences in spouses' characteristics. In our study, husbands were more likely to care for patients with psychotic disorder than for those with bipolar disorder. A systematic review by Karambelas et al.³⁹ reported that care burden was considerably higher among caregivers of individuals with psychotic disorder than among caregivers of those with bipolar disorder. Moreover, Cohen et al.⁴⁰ revealed that emotional burden on caregivers of individuals with schizophrenia is linked to positive symptoms and stigma. Considering the concept of PS (i.e., the burden directly experienced by caregiving), the strain caused by psychotic disorder became distinct, possibly due to the challenges posed by hallucinations and delusions. Regarding employment status, husbands were more likely to be regularly employed and less likely to be engaged in domestic work. Generally, female individuals spend more time than male individuals on caregiving.^{7,41} In Japan, male caregivers tend to have few relationships with the local community.⁴² Given that spouses must cope with both caregiving and work in their lives, this restriction could contribute to the effect of PS on husbands' negative emotions.

In spousal relationships, the caregiver's negative emotions seemed to be associated with patients' disabilities in family communication. Jungbauer and Angermeyer⁴³ interviewed parental and spousal caregivers of individuals with schizophrenia and found that the participants felt the care burden differently. In their study, they suggested that the spouses' burden was characterized by changes in closeness and familiarity with the redefinition of roles within partnerships and families. Furthermore, the spouses' quality of marriage could have different effects on their mental state during caregiving. When spousal caregivers of patients with physical diseases and dementia perceived their marital relationships as positive and supportive, they felt less burdened and depressed.^{44,45} A qualitative study⁴⁶ indicated that some couples regarded the events experienced by their spouse as positive in their lives, which strengthened their marital bonds. In particular, wives who were in a good marriage found that the more they engaged in caregiving, the more their mental state tended to improve.⁴⁷ These previous studies support our findings regarding the association between the negative emotions of spousal caregivers and patients' disabilities in family communication.

TABLE 1 Sociodemographic and clinical characteristics of spouses and PTs.

	Spouses' relationships with PTs				
Variable	Husbands (n = 112)		Wives (n = 54)		Chi-square
Spouses' ages, mean (SD), years	50.7	(10.9)	46.4	(10.3)	39.4
Spouses' education, n (%)					24.5***
<High school	1	(0.9)	2	(3.7)	
High school	26	(23.2)	12	(22.2)	
Two-year college	11	(9.8)	20	(37.0)	
University	63	(56.3)	17	(31.5)	
Postgraduate course	11	(9.8)	2	(3.7)	
Others	0	(0)	1	(1.9)	
Spouses' occupation, n (%)					47.1***
Regular employment	76	(67.9)	15	(27.8)	
Irregular employment	14	(12.5)	21	(38.9)	
Self-employment	6	(5.4)	3	(5.6)	
Housewife/househusband	1	(0.9)	12	(22.2)	
Student	0	(0)	0	(0)	
Unemployment	14	(12.5)	2	(3.7)	
Others	1	(0.9)	1	(1.9)	
Spouses' living status, n (%)					0.07
Living with PTs	103	(92.0)	49	(90.7)	
Not living with PTs	9	(8.0)	5	(9.3)	
Caregiving duration					1.97
<3 months	3	(2.7)	1	(1.9)	
3–6 months	5	(4.5)	4	(7.4)	
6–12 months	6	(5.4)	5	(9.3)	
1–3 years	18	(16.1)	7	(13.0)	
3–5 years	17	(15.2)	7	(13.0)	
5–10 years	15	(13.4)	8	(14.8)	
≥10 years	48	(42.9)	22	(40.7)	
Key person in caregiving, n (%)					1.30
Yes	86	(76.8)	37	(68.5)	
No	26	(23.2)	17	(31.5)	
PT age, mean (SD), years	48.5	(9.8)	47.2	(10.3)	42.4
PT education, n (%)					15.1**
<High school	7	(6.3)	1	(1.9)	
High school	44	(39.3)	13	(24.1)	
Two-year college	33	(29.5)	12	(22.2)	
University	26	(23.2)	22	(40.7)	
Postgraduate course	2	(1.8)	6	(11.1)	
Others	0	(0)	0	(0)	
PT occupation, n (%)					60.9***

(Continues)

**TABLE 1** (Continued)

	Spouses' relationships with PTs				
Variable	Husbands (n = 112)		Wives (n = 54)		Chi-square
Regular employment	10	(8.9)	29	(53.7)	4.84
Irregular employment	20	(17.9)	7	(13.0)	
Self-employment	3	(2.7)	5	(9.3)	
Housewife/househusband	49	(43.8)	0	(0)	
Student	1	(0.9)	0	(0)	
Unemployment	28	(25.0)	11	(20.4)	
Others	1	(0.9)	2	(3.7)	
Diagnosis, n (%)					3.19
Schizophrenia	55	(49.1)	17	(31.5)	
Schizoaffective disorder	8	(7.1)	4	(7.4)	
Bipolar disorder	49	(43.8)	33	(61.1)	
Treatment status, n (%)					12.08***
Regular visits	96	(85.7)	50	(92.6)	
Irregular visits	10	(8.9)	4	(7.4)	
Hospitalization	6	(5.4)	0	(0)	
Number of hospitalizations					
None	46	(41.1)	35	(64.8)	
Once	23	(20.5)	12	(22.2)	
Two or more times	43	(38.4)	7	(13.0)	

Abbreviations: PT, patient; SD, standard deviation.

** $p < 0.01$; *** $p < 0.001$.**TABLE 2** Correlations of the POMS2-AS, SOC-13, patient's disability in FC, and J-ZBI_8 scores for husbands.

	POMS2-AS TMD	POMS2-AS F	SOC-13	Patient's disability in FC	J-ZBI_8 PS	J-ZBI_8 RS	Mean (SD)
POMS2-AS TMD	—						55.4 (12.2)
POMS2-AS F	-0.304**	—					47.4 (11.1)
SOC-13	-0.740**	0.381**	—				53.8 (13.0)
Patient's disability in FC	0.661**	-0.182	-0.467**	—			3.2 (2.8)
J-ZBI_8 PS	0.742**	-0.141**	-0.563**	0.690**	—		6.9 (5.4)
J-ZBI_8 RS	0.625**	-0.094**	-0.430**	0.605**	0.863**	—	4.1 (3.8)

Abbreviations: F, friendliness; FC, family communication; J-ZBI_8, Japanese Version of the Zarit Burden Interview Short Version; POMS2-AS, Profile of Mood States 2nd Edition Adult Short; PS, Personal Strain; RS, Role Strain; SD, standard deviation; SOC-13, Sense of Coherence Scale 13-Item Version; TMD, total mood disturbance.

** $p < 0.01$.

Caregiving spouses' levels of SOC are presumed to alleviate their negative emotions and intensify their positive emotions. SOC was inversely associated with care burden among family caregivers of patients with schizophrenia.⁴⁸ Moreover, for siblings who cared for patients with psychotic disorder, SOC acted as a mediator between patients' disabilities in family communication and siblings' negative and positive emotions.³⁷ Our study suggests that, for the spouses of

patients with severe mental illnesses, SOC also plays a protective role in regulating both positive and negative emotions. In addition, the impact of SOC on mental health, including emotional conditions, presumably differs according to sex. An association has been reported between SOC and mental health states in general,⁴⁹ and between SOC and psychological well-being.⁵⁰ Both associations were found in male individuals but not in female individuals. However, our

TABLE 3 Correlations of the POMS2-AS, SOC-13, patient's disability in FC, and J-ZBI_8 scores for wives.

	POMS2-AS TMD	POMS2-AS F	SOC-13	Patient's disability in FC	J-ZBI_8 PS	J-ZBI_8 RS	Mean (SD)
POMS2-AS TMD	—						59.9 (13.7)
POMS2-AS F	−0.346*	—					47.9 (11.2)
SOC-13	−0.748**	0.410**	—				50.5 (14.3)
Patient's disability in FC	0.568**	−0.101	−0.438**	—			3.0 (2.9)
J-ZBI_8 PS	0.481**	−0.020	−0.469**	0.585**	—		7.8 (6.2)
J-ZBI_8 RS	0.391**	−0.031	−0.360**	0.394**	0.683**	—	3.9 (3.7)

Abbreviations. F, friendliness; FC, family communication; J-ZBI_8, Japanese Version of the Zarit Burden Interview Short Version; POMS2-AS, Profile of Mood States 2nd Edition Adult Short; PS, Personal Strain; RS, Role Strain; SD, standard deviation; SOC-13, Sense of Coherence Scale 13-Item Version; TMD, total mood disturbance.

* $p < 0.05$; ** $p < 0.01$.

TABLE 4 Hierarchical multiple regression analyses of the POMS2-AS TMD with SOC-13, patient's disability in FC, and J-ZBI_8 for husbands and wives.

	Husbands				Wives			
	R^2 change	F change	(df)	β	R^2 change	F change	(df)	β
Demographics	0.079	9.453**	(1.110)	—	0.005	0.257	(1.52)	—
Age	—	—	—	−0.085	—	—	—	0.069
SOC-13	0.483	120.042***	(1.109)	—	0.574	69.951***	(1.51)	—
	—	—	—	−0.437***	—	—	—	−0.636***
Patient's disability in FC	0.123	42.132***	(1.108)	—	0.056	7.715**	(1.50)	—
	—	—	—	0.216**	—	—	—	0.267**
J-ZBI_8	0.050	9.900***	(2.106)	—	0.003	0.193	(2.48)	—
PS	—	—	—	0.296*	—	—	—	−0.023
RS	—	—	—	0.040	—	—	—	0.070

Abbreviations: FC, family communication; J-ZBI_8, Japanese Version of the Zarit Burden Interview Short Version; POMS2-AS, Profile of Mood States 2nd Edition Adult Short; PS, Personal Strain; RS, Role Strain; SOC-13, Sense of Coherence Scale 13-Item Version; TMD, total mood disturbance.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

findings did not indicate sex differences in terms of this parameter. This may be because SOC works effectively through female individuals' care experiences. Sugiura et al.⁹ noted that the female individuals who accept role changes tend to provide higher levels of caregiving, compared with male individuals. Female caregivers experienced stronger levels of meaningfulness in the SOC dimension, compared with male caregivers. This finding implies that SOC has the potential to relieve wives' negative emotions and enhance their positive emotions.

This study has some limitations. First, we used an online panel to screen and recruit survey participants because it is challenging to reach spousal caregivers in clinical settings. The collected data were consequently not cross-validated with clinical data from medical facilities. Despite this limitation, we believe that the use of a countrywide panel facilitated the recruitment of a substantial number of spousal caregivers of patients with severe mental illnesses. Second, the findings of this study could not be generalized to spousal

caregivers in other countries. We suppose that cultural background may have effects on spouses' perspectives on caregiving and employment conditions. The gap in employment rates between male and female people in Japan is 13.3%, with Japan ranking ninth out of the 34 countries in the Organisation for Economic and Co-operation and Development.⁵¹ This might be because the perception of sex roles as "men work outside, and women stay at home and do housework" remains deeply rooted in Japanese people. Third, we did not measure the severity of patients' symptoms using validated scales. The association between patient disabilities and psychotic symptoms has not been directly examined. Future studies should consider incorporating measures related to the severity of patients' symptoms into the survey. Fourth, although we assumed that the SOC-13 had a single-factor model, based on previous evidence, the factor structure of SOC-13 was not confirmed in this study. We did not obtain a sample size sufficient to execute exploratory or confirmatory factor analyses, which are necessary to confirm a stable factor structure. Fifth, the

TABLE 5 Hierarchical multiple regression analyses of the POMS2-AS F with SOC-13, patient's disability in FC, and J-ZBI_8 for husbands and wives.

	Husbands				Wives			
	R ² change	F change	(df)	β	R ² change	F change	(df)	β
Demographics	0.002	0.264	(1.110)	—	0.008	0.415	(1.52)	—
Age	—	—	—	-0.135	—	—	—	-0.073
SOC-13	0.162	21.075***	(1.109)	—	0.161	9.850**	(1.51)	—
	—	—	—	0.449***	—	—	—	0.550***
Patient's disability in FC	0.000	0.022	(1.108)	—	0.010	0.583	(1.50)	—
	—	—	—	-0.100	—	—	—	0.014
J-ZBI_8	0.011	0.702	(2.106)	—	0.040	1.233	(2.48)	—
PS	—	—	—	0.127	—	—	—	0.144
RS	—	—	—	0.031	—	—	—	0.128

Abbreviations: F, friendliness; FC, family communication; J-ZBI_8, Japanese Version of the Zarit Burden Interview Short Version; POMS2-AS, Profile of Mood States 2nd Edition Adult Short; PS, Personal Strain; RS, Role Strain; SOC-13, Sense of Coherence Scale 13-Item Version.

** $p < 0.01$; *** $p < 0.001$.

sample size was the minimum required for this study, but this might make the results susceptible to observational error due to random variation. Finally, as this was a cross-sectional study, we could not prove any causal association based on the findings.

CONCLUSION

This study suggested that a shift in support focus by sex can effectively improve the emotional conditions of spousal caregivers of patients with severe mental illnesses. Husbands' negative emotions can be alleviated by reducing PS, whereas wives' negative emotions can be relieved through communication within the family. Specifically, for husbands, it might be effective to introduce caregiving services, such as home nursing visits. Furthermore, these services should encourage spouses to engage in SOC, which can relieve negative emotions and enhance positive ones. These findings are useful for providing appropriate interventions for spousal caregivers who require emotional support. Further longitudinal studies with adequate sample sizes are needed to confirm the effects of care burden and SOC on the emotional states of spousal caregivers.

AUTHOR CONTRIBUTIONS

Nao Shiraishi conceived of the study. Nao Shiraishi, Haruka Ogawa, and Hiroko Yatsu designed and conducted the survey. Haruka Ogawa analyzed the data and drafted the manuscript. Nao Shiraishi and Tatsuo Akechi supervised the study and revised the manuscript. All authors contributed to and have approved the final version of the manuscript.

ACKNOWLEDGMENTS

The authors thank Rakuten Insight (<https://insight.rakuten.co.jp/en/>) for their assistance in online data collection. This study was

supported by a Grant-in-Aid for Scientific Research (No. 19K14420) from the Japanese Ministry of Education, Science, and Technology. The funding source had no role in the collection, analysis, and interpretation of data; in the writing of the report; or in the decision to submit the article for publication.

CONFLICT OF INTEREST STATEMENT

Nao Shiraishi has received lecture fees from Mochida Pharma and Sumitomo Pharma. Tatsuo Akechi has received lecture fees from AstraZeneca, Chugai, Daiichi-Sankyo, Eisai, Janssen, Kowa, Kyowa Kirin, Lundbeck, MSD, Meiji-Seika Pharma, Mochida, Nipro, Otsuka, Pfizer, Sumitomo Pharma, Takeda, Tsumura, and Viatris and royalties from Igaku-Shoin. Tatsuo Akechi was the inventor of pending patents (2020-135195, 2022-069057) (Institute) and has patents (7313617) (Institute). The remaining authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data of this study are available from the corresponding author upon reasonable request. The authors assume complete responsibility for the data, analyses, interpretation, and execution of the study.

ETHICS APPROVAL STATEMENT

This study was conducted in compliance with the provisions of the Declaration of Helsinki and approved by the Institutional Review Boards of Nagoya City University Graduate School of Medical Sciences and Nagoya City University Hospital (no. 60-19-0123).

PATIENT CONSENT STATEMENT

Informed consent was obtained from all study participants via a web-based platform.

CLINICAL TRIAL REGISTRATION

N/A.

ORCID

Nao Shiraishi  <http://orcid.org/0000-0003-4089-1816>

Tatsuo Akechi  <http://orcid.org/0000-0003-1100-7518>

REFERENCES

- Merrill RM. Within- and cross-mental health disorder correlations in husband-and-wife pairs. *BMC Psychiatry*. 2022;22:765.
- Goldstein TR, Miklowitz DJ, Richards JA. Expressed emotion attitudes and individual psychopathology among the relatives of bipolar patients. *Fam Process*. 2002;41:645–57.
- Angermeyer MC, Kilian R, Wilms HU, Wittmund B. Quality of life of spouses of mentally ill people. *Int J Soc Psychiatry*. 2006;52:278–85.
- Holden C. Sex and the suffering brain. *Science*. 2005;308:1574.
- Pinquart M, Sorensen S. Gender differences in caregiver stressors, social resources, and health: an updated meta-analysis. *J Gerontol B Psychol Sci Soc Sci*. 2006;61:P33–45.
- Wittmund B, Wilms HU, Mory C, Angermeyer MC. Depressive disorders in spouses of mentally ill patients. *Soc Psychiatry Psychiatr Epidemiol*. 2002;37:177–82.
- Sharma N, Chakrabarti S, Grover S. Gender differences in caregiving among family—caregivers of people with mental illnesses. *World J Psychiatry*. 2016;6:7–17.
- Lawn S, McMahon J. The importance of relationship in understanding the experiences of spouse mental health carers. *Qual Health Res*. 2014;24:254–66.
- Sugiura K, Ito M, Kutsumi M, Mikami H. Gender differences in spousal caregiving in Japan. *J Gerontol B Psychol Sci Soc Sci*. 2009;64:147–56.
- Baker KL, Robertson N. Coping with caring for someone with dementia: reviewing the literature about men. *Aging Ment Health*. 2008;12:413–22.
- Zarit SH, Todd PA, Zarit JM. Subjective burden of husbands and wives as caregivers: a longitudinal study. *Gerontologist*. 1986;26:260–6.
- Perlick DA, Berk L, Kaczynski R, Gonzalez J, Link B, Dixon L, et al. Caregiver burden as a predictor of depression among family and friends who provide care for persons with bipolar disorder. *Bipolar Disord*. 2016;18:183–91.
- Alexander G, Bebee CE, Chen KM, Vignes RMD, Dixon B, Escoffery R, et al. Burden of caregivers of adult patients with schizophrenia in a predominantly African ancestry population. *Qual Life Res*. 2016;25:393–400.
- Di Lorenzo Lorenzo, R, Giron A, Panzera N, Fiore G, Pinelli M, et al. Empathy and perceived burden in caregivers of patients with schizophrenia spectrum disorders. *BMC Health Serv Res*. 2021;21:250.
- Davis LL, Gilliss CL, Deshefy-Longhi T, Chestnutt DH, Molloy M. The nature and scope of stressful spousal caregiving relationships. *J Fam Nurs*. 2011;17:224–40.
- Braun M, Scholz U, Bailey B, Perren S, Hornung R, Martin M. Dementia caregiving in spousal relationships: a dyadic perspective. *Aging Ment Health*. 2009;13:426–36.
- Eriksson M. Antonovsky's sense of coherence scale and the relation with health: a systematic review. *J Epidemiol Community Health*. 2006;60:376–81.
- López-Martínez C, Orgeta V, Frías-Osuna A, del-Pino-Casado R. The mediating role of sense of coherence on mental health outcomes in carers of older dependent relatives: a longitudinal study. *Int J Geriatr Psychiatry*. 2021;36:722–30.
- Potier F, Degryse JM, Henrard S, Aubouy G, de Saint-Hubert M. A high sense of coherence protects from the burden of caregiving in older spousal caregivers. *Arch Gerontol Geriatr*. 2018;75:76–82.
- Välimäki TH, Vehviläinen-Julkunen KM, Pietilä AMK, Pirttilä TA. Caregiver depression is associated with a low sense of coherence and health-related quality of life. *Aging Ment Health*. 2009;13:799–807.
- Rakuten. Insight I: panel characteristic survey, 2018. Ana I Domínguez-Panchón version: 2 <https://insight.rakuten.co.jp/download/PanelCharacteristicSurveyEN.pdf>
- Heuchert JP, McNair DM Profile of mood states, POMS-2. 2nd ed™. North Tonawanda: Multi-Health Systems Inc.; 2012.
- Heuchert JP, McNair DM. Japanese translation of POMS2: Profile of mood states Second Edition. Kaneko Shobo; 2015.
- Zarit SH, Reeve KE, Bach-Peterson J. Relatives of the impaired elderly: correlates of feelings of burden. *Gerontologist*. 1980;20:649–55.
- Gonçalves-Pereira M, González-Fraile E, Santos-Zorroza B, Martín-Carrasco M, Fernández-Catalina P, Domínguez-Panchón AI, et al. Assessment of the consequences of caregiving in psychosis: a psychometric comparison of the Zarit Burden Interview (ZBI) and the Involvement Evaluation Questionnaire (IEQ). *Health Qual Life Outcomes*. 2017;15:63.
- Whitlatch CJ, Zarit SH, von Eye A. Efficacy of interventions with caregivers: a reanalysis. *Gerontologist*. 1991;31:9–14.
- Arai Y, MD KK, Hosokawa T, Washio M, Miura H, Hisamichi S. Reliability and validity of the Japanese version of the Zarit Caregiver Burden Interview. *Psychiatry Clin Neurosci*. 1997;51:281–7.
- Arai Y, Tamiya N, Yano E. The short version of the Japanese version of the Zarit Caregiver Burden Interview (J-ZBI_8): its reliability and validity. *Nippon Ronen Igakkai Zasshi*. 2003;40:497–503.
- Kumamoto K, Arai Y. Validation of 'personal strain' and 'role strain': subscales of the short version of the Japanese version of the Zarit Burden Interview (J-ZBI_8). *Psychiatry Clin Neurosci*. 2004;58:606–10.
- Antonovsky A. Unraveling the mystery of health: how people manage stress and stay well. 1st Edition. Jossey-Bass; 1987.
- Antonovsky A. The structure and properties of the sense of coherence scale. *Soc Sci Med*. 1993;36:725–33.
- Yamazaki Y. Kenko-eno-atarashii-mikata-wo-rionka-shita-kenkoseiseiron-to-kenkohojigainen-SOC. *Qual. Nurs*. 1999;5:825–32.
- Togari T, Yamazaki Y, Nakayama K, Kimura Yamaki, C, Sasaki Takayama, et al. Construct validity of Antonovsky's sense of coherence scale: stability of factor structure and predictive validity with regard to the well-being of Japanese undergraduate students from two-year follow-up data. *JPN J Health Hum Ecol*. 2008;74:71–86.
- Hittner JB. Factorial invariance of the 13-item sense of coherence scale across gender. *J Health Psychol*. 2007;12:273–80.
- Bernabé E, Tsakos G, Watt RG, Suominen-Taipale AL, Uutela A, Vahtera J, et al. Structure of the sense of coherence scale in a nationally representative sample: the Finnish Health 2000 survey. *Qual Life Res*. 2009;18:629–36.
- Endo S, Mitsuishi H, Kanou H, Oishi K. An examination of the reliability and the validity of a one-factor model in the thirteen-item seven-point sense of coherence scale (SOC-13). *Bull Coll Community Hum Serv Rikkyo Univ*. 2013;15:23–8.
- Shiraishi N, Yatsu H, Ogawa H, Akechi T. Mediating effects of care burden and sense of coherence between patients' disabilities and siblings' emotions in psychotic disorders. *PCN Reports*. 2022;1:e55.
- Covinsky KE, Newcomer R, Fox P, Wood J, Sands L, Dane K, et al. Patient and caregiver characteristics associated with depression in caregivers of patients with dementia. *J Gen Intern Med*. 2003;18:1006–14.
- Karambelas GJ, Filia K, Byrne LK, Allott KA, Jayasinghe A, Cotton SM. A systematic review comparing caregiver burden and psychological functioning in caregivers of individuals with schizophrenia spectrum disorders and bipolar disorders. *BMC Psychiatry*. 2022;22:422.

40. Cohen M, Lima AFBS, Silva CPA, Miguel SRPS, Fleck MPA. Quality of life of family primary caregivers of individuals with bipolar disorder and schizophrenia in south of Brazil. *Int J Soc Psychiatry*. 2022;68:818–26.
41. Yee JL, Schulz R. Gender differences in psychiatric morbidity among family caregivers. *Gerontologist*. 2000;40:147–64.
42. Mizuno E, Iwasaki M, Sakai I. Subjective experiences of husbands of spouses with schizophrenia: an analysis of the husbands' descriptions of their experiences. *Arch Psychiatr Nurs*. 2011;25:366–75.
43. Jungbauer J, Angermeyer MC. Living with a schizophrenic patient: a comparative study of burden as it affects parents and spouses. *Psychiatry*. 2002;65:110–23.
44. Schumacher KL, Stewart BJ, Archbold PG. Mutuality and preparedness moderate the effects of caregiving demand on cancer family caregiver outcomes. *Nurs Res*. 2007;56:425–33.
45. Lea Steadman P, Tremont G, Duncan Davis J. Premorbid relationship satisfaction and caregiver burden in dementia caregivers. *J Geriatr Psychiatry Neurol*. 2007;20:115–9.
46. Mahrer-Imhof R, Hoffmann A, Froelicher ES. Impact of cardiac disease on couples' relationships. *J Adv Nurs*. 2007;57:513–21.
47. Beach SR, Schulz R, Yee JL, Jackson S. Negative and positive health effects of caring for a disabled spouse: longitudinal findings from the caregiver health effects study. *Psychol Aging*. 2000;15:259–71.
48. Pipatananond P, Boontong T, Hanucharurnkul S, et al. Caregiver burden predictive model: an empirical test among caregivers for the schizophrenic. *Thai J Nur. Res*. 2006;6:24–40.
49. Takayama T, Asano Y, Yamazaki Y, Yoshii K, Nagasaka Y, Fukada J, et al. Sense of coherence, stressful life events and psychological health. [Nihon koshu eisei zasshi] *Jpn J Public Health*. 1999;46: 965–76.
50. Carmel S, Anson O, Levenson A, Bonneh DY, Maoz B. Life events, sense of coherence and health: gender differences on the kibbutz. *Soc Sci Med*. 1991;32:1089–96.
51. Gender Equality Bureau, Cabinet Office. The white paper on gender equality 2021. 2022. Retrieved from https://www.gender.go.jp/about_danjo/whitepaper/r03/zentai/html/honpen/b1_s02_01.html

How to cite this article: Ogawa H, Shiraishi N, Yatsu H, Akechi T. Factors affecting negative and positive emotions among spouses caring for patients with psychotic or bipolar disorder. *Psychiatry Clin Neurosci Rep*. 2024;3:e70029. <https://doi.org/10.1002/pcn5.70029>