

Factors related to anxiety and depression in women with breast cancer and their husbands: role of alexithymia and family functioning

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Abstract

Goals of work The purpose of this study was to explore alexithymia, family functioning, and other factors that might affect anxiety and depression levels in women with breast cancer and in their husbands.

Patients and methods A cross-sectional study was undertaken in 46 postsurgical ambulatory women with breast cancer and their husbands. Documented informed consent

for the study was obtained from each subject. All subjects completed the Zung self-rating anxiety scale (SAS), the Zung self-rating depression scale (SDS), the 20-item Toronto alexithymia scale (TAS-20), and the family assessment device (FAD).

Main results Multiple regression analysis revealed that a high degree of alexithymia in patients correlated with a high degree of patient anxiety. Patient perceptions of inappropriate affective responsiveness among family members correlated with a high degree of depression. Among husbands, a high degree of anxiety was correlated with their own high level of alexithymia or low level of education, and with the occurrence of adjuvant therapy in their wives. Husband perceptions of inappropriate sharing of roles among family members, their own low education level, and a large number of family members correlated with high degrees of depression among them.

Conclusions The present study revealed that alexithymia and family functioning are associated with anxiety and depression, respectively, in both women with breast cancer and in their husbands. Individual traits such as alexithymia and family functioning should be taken into account when we intervene to treat anxiety and depression in breast cancer patients and their husbands.

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Introduction

Anxiety and depression are important and prevalent problems affecting the quality of life of women with breast cancer. A frequently cited study by Derogatis and

colleagues [13], involving 215 randomly selected adult inpatients and outpatients being treated for three different types of cancer, found that 47% were having psychiatric disorders. Among the 47%, more than two-thirds (68%) had “reactive” or situational anxiety and depression (adjustment disorders with anxious or depressed mood), and 13% had major depression.

Family members are typically regarded as caregivers for cancer patients. In family studies of adult cancer patients, the patients’ spouses, in particular, have been the focus of attention as a valued source of emotional support [4, 5, 29]. However, in some studies, spouses reported having as much distress as the patients themselves [42, 44] or even more [4, 29]. Thus, spouses can be considered “second-order patients”, and they may require some form of medical attention.

On the other hand, many studies have been conducted to determine who is at greatest risk of adjustment problems so that support services can be targeted to them. Thus far, social support has been reported to play an important role in the adjustment of both breast cancer patients and their spouses [7, 21, 40, 41] and has attracted considerable attention as a feasible target of treatment. However, some researchers have indicated the limited usefulness of the social support concept for designing preventive or therapeutic interventions and have proposed the importance of focusing on more specific and more detailed processes [11, 12, 49].

Other studies, meanwhile, have focused on the association between communication and distress in couples. These studies have consistently indicated that a breast cancer patient’s partner is a valuable source of emotional support: patients usually want to talk about their concerns with their partner and often find it problematic when they and their partner are not communicating well [31, 38, 46]. Also, empathy has been believed to play a particularly important role in good communication [19, 23, 32, 48].

Rarely, however, few researchers have tried to explain why empathetic communication is poor in some cancer patients and families. Empathy is known to include an ability to identify another’s emotions and to express one’s own emotions. On the other hand, it has been reported that the people who do not express their emotions can hardly obtain support and ruin their psychological health [45, 52]. That is, cancer patients or their families who do not express their emotions may increase not only patient distress but also their own. To avoid this, it is very important to examine why some people in this situation do not express their emotions. Regarding this problem, some researchers have focused on the emotional control involved in conscious restraint against the expression of emotion [22, 59]. Besides emotional control, however, other explanations of why it is difficult for some people to express emotions have not been examined.

Alexithymia is a famous psychological characteristic involving difficulty in expressing emotions and in identifying their own feelings or those of others. The concept initially evolved from clinical observations of patients with psychosomatic disorders; the term was introduced by Nemiah and Sifneos during the early 1970s [37]. The salient features of this construct are as follows: (1) difficulty identifying and describing subjective feelings; (2) difficulty distinguishing between feelings and bodily sensations of emotional arousal; (3) constricted imaginal capacities; and (4) an externally oriented cognitive style [37]. Alexithymia is a common condition, existing in about 10% of healthy people. It has been reported to exist at even higher rates not only in individuals with psychosomatic disease but also in those with panic disorder, posttraumatic stress disorder (PTSD), eating disorder, substance abuse disorder, and so on [58]. It is now considered a possible risk factor in various psychiatric diseases. Moreover, it is difficult for alexithymic people to comprehend the feelings of other people and to make empathic responses [58]. So, we thought it might be important to investigate the relationship between distress and the degree of alexithymia in breast cancer patients and their spouses.

Meanwhile, family members have various functions besides communication. Recently, well-validated questionnaires for evaluating family functioning have been developed, through which several researchers have reported the relationship between poor family functioning and psychological distress in families with cancer patients (e.g., [27, 28]). The concept of family functioning also may be useful for clarifying who is at greatest risk of adjustment problems among these subjects.

The purpose of this study was to explore alexithymia, family functioning, and other factors that might influence anxiety and depression levels in women with breast cancer and in their husbands.

Materials and methods

Study sample and procedure

Patients meeting the following criteria were drawn consecutively from the outpatient population of the Mammary Gland Dispensary of Hiroshima University Hospital during the 6-month period from October 1999 to March 2000:

- (1) diagnosis of stage I or II breast cancer followed by surgery for it;
- (2) having been informed of this diagnosis,
- (3) 20 years of age or older,
- (4) interval of more than 3 months between the initial surgery for breast cancer and the interview for the present study,

- (5) married woman living with her husband,
- (6) well enough physically to complete several questionnaires,
- (7) Eastern Cooperative Oncology Group performance status (PS) of 0–2,
- (8) absence of cognitive impairment,
- (9) no active concomitant malignancy.

We selected patients who had undergone surgery for breast cancer at least 3 months before the interview because an earlier report showed that most patients can psychologically adapt to bad news within 3 months after learning of it [1]. Eligible patients and their husbands were asked to complete several questionnaires, provided both the patient and her husband gave written consent to participate in the study. Patient characteristics and data on the severity of pain in each patient were obtained by a brief interview conducted by a trained psychologist. The pain severity was measured by a four-point Likert scale (1 “not at all” to 4 “very much”). Medical data regarding Eastern Cooperative Oncology Group performance status (PS), treatment regimen, and months elapsed after surgery were collected from patient records. All data were determined at the date of the interview. This study was approved by the Institutional Review Board and the Ethics Committee of Hiroshima University Hospital, Japan.

Psychological measurement

Zung self-rating anxiety scale SAS

The degree of anxiety was measured by the Japanese version of the Zung self-rating anxiety scale. The SAS is a self-report questionnaire with 20 items rated on a four-point scale [61]. A previous study by our colleagues suggested that the Japanese version of the SAS has high validity and reliability [43]. A high score indicated a high degree of anxiety.

Zung self-rating depression scale SDS

The degree of depression was measured by the Japanese version of the Zung self-rating depression scale. The SDS is a self-report questionnaire with 20 items rated on a four-point scale [60]. Fukuda and Kobayashi [16] suggested that the Japanese version of the SDS has high validity and reliability. A high score indicated a high degree of depression.

The 20-item Toronto alexithymia scale (TAS-20)

The degree of alexithymia was measured using the Japanese version of the TAS-20. The TAS-20 is a self-report questionnaire with 20 items rated on a five-point scale with

a three-factor structure: (1) difficulty in identifying feelings; (2) difficulty in describing feelings; (3) externally oriented thinking. Previous studies have suggested that the TAS-20 has adequate validity and reliability [2, 3] and that the Japanese version of the TAS-20 also has high construct validity and reliability [18]. In this study, the TAS-20 total score was used as an index of the degree of alexithymia. A high score indicated a high degree of alexithymia.

Family assessment device (FAD)

Family functioning was assessed by using the Japanese version of the family assessment device (FAD), a 60-item self-report questionnaire designed to assess seven dimensions of family functioning based on the McMaster model of family functioning [34]. Six of the scales on the FAD reflect the dimensions of family functioning outlined in the MMFF [14]: problem solving, communication, roles, affective responsiveness, affective involvement, and behavior control. The seventh scale of general functioning assesses overall health/pathology. Low scores indicated good functioning, whereas high scores denoted poorer functioning. A previous study by our colleagues demonstrated that the Japanese version of the FAD is valid and reliable [54].

Statistical analysis

First, we performed a univariate analysis between the SAS or the SDS scores and investigated sociodemographic, psychosocial, and medical factors to determine possible independent variables by the Mann–Whitney *U*-test or Spearman’s rank correlation coefficient, in patients and in husbands, respectively. Dummy variables were used when independent variables were categorical. Then, we determined the final risk factors by applying stepwise multiple regression analysis with patients’ and husbands’ SAS or SDS scores as the dependent variables, entering all independent variables investigated in this study. All *p* values reported here are two-tailed. We used SPSS Version 10.0J statistical software (SPSS, Chicago, IL, USA) for all of the data analyses.

Results

Patient characteristics

Of the 67 eligible couples, 19 (28.4%) declined to participate in the study. Of the 48 participating couples, 2 patients did not complete the SAS scale. Thus, the data available for the 46 couples (68.7%) who responded were used in the analysis. The mean ages of the 46 participating patients and the 21 nonparticipating patients were 52.3 ± 10.5 [standard deviation (SD)] and 55.6 ± 10.1 years, respectively.

The difference in age between participating and nonparticipating patients was not significant ($t=-1.180$; $df=65$; $p=0.242$). The mean intervals between the initial surgery for breast cancer and the date of the interview of the 46 participating patients and the 21 nonparticipating patients were 18.3 ± 11.7 and 22.8 ± 13.2 months, respectively. The

difference between participating and nonparticipating patients regarding the interval between the initial surgery for breast cancer and the date of the interview was not significant ($t=-1.413$; $df=65$; $p=0.162$).

The participating patients' characteristics (Table 1) include the following: 48% had at least 12 years of education;

Table 1 Univariate analysis of the factors associated with SAS and SDS in patients

Patient characteristics	n (%)	SAS		SDS	
		Mean score (SD)	p value	Mean score (SD)	p value
Sociodemographic factor					
Age ^a 52.3±10.5 years (34–75)	46 (100)	$r=0.117$	0.439	$r=0.093$	0.538
Education ^b					
≤12 years	23 (52)	31.0 (5.4)		38.5(8.6)	
>12 years	21 (48)	31.9 (6.0)	0.841	37.1(5.8)	0.724
Employment status ^b					
Unemployed	29 (63)	32.1 (5.9)		39.0(7.7)	
Employed	17 (37)	30.9 (5.1)	0.438	36.1(6.1)	0.214
Socioeconomic status ^a 36.7±15.0 (15.0–73.0)	46 (100)	$r=0.113$	0.453	$r=0.183$	0.224
Number of family members ^a 3.30±1.26 (2–6)	46 (100)	$r=-0.070$	0.642	$r=-0.045$	0.766
Children younger than 18 years ^b					
No	30 (67)	31.8 (5.2)		37.7(7.7)	
Yes	16 (33)	31.4 (6.5)	0.636	38.3(6.5)	0.890
Psycho-social factors					
TAS-20 total score ^a					
Patients 49.6±9.6 (29.0–72.0)	46 (100)	$r=0.336$	0.023	$r=0.375$	0.010
Husbands 49.9±8.3 (32.0–68.0)	46 (100)	$r=0.076$	0.622	$r=0.222$	0.143
FAD					
Patients					
Problem Solving ^a 2.07±0.45 (1.17–3.17)	46 (100)	$r=0.243$	0.104	$r=0.260$	0.081
Communication ^a 2.04±0.47 (1.00–3.00)	46 (100)	$r=0.305$	0.039	$r=0.390$	0.007
Roles ^a 1.92±0.35 (1.18–2.55)	46 (100)	$r=-0.062$	0.682	$r=0.152$	0.315
Affective responsiveness ^a 2.21±0.53 (1.33–3.50)	46 (100)	$r=0.343$	0.020	$r=0.502$	<0.001
Affective involvement ^a 2.15±0.41 (1.29–3.14)	46 (100)	$r=0.170$	0.259	$r=0.251$	0.092
Behavior control ^a 2.11±0.38 (1.00–2.89)	46 (100)	$r=0.120$	0.426	$r=0.329$	0.025
General functioning ^a 1.89±0.52 (1.00–3.50)	46 (100)	$r=0.208$	0.165	$r=0.364$	0.013
Husbands					
Problem Solving ^a 1.92±0.55 (1.00–3.50)	46 (100)	$r=-0.080$	0.598	$r=0.137$	0.363
Communication ^a 1.99±0.42 (1.11–2.89)	46 (100)	$r=0.016$	0.915	$r=0.209$	0.162
Roles ^a 1.84±0.40 (1.00–2.73)	46 (100)	$r=-0.133$	0.380	$r=0.107$	0.477
Affective responsiveness ^a 2.10±0.52 (1.00–3.50)	46 (100)	$r=0.032$	0.831	$r=0.166$	0.271
Affective involvement ^a 1.95±0.41 (1.14–3.14)	46 (100)	$r=-0.028$	0.852	$r=0.027$	0.860
Behavior control ^a 1.97±0.42 (1.00–2.56)	46 (100)	$r=-0.157$	0.299	$r=0.143$	0.341
General functioning ^a 1.82±0.40 (1.00–2.58)	46 (100)	$r=0.005$	0.974	$r=0.258$	0.083
SAS (husbands) ^a 32.4±7.1 (21–64)	46 (100)	$r=0.169$	0.260	$r=0.235$	0.115
SDS (husbands) ^a 36.4±7.4 (20–50)		$r=0.042$	0.783	$r=0.260$	0.081
Medical factors					
Months elapsed after surgery ^b 18.3±11.7 months (3–47 months)	46 (100)	$r=0.035$	0.817	$r=-0.125$	0.406
Pain ^{b,c}					
0	14 (30)	29.4 (5.8)		34.7 (6.3)	
1,2,3	32 (70)	32.6 (5.3)	0.087	39.3 (7.3)	0.046
Type of surgery ^b					
Mastectomy	24 (57)	31.2 (5.6)		37.9 (7.6)	
Lumpectomy	18 (43)	32.6 (6.2)	0.541	37.5 (7.5)	0.760
Adjuvant therapy (radiation, chemotherapy, or hormone therapy) ^b					
None	6 (13)	28.3 (3.9)		36.3 (8.4)	
One or more	40 (87)	32.2 (5.7)	0.094	38.2 (7.1)	0.707
Past history of psychiatric treatment ^b					
No	43 (93)	31.7 (5.7)		37.7 (7.4)	
Yes	3 (7)	31.7 (5.5)	0.947	40.7 (3.2)	0.410

^a Univariate analysis was performed on Spearman's rank correlation coefficient

^b Univariate analysis was performed on the Mann–Whitney *U*-test

^c Coded as 0 = not at all, 1 = mild, 2 = moderate, 3 = very severe

63% were not employed; 33% had one or more children younger than 18; 70% reported having pain; 87% had undergone or were undergoing one or more adjuvant forms of therapy, such as radiation treatment, chemotherapy, and hormone therapy; and 7% had a history of psychiatric treatment. The husbands' characteristics (Table 2) include

the following: a mean age of 54.4 ± 11.6 years (range 31–82); 48% had at least 12 years of education; 87% were employed; and 2% had a history of psychiatric treatment. Because the patients were enrolled consecutively during a 6-month period, the study was not biased for the patient characteristics, and thus, it can be assumed that the

Table 2 Univariate analysis of the factors associated with SAS and SDS in husbands

Husband characteristics	<i>n</i> (%)	SAS		SDS	
		Mean score (SD)	<i>p</i> value	Mean score (SD)	<i>p</i> value
Sociodemographic factor					
Age ^a 54.4±11.6 years (31–82)	46 (100)	<i>r</i> =0.14	0.344	<i>r</i> =0.187	0.214
Education ^b					
≤12 years	24 (52)	34.7 (8.7)		38.4 (8.1)	
>12 years	22 (48)	29.9 (3.6)	0.018	34.1 (5.9)	0.042
Employment status ^b					
Unemployed	6 (13)	30.4 (2.7)		40.3 (8.3)	
Employed	40 (87)	32.7 (7.6)	0.601	35.8 (7.2)	0.196
Socioeconomic status ^a 36.7±15.0 (15.0–73.0)	46 (100)	<i>r</i> =0.03	0.822	<i>r</i> =0.153	0.311
Number of family members ^a 3.30±1.26 (2–6)	46 (100)	<i>r</i> =0.06	0.694	<i>r</i> =0.262	0.078
Children younger than 18 years ^b					
No	30 (65)	32.7 (7.8)		36.8 (7.8)	
Yes	16 (35)	31.8 (5.8)	0.871	35.6 (6.9)	0.480
Psycho-social factors					
TAS-20 total score ^a					
Husbands 49.9±8.3 (32.0–68.0)	46 (100)	<i>r</i> =0.546	<0.001	<i>r</i> =0.203	0.181
Patients 49.6±9.6 (29.0–72.0)	46 (100)	<i>r</i> =0.244	0.102	<i>r</i> =0.210	0.161
FAD					
Husbands					
Problem solving ^a 1.92±0.55 (1.00–3.50)	46 (100)	<i>r</i> =0.043	0.776	<i>r</i> =0.095	0.532
Communication ^a 1.99±0.42 (1.11–2.89)	46 (100)	<i>r</i> =0.237	0.112	<i>r</i> =0.207	0.168
Roles ^a 1.84±0.40 (1.00–2.73)	46 (100)	<i>r</i> =0.127	0.399	<i>r</i> =0.376	0.010
Affective responsiveness ^a 2.10±0.52 (1.00–3.50)	46 (100)	<i>r</i> =0.216	0.150	<i>r</i> =0.191	0.202
Affective involvement ^a 1.95±0.41 (1.14–3.14)	46 (100)	<i>r</i> =0.433	0.003	<i>r</i> =0.273	0.066
Behavior control ^a 1.97±0.42 (1.00–2.56)	46 (100)	<i>r</i> =0.229	0.126	<i>r</i> =0.255	0.087
General functioning ^a 1.82±0.40 (1.00–2.58)	46 (100)	<i>r</i> =0.095	0.529	<i>r</i> =0.226	0.131
Patients					
Problem solving ^a 2.07±0.45 (1.17–3.17)	46 (100)	<i>r</i> =0.178	0.236	<i>r</i> =0.004	0.981
Communication ^a 2.04±0.47 (1.00–3.00)	46 (100)	<i>r</i> =0.029	0.848	<i>r</i> =-0.023	0.881
Roles ^a 1.92±0.35 (1.18–2.55)	46 (100)	<i>r</i> =0.186	0.216	<i>r</i> =0.104	0.494
Affective responsiveness ^a 2.21±0.53 (1.33–3.50)	46 (100)	<i>r</i> =0.055	0.715	<i>r</i> =0.087	0.566
Affective involvement ^a 2.15±0.41 (1.29–3.14)	46 (100)	<i>r</i> =0.032	0.835	<i>r</i> =0.127	0.399
Behavior control ^a 2.11±0.38 (1.00–2.89)	46 (100)	<i>r</i> =0.233	0.119	<i>r</i> =0.203	0.176
General functioning ^a 1.89±0.52 (1.00–3.50)	46 (100)	<i>r</i> =0.079	0.600	<i>r</i> =-0.012	0.936
SAS (patients) ^a 31.7±5.6 (20–44)	46 (100)	<i>r</i> =0.169	0.260	<i>r</i> =0.042	0.783
SDS (patients) ^a 37.9±7.2 (25–55)	46 (100)	<i>r</i> =0.235	0.115	<i>r</i> =0.260	0.081
Medical factors					
Months elapsed after surgery ^a 18.3±11.7 months (3–47 months)	46 (100)	<i>r</i> =0.044	0.772	<i>r</i> =0.228	0.128
Pain ^{b,c}					
0	14 (30)	32.0 (6.2)		36.6 (8.1)	
1,2,3	32 (70)	32.5 (7.6)	0.981	36.3 (7.2)	0.719
Type of surgery ^b					
Mastectomy	24 (57)	33.5 (8.7)		36.9 (7.8)	
Lumpectomy	18 (43)	31.1 (4.9)	0.684	35.9 (7.8)	0.721
Adjuvant therapy (radiation, chemotherapy, or hormone therapy) ^b					
None	6 (13)	31.6 (6.1)		36.7 (8.1)	
One or more	40 (87)	32.5 (7.4)	0.911	36.3 (7.4)	0.909
Past history of psychiatric treatment					
No	45(98)	32.2 (7.1)		36.1 (7.2)	
Yes	1 (2)	40.0	0.141	49.0	0.087

^a Univariate analysis was performed on Spearman's rank correlation coefficient

^b Univariate analysis was performed on the Mann–Whitney *U*-test

^c Coded as 0 = not at all, 1 = mild, 2 = moderate, 3 = very severe

Table 3 Multiple regression analysis of predictors of SAS in patients

Variable	Coefficient	Standardized coefficient	<i>t</i>	<i>P</i>
TAS-20	0.204	0.355	2.313	0.026

Multiple $R=0.355$; multiple $R^2=0.126$, adjusted $R^2=0.103$

characteristics of the women in this sample were typical for other breast cancer patients in this culture and in this clinical setting and were also typical for their healthy peers.

Factors correlated with anxiety and depression in patients

Table 1 summarizes the results of the univariate analysis of the factors associated with patient SAS and SDS scores. Among the investigated variables, high patient total score on the TAS-20 and high patient scores on the communication and affective responsiveness subscales of the FAD were significantly associated with high patient SAS score. Meanwhile, high patient total score on the TAS-20, high patient scores on the communication, affective responsiveness, behavior control, and general functioning subscale scores of the FAD, and the presence of pain were significantly associated with high patient SDS scores. The results of the multiple regression analysis of factors correlated with patient SAS score are shown in Table 3. The only factor correlated with high patient SAS score was high patient TAS-20 total score. This indicated that a high degree of patient alexithymia correlated with a high degree of patient anxiety. This model revealed that the selected independent variable accounted for 12.6% of the variance in patient SAS scores. The results of the multiple regression analysis of factors correlated with patient SDS score are shown in Table 4. The only factor correlated with high patient SDS score was a high score on the affective responsiveness subscale of the FAD. This means that patient perceptions of inappropriate affective responsiveness among family members correlated with their high degree of depression. This model revealed that the selected independent variable accounted for 34.5% of the variance in patient SDS scores.

Table 4 Multiple regression analysis of predictors of SDS in patients

Variable	Coefficient	Standardized coefficient	<i>t</i>	<i>P</i>
FAD (patients) Affective Responsiveness	8.220	0.588	4.416	<0.001

Multiple $R=0.588$; multiple $R^2=0.345$; adjusted $R^2=0.327$

Table 5 Multiple regression analysis of predictors of SAS in husbands

Variable	Coefficient	Standardized coefficient	<i>t</i>	<i>P</i>
TAS-20	0.387	0.433	3.140	0.003
Education ^a	-6.183	-0.420	-2.924	0.006
Adjuvant therapy ^b	7.010	0.337	2.299	0.027

Multiple $R=0.597$; multiple $R^2=0.356$; adjusted $R^2=0.304$

^a Coded as 0 ≤ 12 years, 1 > 12 years

^b Coded as 0 = none, 1 = one or more

Factors correlated with anxiety and depression in husbands

The results of the univariate analysis of the factors associated with husband SAS scores and SDS scores are summarized in Table 2. Among the investigated variables, high husband SAS score was significantly associated with low husband education level, high husband total score on the TAS-20, and high husband score on the affective involvement subscale of the FAD. Meanwhile, low husband education level and high husband score on the roles subscale of the FAD were significantly associated with high husband SDS score.

The results of the multiple regression analysis of factors correlated with the husband SAS score are shown in Table 5. The factors correlated with high husband SAS score were high husband TAS-20 total score, low husband education level, and the delivery of adjuvant therapy for patients. This finding indicated that a high degree of alexithymia among husbands, a low husband education level, and adjuvant therapy for patients was correlated with high degrees of anxiety among husbands. This model revealed that the selected independent variables accounted for 35.6% of the variance in the husband SAS scores.

The results of the multiple regression analysis of factors correlated with the husband SDS scores are shown in Table 6. The factors correlated with high husband SDS score were high husband scores on the roles subscale of the FAD, low husband education level, and a large number of

Table 6 Multiple regression analysis of predictors of SDS in husbands

Variable	Coefficient	Standardized coefficient	<i>t</i>	<i>P</i>
FAD (husbands) Roles	5.775	0.312	2.251	0.030
Education ^a	-5.174	-0.350	-2.514	0.016
Number of family members	1.733	0.306	2.188	0.035

Multiple $R=0.543$; multiple $R^2=0.295$; adjusted $R^2=0.238$

^a Coded as 0 ≤ 12 years, 1 > 12 years

family members. This meant that husband perceptions of inappropriate shares of roles among family members, low husband education level, and large number of family members correlated with the high degree of depression among husbands. This model revealed that the selected independent variable accounted for 29.5% of the variance in the husband SDS scores.

Discussion

We found that alexithymia, family functioning, and other factors might be related to psychological distress in women with breast cancer and in their husbands. We also found that there are important differences in related factors between anxiety and depression, or between patients and husbands.

Alexithymia and anxiety among patients and husbands

High degrees of alexithymia among patients and husbands was correlated with high degrees of anxiety in both. Alexithymia has been found to exist at high rates in patients with anxiety disorders such as panic disorder and PTSD [58]. The salient feature of alexithymia is difficulty identifying and describing subjective feelings [37]. That is, high anxiety in alexithymic people may be related to a deficit in emotional regulation that reflects both deficits in the cognitive–experiential component of emotion response systems (i.e., deficits in the top–down regulation from the higher-order brain regions, such as language areas to the limbic structure) and deficits at the level of interpersonal regulation of emotion (i.e., an inability to express their emotions and to get support from others) [57]. But family functioning (an important factor in social support) and alexithymia in spouses were not correlated with anxiety in patients or husbands. These results could indicate the possibility that anxiety in patients and husbands is related to deficits in the internal regulation of emotion rather than to deficits in interpersonal regulation of emotion. So, to decrease the anxiety of patients and husbands, it may be insufficient to encourage emotional expression and to get support from others, as in the emotion suppression model, but it may be useful to facilitate the internal control of emotion (e.g., biofeedback or relaxation training) or to treat symptoms directly by medication.

Moreover, we would like to refer to the issue of whether alexithymia, as observed in this study, had trait or state characteristics. Theoretically, alexithymia has been considered as a developmental deficit [56, 58]. Several longitudinal studies have indicated alexithymia as a stable personality trait [51, 53, 55]. From the point of view of anxiety, Berthoz et al. [6] has suggested that alexithymia was correlated with both state anxiety and trait anxiety, although partial

correlations revealed a tight link between trait anxiety and alexithymia. So, we consider that alexithymia observed in this study also has trait characteristics. However, some researchers have indicated that “secondary (reactive) alexithymia” existed in kidney transplantation patients and in hemodialysis patients [15, 17], and these secondary alexithymia were considered as a defensive reaction to stressful events. Because cancer causes many stressful events, alexithymia in this study also may, at least in part, have reactive characteristics. However, as this study was conducted by a cross-sectional design, we cannot conclude with certainty that alexithymia has either trait or state characteristics. Further longitudinal study will be needed to clarify this issue.

Family functioning and depression in patients and husbands

Family functioning was related to depression in both patients and husbands. Family functioning has been reported to be related to depression in major depression patients without cancer [25, 26]. The present study indicated that family functioning is related to depression in cancer patients and their husbands as well as in people without cancer. But the subtypes of family functioning that correlated with depression differed between patients and husbands. Patient depression was correlated with patient perceptions of inappropriate affective responsiveness among family members in the FAD, while husband perceptions of inappropriate roles among family members in the FAD was correlated with depression in husbands. According to its definition in the FAD, affective responsiveness refers to the ability of family members to respond with appropriate qualities and quantities of feelings to a wide range of stimuli [26]. The importance of emotional support of cancer patients by family members is well known [4, 5, 27, 30, 31, 38]. Some researchers have discussed the importance of the quality of communication among patients and family members, especially the importance of empathy [32, 48]. The results of the present study also could be considered to indicate that family members’ emotional responsiveness to distress could greatly influence the patient’s mental state, particularly pertaining to depression. In other words, we speculate that patient depression worsens if the patient cannot get an empathic response from family during times of distress.

Meanwhile, one factor related to husband depression was the role of the FAD. According to the definition in the FAD, roles are recurrent patterns of behavior necessary to fulfill the instrumental and affective needs of family members [26]. Many breast cancer patients have central roles in caring for family members, such as housework, childcare, and communication with neighbors or relatives. Husbands must play not only their own occupational roles

but also the roles that their wives have ever played, including tending to the needs of other family members. Furthermore, the husband must also care for his ill wife; patients and the total burden become very severe. The results of this study may indicate a great relationship between husband depression and husband frustration about their share of family roles after a decrease in patient function; in other words, frustration over the increase in their burden. The number of family members was also correlated with husband depression. This might also indicate the relation between husband depression and increasing burden because the larger the family, the more people the husband must care for. Thus, although family functioning was associated with depression in both breast cancer patients and husbands, the subscales of family functioning, which correlated with depression, differed between patients and husbands. So, different types of family intervention might be effective for breast cancer patients and their husbands. Intervention to accelerate empathic communication among family members might be effective for breast cancer patients, while intervention to decrease the burden on husbands, such as promoting the sharing of roles among family members or giving information about resources for patient care, might be effective for husbands.

Differences among risk factors for anxiety and depression

As mentioned above, different factors were correlated with anxiety and depression in breast cancer patients and their husbands. Previous studies have demonstrated some differences among risk factors for anxiety and depression in psychiatric populations or in general populations. Newman et al. [39] found that life events were more strongly correlated with major depressive episodes than with general anxiety disorder. Murphy et al. [36] suggested that although the prevalence of depression was significantly higher in a population having low socioeconomic status than in populations of other socioeconomic statuses, the relationship between anxiety and socioeconomic status remained unclear. These studies suggest that depression may be affected more by environmental factors than by anxiety. Interestingly, this study also seems to support these previous findings because family functioning as an environmental factor was correlated with depression, while alexithymia, as an individual personality characteristic, was correlated with anxiety. In cancer populations, the importance of social support has been indicated repeatedly, as mentioned above. But the influences of personality characteristics on anxiety and depression remain unclear, as few previous studies have investigated related factors, including personality characteristics, simultaneously for anxiety and depression, in cancer patients or in their relatives. In future studies of psychological distress in cancer patients and their

relatives, personality characteristics such as alexithymia and other factors should be considered.

Other related factors

Education level

Low education level in husbands was correlated with both anxiety and depression in husbands. A study of healthy subjects found that a low education level was associated with a high degree of anxiety and depression [24, 47]. Low education level has been reported as a risk factor for major depressive disorder [8, 20, 33]. These results are consistent with those of the present study. We speculate that because husbands with low education levels might not collect or analyze useful information and might fail to adjust to the changed situations after spouses get cancer, they might have high degrees of anxiety and depression. Interventions to give adequate information that meet husbands' needs against their increased burden and to support their problem solving may be useful.

Adjuvant therapy

Husbands of patients receiving adjuvant therapy were more anxious than husbands of patients not receiving it. As far as we know, distress in the spouses of cancer patients has never been studied in relation to adjuvant therapy. Several researchers have reported on breast cancer patients' distress during adjuvant therapy, but their results have been controversial. Cathcart et al. [10] reported a high prevalence of depression during adjuvant tamoxifen therapy in breast cancer patients. On the other hand, Cassileth et al. [9] and Montgomery et al. [35] reported no difference in distress levels during adjuvant therapy compared with control groups (an observation group and a healthy control group, respectively). In the present study, patient anxiety and depression were not correlated with husband anxiety and depression. So, we consider that adjuvant therapy does not influence husband anxiety through patient anxiety and depression. One possible explanation for the association between adjuvant therapy and husband anxiety is that when the patient receives adjuvant therapy, the husband might recognize that his wife's condition is not curable, and his anxiety about his wife relapsing might increase. Further study is needed to confirm this interpretation, as we did not investigate the contents of anxiety in this study.

There are several limitations to this study. First, because the sample size was small, so other important factors related to couples' anxiety and depression may have been overlooked. For example, patient pain and a history of psychiatric treatment in husbands each was significantly related to, or tended to be correlated with, anxiety and

depression among couples in univariate analysis but not in multiple regression analysis. Second, the proportion of related factors to couple anxiety and depression is relatively small in this study, and other factors not assessed in this study might be correlated with anxiety and depression (e.g., other personality characteristics or social support issues other than those related to family). Finally, because this study was performed using a cross-sectional design, no causal relationships could be determined. To investigate such relationships, further study, including a prospective study, is needed.

In conclusion, the present study revealed that alexithymia and family functioning were associated with anxiety and depression, respectively, in both women with breast cancer and their husbands. Generally, it has been known that anxiety and depression often occur simultaneously and share many common symptoms [50], so it might be useful to take care in putting into perspective both individual traits, such as alexithymia, and family functioning when we intervene to treat anxiety and depression in breast cancer patients and their husbands. Moreover, the present results suggest we should pay attention to alexithymia especially in anxious (rather than depressive) patients and their husbands and to family functioning in depressive (rather than anxious) patients and husbands. As mentioned above, although this study has several limitations, its results are meaningful as a first report demonstrating a correlation between alexithymia and anxiety and between family functioning and depression simultaneously in women with breast cancer and in their husbands. In future studies, a detailed investigation of personality characteristics such as alexithymia and family functioning is needed to formulate strategies to decrease anxiety and depression in women with breast cancer and their husbands.

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