Quality of Life and Coping of Women Treated for Breast Cancer and Their Caregiver. What are the Interactions?

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Abstract This longitudinal study analyzed the interactions between the quality of life and the coping strategies of 100 patients treated for breast cancer and their caregivers. Data were collected after diagnosis, at the end of treatment, and 6 months after treatment with the Quality of Life Questionnaire-C30 (QLQ-C30), Duke Health Profile and Ways of Coping Checklist for both patients and caregivers. The theoretical model was tested using a typology of patients and mixed model analyses. The quality of life of patients changed over time and no cluster effect was found. The influence of the sociodemographic characteristics, coping strategies (patients and caregivers) and the quality of life of caregivers on patient's quality of life were different according to the quality of life dimensions considered. To understand the adaptation of patients to their disease, it is therefore essential to look at whether the caregiver is capable of playing a supporting role.

Keywords Breast cancer · Quality of life · Coping · Caregiver · Mixed models

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Introduction

During the last 10 years, many studies have been dedicated to the quality of life of women treated for breast cancer. Most have demonstrated that these women usually claim to have a good quality of life regarding the physical dimension (Ganz Rowland, Desmond, Meyerowitz, & Wyatt, 1988; Mols, Vingerhoets, Coebergh, & Van de Poll-Franse, 2005), similar to that observed for the general population (Ganz Rowland, Desmond, Meyerowitz, & Wyatt, 1988; Holzner, Kemmler, & Kopp, 2001). Conversely, the mental dimension of their quality of life generally seems to deteriorate (DREES, 2006; Mandealbatt, Figueiredo, & Cullen, 2003). While chemotherapy has already been identified as a negative predictor of quality of life, other factors such as social support appear to be major positive determinants of the patient's quality of life (Parker, Baile, De Moor, & Cohen, 2003) and adjustment to cancer (Baider, Perry, Holland, Sison, & Kapln DeNour, 1995; Couper et al., 2006). But what are the consequences and what is the impact of the disease on the patient's family? It is known that breast cancer may have a significant and long-term impact on the patient and their family (Lindholm, Rehnseldt, & Arman, Lindholm et al. 2002; Northouse & Swainn, 1987). In particular, spouses present significantly higher values for several psychic parameters including stress level (Given & Given, 1992), mean anxiety score (Grunfeld et al. 2004), severe depression (Gaston-Johansson, Lachica, Fall-Dickson, & Kennedy, 2004) and/or an overall alteration of their physical, mental, and emotional health status with a lower vitality assessed by the quality of life scale Medical Outcome Study Short Form-36 (MOS SF-36) (Wagner, Bigatti, & Stoniolo, 2006).

With the aim of understanding the complex interactions between patients and their spouses, and the impact of the disease on their respective quality of life, we used the

coping concept as a major variable of interest. Although several studies have compared the coping strategies used by patients with those used by caregivers to find out whether their respective adaptation strategies were equivalent, such studies are scarce and their results sometimes contradictory. In the case of breast cancer, spouses are the major sources of support for their wives (Petrie, Logan, & DeGrasse, 2001). Some studies have shown that, although the coping strategies of the patient and their spouse are very similar, women with breast cancer use more varied coping strategies than their caregivers. Moreover, Ben-Zur, Gilbar and Lev, (2001) noticed that patients used more problem-centered coping than their spouses, but a similar number used avoidance strategies. It has also been shown that the strategies used by patients at the beginning of their illness are independent of the one chosen by their spouse (Ptacek, Ptacek, & Dodge, 1994). Other studies have emphasized that patients mainly use emotional support, religion, positive interpretation, entertainment, emotional discharge or humor, while spouses mainly use alcohol or drugs (Kershaw, Northouse, Kritpracha, Schafenacker, & Mood, 2004). Some authors have tried to confirm an interaction between the patient and their caregiver's coping styles on one hand, and the patient's adjustment to the quality of life on the other hand (Hannum et al., 1991). They have demonstrated that the stress reported by the spouse is a product of their own coping and that of the patient. Thus, women may appear more influenced by the coping strategies of their spouse than the men are. In addition, they hypothesized a "strategy asymmetry" such that when the woman expresses more stress, her spouse expresses more optimism. The same authors also noticed that the coping strategies of the spouse are good predictors of the patient's psychological stress.

In this specific context of breast cancer, the aim of this study was to investigate both the women's reactions and those of their caregiver. The main objective was to determine to what extent the coping strategies and the quality of life of these caregivers may influence the quality of life of the patients. The second objective was to investigate whether the quality of life of the patient and of their caregiver, as well as their coping strategies, could change over time.

Method

Procedure

This is the first study to be carried out on this specific topic by the Center against Cancer René Gauducheau (Nantes, France). It was a longitudinal study, taking place over three visits, with direct psychological benefits for patients and caregivers. Most data were collected about 2 or 3 weeks after diagnosis (V1), at the end of chemotherapy and/or radiotherapy treatment (V2), and 6 months after treatment (V3). At each visit, the quality of life and coping strategies of the patients and of their caregivers were measured using the Quality of Life Questionnaire-C30 (QLQ-C30) (quality of life of the patients), Duke Health Profile (DHP) (quality of life of the caregivers) and Ways of Coping Checklist (WCC) (coping strategies of patients and caregivers) questionnaires. In addition, basic clinical information (diagnosis, stage of the disease, treatment methods) was also collected. Patients diagnosed with primary breast cancer were included. Only those patients in good enough overall health to fill in the questionnaires and respond to the interview took part. They were asked to choose a caregiver to participate in the study, a person who could be their spouse, another member of their family (sister, daughter, cousin) or a friend. This caregiver was informed about the study and their formal agreement obtained. A similar informed written consent was then requested from the two participants, i.e. patient and caregiver. They were both monitored longitudinally—but individually—over three visits by a psychology researcher. In total, 100 patients and their caregivers participated in this study between 2005 and 2008.

Participants

Table 1 reports the sociodemographic and medical characteristics of the participants. It should be noted that 75 % of the women of our sample are aged from 45 to 65 years. Eighty percent of them were married and more than 90 % had at least one child. Three-quarters of the women had experienced at least one life event and 78 % had already faced cancer. For more than 75 % of the women, the stress level associated with cancer was very high and they more often displayed strategies centered on the problem and the search for social support. Concerning the caregivers, 80 % were men (always spouses) and 20 % were women (a daughter, a sister, a mother, a cousin or a friend). Their age was identical to that of the patients. 66 % were employed and 64 % were present at the diagnosis. Like the patients, many had already faced cancer (59 %). Finally, to adapt to the cancer of their close relative, caregivers preferred social support-centered coping (67 %) and problem-centered coping (65 %) rather than emotion-centered coping.

Measures

QLQ-C30

The European Organization of Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire C30 (QLQ C30) consists of 30 items covering the functioning and

Table 1 Sociodemographic and medical characteristics of participants

Variable	Category	Frequency (%)
Women (N = 100)		
Age	<45	13 (13%)
	45–54	38 (38%)
	55–64	35 (35%)
	≥65	14 (14%)
Employed	Yes	61 (61%)
Family situation	Live alone	9 (9%)
Number of children	0	7 (7%)
	1 or 2	60 (60%)
	≥3	33 (33%)
Life events	No	25 (25%)
	Yes, one	50 (50%)
	Yes, several	25 (25%)
Medical history	Yes	28 (28%)
Surgical history	Yes	58 (58%)
Already faced cancer	Yes	78 (78%)
Stress level (WCC)	Weak	14 (14%)
	Moderate	50 (50%)
	Strong	78 (78%)
WCC (mean scores and standard errors)	Problem-focused	71.7 (16.6)
	Emotion-focused	50.4 (18.1)
	Social support-seeking	77.4 (13.9)
Caregivers (N = 100)		
Gender	Male	80 (80%)
Age	<45	22 (22%)
	45–54	29 (29%)
	55–64	34 (34%)
	≥65	15 (15%)
Employed	Yes	66 (66%)
Family situation	Live alone	7 (7%)
Link with the women	Husband	79 (79%)
Present at the diagnosis	Yes	64 (64%)
Already faced cancer	Yes	59 (59%)
Stress level (WCC)	Weak	20 (20%)
	Moderate	42 (42%)
	Strong	38 (38%)
WCC (mean scores and standard errors)	Problem-focused	64.6 (16.0)
	Emotion-focused	48.5 (16.9)
	Social support-seeking	66.5 (16.2)

WCC Ways of Coping Checklist

symptoms of cancer patients (Groenvold, Klee, Sprangers, & Aaronson, 1997). Six multi-item functioning scales are scored: physical functioning, role functioning, emotional functioning, cognitive functioning, social functioning and global health-related quality of life. In addition, nine

single-item symptom scales are scored: fatigue, pain, dyspnoea and gastro-intestinal problems. The scales are linearly transformed according to the EORTC guidelines, so that all scales range from 0 to 100, in which a higher score represents a higher level of functioning. With respect to the single-item scales, a higher score indicates more symptoms or problems. The scale used in this study is the 3rd version whose quality of acceptability has been demonstrated to be higher than that of other tools (Conroy et al., 2004). For this first part of the study, three dimensions were assessed, i.e. global health status, physical functioning and emotional functioning.

DHP

For the caregivers who were in good health, a generic scale different from that of the patients was chosen. The DHP quality of life scale has already been used for assessing the quality of life of the caregiver (Pakerson, Broadhead, & Tse, 1990). It is a generic scale for quality of life associated with health that includes 17 items. Six of these focus on the functioning of health (i.e. physical, mental, social, global, perceived, and self-esteem); 5 other items focus on the dysfunctioning of health (i.e. anxiety, depression, anxiety + depression, pain, disease). Some of these sub-scales are independent and do not share any item, while others have common items. This scale has been translated and validated in several languages including French (Guillemin, Paul-Dauphin, Virion, Bouchet, & Briançon, 1997). The replies to these various items are given on a 3-point Likert scale: "yes, it is exactly the case", "it is more or less the case", "it is not the case". The quotation system used by this questionnaire is similar to that of the QLQ-C30 i.e. the scores are always reported over a 0–100 range.

WCC

Coping was assessed using the French version of the WCC (Vitaliano, 1985). The WCC contains 27 items assessing problem-focused coping (10 items), emotion-focused coping (9 items) and social support-seeking strategies (8 items) (Cousson, Bruchon-Schweitzer, Quintard, Nuissier, & Rascle, 1996). Patients indicated which strategies they used to cope with their illness. The responses were given on a 4-point Likert scale. The authors subjected the 42-item version to a principal component analysis followed by a varimax rotation on 468 French adults. This procedure enabled 3 factors to be isolated resituating 35 % of the total variance using 27 items: (1) emotion-centered coping (9 items, alpha coefficient of .72), (2) problem-centered coping (10 items, alpha coefficient of .79), (3) social support-centered coping (8 items, alpha coefficient of 0.73). For the present study, the first question asked (i.e. "specify

the intensity of the discomfort or stress induced by a stressful situation during recent months") was replaced by the following alternatives. For patient and caregiver, the stress level was assessed with regard to the diagnosis during T1, and to the treatment and to the disease during T2 and T3. The responses to this question were given on a 3-point Likert scale (low, medium or high).

Statistical Analyses

In order to study the impact of patients' and caregivers' coping and of the caregivers' quality of life on the patients' quality of life, it was necessary to take into account in the analysis their sociodemographic characteristics. Instead of introducing all these variables in a model, which could produce results that are difficult to interpret in a sample of only 100 women, a typology of the patients was realized. This typology took into account the socio-demographic characteristics of the patients and of the caregivers (age, social activity, number of children, life events in the 3 last years, medical and surgical history, sex and link between the patient of the caregiver), the quality of life of the caregiver (measured by DHP scores) and the coping of the patient and of the caregiver (measured by WCC scores). Consequently, a mixture of quantitative and categorical variables was used for the typology whose aim was to provide homogeneous clusters of patients.

Well-known methods of clustering, such as hierarchical cluster analysis (HCA) can only be performed on quantitative variables. Therefore, a previous analysis called multiple correspondence analysis (MCA) was performed. MCA is a method for describing qualitative data. It can be used to transform similarities between individuals and relations between variables into geometric distances so-called factorial axes. Individuals having similar values on their categorical variables will have comparable coordinates on factorial axes, and inversely.

Since MCA is only an intermediate analysis providing the factorial axes, the corresponding results are not presented in this paper.

An HCA was then realized on quantitative variables and factorial axes (created by the MCA) in order to determine clusters. This analysis aimed at computing distances between the individuals, and at clustering them, until there were only few clusters remaining. At each step, it was possible to quantify the loss of variance explained by the clustering and this constituted the criteria for cluster final identification. A good partition of the individuals corresponded to a partition with a small number of clusters along with a strong quantity of variance explained by the partition. The combination of MCA and HCA helped to obtain clusters in which patients were more similar to one another than to those in other clusters.

The clusters that were obtained for the patients were described by comparing the mean response in the cluster to the mean response on the complete sample of patients using Student's tests.

Mixed Model Analyses

The evolution with time of the patients' quality of life was studied using linear mixed models (Diggle, Liang, & Zeger, 1994; Verbeke & Molenberghs, 2000) to account for the correlation between the measurements from the same individual and to allow for random effects, if necessary. These models enabled an investigation of whether the following covariates could explain the change in the patients' quality of life over time: quality of life of caregivers (DHP), coping strategies used by the patients or their caregivers (WCC). In order to take into account all the characteristics of the patients and of the caregivers as well, the clustering that had previously been constructed was used in the linear mixed models as a covariate. A time and a cluster effect were also systematically included and assessed in the models as well as their possible interaction.

First of all, we investigated whether the quality of life of the caregivers and the coping strategies used by the patients or their caregivers changed over time using mixed models including a time effect. If the latter was significant, these covariates were considered as time-dependent; otherwise they were fixed at their initial values collected at the first visit.

Univariate analyses were initially performed to assess the effect of each covariate (caregivers' quality of life, coping strategies used by the patients or their caregivers, possibly treated as time-dependent covariates) on the evolution of the patients' quality of life over time using mixed models including a time and a cluster effect as well as possible interactions. Variables finally retained in the multivariate models were those significantly associated with the evolution of the patients' quality of life over time with the $p < .05$ criterion.

Three dimensions of the patients' quality of life measured by the QLQ-C30 scale were investigated: global health status, physical and emotional functioning.

Results

Typology of the Patients

The HCA allowed only 4 clusters to be retained, composed of 52, 28, 18 and 2 patients respectively.

Only the first three were used in the following analyses, because the last one concerned only 2 patients who had very different characteristics compared to the other patients.

The first cluster was composed of patients older than the mean of the total sample (more than 65 years: 23.1 vs. 14.0 %, $p = .007$). The intensity of stress was considered more often as medium (59.6 vs. 50.0 %, $p = .046$). These patients used less emotion-centered coping (mean score: 42 vs. 50, $p < .001$) and problem-centered coping (mean score: 66 vs. 72, $p = .001$). Their caregivers were more often under 45 years old (32.7 vs. 22.0 %, $p = .008$), had a perceived health better than the mean (DHP score: 87.5 vs. 80.3, $p = .015$), and used the three coping strategies less, i.e. problem-centered (65.9 vs. 71.7, $p < .001$), emotion-centered (41.9 vs. 50.4, $p = .001$), and social support-centered coping (75.9 vs. 77.4, $p < .001$).

The second cluster was composed of patients with a strong emotion-centered coping (mean score: 58.4 vs. 50.4, $p = .005$) and a strong problem-centered coping (mean score: 77.6 vs. 71.7, $p = .023$). The caregiver was often present at the cancer diagnosis (82.1 vs. 64.0 %, $p = .019$) and generally presented a weak health status (DHP mean scores: 66.8 vs. 72.4, $p = .045$ for physical health; 62.3 vs. 68.2, $p = .048$ for mental health; 69.6 vs. 80.3, $p = .030$ for perceived health) and more incapacities and depression (DHP mean scores: 38.4 vs. 32.5, $p = .041$ for depression and 8.9 vs. 3.6, $p = .049$ for incapacities). Lastly, these caregivers used the three coping strategies more often than the total sample (mean score: 75.3 vs. 64.6, $p = .002$ for problem-centered; 59.3 vs. 48.5, $p = .004$ for emotion-centered; 73.8 vs. 66.5, $p = .038$ for the social support-centered).

The third cluster was composed of patients whose ages ranged from 45 to 54 years (61.1 vs. 38.0 %, $p = .026$) and none of them was over 65. These patients more frequently used problem-centered coping (mean score: 82.0 vs. 71.7, $p = .003$), emotion-centered coping (mean score: 60.8 vs. 50.4, $p = .007$) and social support-centered coping (mean score: 83.5 vs. 77.4, $p = .040$). The caregivers were more often between 45 and 54 years (50.0 vs. 29.0 %, $p = .031$) and a large majority were employed (94.4 vs. 66.0 %, $p = .005$).

Mixed Model Analyses

Examination of Time-Dependent Covariates

A significant time effect was found for the general health and perceived health dimensions of the caregivers' quality of life measured by the DHP. It was also evident for the problem- and social support-centered coping strategies used by the patients and for the problem- and emotional-centered coping strategies used by the caregivers. Consequently, these covariates were all treated as time-dependent and included as such in the subsequent mixed models.

Patients' Quality of Life: Global Health Status

The results of the multivariate analyses (Fig. 1) showed that there was a significant interaction between the support-centered coping strategy of the caregivers and the clusters derived from the typology ($p = .038$), meaning that the effect of this coping strategy was different between the clusters. More precisely, there was only a negative effect of this caregiver coping strategy on the change over time of the patients' global health status in cluster 1; it was not significant in the other two clusters (2 and 3). In cluster 1, an increase in the scores of the support-centered coping strategy on inclusion of the caregivers was associated with a decrease in the patients' global health status scores over time.

Patients' Quality of Life: Physical Functioning

The results of the multivariate analyses (Fig. 2) showed that there was a significant time effect ($p < .001$) and that the caregivers' physical health was significantly associated with changes in the patients' physical functioning over time ($p = .047$). More precisely, the patients' physical functioning mean scores decreased significantly between the first and second visit (corresponding to the end of treatment) and then increased between visits 2 and 3 but without reaching its initial level (visit 1). Moreover, an increase in the scores of the caregivers' physical health on inclusion was associated with an increase in the patients' physical functioning scores over time.

Patients' Quality of Life: Emotional Functioning

The results of the multivariate analyses (Fig. 3) showed that there was a significant time effect ($p = .005$) and that other covariates were also significantly associated with changes in the patients' emotional functioning over time, namely the patients' emotional coping strategy ($p < .001$) and the caregivers' problem coping strategy ($p = .002$). More precisely, an increase in the scores of the patient's emotional coping strategy was associated with a decrease in her emotional functioning scores over time whereas an increase in the scores of the caregivers' problem coping strategy was related to an increase in the patients' emotional functioning scores over time.

Moreover, significant interactions with time were observed for the caregivers' perceived health ($p = .030$) as well as for their feelings of anxiety ($p = .025$), meaning that the corresponding effects on the change over time of

Fig. 1 Estimation (from the final mixed model) of the Global Health Status Score of the Quality of Life Questionnaire-C30 of the patients for each cluster (taking account of the mean score of Social Support-Centered Coping of the Ways of Coping Checklist of the caregivers considered as a fixed variable between the visits)
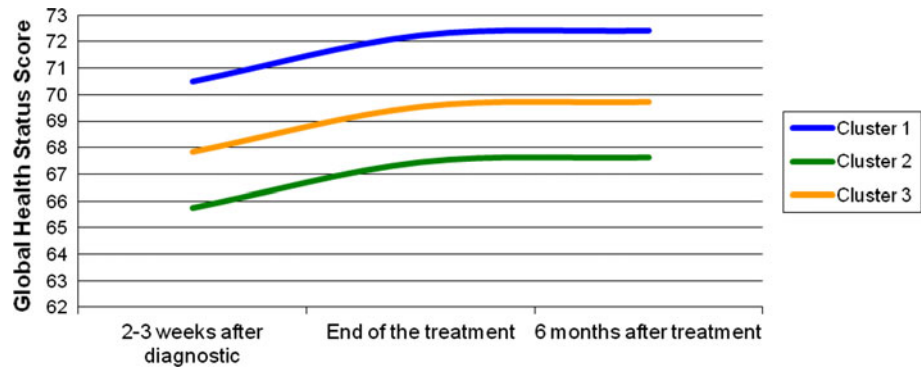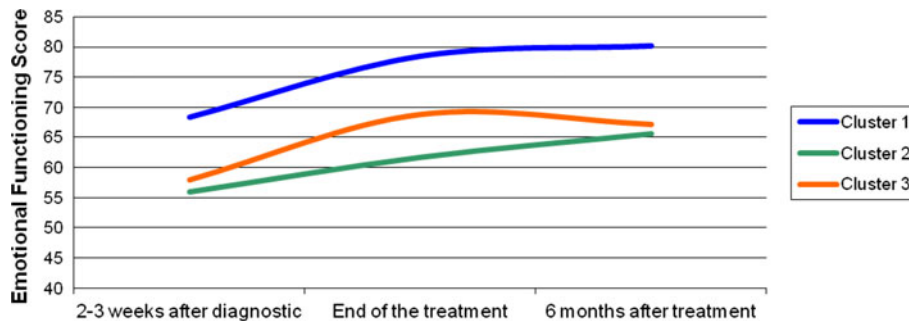
Fig. 2 Estimation (from the final mixed model) of the Physical Functioning Mean Score of the Quality of Life Questionnaire-C30 of the patients for each cluster (taking account of the mean score of Physical Health of the Duke Health Profile of the caregivers considered as a fixed variable between the visits)
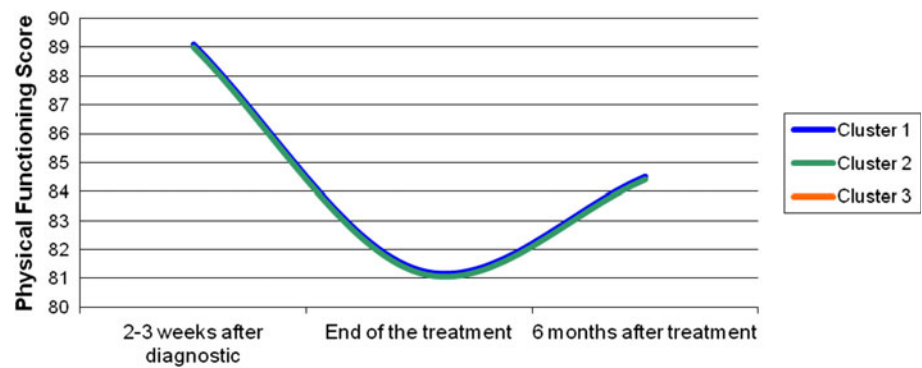
Fig. 3 Estimation (from the final mixed model) of the Emotional Functioning Mean Score of the Quality of Life Questionnaire-C30 of the patients for each cluster (taking account, for the patients, of the mean score of Emotional-Centered Coping (Ways of Coping Checklist) considered as fixed between the visits and, for the caregivers, of the mean anxiety score (Duke Health Profile), the mean perceived health score (Duke Health Profile) and the mean score of Problem-Centered Coping (Ways of Coping Checklist) considered as three unfixed variables between the visits)

the patients' emotional functioning were different across the visits. Indeed, a significant effect was only found at visit 2 (end of treatment): a decrease in the scores of the caregivers' perceived health or of their feelings of anxiety was associated with an increase in the scores of the patient's emotional functioning.

Discussion

In oncology, few studies have focused on the interactions between patients and caregivers in relation to their quality of life and their adjustment strategies (Bodenmann, 1995; Julkunen, Gustavsson-Lilius, & Hietane, 2009). Thus, the aim of this study was to constitute "patient-caregiver" clusters in order to show that the close friend or relative has a special role to play which is determined not only by their status and sociodemographic characteristics but also by their quality of life and coping strategies. In France, the law does not clearly define "who is" or "what is" a close friend or relative (Dupuy, 2006). Moreover, the position of the natural helper is not easy because it is mostly either imposed by marital status or "requested' by the patient (Nationale Institut of the Cancer [Institut Nationale du Cancer]

(INCa), 2006). As a result, it is practically impossible to avoid becoming a caregiver for a member of one's own family. In our study, 81 % of patients chose their husband as their caregiver (clusters 2 and 3) while 19 % (cluster 1) chose someone who did not share their daily life (a child, a more distant family member or a female friend). Assuming that the characteristics of the caregiver have to be taken into account and related to those of the patient in order to better understand the interactions between patients and caregivers, we first looked at the age and gender of caregivers. The first cluster of patients was made up of women of above average age for the sample (over 65), with no occupation, who had chosen a woman as their caregiver, often younger than themselves (under 45) and also with no occupation. The second cluster was composed of women aged between 54 and 65 years who had all chosen their husband as their caregiver, and he had been present since the diagnosis. It should be noted that many of these men (67.9 %) had already had experience of cancer in a close friend or relative, which could make them rather vulnerable when faced with this illness again. The third cluster was made up of younger women, between 45 and 54 years old, who had all chosen their husband (of similar age) as caregiver but he was less available. We observed that, when marital status did not oblige the husband to be the caregiver, the patient was more likely to choose a young woman as her caregiver. It is generally agreed that women are more empathic, more expressive and show their emotions more easily (Klauer & Winkeler, 2006). Similarly, within a couple, the woman is often the main confidante of her husband and has close relationships with other people in addition to her spouse. These initial results underline the importance of the support provided by close friends, relatives and spouses, but they also raise the issue of social interactions, both positive and negative, and the need to question the capability of close friends and relatives to take on the role of caregiver.

In our study, the results of the mixed multivariate analyses show how the quality of life and coping strategies change over time for both patients and caregivers, and highlight a number of interactions. The results in Fig. 1 illustrate that the coping strategies of caregivers may have a negative effect on the quality of life of patients depending on the cluster. For example, in cluster 1, the strategy of seeking social support used by caregivers from the beginning of and throughout the illness could have a negative effect on the overall quality of life of the patients. One hypothesis is that these caregivers, often young women, participated from time to time at the patient's request, but without the willingness or skill to do so every day. The results in Fig. 2 show that, over time, the physical aspect of the quality of life of the caregiver has a simultaneous effect on that of the patient, regardless of the cluster. As expected, the physical quality of life of the patient

deteriorates between the second and third stage of this study, corresponding to the treatment period, before improving after the end of treatment and 6 months later. The same effect is observed for both patients and caregivers; in other words, there is a symmetry between them which is independent of the cluster. These findings raise the hypothesis of considering close friends or relatives as "co-patients" (INCa, 2006). It is true that they provide both material and emotional support to the patient, which consequently increases their fatigue. In addition, this effect is only observed on the physical dimension of the quality of life because it is always more difficult to recognize that one is not well psychologically.

The third important result (Fig. 3) concerns the mental aspect of the quality of life of patients but shows no cluster effect. When the caregiver uses a problem-centered strategy, the mental aspect of the patient's quality of life improves. The hypothesis is that the patient is sensitive to her caregiver's reactions and so she regains a certain mental quality of life when the caregiver uses effective strategies. Moreover, at the end of treatment (V2), a significant interaction occurs between the deterioration in the mental aspect of the quality of life of the caregiver (manifest anxiety) and that of the patient. It may be that the patient and her caregiver have the feeling that the end of the treatment is an "abandonment", and the healthcare system could become a source of anxiety. So the caregiver must reinforce their social support role. For some years now, it has been widely accepted that breast cancer affects both the patient and her spouse (Northouse & Swain, 1987). It is therefore not surprising to find that husbands show higher levels of stress than their sick spouses (Given & Given, 1992). In our study, this is the case for cluster 2, where husbands have a poor quality of life, characterized by an altered mental aspect due to high perceived stress levels. This result is in agreement with other studies indicating that husbands of women with breast cancer show a change in their mental, emotional, and general health and have less vitality on the MOS SF-36 quality of life scale (Wagner et al., 2006) with signs of severe depression (Gaston-Johansson et al., 2004). From these results, it seems appropriate to investigate factors of vulnerability of caregivers. Husbands of cluster 2 who have already had to cope with cancer may present significant vulnerability factors.

Although some researchers have shown that the strategies used by women with breast cancer and their caregivers can be similar, others have found that patients use more problem-centered strategies but a similar number of avoidance strategies (Ben-Zur et al., 2001; Kershaw et al., 2004). In contrast, other studies have shown that the strategies used by patients at the beginning of their illness have no influence on those of the caregiver, and vice versa

(Ptacek et al., 1994). According to our study, there may be a certain symmetry between the oldest patients and their younger caregivers who is not the spouse (cluster 1). It is also clear that the older spouses (cluster 2), who have already had to cope with cancer, make significant use of all three coping strategies, whereas their wives use mostly emotion- and problem-centered strategies. On the other hand, the youngest and least available spouses used no particular strategy while their wives frequently employed all three. These very disparate results illustrate the difficulty of elucidating interactions between patients and caregivers and, above all, the need to constitute homogeneous groups in terms of the status of the caregiver. More research is needed to complete the results of this study particularly on patient-caregiver interactions and the concept of the "coping dyadic" (Bodenmamm et al., 2006).

A number of limitations to this study should be considered. First, it involved patients with the most common type of cancer in France (breast cancer). Secondly, only a small number of patients and caregivers took part. Initially, there were 100 women and 100 caregivers but, after constitution of the typologies, this decreased to 80 in the second phase of the study (V2) and to 78 in the third phase (V3). The results must therefore be treated with caution and seen as some paths to be explored rather than confirmed facts. Despite these limitations, our study shows that the quality of life and the adjustment to cancer for both patients and caregivers is a complex experience which depends on a great many interactions that have yet to be understood. In conclusion, attention must be focused not only on the patient but also on her family and particularly her spouse, who must cope with the illness. This message must be circulated among healthcare professionals and, from a clinical point of view, the family and close friends should be evaluated for their ability and willingness to support the patient during her illness.

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