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## ORIGINAL ARTICLE

# Adjustment of young women with breast cancer after chemotherapy: A mediation model of emotional competence via emotional distress

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## Abstract

**Objective:** Emotional competence (EC) is considered a substantial resource in the adjustment of cancer patients, especially via its effect on anxiety and depression symptoms. This research aimed at assessing the impact of intrapersonal EC in young women ( $\leq 45$  years) with breast cancer (YWBC) on their specific quality of life (i.e. subjective experience related to daily difficulties and perceived repercussions of the disease and treatments) related to chemotherapy, via anxiety and depression symptoms.

**Methods:** Two hundred fifty YWBC from 24 French centers completed a self-reported questionnaire after diagnosis (T1) and after the chemotherapy phase (T2), comprising the Young Women Breast Cancer Inventory, the Profile of EC and

the Hospital Anxiety and Depression Scale. The indirect effect of EC (T1) on subjective experience (T2) via anxiety and depression symptoms (T2) was tested using regressions and the Macro PROCESS.

**Results:** Emotional competence predicted fewer anxiety and depression symptoms at T1 and T2, and a better subjective experience at T2 via fewer anxiety and depression symptoms. Depression symptoms appeared to be a stronger mediator than anxiety symptoms on four dimensions (Support from close relatives, feeling of couple cohesion, body image and sexuality, management of children and everyday life), whereas anxiety symptoms appeared to be a stronger mediator on two dimensions (negative affectivity and apprehension about the future, deterioration of relationships).

**Conclusions:** These results support the importance of developing psycho-affective interventions to reinforce the EC of YWBC during chemotherapy in order to facilitate the cognitive and emotional processes necessary for a better adjustment and subjective experience.

#### KEYWORDS

anxiety, breast cancer, cancer, chemotherapy, depression, emotional intelligence, oncology, psycho-oncology, quality of life

## 1 | INTRODUCTION

Although breast cancer is pathogenic for all women, young women (i.e. usually  $\leq 45$  years old) with breast cancer (young women ( $\leq 45$  years) with breast cancer (YWBC)) represent a population at risk with specific difficulties in terms of affectivity, fear of cancer recurrence, relationships, body image, sexuality, daily and professional worries.<sup>1-6</sup> Research highlights YWBC generally have a lower quality of life, are more vulnerable to the negative effects of the disease, suffer from greater emotional distress, and have more difficulties in finding adjustment strategies to cope with the disease.<sup>1,2,7-13</sup>

The context of young women is marked by instability and transitions (e.g. changes in responsibilities and parental dependency, development of one's social and professional role as an adult and of the conjugal relationship), which can be exacerbated by the presence of cancer.<sup>14</sup> It is therefore important to focus on the quality of life of these patients via their perception of the impact of the disease and treatments on their specific age-related life context (i.e. called "subjective experience").<sup>1</sup> In fact, YWBC perceive the cancer experience as a life stage that shapes their development trajectory and changes their world view (e.g. self-evaluation through strengths and weaknesses, integration of the disease into one's identity, re-evaluation of relationships with others, perception of the future, femininity and future family life).<sup>5,14-16</sup> This can lead to traumatic psychological consequences (e.g. mental disorders, emotional distress).<sup>17-19</sup> It is important to identify affective-cognitive processes that will allow them to manage this negative life event and reduce the associated emotional distress.

For instance, emotional competence (EC) plays a central role for cancer patients in compensating and coping with emotional distress

and promotes a better cancer adjustment.<sup>20-22</sup> Emotional distress plays a mediating role between EC and cancer adjustment<sup>20,21</sup> and an important role in the quality of life of YWBC.<sup>1,10</sup> EC refers to the tendency to identify, understand, express in an adapted manner, regulate and use emotions.<sup>23,24</sup> Intrapersonal EC (in relation to one's own emotions) has a greater effect than interpersonal EC (in relation to the emotions of others) on the health of the general and clinical population and on patients' experiences of cancer.<sup>20,23</sup> It also has a beneficial impact on the quality of life, supportive care needs, emotional distress, and cognitive experience of cancer patients,<sup>18,20-22,25,26</sup> particularly breast cancer patients.<sup>27-29</sup> The use of EC has been shown to have a stronger impact on anxiety and depression symptoms,<sup>20,21,23,30</sup> that, in turn, influences patients' adjustment (i.e. in terms of post-surgical quality of life in esogastric cancer patients or supportive care needs with different types of cancer).<sup>20,21</sup> This mediational model might be replicated in other contexts and in other specific sub-populations of cancer patients and adjusting variables. In fact, the type of treatment received or the stage of the care pathway may have an impact on EC and its effects.<sup>23,31</sup> To our knowledge, no study has yet assessed the effect of EC on the subjective experience of YWBC via its impact on anxiety and depression symptoms in a longitudinal perspective from after diagnosis to after chemotherapy, which seems to have a specific impact.<sup>3,13,32</sup>

Thus, the first objective was to assess the direct effect of intrapersonal EC (T1) on anxiety, depression, and subjective experience at T1 and T2. Emotional competence should predict a better adjustment at T1 and T2 (Hypothesis 1). The second objective was to assess the indirect effect of intrapersonal EC (T1) on subjective experience (T2) via anxiety and depression symptoms (T2) (see

Figure S1). Emotional competence should predict a better subjective experience at T2 via fewer anxiety and depression symptoms (Hypothesis 2).

## 2 | METHODS

KALICOU-3 is a multicenter, longitudinal, non-randomized and descriptive study carried out in collaboration with 30 cancer centers (hospitals and private centers) in France by the regional cancer center of Lille. The main objective was to assess the effect of EC of YWBC and their partners on their quality of life through their individual subjective experience of the disease throughout their care pathway, from chemotherapy to follow-up. The present study is a first step of data analysis and publication.

### 2.1 | Participants and procedure

From 2016 to 2019, 392 YWBC were included in the KALICOU-3 study and met the inclusion criteria: women  $\geq 18$  years and  $\leq 45$  years at the time of diagnosis of non-metastatic breast cancer, undergoing chemotherapy (i.e. neo-adjuvant or adjuvant chemotherapy). At the time of data extraction, 250 participants completed a self-reported questionnaire twice: at T1 (i.e. after diagnosis and before chemotherapy  $\pm$  targeted therapies) and at T2 (i.e. after the end of chemotherapy, i.e. after the sixth or eighth cycle of chemotherapy). Data were collected from 24 French centers. Each center included one to 33 patients ( $M = 10.42$ ,  $SD = 9.99$ ). The characteristics of the sample are presented in Table 1.

The study was conducted in accordance with the Declaration of Helsinki, the French regulations on clinical trials and authorizations from the Ethics Committee (N° ID RCB: 2015-A01808-41; CPP: 03/005/2016). Oncologists proposed the study during a medical consultation after diagnosis. All participants provided their written informed consent and received no compensation.

### 2.2 | Measures

**Subjective experience of cancer:** The French version of the Young Women Breast Cancer Inventory (YW-BCI) was specifically developed and validated to assess the quality of life of YWBC in terms of daily difficulties and perceived repercussions of the disease and its treatments on various areas of life.<sup>1</sup> This scale is composed of 36 items with a five-point response (one “strongly disagree” to five “strongly agree”), which distinguishes eight dimensions of their subjective experience related to: (1) negative affectivity and apprehension about the future (six items,  $\alpha = 0.80$  for the present study), (2) support from close relatives (four items,  $\alpha = 0.68$ ), (3) deterioration of relationships with close relatives (five items,  $\alpha = 0.66$ ), (4) feeling of couple cohesion (five items,  $\alpha = 0.84$ ), (5) body image and sexuality (four items,  $\alpha = 0.74$ ), (6) management of child (ren) and everyday life

(five items,  $\alpha = 0.80$ ), (7) career management (three items,  $\alpha = 0.78$ ), and<sup>8</sup> (8) financial difficulties (four items,  $\alpha = 0.62$ ). Higher scores indicate a poorer subjective experience (i.e. greater difficulties and repercussions of the disease and its treatments on everyday life).

**Emotional competence:** The French version of the Profile of Emotional Competence was used to assess the individuals' perception of their intrapersonal EC used in daily life.<sup>24</sup> This scale provides a score of intrapersonal EC based on 25 items ( $\alpha = 0.82$  for the present study, e.g. “I find it difficult to handle my emotions”, “When I am touched by something, I immediately know what I feel”) with a five-point response (1 “strongly disagree” to 5 “strongly agree”). A higher score indicates a higher use of EC in daily life.

**Anxiety and depression:** The French version of the Hospital Anxiety and Depression Scale assesses the number and severity of the anxiety and depression symptoms of cancer patients.<sup>33</sup> This scale is composed of 14 items with a four-point response and gives two scores: one for anxiety symptoms (seven items,  $\alpha = 0.78$  for the present study) and one for depression symptoms (seven items,  $\alpha = 0.72$ ). Higher scores indicate stronger anxiety or depression symptoms.

### 2.3 | Statistical analyses

Analyses were carried out using IBM SPSS Statistics 24.0. Multiple regressions were used to test the direct effect of intrapersonal EC, using a bootstrapping procedure with a 99% confidence intervals, CI. Finally, the indirect effects of intrapersonal EC at T1 (i.e. variable X) on the eight dimensions of the patients' subjective experience at T2 (i.e. variable Y) via anxiety and depression symptoms at T2 (i.e. variables M) were tested using Macro PROCESS to quantify the indirect effects.<sup>34</sup> Eight models (presented in Figure S1) were tested using a bootstrapping procedure with a 99% CI. This approach tests whether a variable X influences variables M that, in turn, may influence a variable Y, without necessarily having a direct effect of X on Y.<sup>35,36</sup> The total indirect effect (i.e. via anxiety and depression symptoms, adjusted for controlled variables) and the specific indirect effects via anxiety (i.e. controlling for the indirect effect via depression symptoms) and via depression (i.e. controlling for the indirect effect via anxiety symptoms) were considered.

All models at T1 were adjusted for age, education level, professional status, delay between diagnosis and T1. All models at T2 were adjusted for age, education level, professional status, delay between diagnosis and T2, and type of chemotherapy received (i.e. neo-adjuvant or adjuvant chemotherapy).

## 3 | RESULTS

For informational use and to better analyze the data, the scales were described and compared between T1 and T2 (see Table S1), showing: (1) an increase in depressive symptoms with a deterioration of subjective experience, (2) a decrease in anxiety, and (3) a small (0.07) yet significant decrease in EC.

TABLE 1 Sample characteristics at baseline (N = 250)

Variables	N	%
Mean age (SD), range: 38.59 (5.00), 24–45		
Education level		
No qualification or below baccalaureate	3	1.20
Baccalaureate or equivalent diploma	79	31.60
> Baccalaureate	150	60.00
Missing data	18	7.20
Living as a couple		
Yes	250	100
With child(ren)		
Yes	218	87.20
No	26	10.40
Missing data	6	2.40
Professional status		
Active	128	51.20
Inactive (between jobs or on sick leave)	116	46.40
Missing data	6	2.40
Mean time (SD), range		
Diagnosis and questionnaire at T1 (days): 59.77 (29.60), 6–166		
End of chemotherapy and questionnaire at T2 (days): 25.72 (20.74), 0–113		
Diagnosis and questionnaire at T2 (weeks): 30.79 (5.65), 16.71–49.57		
Questionnaire at T1 and questionnaire at T2 (weeks): 22.25 (3.97), 11.86–36.71		
Chemotherapy		
Neo-adjuvant	77	30.80
Adjuvant	154	61.60
Missing data	19	7.60
Stage		
0	4	1.60
I	92	36.80
II	105	42.00
III	31	12.40
No information	18	7.20

### 3.1 | Direct effects

Intrapersonal EC at T1 predicted better subjective experience related to four sub-dimensions at T1 (i.e. negative affectivity and apprehension about the future, deterioration of relationships with close relatives, body image and sexuality, management of children and everyday life) and to one sub-dimension at T2 (i.e. negative

affectivity and apprehension about the future), partly supporting Hypothesis 1 (Table 2). Finally, EC predicted fewer anxiety and depression symptoms at T1 and T2, supporting Hypothesis 1.

### 3.2 | Indirect effects

Results showed a significant indirect effect of EC at T1 on all dimensions of the subjective experience of YWBC at T2 via anxiety and depression symptoms, except career management (Table 3), supporting Hypothesis 2. More precisely, depression symptoms appeared to be a stronger mediator than anxiety symptoms on four dimensions (i.e. Support from close relatives, feeling of couple cohesion, body image and sexuality, and management of children and everyday life), whereas anxiety symptoms appeared to be a stronger mediator on two dimensions (i.e. negative affectivity and apprehension about the future, deterioration of relationships).

## 4 | DISCUSSION

The main objective of this study was to assess the direct and indirect effects of EC on the subjective experience of the disease and its treatments in YWBC after diagnosis (T1) and after chemotherapy (T2) via anxiety and depression symptoms (mediation model). Despite the negative impact of chemotherapy, EC promotes a better psychological experience after chemotherapy (i.e. fewer anxiety and depression symptoms, lower negative affectivity and apprehension about the future) and a better subjective experience via fewer anxiety and depression symptoms.

Results support other findings showing a stronger effect of EC on anxiety and depression symptoms than on other adjustment issues (e.g. quality of life, supportive care needs).<sup>20,21,31</sup> Although EC had a limited direct effect on subjective experience after chemotherapy, EC after diagnosis (T1) showed significant indirect effect on subjective experience (i.e. fewer difficulties or lower impact of the disease and its treatments on daily life) after chemotherapy (T2) via fewer symptoms of anxiety and depression, supported mediational model. Intrapersonal EC, which enables patients to discriminate and regulate their own emotions in daily life, may thus reduce the negative effect of diagnosis and treatments and influence the way they perceive and deal with the cancer experience and resulting difficulties. It is possible that patients who use their EC more are more attentive to their emotions and bodily sensations, and thus more connected to their experience (less experiential avoidance). This approaching behavior could thus help identify difficulties and needs by taking adapted actions for fewer anxious and depressive symptoms, better interpersonal relationships (e.g. deterioration of relationships, feeling of cohesion of the couple) and easier daily life management life (e.g. management of children and daily life).

Emotional competence showed a significant indirect effect via anxiety symptoms on negative affectivity, apprehension about the

**TABLE 2** Total direct effect of intrapersonal emotional competence at T1 on sub-dimensions of subjective experience and anxiety and depression symptoms at T1 and T2

Variables	BCa 99% CI			
	Estimate	SE	Lower	Upper
Issues at T1				
Negative affectivity and apprehension about the future (T1)	-2.24 <sup>a</sup>	0.57	-3.62	-0.64
Support from close relatives (T1)	-0.48	0.26	-1.02	0.04
Deterioration of relationships with close relatives (T1)	-1.53 <sup>a</sup>	0.46	-2.72	-0.21
Feeling of couple cohesion (T1)	-0.40	0.33	-1.23	0.51
Body image and sexuality (T1)	-1.39 <sup>a</sup>	0.51	-2.67	-0.02
Management of child (ren) and everyday life (T1)	-1.87 <sup>a</sup>	0.54	-3.21	-0.45
Career management (T1)	0.36	0.42	-0.68	1.35
Financial difficulties (T1)	-1.01	0.46	-2.22	0.12
Anxiety (T1)	-3.50 <sup>a</sup>	0.44	-4.30	-2.65
Depression (T1)	-2.69 <sup>a</sup>	0.41	-3.92	-1.66
Issues at T2				
Negative affectivity and apprehension about the future (T2)	-3.16 <sup>a</sup>	0.66	-4.91	-1.25
Support from close relatives (T2)	-0.36	0.33	-1.46	0.52
Deterioration of relationships with close relatives (T2)	-1.07	0.51	-2.54	0.36
Feeling of couple cohesion (T2)	-0.58	0.55	-2.15	0.79
Body image and sexuality (T2)	-0.89	0.56	-2.33	0.80
Management of child (ren) and everyday life (T2)	-1.42	0.57	-2.92	0.05
Career management (T2)	-0.33	0.42	-1.31	0.63
Financial difficulties (T2)	-0.73	0.51	-2.02	0.42
Anxiety (T2)	-3.55 <sup>a</sup>	0.52	-4.89	-2.07
Depression (T2)	-2.30 <sup>a</sup>	0.44	-3.54	-1.19

Note: BCa, bias corrected and accelerated; CI, confidence intervals; 1000 bootstrap samples.

<sup>a</sup>Significant 99% confidence interval.

future and deterioration of relationships, but also a significant indirect effect via depression on support from close relatives, feeling of couple cohesion, body image and sexuality, management of children and everyday life. These results are in accordance with the three various patterns of results highlighted between T1 and T2 in supplemental material: first, a deterioration in the subjective experience of YWBC related to practical tasks (i.e. management of children and everyday life), social relationships (i.e. support from relatives, deterioration of relationships, and couple cohesion), and body image and sexuality, with increased depression symptoms after chemotherapy (contrary to anxiety). This may reveal a stronger interdependence between depression and these everyday difficulties. These variables may be more influenced by the negative impact of treatments as opposed to anxiety symptoms, as explained by other authors.<sup>31,37</sup> Second, results showed a reduced level of anxiety (i.e. anxiety symptoms, difficulties in negative affectivity and apprehension about the future). This may be related to the time needed to adapt and assimilate the cancer diagnosis, but it may also reflect the development of a greater sense of control and reassurance in the medical

management of the disease, owing to the initiation of treatments (i.e. chemotherapy). Third, results showed a stabilization of subjective experience related to career management and financial difficulties, which seem to emerge at diagnosis, persist over time, and to be less dependent on emotional processes.

As previously shown,<sup>31</sup> anxiety and depression evolve differently along treatment phases and play a different role in the psychological processes that influence quality of life<sup>31</sup> and supportive care needs.<sup>21</sup> Future studies should focus more specifically on these processes and certain sub-dimensions of subjective experience to better understand the results. To improve the model, it would be interesting to assess the effects of EC at other stages of the cancer pathway. In view of the significant results related to interpersonal experience, a dyadic analysis and interpersonal EC also seems relevant.

Surprisingly, use of intrapersonal EC in daily life decreased after chemotherapy. Emotional competence is considered as a personality trait and should be stable over time. However, as previously supposed,<sup>23</sup> some events may have an incidence on EC in daily life via their potentially traumatic impact or the specificity

**TABLE 3** Indirect effects of intrapersonal EC (T1) on subjective experience (T2) via anxiety and depression symptoms (T2)

	Standardized indirect effects			
	BCa 99% CI			
	Standardized estimate	SE	Lower	Upper
<b>Negative affectivity and apprehension about the future</b>				
Total indirect effect	-0.33 <sup>a</sup>	0.05	-0.46	-0.21
via Anxiety	-0.28 <sup>a</sup>	0.05	-0.42	-0.16
via Depression	-0.05	0.02	-0.12	0.01
<b>Support from close relatives</b>				
Total indirect effect	-0.08	0.04	-0.20	0.03
via Anxiety	0.02	0.04	-0.10	0.14
via Depression	-0.10 <sup>a</sup>	0.04	-0.21	-0.01
<b>Deterioration of relationships</b>				
Total indirect effect	-0.21 <sup>a</sup>	0.05	-0.34	-0.11
via Anxiety	-0.16 <sup>a</sup>	0.05	-0.30	-0.05
via Depression	-0.05	0.04	-0.15	0.04
<b>Feeling of couple cohesion</b>				
Total indirect effect	-0.13 <sup>a</sup>	0.04	-0.25	-0.03
via Anxiety	-0.04	0.04	-0.16	0.07
via Depression	-0.09 <sup>a</sup>	0.04	-0.21	0.01
<b>Body image and sexuality</b>				
Total indirect effect	-0.18 <sup>a</sup>	0.08	-0.30	-0.06
via Anxiety	-0.04	0.04	-0.15	0.07
via Depression	-0.14 <sup>a</sup>	0.04	-0.26	-0.05
<b>Management of children and everyday life</b>				
Total indirect effect	-0.14 <sup>a</sup>	0.04	-0.25	-0.05
via Anxiety	-0.04	0.04	-0.16	0.07
via Depression	-0.10 <sup>a</sup>	0.04	-0.21	-0.02
<b>Career management</b>				
Total indirect effect	-0.08	0.04	-0.18	0.03
via Anxiety	0.01	0.04	-0.11	0.13
via Depression	-0.08	0.04	-0.20	0.01
<b>Finances difficulties</b>				
Total indirect effect	-0.15 <sup>a</sup>	0.04	-0.27	-0.05
via Anxiety	-0.10	0.05	-0.23	0.01
via Depression	-0.05	0.03	-0.15	0.03

Note: BCa, bias corrected and accelerated; CI, confidence intervals; 5000 bootstrap samples as recommended.<sup>35</sup>

Abbreviation: EC, emotional competence.

<sup>a</sup>Significant 99% confidence interval.

and intensity of associated emotions. This result may also reflect a form of fatigability in patients or a decreased need to mobilize their resources to deal with the situation. However, although the

difference between T1 and T2 of 0.07 on a five-point Likert-type scale was significant, the clinical implications of this difference require further study.

#### 4.1 | Clinical implications

This study shows that EC should be integrated in theoretical models and psycho-affective interventions to reinforce the use of intrapersonal EC and facilitate the cognitive and emotional processes necessary for a better adjustment and subjective experience during and after chemotherapy. It could help identify YWBC at greater risk of difficulties in order to target and adapt specific interventions focusing on breast cancer-related distress for instance, especially in patients with higher emotional distress or low active coping scores at baseline.<sup>38</sup> Moreover, EC used in daily life can be taught and improved sustainably by interventions in a durable way over time.<sup>39,40</sup>

#### 4.2 | Study limitations

There are limitations to the present study. This sample was exclusively composed of YWBC living in a couple and with non-metastatic cancer, thus limiting generalization to all YWBC. Moreover, the negative side effects of surgery and chemotherapy and other mediators should be taken into account in models, and delays between the various phases of cancer (e.g. diagnosis, chemotherapy) and the completion of questionnaires should be homogenized. Finally, the lack of studies using the YW-BCI may also appear as a limitation.

### 5 | CONCLUSION

Overall, study revealed two processes: (1) an increase in depressive symptoms with a deterioration of subjective experience (i.e. stronger difficulties or impact of the disease and its treatments on daily life) for YWBC between diagnosis and the end of chemotherapy but (2) a decrease in anxiety symptoms and apprehension about the future. Findings support the crucial impact of EC on anxiety and depression at different stages of the cancer pathway (e.g. after diagnosis, chemotherapy). Patients who used their EC after diagnosis in daily life reported fewer symptoms of anxiety and depression and, as a result, a better subjective experience after chemotherapy.

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### CONFLICT OF INTEREST

The authors declare no conflict of interest.

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Manuscript writing: Anne-Sophie Baudry, Véronique Christophe, Anne Congard, Aurélie Untas, Vanlemmens, V., Sonya Yakimova.

### DATA AVAILABILITY STATEMENT

Authors elect to not share data/Research data are not shared.

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Additional supporting information may be found in the online version of the article at the publisher's website.

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