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## **‘Bad news consultations’ with oncologic nurses: impact on perceived stress and patient experience**

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## 1. Introduction

Breaking bad news in oncology is well known as a difficult and stressful event for the patient (Abdollahi et al., 2019; Matthews et al., 2019; Schofield, 2003; Seifart et al., 2014). This unfavourable information ‘...results in a cognitive, behavioural, or emotional deficit in the person receiving the news that persists for some time after the news is received’ (Ptacek and Eberhardt, 1996 pp. 496). Patients receiving a diagnosis of cancer frequently report feelings of anxiety, stress fear, anger, distress and nervousness (Danzi et al., 2018; Holst-Hansson et al., 2017; Schubart et al., 2014). The incidences of cancer-related, Acute Stress Disorder and Post Traumatic Stress Disorder (PTSD) are significant in newly diagnosed cancer patients (Kangas, 2013; Kangas et al., 2005; Marziliano et al., 2020). Also, anxiety and depressive disorders share common latent structures including cognitive, affective and physiological symptoms (Craske, 2012). These comorbidity patterns have been documented in several cancer studies (Kangas et al., 2014). In others, immediate adverse health consequences of cancer diagnosis have been observed, in particular a significant increase in the risk of both suicide and death from cardiovascular causes (Fang and Valdimarsdóttir, 2012). Collectively, these findings indicate that newly diagnosed cancer patients are vulnerable to chronic psychopathology.

To improve the bad news-related stress in oncology, guidelines have been developed to assist healthcare professionals in disclosing unfavourable information, such as the SPIKES protocol (Baile et al., 2000). In addition, specific ‘Bad News consultations’ (BNC) were institutionally implemented into all the French anti-cancer centres (Cancer plan 2014-2019’, see annexe 1 for details).. Some oncological nurses, who have received specific oncological training, conduct these BNCs for 30 to 45 minutes. They allow the patient and her/his caregiver to have access to a nurse who listens, rephrases, informs and refers the patient to other professionals (Purpose 1), according to her/his needs. Information should be progressive (step by step, in an authentic and sincere relationship), coherent (say nothing that is not true), addressing the patient first, then her/his relatives. Information should be adapted to each patient, according to her/his request and to her/his resources, including patient support, freedom of speech and active listening (Purpose 2) and be taken up again and again. BNCs must offer a presentation of solutions and therapeutic resources as soon as possible, with an opening towards realistic hope (Purpose 3). The nurse assesses the patient's psychological, nutritional and social status in order to facilitate access to oncological supportive care

(Purpose 4). BNCs are systematically proposed to all patients. They occur either the same day as the medical diagnosis consultation, or within the 10 days that follow it. The nurse may or may not have been present during the prior medical consultation with the physician.

Studies carried out on the benefits of the BNC are encouraging, but remain rare and have limitations (Remmers et al., 2010; Tobin, 2012). Much of the research has focused on the identification of the nurses' concerns in BNC (González-Cabrera et al., 2020; Mishelmovich et al., 2016; Zumstein-Shaha et al., 2020). Finally, to our knowledge, the impact of the BNC on patients' perceived stress, remains unknown.

Perceived stress is known to be higher among women than men and also to increase with reduced age, education and income (Cohen and Janicki-Deverts, 2012). In oncology, disease-related characteristics (*e.g.*, tumour localisation) and types of treatment, are also known to increase stress and distress (Dolbeault et al., 2008). One other moderator; the patients' time since diagnosis, is also psychologically, theoretically grounded in the processing of the stress and trauma (Marziliano et al., 2020; Ramos et al., 2018). The patients' susceptibility to stress, or their 'stress resilience', is also a decisive variable to enhance coping strategies (Cohen et al., 2014). It is defined as the adaptive response to external or internal stressors, that facilitates recovery from adverse events, such as cancer and associated psychological trauma (Cohen et al., 2014; Kennedy et al., 2017; Li and Wang, 2016; Marziliano et al., 2020; Matzka et al., 2016).

This research first aimed to evaluate the impact of the BNC on the patients' perceived stress, taking into account some initial predispositions (*e.g.*, stress resilience) but also the local organisation. It was assumed that (i) patients' perceived stress would be reduced after the BNC, all the more so, given its higher level in women and younger patients; (ii) reduction of perceived stress would be higher if the patient's resilience level was high; (iii) perceived stress reduction would be higher if the nurse was present at the prior medical consultation and if the interval between the two consultations was short. The secondary objective of this study was to determine the patient's perception of the benefits of and their satisfaction with, the BNC. The hypothesis was made that the patient was provided with knowledge and information, that their emotions were met with empathetic responses and respect and that this lead to an improved healthcare pathway and facilitated access to supportive care.

## **2. Methods**

### ***2.1. Design and population***

This is a monocentric, cross-sectional evaluation study. The study included all consenting patients  $\geq 18$  years old who underwent a BNC for the first time in our centre from May to December 2017, whatever their oncologic disease. Eligible participants spoke and read French as their first language, had normal or corrected-to-normal eyesight/audition and had sent back the questionnaire to the centre. Exclusion criteria were sensorial, psychological or cognitive incapacities to correctly respond to the questionnaire (Flowchart in Fig. 1). All the nurses conducting the BNC had received a specific patient-education training of 40 hours, based on the National Cancer Plan ('Objective 7, Cancer plan 2014-2019', INCa) and had experience ( $> 5$  years) in oncologic patient care. The study was approved by the local institutional ethical review board (COMERE#28.02.17). All patients were informed of the study and gave informed consent prior to study entry. The study was conducted in accordance with the Good Clinical Practice requirements, the Helsinki Declaration and the Transparent Reporting of Evaluations with Non-randomised Designs guideline (Des Jarlais et al., 2004).

**[Insert Fig. 1.]**

### ***2.2. Materials***

#### *- The Visual Analogue Scale (VAS) of perceived stress*

A VAS was used to estimate the patients' perceived stress levels. Participants were asked to indicate how stressed they felt by making a mark on a 10-cm horizontal line with no graduation marks, the ends of which were labelled "perfectly relaxed" (0 cm) and "very stressed" (10 cm). Assessments of perceived stress using several, single items have been shown to be as reliable as assessments using longer scales (Guerdoux-Ninot and Trouillet, 2019; Lesage and Berjot, 2011; Littman et al., 2006). A control was systematically performed to ensure the patient could use the scale correctly (*i.e.* he/she was first asked to tick the middle of a neutral 10-cm line).

#### *- The 25-question questionnaire on BNC experience*

A working group, composed of the head nurse of the consultations department, the BNC nurses and two psychologists from our Institute, created a 25-question questionnaire. The questionnaire contains quantitative questions and also 8 opened-ended questions to gather

more qualitative data (in particular items #4, 5, 14, 15, 16, 17, 19 and 23). The questionnaire included the two validated items of the CD-RISC2, in order to assess stress resilience (Connor and Davidson, 2003; Vaishnavi et al., 2007). The item #18 (“Able to adapt to change”) and #20 (“Tend to bounce back after illness or hardship”) provided a score of 8 (with a Likert scale from a 5-point range of responses, as follows: 0-not true at all, 1-rarely true, 2-sometimes true, 3-often true, and 4-true nearly all of the time). The other items of the questionnaire used in this study were developed in line with the purposes of the National Cancer Plan. First, four items (#6, 7, 8 and 23) evaluated the efficiency of the BNC in repeating, rephrasing and adding information on the patient’s disease, treatments and healthcare pathway (Purpose 1). Then, for Purpose 2, seven items (#9 to 17) assessed the BNC as being a place for patient support, freedom of speech and active listening. Thirdly, for Purpose 3, five items (#2, 4, 5, 19 and 21) evaluated the benefits and the relevance of the BNC, as perceived by the patients. Participants were also asked to give the BNC a mark (from 0 to 20) (#22) and to explain it in two lines (Purpose 3). Four items (#12, 12bis, 13 and 13bis) were dedicated to assessing the effect of the BNC in facilitating access to supportive care (Purpose 4). Finally, the feasibility of such a study in our Institute was explored using 2 items. The Quality Department, together with the head of the Supportive Care Department, reviewed the questionnaire and made some minor changes. Subsequently, the questionnaire feasibility and eligibility, were tested using 10 voluntary patients in our Institute.

### ***2.3. Procedure***

From May to December 2017, in the Consultations Department of our Institute (including surgery, chemotherapy and oral therapy, but not radiotherapy treatments), BNC nurses presented the study randomly to one in three patients, constrained by the time available in their usual job and in agreement with the study coordinator and with their manager. Only patients who were presented with the study, who consented and who were eligible, were included in the study. After signing the informed consent form, the participant was invited to sit down in a quiet room and to meet the nurse for the usual BNC, with or without their caregiver, as requested by the patient. The nurse first asked the patient to tick the middle of a neutral 10-cm line. The nurse checked with her/him whether the instruction was well understood. Then, the nurse gave the patient the perceived stress-VAS at the beginning (T0) and at the end (T1) of the BNC. The patient was asked to self-assess her/his level of perceived stress using the VAS and then, to turn the VAS over so that the nurse could not see it (to limit a social desirability bias). Neither, the patient nor the nurse saw the T0 score when she/he

ticked the line at T1, about 30-40 minutes afterwards (to limit a memory bias). Also, at the end of the BNC, the 25-question questionnaire was handed to the patient, together with a prepaid envelope. The participant was asked to fill it in and to send it back within 15 days. In cases where the questionnaire was not received by the project team within 15 days, a phone call was made by a nurse, to the patient. The nurse who conducted the BNC collected the patient's clinical data on the same day. It was then integrated within the questionnaire data and anonymised before analysis.

#### ***2.4. Statistical considerations***

Based on the prospective primary objective and on the literature data concerning the VAS of perceived stress (Guerdoux-Ninot and Trouillet, 2019), the necessary number of patients to be included in the study would have been 32, as a minimum. However, taking into account the retrospective secondary objectives to be assessed, it was decided to include all patients who underwent the BNC during the inclusion period and who consented to study participation after the study was presented to them. All quantitative data was analysed using the *lmer* function of the *lme4* package (Bates et al., 2015) for *R* (R Core Team, 2013). The Restricted Maximum Likelihood method was used to test the adjustment to data of several mixed-effect models ( $M_{ij}$ ) describing the relationship between the perceived stress and fixed effects and a random effect. The intercept, *Age*, *Resilience score* and the subsequent covariates (with fixed and reproducible levels) were modelled using fixed effects parameters. A random effect coding for the patient was included because measures for each participant were interdependent (*i.e.*, repeated measures). Random effects coding for the *type of treatments* and the *type of cancer* were included, because a random sample from the set of all possible levels for these variables was observed (Bates et al., 2015). The *p* values were obtained for random effects (variance) using the distributed chi-squared likelihood-ratio test (L.Ratio), which shows minimal type I error inflation (Barr et al., 2013). The significance level of the L.Ratio test was set at  $p \leq .05$ . Qualitative data were managed with the QSR International's NVivo 12 software, and a thematic analysis was conducted within the data (Braun and Clarke, 2006).

### **3. Results**

#### ***3.1. Sample characteristics***

From January 2010 to December 2020, 16,406 BNCs took place in our Institute. During 8 months (May to December 2017), 1576 BNC occurred during which, 468 patients were approached for the study. As the flowchart shows (Fig. 1), 370 participants were initially

enrolled in the study and finally, 336 questionnaires distributed to the patients were returned to the centre (return rate of 91%). The participants' characteristics are presented in Table 1. More than three quarters of the patients (81%, n=272) experienced a BNC after a medical consultation announcing a cancer diagnosis. In 66.4 % of BNCs (n=223), the nurse was present at the prior medical consultation. He/she did not participate in the previous medical consultation in 29.8% of BNCs (N=100). Nine participants (2.7%) did not remember if it was the case or not. The BNC occurred the same day as the medical consultation in 47.3% of cases (n=159), while it occurred at a later date in 49.7% of BNCs (n=176). Three participants (0.9%) did not remember the timing.

**[Insert Table 1]**

### ***3.2. Relationship between perceived stress, fixed effects and random effects***

Model 1 (incorporating the random effect coding for the *Subjects*) was compared with Model 2, in which the random effect coding for the *Type of cancer* was added: no significant effect of the *Type of cancer* was revealed (L.Ratio=19.74 p=.14). Also, the comparison of Model 1 with Model 3, in which the random effect coding for the *Type of treatment* was added, did not reveal a significant effect of the *Type of treatment* (L.Ratio=.75; p=.39).

Results from the model did not reveal significant effects of *Age* ( $B < .001$ ;  $p = .94$ ). Dummy coding for the covariates *Interval between the medical consultation and the BNC* ( $B = -.38$ ;  $p = .22$ ) and *Presence of the nurse at the medical consultation* ( $B = -.05$ ;  $p = .86$ ) were not significant. However, analysis of the measures of perceived stress revealed a significant and negative effect of the *Resilience score* ( $B = -.43$ ;  $p < .001$ ), the dummy coding for covariates *Time* ( $B = -1.91$ ;  $p < .001$ ) and *Gender* ( $B = .72$ ;  $p = .03$ ). The '*Time\*Resilience score*' interaction term was also added to the models in order to test the hypothesis that resilience moderates the effect of *Time*, on the measurement of perceived stress. The effect of the interaction term was not significant ( $B = .09$ ;  $p = .24$ ). Multivariate analysis and statistical estimates of the model are shown in Table 2.

**[Insert Table 2]**

### ***3.3. The BNC experiences gathered with the questionnaire***

Table 3, Figures 2 and 3 show the responses to the questionnaire about the BNC experience, organised according to the 4 objectives of the BNC.

For Purpose 1 (*i.e.* efficiency of the BNC in repeating, rephrasing and adding information on the patient's disease, treatments and healthcare pathway), the data shows that more than half



of patients (56.3%, n=171) needed to ask further questions to the nurse after the medical consultation (Table 3). Complementary information was specified for 84.4% of patients (n=265). Qualitative responses show that patients were given expected information, especially on the '*practical issues*' theme. Finally, most of the participants (88.1%, n=295) did not report any supplementary wishes during the BNC.

For Purpose 2 (*i.e.* BNC as a place for patient support, freedom of speech and active listening), most patients reported that their familial, social and economic situations were sufficiently taken into account during the BNC (84.1%, 74.9%, 55.9% respectively). Almost all the participants (93.9%, n=308) felt they were able to express their feelings and worries. Only 3.9% of patients (n=13) reported that they were not able. Thematic analysis showed that the main reason reported by these patients was their own '*distress*'. Almost all the patients (99.7%, n=324) felt they were listened to during the BNC. Furthermore, the communication with the nurse was judged adapted to their situation for 99.8% of the participants (n=316). Finally, 94.8% of participants (n=309) felt that they had been respected in their ideas, values and beliefs.

For Purpose 3 (*i.e.* benefits and relevance of the BNC), most of the patients (61%, n=202) thought that the BNC should occur just after the medical consultation. The presence of the nurse during the medical consultation was beneficial for their healthcare pathway for 81.2% (n=95) of the patients that experienced this situation. Qualitative analyses are detailed in Table. 3. Interestingly, 51% of patients (n=129) who experienced a BNC with a nurse who was not present during the previous medical consultation would not have wanted him/her to be present. Furthermore, most of the patients reported that the BNC had completely 27.9% (n=90) or rather 35.9% (n=116) changed their point of view on the disease or its treatment, because of a '*better understanding*'. Only 15 patients (4.6%) reported that the BNC did not at all change their opinion. The BNC appears to be useful in 96% of patients (n=311). Finally, participants gave a score for the BNC (from 0 to 20) of 17.1/20 on average ( $\pm 2.3$  SD). The qualitative analysis shows four key themes related to this high mean mark: (1) '*the nurse's human qualities*' and especially the '*listening quality*' (including also '*empathy*', '*respect*', '*goodwill*', '*gentleness*', '*kindness*'), (2) '*the nurse's medical skills*' especially '*by providing information*' (including '*rephrasing*', '*clarifying*' and '*responding*'), (3) '*the emotional benefit of the BNC*', especially the distress decrease (including '*reassurance*', '*calming*', '*comfort*'). Some data are illustrated on Fig. 2.

**[Insert Table 3 and Fig. 2]**

For Purpose 4 (*i.e.* BNC to facilitate access to oncological supportive care), patients were asked (on item #12) whether an appointment with a supportive caretaker was proposed during the BNC. According to the participants, 320 appointments were proposed and none was evoked in 112 cases. Figure 2 shows the number and the type of appointments that were reported. Psychology, social assistance and nutritional interventions were the supportive care types that were proposed the most often. Only 24.2% (n=77) of patients wished to meet one of them (item#12bis) and 59.4% (n=189) of participants did not. Finally, 16.4% (n=52) reported that meeting one, was not proposed. Among the 78 patients who wanted an appointment (item #13), 35.9% (n=28) had met the supportive caretaker, 41% (n=32) were waiting for the scheduled appointment and 23% (n=18) did not meet the caretaker although he/she wished to. Qualitative responses (item #13bis) explained that they did not meet a professional in supportive care, mostly because it was not ‘*good timing*’.

**[Insert Fig. 3]**

#### **4. Discussion**

As expected, the main quantitative result shows that the patients’ perceived stress significantly decreased after the BNC. It was higher for women than men and was lower in patients who exhibited superior stress resilience. The experimental control situation supported the measurements’ validity: the patients used the scales correctly. Psychological stress plays a role in the quality of health, in the risk of illness, in the progression of disease, in the increase in reported symptoms, in more frequent use of health services and even in increased mortality (Cohen and Janicki-Deverts, 2012; Mehnert et al., 2018; Smith et al., 2018). In fact, the ‘Plan Cancer’ in France has mandated that cancer centres implement BNC as a new criterion for accreditation. Previous study has confirmed that supportive communication might contribute to reducing the patient’s level of arousal during BNC (Danzi et al., 2018), in terms of heart rate variability parameters (an effective marker of physiological arousal associated with different emotional responses). Our results support the hypothesis that the BNC may improve the patient’s level of arousal, in terms of perceived stress.

Even if the measurements in the current study enabled a quantification of the decrease in perceived stress following a BNC, the nature of that perceived stress could not be established

using only an EVA. Additional subjective data, gathered with the questionnaire using both ordinal and opened-questions, provided additional qualitative data. Notably, the qualitative analysis suggests that the decrease in perceived stress after BNC, may be linked to several factors. Firstly, most patients needed complementary information after the medical consultation, especially about hospitalisation, practical issues and side effects. 84% of patients were given the expected supplementary information. Patients indicated that, providing supplementary information and also, rephrasing or clarifying that information, significantly contributed to a positive evaluation of the BNC. Only a few of the interviewed patients, wished that the BNC had included even more information. Apart from these exceptions, the data confirms that the BNC s provided the opportunity to re-phrase, repeat and complete information given previously (Purpose 1). Information should be given to patients because it is the basis for decision making, it reduces uncertainty and it supports coping efforts (Bouleuc et al., 2010; Danzi et al., 2018; de Haes and Teunissen, 2005). The quantitative decrease in perceived stress may have been related to an information input that was necessary. Moreover, the participants indicated both information and reassurance, as significant reasons to give a good mark to the BNC.

Secondly, qualitative analysis showed that participants have attributed a high mark to the BNCs because of the nurse's human qualities and especially her/his listening skills. The patients indicated feeling reassured and less stressed. In addition, when asked directly, almost all of the patients felt they were listened to (99.7%), respected in their ideas, values and beliefs (about 95%), able to express their feelings/worries (94%) and considered the communication with the nurse to be relevant and adapted to their situation (99.7%). Moreover, the answers to direct questions suggest that the patients' familial, social and economic situations were mostly sufficiently taken into account during the BNC. Taken as a whole, this data suggests that nurses have adequately taken into account the patients' emotional state after the bad news. She/he also took into account different fields of her/his life, as a 'whole person', not only the disease, in the context of his or her psychological and social circumstances. The skills and qualities described by the BNC are in accordance with the principles of patient-centred communication (Hashim, 2017; van Mossel et al., 2011). Patient centredness increases satisfaction, reduces anxiety amongst patients (Fujimori et al., 2014; Kissane et al., 2012), can buffer the effect of the distress experienced by patients (Danzi et al., 2018) and helps for more accurate recall of information (O'Keefe et al., 2001) and for a better emotion regulation (Epstein et al., 2017; Mishelovich et al., 2016). These subjective

and qualitative explanations may explain the decrease of perceived stress, quantitatively measured in the study. Thus, engaging in focused active listening, expressing empathy and respect, understanding the patient's perspective of the illness and communicating understanding, may be key features of a decrease in the patients' perceived stress in BNC. This may explain why the BNCs were useful in 96% of patients, changing their point of view on the disease or its treatment, with an excellent mean mark of 17.1/20. Patients expressed their positive and qualitative feelings with a positive, quantitative marker.

Contrary to the original hypothesis, incorporating age, type of cancer and type of treatment in the statistical model did not reveal significant effects on the perceived stress measures. Sex did. If breaking bad news is a stressful event in psycho-oncology, the responses and the way to behave with the announcement may vary among patients (Riba et al., 2019). Previous studies have already shown that life-threatening illness, clinical factors, demographic and psychosocial factors may all influence the patients' ability to cope with bad news (Cohen and Janicki-Deverts, 2012; Dolbeault et al., 2008; Dolbeault and Brédart, 2010). However, there is also a strong body of evidence suggesting that gender (social construct) and sex (biological construct) may represent the primary variables affecting both perceived stress and coping responses (Mauvais-Jarvis et al., 2020). That may be why the gender surpasses age, type of cancer, as well as type of treatment, in the perceived stress of BNC, at this time of the disease.

It was also hypothesised that perceived stress reduction would be higher, if the time between the two consultations (*i.e.* medical and BNC) was short and if the nurse was present at the medical consultation. However, the analysis shows that both these covariates were not significant as fixed effects on perceived stress. Actually, previous studies suggested that the minimal delay to reinterpret and find meaning in a stressful experience varies from 2 to 4 months after the trauma (Marziliano et al., 2020). Yet, in the current study, BNC occurred either the same day as the medical consultation, or maximum 10 days after the initial consultation. This may explain why the delay between the two consultations was not significant on perceived stress measures. This necessary timing is also coherent with the non-significant interaction found between *Stress resilience score* (*i.e.* score on the CD-RISC) and *Time* (*i.e.* T0 at the beginning of the BNC *versus* T1 at the end). Resilience can be defined as the personal qualities that enable one to thrive in the face of adversity (Connor and Davidson, 2003) or a measure of successful stress-coping ability (Vaishnavi et al., 2007). Indeed, as expected in our study, perceived stress was lower in participants exhibiting a high level of

stress resilience, compared with participants with a low level. If resilience is a patients' susceptibility to stress (such as a personality trait), it also needs time to enhance coping strategies (such as a skill or a process). BNC may not allow this time-consuming process, explaining the absence of significant interaction between the two variables.

Regarding the presence (or not) of the nurse during the previous medical consultation with the surgeon/oncologist, qualitative data shows that the participants have taken ownership of the situation. The presence of the nurse was judged beneficial for the patients who have experienced the partnership (physician plus nurse), whereas it would not have been desired for half of the patients who had not experienced it. Finally, whatever the previous situation of the nurse (present or not), participants widely received necessary and complementary information. One can guess that the nurse had sufficient knowledge and experience in oncology, even if she/he had not participated in the medical consultation, to manage the stress related to the cancer.

Regarding the access to supportive care, about two patients in three were proposed an appointment with a professional during the BNC, predominantly a psychologist, then a social assistant and a dietician/nutritional physician. One third of the patients mentioned no proposition. It can be observed that physical therapists are totally absent in the questionnaire. Nonetheless, these professionals are becoming more and more important in the healthcare pathway (Lopez et al., 2019). Finally, the number of participants who wanted to meet the health caretaker at this moment was low (less than a quarter of the patients), probably because it was not '*good timing*'. Again, this qualitative explanation helps to better understand the behaviour of patients facing a diagnosis of cancer, by introducing a time notion in the care pathway. Expressing a symptom does not necessarily mean wanting it to be taken care of. Having said that, the proposed appointment is one form of first exposure to supportive care.

To our knowledge, this is the first piece of research showing a decrease in perceived stress after a BNC. The different types of information gathered in this study, quantitative and qualitative, enriched one another, to better understand and interpret the decrease of perceived stress. Thematic analysis was used to analyse patterns within data. Conducting semi-structured interviews would have enhanced the efficiency of the project. Despite all, using the qualitative responses enabled us to gather additional data to complement the primary objective. We also acknowledge that conclusions from this study are limited by the absence of

a control group. However, as the implementation of the BNC was already effective in France, designing a controlled randomised trial may have created ethical problems. Designing a multicentre trial with other countries may have created a health-culture-bias. Designing a control group, with another consultation may have created a time-bias (*i.e.* heterogeneity in the time since diagnosis). Even a ‘neutral waiting situation’ as a control group, would have produced ethical and cognitive-behavioural bias. Furthermore, decrease in perceived stress was supported by a mixed method, both quantitative and qualitative. Verbatim and responses to the questionnaire, underpinned the hypothesis. Another limitation concerns the resilience measure using a brief 2-item tool (*i.e.*, the CD-RISC2). Although many scales have been developed for evaluating resilience, they are not widely adopted and no one scale is preferable over the others (Windle et al., 2011). This scale was chosen because of its shortness, as well as its easiness, its eligibility and its psychometric qualities. However, the proportion of high scores might indicate a floor effect, suggesting a likely lack of sensitivity. Thirdly, it is worth noting that some variables, that may influence a patient’s ability to cope with stress when facing life-threatening bad news, were not taken into account in the models. Future studies should, for instance, incorporate education, as well as the presence (or not) of the caregiver during the BNC, as likely variables influencing perceived stress. Finally, despite its importance when facing a diagnosis of cancer, spirituality and also spiritual care, were not addressed in this study. Nurses play a significant role in assessing and attending to spiritual needs (Zumstein-Shaha et al., 2020). However, the question of the appropriate timing and process of addressing and supporting patients’ spiritual issues, remains open.

## **5. Conclusion**

Perceived stress when facing a diagnosis of cancer can be reduced after a BNC, conducted by a specialist nurse. BNCs allow a patient-centred communication, which is one of six elements of high-quality health care. This study reinforces the relevance of implementation of BNCs in anticancer centres. It promotes the training of nurses and health professionals, to deal with psychosocial distress and to better support patients and their families.

### **Credit author contribution statement**

Estelle Guerdoux (EG): Conceptualization, Methodology, Data curation, Analysis, Writing - original draft, Results section, Interpretation. Patrice Champoiral: Conceptualization, Writing – review, preparation. H el ene de Forges (HF): Writing - original draft, preparation, Analysing, Writing - review & editing, Laure Valy and Fran ois Jouv et: Data collection,

Writing – review. Raphaël Trouillet (RT): Methodology, Data analysis, Writing – review.  
Christine Chauvet: Conceptualization, Writing – review.

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### **Declaration of competing interest**

No conflict of interest is declared by any of the authors.

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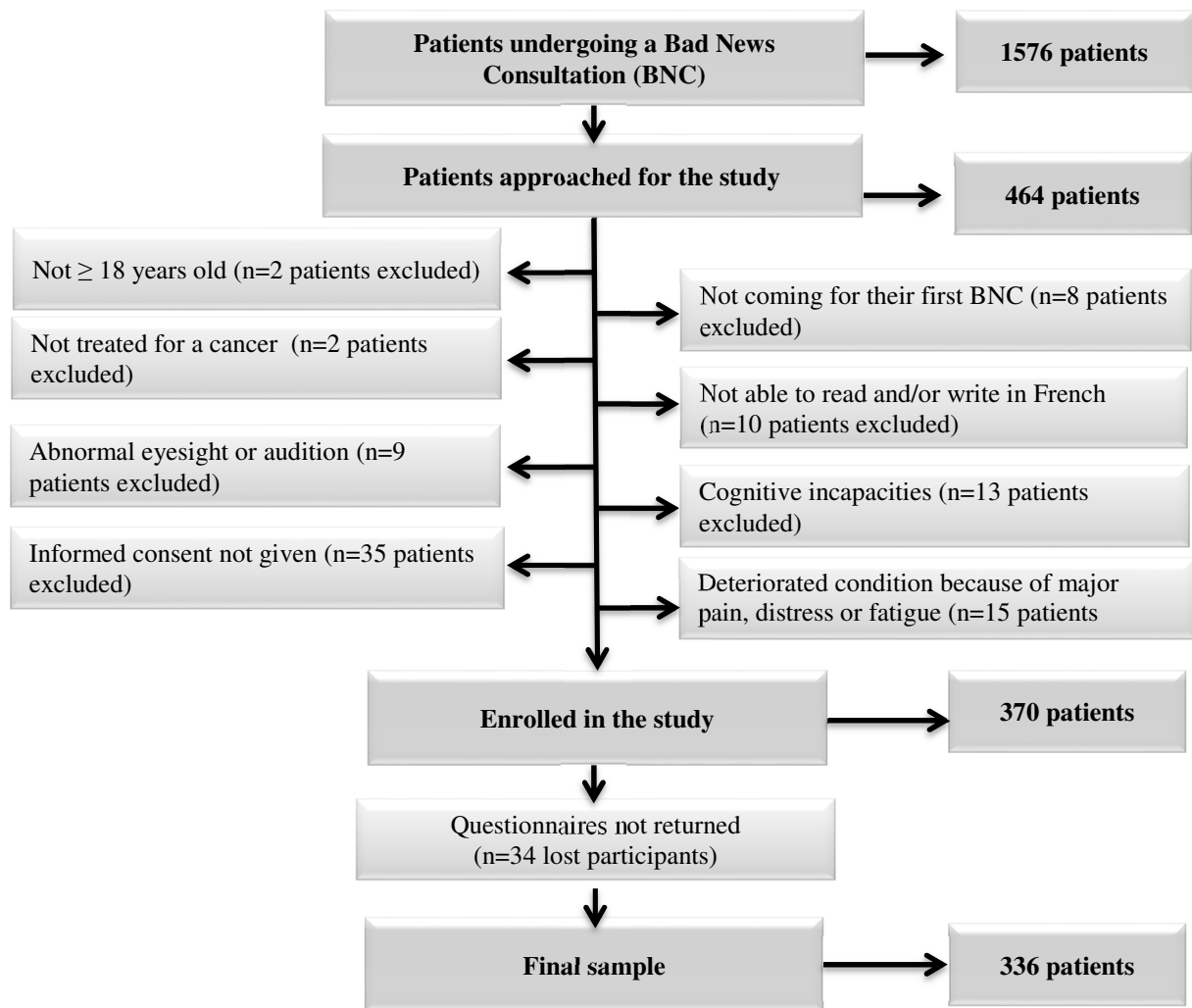
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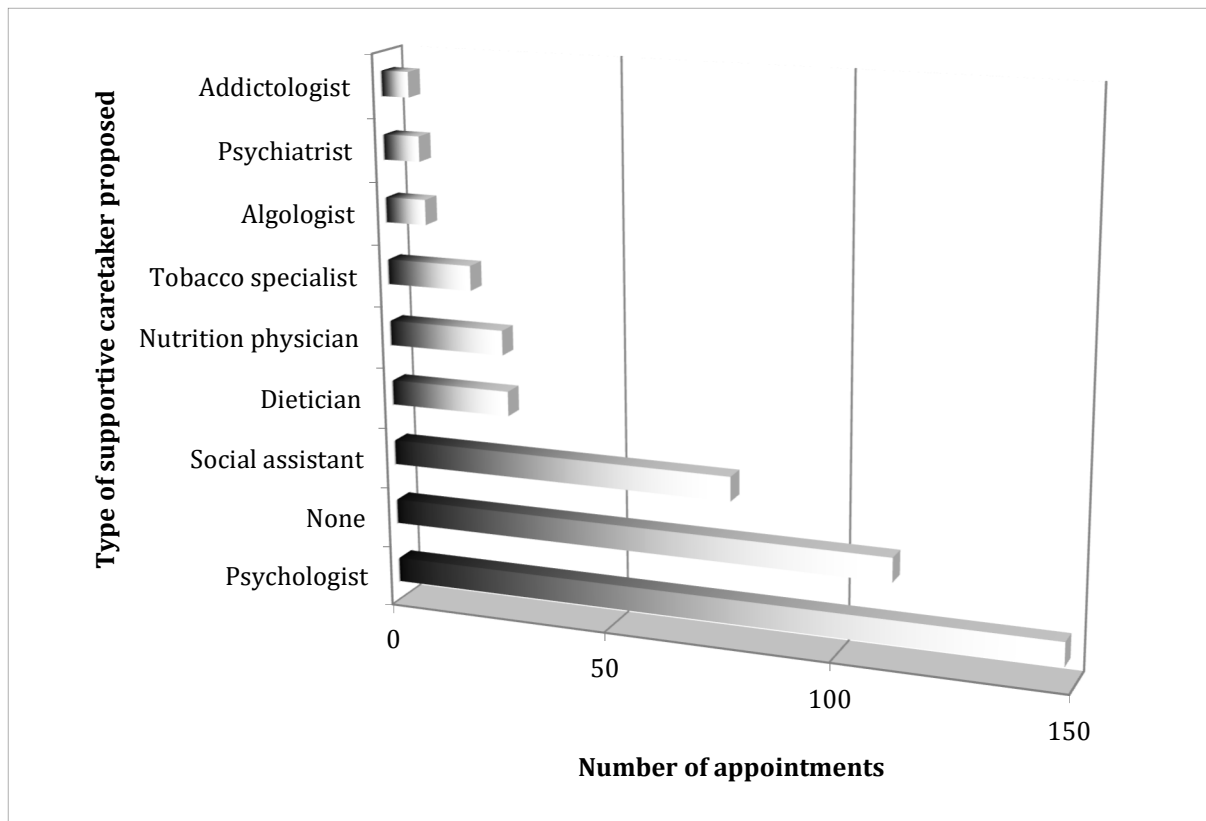
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**Fig. 1.** Flow chart of participant selection.

- *A complementary interview to the doctor's information, which provided me with more details about the disease.*
- *A nurse who listened to my concerns and problems, who responded with competence, humanity and assurance.*
- *The nurse was very brave and responded to my anxieties whilst reassuring me.*

**Fig. 2.** Examples of explanations given by patients who gave the BNC a high mark.



**Fig. 3.** Type and number of appointments that were proposed as a supportive care during the BNC, according to the participants.

**Table 1** Characteristics of the participants.

Patients' characteristics (N=336)	
<b>Gender, n (%)</b>	
Female	258 (76.8)
Male	66 (19.6)
<i>Missing</i>	12
<b>Age (years), median [range]</b>	62 [23-88]
<b>Marital status, n (%)</b>	
Married	205 (61.0)
Single (divorced, widowed, single)	70 (20.8)
<i>Missing</i>	61
<b>Type of cancer, n (%)</b>	
Breast	183 (54.5)
Colorectal	52 (15.5)
Gynecologic	35 (10.4)
Hepato-biliopancreatic	15 (4.4)
Sarcoma	9 (2.7)
Others	35 (10.4)
<i>Missing</i>	7 (2.1)
<b>Metastatic disease, n (%)</b>	
No	243 (72.3)
Yes	78 (23.2)
<i>Missing</i>	15
<b>Recurrence, n (%)</b>	
No	272 (81)
Yes	51 (15.2)
<i>Missing</i>	15
<b>Type of treatment, n (%)</b>	
Surgery	225 (66.9)
Adjuvant chemotherapy	56 (16.7)
Neo-adjuvant chemotherapy	32 (9.5)
Oral therapy	1 (0.3)
<i>Missing</i>	22
<b>Score on the CD-RISC2 (stress resilience), mean (<math>\pm</math>SD)</b>	6.3 ( $\pm$ 1.6)
<b>Score on the VAS of perceived stress, mean (<math>\pm</math>SD)</b>	
Control	4.8 ( $\pm$ 0.3)
T0	3.9 ( $\pm$ 2.8)
T1	2.5 ( $\pm$ 2.2)

CD-RISC2: Connor-Davidson Resilience Scale 2; SD: Standard Deviation; VAS Visual Analog Scale; BNC Bad News Consultations; T0:At the beginning of the BNC; T1: at the end of the BNC

**Table 2**

Multivariable analysis on perceived stress: values of the variables included in mixed-effects model

	Fixed effects				Random effect (intercept)	
	<i>B</i>	<i>SE</i>	CR	<i>p</i> -value	Variance	SD
<b>Random effect</b>	-	-	-	-	-	-
Subjects	-	-	-	-	3.86	1.96
Type of cancer	-	-	-	-	<0.001	<0.001
Type of treatment	-	-	-	-	0.07	0.27
<b>Fixed effects</b>	-	-	-	-	-	-
Age	<0.001	0.01	0.07	0.94	-	-
Gender	0.72	0.33	2.18	<b>0.03</b>	-	-
Interval medical consultation - BNC	-0.38	0.31	-1.22	0.22	-	-
Presence of the nurse at the medical consultation	0.05	0.32	0.17	0.86	-	-
CD-RISC2 resilience score	-0.43	0.09	-4.39	<b>&lt;0.001</b>	-	-
Time (T0 and T1)	-1.91	0.53	-3.57	<b>&lt;0.001</b>	-	-
Resilience * Time	0.09	0.08	1.17	0.24	-	-

*B*: unstandardized regression coefficient; *SE*: standard Error; *CR*: Critical Ratio; *SD*: Standard Deviation



**Table 3**

Responses to the questionnaire presented as a function of 3 purposes of the Bad News Consultation.

<b>Purpose 1: To rephrase, repeat and complete information given previously</b>		<b>n (%)</b>
		→ Thematic analysis
6. After the medical consultation, did you feel the need to ask the nurse additional questions? (n=304)		
Yes		<b>171 (56.3%)</b>
→ If yes, explain what information (maximum 2 lines - 328 characters)		→ 3 themes: 'hospitalisation', 'practical issues', 'side effects'
No		<b>115 (37.8%)</b>
Do not know		<b>18 (5.9%)</b>
7. Did the nurse give you complementary information? (n=314)		
Yes		<b>265 (84.4%)</b>
→ If yes, explain what information (maximum 2 lines)		→ 1 theme: 'practical issues'
No		<b>46 (14.7%)</b>
8. Was the amount of information given by the nurse: (n=322)		
Sufficient?		<b>296 (91.9%)</b>
Too much?		<b>18 (5.6%)</b>
Insufficient?		<b>8 (2.5%)</b>
23. What else would you have wanted during the BNC? (n=335)		
Nothing else		<b>295 (88.1%)</b>
Something else		<b>40 (11.9%)</b>
→ If something, explain what (maximum 4 lines)		→ 2 themes: 'more details', 'additional comforts'
<b>Purpose 2: A place for patient support, freedom of speech and active listening</b>		
9. Was your family situation sufficiently taken into account during the BNC? (n=327)		
Yes		<b>275 (84.1%)</b>
No		<b>15 (4.6%)</b>
Do not know		<b>37 (11.3%)</b>
10. Was your social situation sufficiently taken into account during the BNC? (n=323)		
Yes		<b>242 (74.9%)</b>
No		<b>27 (8.4%)</b>
Do not know		<b>54 (16.7%)</b>
11. Was your economic situation sufficiently taken into account during the BNC? (n=313)		
Yes		<b>175 (55.9%)</b>
No		<b>62 (19.8%)</b>
Do not know		<b>76 (24.3%)</b>
14. During the consultation, were you able to express your feelings and the subjects that worry you? (n=328)		
Yes, completely / Yes, rather		<b>308 (93.9%)</b>
Not so much / Not at all		<b>13 (3.9%)</b>
→ If no, explain why (maximum 2 lines)		→ 1 theme: 'distress'
Do not know		<b>7 (2.1%)</b>
15. Did you feel you were listened to? (n=325)		
Yes, completely / Yes, rather		<b>324 (99.7%)</b>
Not so much / Not at all		<b>1 (0.3%)</b>
→ If no, explain why (maximum 2 lines)		→ 'lack of precision'
Do not know		<b>2 (0.6%)</b>

16. Did you feel communication with the nurse was adapted to your situation? (n=323)	
Yes, completely / Yes, rather	316 (97.1%)
Not so much / Not at all	4 (1.2%)
→ If no, explain why (maximum 2 lines)	→ 2 themes: 'distress', 'frightening situation'
Do not know	3 (0.9%)
17. Did you feel your ideas, values and beliefs were respected during the BNC? (n=326)	
Yes, completely / Yes, rather	309 (94.8%)
Not so much / Not at all	1 (0.3%)
→ If no, explain why (maximum 2 lines)	No data
Do not know	16 (4.9%)
<b>Purpose 3: Benefits and relevance of the BNC</b>	
2. When do you think the BNC should occur, in order to be most beneficial? (n=331)	
Just after the medical consultation	202 (61%)
several days after the medical consultation	97 (29.3%)
Do not know	32 (9.7%)
4. If the nurse was present during the medical consultation, do you feel it benefited your care pathway? (n=117)	
Yes, completely / Yes, rather	95 (81.2%)
→ If yes, explain in what way (maximum 2 lines)	→ 3 themes: 'go back to previous information', 'explain and clarify in detail some practical points', 'appeasement'
Not so much / Not at all	10 (8.6%)
Do not know	12 (10.3%)
5. If the nurse was not present during the medical consultation, would you have wanted him/her to be present? (n=253)	
Yes, completely / Yes, rather	68 (26.9%)
→ If yes, explain why (maximum 2 lines)	→ 1 theme: 'reassuring'
Not so much / Not at all	129 (51%)
→ If no, explain why (maximum 2 lines)	→ 2 themes: 'different words', 'different timings'
Do not know	56 (22.1%)
19. Would you say that the BNC has changed your point of view on the disease or its treatments? (n=323)	
Yes, completely / Yes, rather (If yes, in what way?)	206 (63.8%)
→ If yes, explain in what way (maximum 2 lines)	→ 1 theme: 'better understanding'
Not so much / Not at all	76 (24.5%)
Do not know	41 (12.7%)
21. Was the BNC useful? (n=324)	
Very useful / Useful	311 (96%)
Not so useful / Not useful	11 (3.4%)
Other	2 (0.6%)
Do not know	5 (1.5%)

Notes: The answers "Do not know" are presented only if the percentage exceeds 5%.