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Testing two competitive models of empathic communication in cancer care encounters: a factorial analysis of the CARE measure.

Abstract

Objective: The mechanisms associating physician empathy (PE) with patient outcomes remain unclear. PE can be considered as a whole (one process) or three subcomponents can be identified (an establishing rapport process; an emotional process; a cognitive process). The objective was to test two competitive models of PE in cancer care: a three-process model adapted from Neumann’s model versus a one-process model, with the use of the Consultation and Relational Empathy measure (CARE).

Methods: The CARE was completed by 488 esogastric cancer patients from the national French database FREGAT. **A confirmatory factor analysis (CFA) and a bifactor model were performed to test the two competitive models.**

Results: The CFA revealed that the one-factor structure showed a moderate fit to the data whereas the three-factor structure showed a good fit. **However, the bifactor model favored unidimensionality.**

Conclusion: **We cannot provide a clear-cut conclusion about whether PE should be considered as on unique process or not. Further work is still needed. Meanwhile, one should not preclude the use of three subscores in cancer care if specific elements of the encounter need to be assessed.**

Keywords: Empathy, neoplasms, CARE questionnaire, communication, cancer, physicians.

1. Introduction

Physician empathy (PE) can be defined as "the ability (i) to understand the patient's situation, perspective and feelings (and their attached meanings); (ii) to communicate that understanding and check its accuracy; and (iii) to act on that understanding with the patient in a helpful (therapeutic) way" (Mercer & Reynolds, 2002). It is a central aspect of the physician-patient relationship and is expected and appreciated by patients (Goldman et al., 2009; Mazzi, Rimondini, Boerma, Zimmermann, & Bensing, 2016; Mercer & Murphy, 2008). In cancer care, PE is of particular importance to help patients face this emotionally demanding context. Cancer diagnosis can trigger feelings of shock and despair (Shim et al., 2016). Physicians play a key role in these different steps by giving information, or acknowledging patients' difficulties. Therefore, PE is valued by patients throughout their cancer care pathway (Shim et al., 2016; Takayama et al., 2001; Thorne et al., 2014). A systematic review reported that higher levels of PE were associated with fewer psychosocial needs, less distress, a better quality of life and greater satisfaction with care in cancer patients (Lelorain et al., 2012).

While self-reported physician empathy is used in the majority of studies (Pedersen, 2009; Sulzer et al., 2016), it is the patient assessment of PE that is most associated with positive patient outcomes (Elliott et al., 2018; Lelorain et al., 2012). Recent studies demonstrated that the association between the patient perception of PE and the physician self-reported measure of empathy was low or absent (Bernardo et al., 2018; Dong et al., 2014; Hermans et al., 2018). Therefore, the patient perception of PE should be favored in empathy studies. Amongst patient measures of PE, the Consultation and Relational Empathy (CARE) measure is widely used (Appendix 1). Indeed, a recent meta-analysis only included studies using the CARE scale to assess PE and 69 hits were retrieved (Howick et al., 2017). The CARE scale is thus the gold standard for the assessment of patient-perception of PE.

The nature of empathy is unclear; PE is generally considered as a whole and its subcomponents are rarely identified. In fact, the CARE has been validated in primary care settings in many languages and a large majority of the validations found a unidimensional structure of the scale using exploratory factor analysis (EFA) (e.g. Crosta Ahlforn, Bojner Horwitz, & Osika, 2017; Kersten, White, & Tennant, 2012; van Dijk et al., 2016). The scale presents good psychometric properties with Cronbach's alphas higher than 0.9 (e.g. Aomatsu et al., 2014; Bikker, Fitzpatrick, Murphy, & Mercer, 2015; Crosta Ahlforn et al., 2017; van Dijk et al., 2016).

However, subcomponents of PE may be identified in models. Based on "the effect model of empathic communication in the clinical encounter" (Neumann et al., 2007, 2009), we postulate that PE impacts patient outcomes via three distinct processes : an "establishing rapport process" ; an "emotional process" and a "cognitive process". In the "establishing rapport process", patients need to feel comfortable with their physician to establish a trusting relationship. When the relationship develops, patients are able to provide more accurate information about their symptoms and concerns. In the "emotional process", physicians show attention and compassion towards patients' difficulties and concerns. In response, patients feel listened to, considered as individuals and acknowledged in their difficulties (Neumann et al., 2009). In the "cognitive process", physicians have a better understanding of patient needs and concerns, propose more adapted therapeutics and set up a more educative and participative communication, by giving patients control over their disease (Neumann et al., 2009).

In this line, some validations call into question the unidimensionality of the CARE. First, items nine (Helping you to take control) and ten (Making a plan of action with you) have higher proportions of "Does not apply" ratings compared to other items (e.g. Bikker, Fitzpatrick, Murphy, & Mercer, 2015; Crosta Ahlforn et al., 2017; van Dijk et al., 2016). Item ten was discarded from the scale in a Rasch model analysis in cancer care (Wirtz et al., 2011). These items are considered to pertain to empowerment and shared decision-making (Mercer et al., 2008). In addition, a qualitative study associated items seven to ten with patient empowerment (Fung & Mercer, 2009). Secondly, the Croatian version of the CARE measure found a two-factor scaling structure (Hanževački et al., 2015). Factor 1 (items 1-3, 7-10) was defined as relating to "concrete situations" whereas Factor 2 (items 4-6) was defined as relating to "abstract situations". However, none of these studies actually tested a theoretical model of PE.

PE is considered as a whole in studies, but conceptualized as comprising different processes. Therefore, it seems interesting to differentiate these processes to better understand how patient-physician relationships function and how these processes can trigger different beneficial patient outcomes. Our study aimed to test two competitive models of empathic communication in cancer care with a theoretically-driven analysis of the CARE measure: the classic one-process model of empathy versus the three-process model (establishing rapport process, an emotional process and a cognitive process) adapted from Neumann's model (2009).

2. Methods

2.1. Participants and procedure

Data for this study were collected between June 2014 and October 2018 from 30 French centers via the clinico-biological database French EsoGastric Tumors (FREGAT, https://www.fregat-database.org/en) targeting esophageal and gastric cancers. The database comprises both clinical and social and humanities sciences data, of which the CARE measure is part. The study was proposed to all adult patients with esophageal and gastric cancers, who had not had cancer treatments yet. The sample was composed of 488 esogastric cancer patients who completed the CARE measure after receiving their cancer diagnosis and before starting any treatment. The questionnaire was given at the time of the inclusion before treatments began. Mean time between inclusion and questionnaire return was 35 days (*SD* = 20.8). **Of the 488 patients in the database, 414 patients (84.8%) aged from 25 to 88 (*M* = 61.85, *SD* = 10.32) completed the full questionnaire (Figure 1).** The majority of patients were men (*N* = 310, 74.9%), retired (*N* = 227, 54.8%), married (*N* = 278, 67.2%) and had no post-secondary education (*N* = 230, 55.5%). They mostly suffered from esophagus cancer (*N* = 198, 47.8%). Detailed sociodemographic and medical information is provided in Table 1.

Insert Table 1

The study was conducted in accordance with the Declaration of Helsinki, the French regulation on clinical trials, and authorizations from the "Comité de Protection des Personnes Nord Ouest IV" (Ethics Committee, project number: 13/67). All participants provided written informed consent.

2.2. The CARE measure and context of the study

The CARE measure was developed for use in primary care (Mercer et al., 2004). The scale evaluates patient perception of their referent physician's empathy at the last consultation with ten items. The scale has a five-point Likert response scale: "Poor, Fair, Good, Very Good and Excellent" to the question "How was your doctor at….". It also proposes a "Does Not Apply" answer. The score ranges from 10 (low perceived empathy) to 50 (high perceived

empathy). Cronbach's alpha of the original version of the scale was $\alpha = 0.92$ (Mercer et al., 2004).

The CARE measure is widely used in French-speaking research (Lelorain, Cattan, et al., 2018; Lelorain, Cortot, et al., 2018; e.g. Lelorain et al., 2015) and was chosen to measure patient perception of PE in the FREGAT database (FRench EsoGAstric Tumors, https://www.fregat-database.org/en/), (Mariette et al., 2018). The forward-translated French version used in the database was back-translated into English by a bilingual translator whose mother tongue was English. An analysis identified the differences between the original CARE and the back-translated version. After analysis, no modifications of the French version were necessary as judged by the lead authors. The French version of the scale is available in Appendix 1.

2.3. Statistical analysis

Before comparing the one-process model of empathy versus the three-process model, the one-dimensional structure of CARE with a French-speaking esogastric cancer sample was verified as it was not formally validated in this type of sample (i.e. cancer patients) in French. In order to do so, the FREGAT sample was randomly divided in half considering the 414 with fill questionnaire completed, which is the standard procedure when performing both EFA and CFA (Anderson & Gerbing, 1988, p. 421). EFA was performed on the first half, called sample A ($N = 207$), and CFA on the second half, called sample B ($N = 207$). The Chi square test for categorical variables and ANOVA for numeric variables were performed to compare the sociodemographic and medical characteristics of samples A and B.

Preliminary descriptive analyses were carried out in order to assess the response pattern in cancer care. EFA was conducted using IBM SPSS Version 24 to verify the initial structure of the scale in cancer care. **The Kaiser-Meyer Olkin criteria and Bartlett Test of Sphericity were used to assess if Principal Component Analysis (PCA) could be performed.** PCA using Varimax rotation was carried out and items with factor loadings under 0.30 were discarded from the scale. The scree plot and the eigenvalue criterion > 1 were used to determine the number of factors according to Kaiser's criterion (Kaiser, 1960). If an item loaded on more than one factor, the item was deleted. Internal reliability was assessed using Cronbach's alpha coefficients (above 0.70) (Cronbach, 1951; Lance et al., 2006).

CFA was carried out in a structural equation modeling (SEM) framework. The analyses were conducted using IBM AMOS Version 22. Skewness and kurtosis indices were used to

ensure the assumption of normality. Multivariate outliers were discarded from the sample based on the Squared Mahalanobis Distance Test (Byrne, 2009; Kline, 2011). The final sample B was composed of 196 patients. As recommended by Jackson, Gillapsy & Purc-Stephenson (2009), two competitive models were tested: the one-process model (M1-Uni) and the three-process model (M2-Tri). M1-Uni was specified as unidimensional with the ten items loading onto a single latent variable called "Patient perception of PE". M2-Tri was specified as a correlated three-factor model in which items 1-3 loaded onto one latent factor called "establishing rapport process", items 4-6 loaded onto one latent factor called **"**emotional process" and items 7-10 loaded onto one latent factor called "cognitive process". The factorial structure was tested using Maximum Likelihood estimation. Model fit was calculated using the X^2/df ratio, the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). An acceptable model fit is indicated by a X^2/df ≤ 3; CFI $\geq .90$; SRMR $\leq .08$ and RMSEA $\leq .08$. A well-fitting model is indicated by a X^2/df ≤ 2; CFI $\geq .95$; SRMR $\leq .05$ and RMSEA $\leq .06$ (Bentler, 1990; Hu & Bentler, 1999; Kline, 2011; Steiger, 1990). The Bayesian Information Criterion (BIC) was used to compare the non-nested models, with smaller values indicating a better model fit. A ten-point difference between two BIC values indicates that the model with the lower BIC value is statistically superior (Raftery, 1995).

Finally, a bifactor model was conducted. Bifactor models enable to test the extent to which a set of items are explained by a general underlying factor and group-level factors (Gibbons & Hedeker, 1992). This type of model enables to assess if a scale is unidimensional or multidimensional. The following fit indexes were computed: the percentage of unconfounded correlations (PUC), the explained common variance (ECV) the hierarchical Omega coefficient (OmegaH) (Rodriguez et al., 2016a). The ECV indicates the degree of unidimensionality of general to group factors. The PUC assesses the biasing effect of forcing multidimensional data into a unidimensional structure. The OmegaH coefficient indicated the percentage of variance in a unit-weighted composite attributable to a general factor (Rodriguez et al., 2016b). The analysis was conducted with R with lavaan and bifactorindicescalculator packages.

Insert Figure 1

3. Results

No statistical differences were found between sample A and sample B regarding age ($F(1) = 1.23$, p >.050), gender ($\chi^2(1) = 1.28$, $p > .050$), marital status ($\chi^2(4) = 4.89$, $p > .050$), education ($\chi^2(1) = 3.8$, $p > .050$), employment status ($\chi^2(2) = 2.18$, $p > .050$), tumor localization ($\chi^2(2) = 3.48$, $p > .050$) and grade ($\chi^2(3) = 3.93$, $p > .050$).

3.1. Verification of the CARE unidimensionality with French-speaking cancer patients (EFA)

Descriptive data on the response pattern for the total sample before discarding missing data ($N = 488$) are reported in Table 2. No statistical differences between participants with and without missing data were found regarding age ($F(1) = 1.43$, p >.05), gender ($\chi^2(1) = 2.88$, $p > .050$), marital status ($\chi^2(4) = 0.88$, $p > .050$), education ($\chi^2(1) = 0.14$, $p > .050$), employment status ($\chi^2(2) = 2.08$, $p > .050$), tumor localization ($\chi^2(2) = .61$, $p > .050$) and grade ($\chi^2(3) = 2.28$, $p > .050$).

Items nine and ten were the most rated as "Does not apply"; however, these did not exceed 3.68% of answers for item nine and 4.29% for item ten. Missing values ranged from 0.4% for item one to 3.27% for item ten. After discarding missing data, the mean total CARE measure score was 41.92 ($SD = 7.715$, $N = 414$) ranging from 11 to 50. As 22% of the sample reported the maximum score of 50, a ceiling effect was present. There was no evidence of a floor effect as 0.2% of the sample reported a minimum score of 11.

Insert Table 2

The Kaiser-Meyer Olkin criteria (KMO = 0.94) and Bartlett Test of Sphericity (Approx. Chi Square = 2002.42, $p < .001$) indicated that PCA could be performed. According to the scree plot and the eigenvalue criterion, one factor was retained from PCA. This factor explained 73.41 % of the variance. No items were discarded as factor loadings all exceeded .30 with high values ranging from .82 for items seven and eight to .88 for items ten and three (Table 2). Cronbach's alpha for the scale was $\alpha = 0.959$, which indicated excellent internal reliability. Cronbach's alpha would not be improved by the removal of any item. Homogeneity was prominent as item total correlations ranged from .78 for items seven and eight to .85 for item ten (Table 3).

Insert Table 3

3.2. Confirmatory factor analysis

According to Hu & Bentler (1999), the χ^2/df ratio was acceptable for M2-Tri (χ^2/df = 2.70, $p < .001$) and poor for M1-Uni (χ^2/df = 4.35, $p < .001$). CFI was acceptable for M1-Uni (*CFI* = .948) and excellent for M2-Tri (*CFI* = .976). RMSEA was poor for M1-Uni (*RMSEA* = .131, *90% CI* = [.110, .153]) and mediocre for M2-Tri (*RMSEA* = .093, *90% CI* = [.70, .117]). SRMR was excellent for both models (*SRMR* = .026 for M1-Uni ; *SRMR* = .019 for M2-Tri). The BIC value for M1-Uni was higher (*BIC* = 257.84) than for M2-Tri (*BIC* = 207.66).

M1-Uni revealed a moderate fit to the data whereas M2-Tri revealed a good fit to the data except for RMSEA. Overall, goodness of fit statistics indicated that M2-Tri provides a good representation of the data. To conclude, and most importantly, BIC values were lower for the alternative model (M2-Tri) by more than ten points, indicating its statistical superiority (Raftery, 1995) though M1-Uni is still acceptable.

Cronbach's alpha coefficients for M2-Tri were .913 for the establishing rapport process factor, .923 for the emotional process factor and .939 for the cognitive process factor, which presents excellent reliability. As for factor loadings, all indicators loaded strongly onto their respective latent factors with the loadings being positive and high (> .75), as shown in Figure 2.

Given this statistical information, M2-Tri was considered the best model fitting the data. We chose not to perform a specification search with post hoc analysis as we did not have strong theoretical reasons to allow for correlating measurement errors. Because we lacked justification, the risk would be to improve the model fit by chance (Byrne, 2009; Hermida, 2015).

Insert Figure 2

3.3. Bifactor model

The bifactor model structure is represented in Figure 3. Convergence could not be reached for sample B in R software. Therefore, the analysis was conducted on the whole sample (N = 414). The M1-Uni and M2-Tri models were also run on this sample to enable

comparisons. Standardized regression weights are reported in Figure 3 and results are presented in Table 4.

The χ^2/df ratio was poor for the three models. CFI was acceptable for M1-Uni and excellent for M2-Tri and for the bifactor model. RMSEA was poor for the three models. SRMR was excellent for the three models. The BIC value for M1-Uni was higher than for M2-Tri and for the bifactor model. There was a two-point difference between M2-Tri and the bifactor models which suggests that they are equivalent.

Regarding specific bifactor model indices, the ECV indicates the general factor explains 91% of the common variance extracted with 9% spread across group factors. The PUC indicates that the majority of the correlations between items from different group factors reflect general factor variance. The general trait in the bifactor model becomes almost similar to the single trait estimated in the M1-Uni as ECV is also high. The OmegaH coefficient indicates that 95% of the variance of unit-weighted total scores can be attributed to the individual differences on the general factor.

Insert Table 4 and Figure 3

4. Discussion-conclusion

4.1. Discussion

Physician empathy (PE) has been shown to be associated with beneficial cancer patient outcomes such as with less psychosocial needs, less distress and a better quality of life (Lelorain et al., 2012). The mechanisms associating PE with cancer patients' outcomes remain unclear. PE can be considered as a whole (one process) or three subcomponents can be identified (an establishing rapport process; an emotional process; a cognitive process). The objective of this study was to test two competitive models of PE in cancer care: a three-process model versus a one-process model, with the use of the Consultation and Relational Empathy measure (CARE).

The main objective was to test two competitive models from a theoretical point of view, using CFA **and a bifactor model** to compare the three-process model with a one-process model.

Flores-Kanter et al., (2018) specify that it is recommended to use multiple criteria when assessing bifactor models. First, conceptual grounds are needed. In this case, the M2-Tri Model was based on the literature and on an existing model (Neumann et al., 2009). Second, they recommend using overall model fit indices. In this case, CFA on sample B revealed that the scale had a better fit to the data with a three-factor structure. CFA on the whole sample revealed that the three-process model had equivalent goodness-of-fit indices to the bifactor model. Finally, they recommend looking at specific bifactor model indicators. In this case, the bifactor model indicators favor unidimensionality. Therefore, it is difficult to conclude clearly on the possibility to identify these three processes.

Other studies have already differentiated the emotional and cognitive aspects of patient-physician relationships (Di Blasi et al., 2001; Lelorain, Cortot, et al., 2018; Morse et al., 1992; Ong et al., 1995; Pincus et al., 2013). **Besides, studies have also shown that the predictive validity of PE subcomponents on patient outcomes differed.** For example, a recent study demonstrated that the emotional aspects of empathy did not have the same effect as the cognitive aspects on cancer patient survival assessed by the CARE measure (Lelorain, Cortot, et al., 2018). **Moreover, while the cognitive process of PE is clearly associated with cancer patient satisfaction or quality of life (Ernstmann et al., 2016; Ong et al., 2000), the results are unclear regarding the two other processes (Eide et al., 2003; Grassi et al., 2015; Ong et al., 2000).**

Therefore, these analyses do not rule out the existence of the three-process model we proposed based on the effect model of empathic communication in the clinical encounter (Neumann et al., 2009). The first three items describe the necessary climate for rapport to develop (item 1), allowing patients to talk about their symptoms and concerns (items 2 and 3). The emotional process refers to the emotional reactions of patients, including the feeling of being valued as individuals (item 4), understood and accepted (items 5 and 6). The cognitive process includes the physicians' better understanding of patients' symptoms and concerns. Therefore, they can give more illness-related information while remaining honest and positive (items 7 and 8), and provide more patient education, such as giving control or sharing decision-making (items 9 and 10). A qualitative analysis of the CARE measure has identified distinct themes in the scale pertaining to emotions: "Connecting and communicating" (items 1-3); "Assessing holistically" (item 4); "Responding" (items 5 and 6); or to cognition and behavior such as "Empowering" (items 7-10) (Fung & Mercer, 2009).

Therefore, the CARE measure **could be** used with cancer patients with either one global score, or **three distinct subscores, although this is less reliable from a statistical point of view,** namely (1) establishing rapport process with items 1-3; (2) the emotional process with items 4-6 and (3) the cognitive process with items 7-10. This three-process model contributes to the understanding of the mechanisms by which PE affects patient outcomes in cancer care. The use of three subscores enables specific characteristics of consultations to be assessed. Factor 1 could be useful to assess the very first encounter with the physician, Factor 2 could be appropriate in emotionally demanding encounters when patients are particularly distressed and Factor 3 could be relevant in encounters in which medical decisions are made. Indeed, studies show that physician emotional concern is not always beneficial to patients in the contexts of decision-making or education sessions (Oguchi et al., 2011; Smith et al., 2011). Conversely, using one single score could be more relevant when PE is assessed globally, over time, and does not refer to a specific encounter. A longitudinal study found that a global PE score 18 months after diagnosis predicted adherence to treatment 18 months later (Liu et al., 2013). Therefore, we leave researchers and clinicians to choose whether to use a single score or three subscores, depending on the aims of the assessment.

Descriptive statistics indicate a ceiling effect as 22% of the sample reported the maximum score of 50. This finding is not surprising and has already been reported in other CARE measures validations carried out in nurses (Bikker et al., 2017), in osteoarthritis patients

(Kersten et al., 2012), and in primary care settings (Crosta Ahlforn et al., 2017; Mercer et al., 2004; van Dijk et al., 2016). Finally, in a recent meta-analysis with various healthcare practitioners, the mean score of the CARE measure was above 40 out of 50, which is very high (Howick et al., 2017). This ceiling effect could reflect social desirability. However, we rather suggest that there could be a bias in patient perception of PE in the context of serious medical conditions such as cancer. In a study displaying high levels of satisfaction with care in patients, Von Essen, Larsson, Oberg, & Sjödén, (2002) have argued that individuals tend to evaluate their lives more positively when they face serious illness. Therefore, it could be reassuring for patients to perceive their doctor as competent and empathetic, leading to higher hope and less anxiety (Cao et al., 2016; Von Essen et al., 2002; Zachariae et al., 2003). PE was found to be associated with emotional acceptance of terminal illness (Mack et al., 2009).

Our study took place in the specific context of diagnosis announcement. We can postulate that in this particular type of medical encounter, patient expectations about medical communication are not the same as in other oncology medical encounters (Fallowfield & Jenkins, 2004; Fujimori et al., 2007; Shim et al., 2016), which is supported by recent studies in oncology (Lelorain, Cattan, et al., 2018; Lelorain, Cortot, et al., 2018).

Moreover, patients do not know their physician well at this time of cancer care, which **could explain why these three factors do not appear clearly**. Previous work has shown positive associations between CARE measure scores and how well patients know their healthcare practitioner (Aomatsu et al., 2014; Bikker, Fitzpatrick, Murphy, Forster, et al., 2015; Fung et al., 2009; Mercer et al., 2011). **More time might be needed to establish a trusting relationship enabling patients to feel comfortable and disclose more information. Indeed, despite replacement, physician retirement was found to be associated with unfavourable outcomes such as with the loss of a trusted advisor, with difficulty with transition or with emotional distress (Lam et al., 2020). Further research is needed to clarify the existence of these three empathic processes.**

It would be interesting to conduct longitudinal studies to assess the evolution of PE from the very first encounters, when rapport is being established, to the end of the treatment phase, when collaboration is set. As the different processes are not expected to be equally beneficial depending on the treatment phase, it would also be interesting to assess the effect of the three different empathic processes on patient adjustment to cancer. Finally, it would be interesting to investigate how these processes take place over time, in order to understand if they occur simultaneously or if they are interwoven or if one specific process is needed to trigger another.

The model proposed by Neumann et al., (2009) is presented in a way that suggests a temporal order of the processes, with first the establishment of rapport and then the emotional and cognitive processes. From a clinical point of view, it is indeed plausible that the establishing rapport process is first needed to make patients feel comfortable enough to disclose more information. Regarding the emotional and cognitive processes, neurobiological research supports the interwoven of these two processes (e.g. Richter et al., 2019), so that it is likely that it is also the case in clinical settings.

We wish to discuss two points regarding the practical use of the CARE measure in French. First, the response "Fair" was translated into French by "Passable". This word is negatively connoted. Consequently, we recommend translating "Fair" into "Moyen" (medium), which is more neutral (Appendix 1).

Second, the scale provides a "Does not apply" answer for each item. In primary care settings, items 9 and 10 have higher proportions of this answer than other items do (e.g. Bikker et al., 2017; Crosta Ahlforn et al., 2017; van Dijk et al., 2016). These items seem to pertain to empowerment or shared-decision making (Fung & Mercer, 2009; Mercer et al., 2008), which would not systematically be addressed in every day primary care consultations, when there is no medical decision to undertake. The option "Does not apply" threatens the validity of the scale by increasing the number of missing values. However, it also helps to understand which specific aspects of the consultation have not been addressed, and is thus informative. It has been suggested that scoring should include a maximum of two "Does not apply" responses (Mercer et al., 2005). To conclude, depending on the aim of the assessment, we recommend either deleting this option to avoid missing data or keeping the option and considering that these specific issues were not addressed in consultations, which is a valuable information to collect. It could help clinicians to address these gaps.

Empathic communication is valued by cancer patients and is associated with beneficial outcomes for them. The CARE measure provides clinicians with valuable information about how their communication is perceived by their patients, either globally with one score or specifically with the use of the three subdimensions. **Evaluating these three processes would allow health professionals to have a feedback on their communication skills. They would get more information about which empathic processes they may have insufficiently developed, or are poorly or inadequately perceived by patients, so that they can practice developing them specifically. The CARE measure could be a reliable tool to measure**

progress in these three domains. Studies have already found that 40 CARE measures were sufficient to differentiate doctors based on their empathic skills (Bikker, Fitzpatrick, Murphy, Forster, et al., 2015; Matsuhisa et al., 2018; Mercer et al., 2011). Furthermore, Howick et al. (2017) showed that a large majority of studies using the CARE measure assessed PE but rarely the empathy of other healthcare professionals such as nurses. Further work is required to assess the effect of patient perception of empathy with healthcare professionals other than physicians. Clearly, patients are in contact with other medical specialists, nurses, and allied healthcare professionals, and their empathy should also be considered.

4.2. Limitations

This study has several limitations. The questionnaires were answered in the context of diagnosis disclosure, which is very specific as this type of consultation is particularly demanding. Moreover, we lacked contextual information on the physicians and on the encounter. More information, such as physician gender (Gleichgerrcht & Decety, 2013; Singh et al., 2018) or specialty (Chaitoff et al., 2017), is required as these are known to influence patient-physician interactions. The scale was used in the context of cancer diagnosis, with patients having esogastric cancers and being mostly men, which is not representative of all cancer care contexts. We invite researchers to complete our findings with data on other cancer contexts. The study did not assess the three processes' predictive validity. Further research is needed to assess the independent contribution of these three processes to patient outcomes in cancer care. As the correlations were very high between the three factors, their predictive utility may be questioned. However, past research (Lelorain, Cortot, et al., 2018) demonstrated the benefits of differentiated factors over a single one. Other research are needed to clarify this issue. **Finally, the bifactor model could not be performed on the same sample as CFA and there seems to be a problem with standardized regression weights. The loadings for items 5 and 6 are close to zero, which could explain why the remaining item 4 has a high loading. Moreover, there might also be a problem for factor 1 as the regression weights equal zero. This could be linked to the high loading on the general factor. Further understanding is needed.**

4.3. Conclusion

The three-factor model distinguishing three empathic processes, namely 1) an establishing rapport process 2) an emotional process and 3) a cognitive process, **needs to be further investigated**. This theoretically-driven analysis of the CARE measure is a step forward in understanding the underlying mechanisms associating PE and patient outcomes and implies a different conceptualization of communication interactions in medical encounters.

Depending on the context, specific processes might be more expected than others. Although the CARE measure was developed and validated in primary care, our results suggest that it is a valid tool to assess patient perception of PE in cancer care as well. We recommend using one global score for an overall assessment of physicians during a long period or three subscores for specific encounters. Future studies are needed to verify this recommendation in order to improve the clinical management of patients and determine the impact of PE on their adaptation to disease at different points in their care pathway.

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Tables

Table 1

Sociodemographic and medical characteristics of the two samples.

		Sample A (*N* = 207)		Sample B (*N* = 207)		Total Sample (*N* = 414)	
		N	**%**	***N***	**%**	***N***	**%**
Age	Mean (SD)	62.41 (10.53)		61.28 (10.09)		61.85 (10.32)	
	Median (min-max)	63.60 (29.76 – 87.23)		61.72 (25.79 – 88.24)		62.93 (25.79 – 88.24)	
Gender	Man	160	77.3	150	72.5	310	74.9
	Woman	47	22.70	57	27.5	104	25.10
Education	< High School	121	58.45	109	52.70	230	55.50
	≥ College	45	21.74	64	30.92	109	26.33
	Missing	41	19.80	34	16.43	75	18.12
Employment status	Active	16	7.70	18	8.70	34	8.20
	Inactive	57	27.54	70	33.81	127	30.68
	Retired	120	58	107	51.70	227	54.83
	Missing	14	6.76	12	5.80	26	6.28
Marital status	Single	18	8.70	26	12.60	44	10.62
	Married	139	67.10	139	67.10	278	67.15
	Divorced	21	10.10	22	10.60	43	10.38
	Widowed	16	7.70	12	5.80	28	6.76
	Missing	13	6.30	8	3.90	21	5.07
Tumor localization	Esophagus	96	46.37	102	49.27	198	47.83
	Esogastric junction	68	32.85	50	24.15	118	28.50
	Stomach	36	17.39	43	20.77	79	19.08
	Missing	7	3.38	12	5.78	19	4.59
Grade	Grade I	69	33.30	59	28.50	128	30.92
	Grade II	69	33.30	50	24.20	119	28.74
	Grade III	51	24.60	57	27.50	108	26.08
	Undifferentiated	1	0.50	3	1.40	4	0.97
	Missing	17	8.21	38	18.35	55	13.29

Note. Details of differences are given in section 3.1.

Table 2

Descriptive data on the response pattern ($N = 488$).

Item, N (%)	Poor	Fair	Good	Very Good	Excellent	Does Not Apply	Missing
1. Making you feel at ease	3 (0.6)	10 (2)	82 (16.80)	154 (31.60)	237 (48.60)	0 (0)	2 (0.41)
2. Letting you tell your story	4 (0.80)	13 (2.70)	86 (17.60)	176 (36.10)	197 (40.40)	8 (1.64)	4 (0.82)
3. Really listening	4 (0.80)	17 (3.50)	70 (14.30)	165 (33.80)	224 (45.90)	2 (0.41)	6 (1.22)
4. Being interested in you as a whole person	6 (1.20)	12 (2.50)	93 (19.10)	150 (30.70)	209 (42.80)	11 (2.25)	7 (1.43)
5. Fully understanding your concerns	6 (1.20)	15 (3.10)	91 (18.60)	177 (36.30)	176 (36.10)	11 (2.25)	12 (2.45)
6. Showing care and compassion	7 (1.40)	14 (2.90)	103 (21.10)	160 (32.80)	186 (38.10)	11 (2.25)	7 (1.43)
7. Being positive	5 (1)	10 (2)	76 (15.60)	162 (33.20)	221 (45.30)	5 (1.02)	9 (1.84)
8. Explaining things clearly	4 (0.80)	14 (2.90)	52 (10.70)	147 (30.10)	260 (53.30)	3 (0.61)	8 (1.64)
9. Helping you to take control	3 (0.60)	15 (3.10)	93 (19.10)	162 (33.20)	186 (38.10)	18 (3.68)	11 (2.25)
10. Making a plan of action with you	5 (1)	18 (3.70)	94 (19.30)	146 (29.90)	188 (38.50)	21 (4.29)	16 (3.27)

Table 3

Reliability and homogeneity of the French version of the CARE measure ($N = 207$).

Item	Factor loadings	Scale mean if item deleted	Corrected item-total correlation	Cronbach's alpha if item deleted
1. Making you feel at ease	.86	37.96	.82	.955
2. Letting you tell your story	.88	38.07	.83	.955
3. Really listening	.87	37.95	.84	.954
4. Being interested in you as a whole person	.87	38.05	.84	.954
5. Fully understanding your concerns	.87	38.14	.84	.954
6. Showing care and compassion	.87	38.13	.84	.954
7. Being positive	.82	37.94	.78	.957
8. Explaining things clearly	.82	37.83	.78	.957
9. Helping you to take control	.83	37.08	.79	.956
10. Making a plan of action with you	.88	38.16	.85	.954

Table 4

Goodness of fit indices for M1-Uni, M2-Tri and Bifactor model (N = 414)

	M1-Uni	M2-Tri	Bifactor Model
χ^2/df	7.13*	4.55*	4.05*
CFI	.948	.973	.982
RMSEA	.122	.093	.086
[90% CI]	[.11 - .14]	[.08 - .11]	[.07 - .10]
SRMR	.031	.022	.019
BIC	6969.5	6883.5	6881.7
PUC			.80
ECV			.91
Omega Hierarchical			.95

Note

* $p < .001$

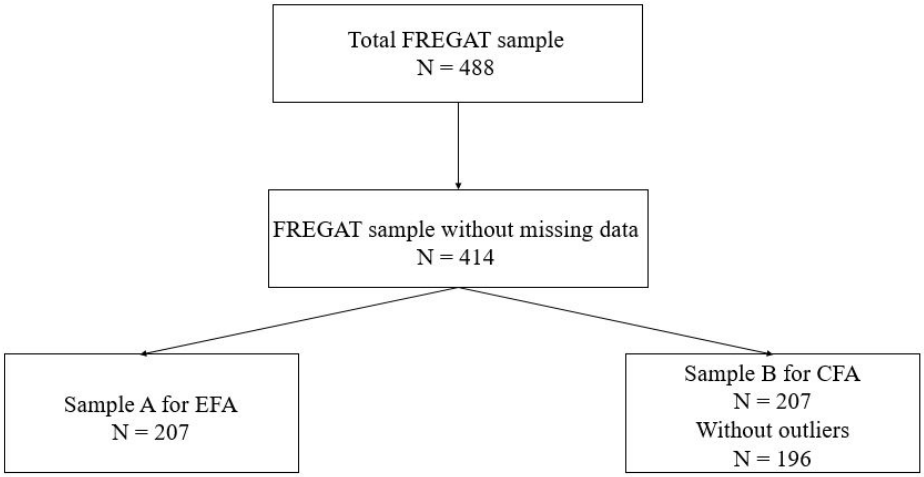
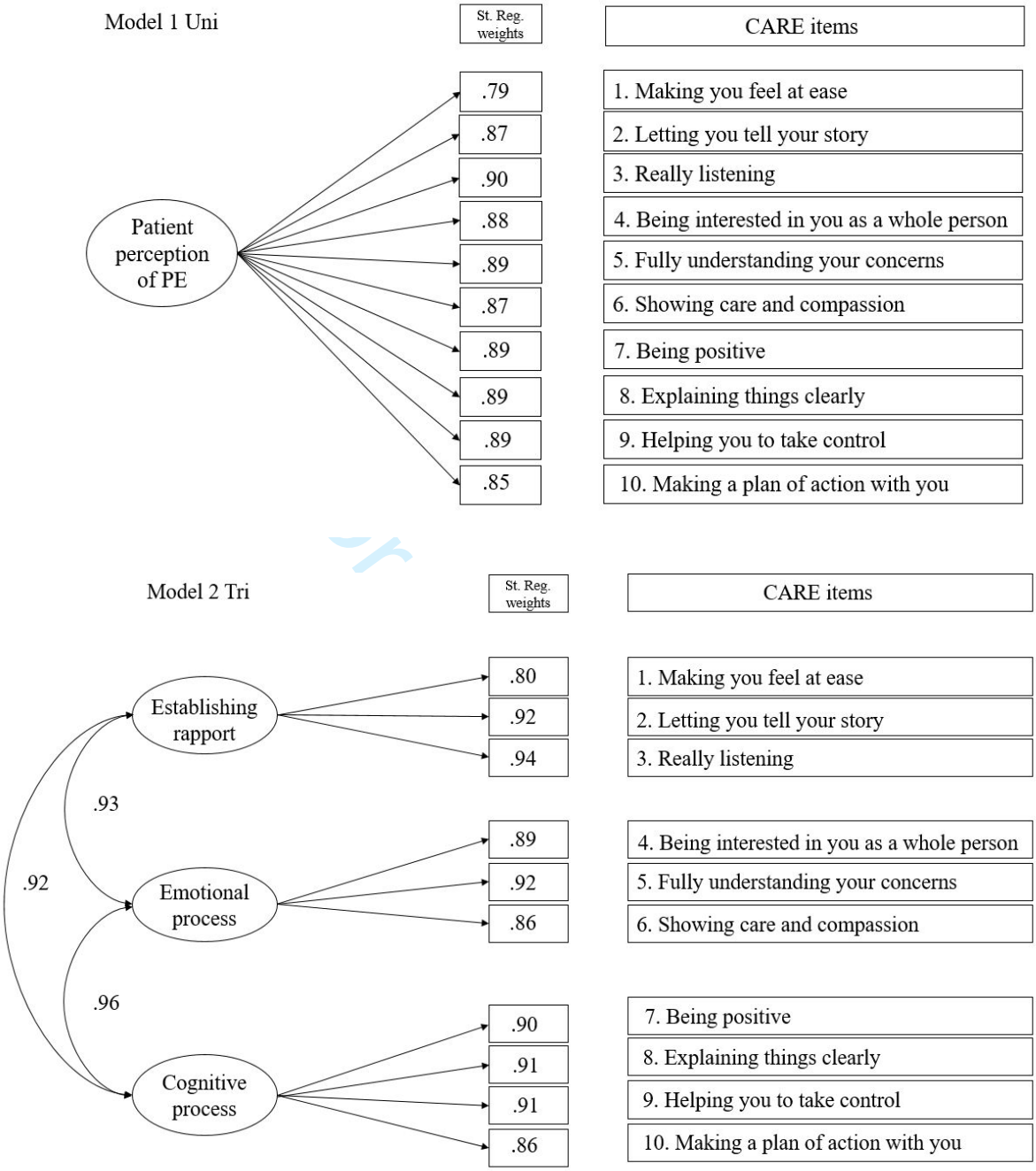


Figure 1.

Participants of the FREGAT sample.



St. Reg. weights = standardized regression weights

Figure 2.

Standardized regression weights for M1-Uni and M2-Tri in sample B

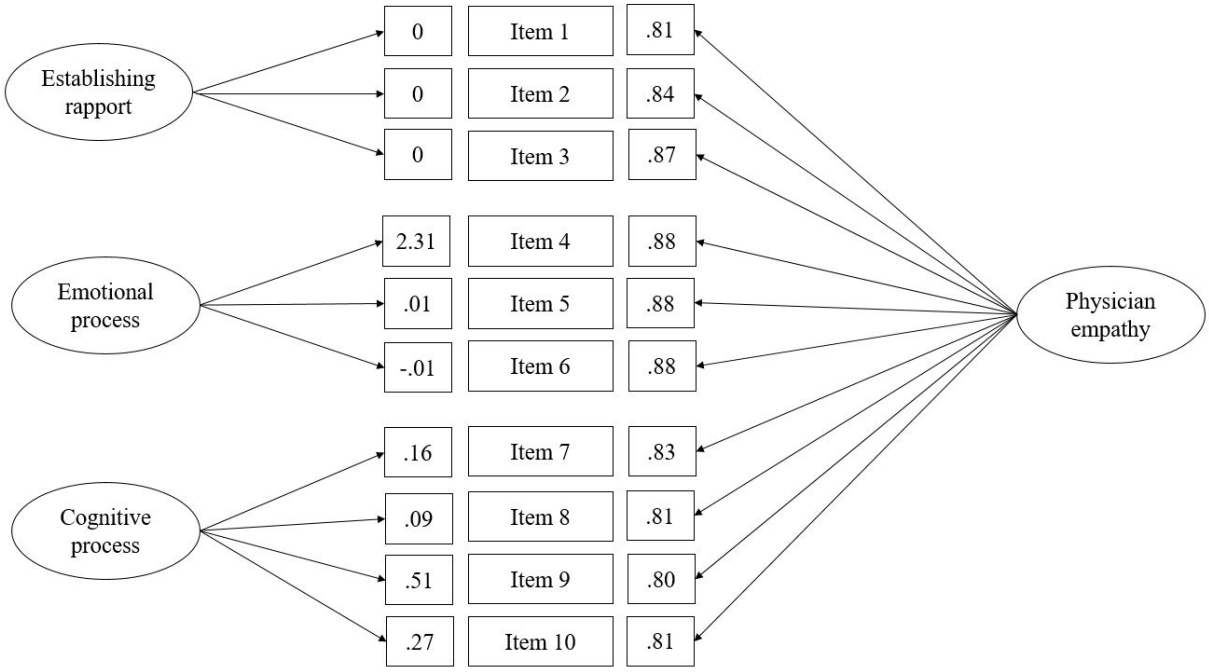


Figure 3.

Standardized regression weights for the bifactor model on the whole sample (N=414).

APPENDIX ONE: French version of the CARE measure.

Selon vous, comment était votre médecin à l'hôpital pour :

	Mauvais	Moyen	Bon	Très bon	Excellent	Ne s'applique pas
1. **Vous faire sentir à l'aise** (Être amical et chaleureux avec vous, vous traiter avec respect, ne pas être froid ou brusque).	1	2	3	4	5	NSP
2. **Vous laisser raconter votre « histoire »** (Vous donner du temps pour décrire entièrement votre problème avec vos propres mots, ne pas vous interrompre ou ne pas vous distraire).	1	2	3	4	5	NSP
3. **Vraiment vous écouter** (Être attentif à ce vous dites, ne pas être distrait pendant que vous parlez).	1	2	3	4	5	NSP
4. **Etre intéressé par vous comme une personne entière** (Demander ou savoir des détails pertinents au sujet de votre vie ou de votre situation, ne pas vous traiter comme un numéro).	1	2	3	4	5	NSP
5. **Comprendre complètement vos préoccupations** (Communiquer ce qu'il a compris de vos préoccupations, ne pas en mésestimer ou en diminuer l'importance).	1	2	3	4	5	NSP
6. **Vous démontrer de l'attention et de la compassion** (Sembler véritablement préoccupé par votre situation, être en lien avec vous sur le plan humain, ne pas être indifférent ou détaché).	1	2	3	4	5	NSP
7. **Etre positif (ive)** (Avoir une approche et une attitude positives, être honnête mais pas négatif(ive) concernant votre problème)	1	2	3	4	5	NSP
8. **Expliquer les choses clairement** (Répondre pleinement à vos questions, vous donner des renseignements adéquats, ne pas être vague)	1	2	3	4	5	NSP
9. **Vous aider à prendre le contrôle** (Explorer avec vous ce que vous pouvez faire pour améliorer votre santé, vous encourager plutôt que de vous faire la leçon)	1	2	3	4	5	NSP
10. **Faire un plan d'action avec vous** (discuter avec vous des possibilités, vous permettre de vous impliquer dans les décisions autant que vous le désirez, ne pas ignorer votre point de vue)	1	2	3	4	5	NSP