

FAMILY RELATIONSHIPS AND POST-TRAUMATIC GROWTH IN BREAST CANCER PATIENTS

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received: 5.12.2012;

revised: 26.2.2012;

accepted: 18.3.2012

SUMMARY

Background: Post-traumatic growth (PTG) refers to the process of attributing meaning to traumatic events and positive changes in life after facing trauma. A number of studies have already demonstrated that demographic- and coping-approaches related variables predict PTG, yet little is known about whether PTG may be predicted by family processes such as flexibility, cohesion, communication and satisfaction. The main purpose of the study therefore was to determine whether family-related factors predict PTG above and beyond demographic variables and coping related processes.

Subjects and methods: The study included 190 women, breast-cancer patients, aged 31 to 83 years. Their educational level was representative of the educational level in the population of this age range. The Participants were members of the Oncology Patients Society. Post traumatic growth index, FACES-IV - family relationships scale, coping response inventory, demographic, and illness-related questionnaires were administered after informed consent was obtained. The PTG index was used as an outcome measure.

Results: Congruent with previous findings, analyses yielded weak correlations between demographic- and illness-related variables, and PTG. Also congruent with previous findings, approach related coping strategies were found to predict PTG, $R^2 = 0.16$, $p < 0.001$. In addition to previous findings, family related factors predicted unique proportion of variance on PTG, $p < 0.05$, with communication having positive and satisfaction negative load on PTG.

Conclusions: Results showed that family related factors predicted PTG above and beyond coping-related strategies and demographics. Communication, however, seems to mediate the association between satisfaction and PTG. Theoretical concerns and practical implications are discussed.

Key words: post traumatic growth - family relationships - breast cancer

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INTRODUCTION

A growing body of research demonstrates that traumatic experiences may trigger not only distress but also positive life changes. Evidence suggests that as much as 40-70% of people who experienced a traumatic event later report some benefit from their experience, including changes in self, relationships, spirituality, life philosophy, and changes in priorities (Fraizer et al. 2004, Woodward & Joseph 2003, Carver & Antoni 2004). Positive life changes were documented as a side effect of coping/dealing with a wide range of traumatic events such as burn injuries (Rosenbach & Ronneberg 2008), sexual assault (Fraizer et al. 2004), shipping disaster, tornado, bombing, rape, infertility, heart attack, multiple sclerosis, or cancer (see Joseph & Linley 2005).

In the recent literature, the process of attributing meaning to traumatic events is known as post-traumatic growth (PTG), defined as a "positive cognitive process that is initiated to cope with traumatic events that extract an extreme cognitive and emotional toll" (Tedeschi & Calhoun 1995, p. 5). PTG seems to manifest itself in three main domains (Joseph & Linley 2005). First, people report changes in life philosophy; for example, finding appreciation for each new day and re-establishing what really matters to them. Second, people change their views of themselves; for example, they have a greater sense of personal resilience,

strength, and wisdom. Third, people report that their relationships are somehow enhanced; for example, now they value their family and friends more and feel increased compassion toward others (Joseph & Linley 2005, Rosenbach & Ronneberg 2008).

On the other hand, growth after a traumatic event is not a universal experience. Although various theoretical models have been proposed to explain the growth (Joseph & Linley 2005), such as those from the humanistic tradition (Frankl 1963) or those associated with PTSD (Horowitz 1986, Janoff Bulman 1992, Rachman 1980), it remains uncertain why some individuals grow after traumatic events, and the others do not (Woodward & Joseph 2003); models tend to be descriptive rather than explanatory (Joseph & Linley 2005), and lack satisfactory insight into the processes behind growth. Drawing on the existing trauma and stress literature (for the overview, see Barsakova & Oesterrich 2009) different factors have been suggested to contribute to PTG, gender and age, traumatic event, personality traits, coping strategies, and social support being among them. Younger people as well as women tend to experience higher PTG (Barsakova & Oesterrich 2009), whereas social-economical status does not seem to relate to PTG. Social factors are also important in predicting development in PTG although the relationships are not straightforward. Barsakova & Oesterrich (2009) for example noted that marital status was not

directly related to PTG; rather, quality of social relationships manifested through emotional and instrumental support seem to be of greater value than social status alone. These findings are in line with the findings regarding coping strategies: the use of adaptive coping strategies such as the problem oriented approach or seeking emotional support from others predicts higher PTG (Barsakova & Oesterrich 2009). Whereas some of these data were obtained in patients other than those suffering from cancer, the first aim of the current study was to obtain and replicate the findings in this particular group.

For cancer patients, both diagnosis and side effects of treatment are demanding (Carver & Antoni 2004). Distress is not present only in patients but also in their family members, with coping processes following similar underlying mechanisms of adjustment to those of the patients themselves. Jakovljević et al. (2010) found that impaired parental functioning may be a mechanism linking family stress with cancer risk. Also, Mosher et al. (2006) found that daughters who cared for their mothers following breast cancer diagnosis also reported different forms of adaptation behaviour, including PTG.

Although there is some evidence suggesting that family variables such as instrumental and emotional support of the marital partner contribute to PTG (Barsakova & Oesterrich 2009), surprisingly little is known about which aspects, processes, and outcomes within the family as a system predict PTG. The central aim of the current study was to test the assumption that family processes and outcomes such as family flexibility, cohesion, communication, and satisfaction predict PTG above and beyond the coping mechanisms addressed in some previous studies (for the overview see Barsakova & Oesterrich 2009), structural characteristics of the family such as age or socio-economical status, or status or illness alone. To test this assumption, we collected the data on family relationships from a group of breast cancer patients and applied different hierarchical regression analyses. The study directly addressed family-related mechanisms of adjustment to breast cancer; the implications of this study are of particular importance both to patients and their family members because coping with cancer is family-related rather than simply an individual-related problem (Rolland 2003, Walsh 2003). Increased knowledge about these issues can be directly used by professionals providing psychological help to families coping with breast-cancer.

SUBJECTS AND METHODS

Subjects

The study included 225 breast cancer patients, members of the Oncology Patients Society of Slovenia. The study was performed with the approval of the Institutional Review Board of the participating centre, in accord with APA ethical standards of psychological

testing. Women received a brief description of a study by a representative of the Society. Those interested were put in touch with a female researcher who explained the study in more detail, obtained informed consent, and gave instructions for completing the questionnaires. Of the 225 patients informed, 200 agreed to participate; 10 participants failed to answer all questions so that their data were omitted from further analyses. 190 participants, aged 31 to 83 years ($M=61.7$, $SD=9.7$), were thus included in further analyses. The data were collected at group meetings of the Society. The timing was not limited though most of the respondents completed the questionnaires in 45-60 minutes.

Most of the women participating in the study were retired (67%). Their education level was comparable to the educational level in the population of that age range (SURS, 2002), 35% had basic educational level, 46% had high school, and 19% had a college degree. 76% were married or living with a partner, 5% were divorced, 14% were widowed, and 4% described themselves as single. Almost all women (96%) had children. In the time of the study, half of the women (46%) had been in remission state for at least 5 years, 23% were in remission for less than 5 years, 24% were undergoing treatment, and 6% had experienced recurrence. 39% had experienced surgical treatment on one or both breasts, 55% had had radical mastectomies, 48% had undergone radiation, 45% chemotherapy, and 39% hormonal treatment. 16% of the women had also undergone alternative types of cancer treatment.

Methods

Post traumatic growth was assessed using the Post Traumatic Growth Inventory (PTGI, Tadeschi & Calhoun 1996, Slovenian adaptation, Tavcar 2007). PTGI (Ganstad et al. 2009, Steel et al. 2008) is a 21-item self-report instrument of positive outcomes after the traumatic experience scored with a 6-point Likert-type scale ranging from 0 (I did not experience this change as a result of my crisis) to 5 (I experienced this change to a very great degree as a result of my crisis). The PTGI is comprised of five subscales (Relating to others, New Possibilities, Personal Strength, Spiritual Change, and Appreciation of Life), and a total post-traumatic growth score. Scores can range from 0-10 to 0-35 for subscales, and 0-105 for the total PTG score, with high scores indicating positive growth. The scale has been used widely across different samples and has demonstrated good psychometric properties (Gangrad et al. 2009, Steel et al. 2008). In the present study, the scale had very good internal reliability (Cronbach's Alpha =0.94) with reliabilities for sub-scales ranging from 0.62 (Spiritual changes) to 0.88 (Relationships with others).

Family relationships were assessed with the FACES IV Package (Olson et al. 2006; adapted to Slovenian by Svetina et al. 2009) which is a self-report measure of family relationships. The FACES IV consists of 42

items distributed into two core scales of Circumplex model (Olson et al. 2006): family cohesion and flexibility, as well as four sub-scales: disengagement, enmeshment, rigid, and chaotic family relationships. The package consists of two additional scales, family communication (10 items), and family satisfaction (10 items), with the first scale assessing the level of general satisfaction with the participant's family relationships, and the second scale measuring positive emotions / concerns about the quality of family communications. All items are presented on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). The participants were directed to complete the FACES scale with regard to the family members that they lived with in the time of the study. The reliability of FACES IV - SI, as measured by Cronbach's coefficients is medium to high, 0.84 for cohesion, 0.73 for flexibility, 0.92 for communication, and 0.93 for satisfaction. Construct validity as indicated by CFA suggested satisfactory fit to the predicted 6-factor model: $\chi^2=4429.81$, $df=804$, $p<0.001$; RMSEA=0.068; CFI=0.93; NNFI=0.92 (Svetina et al. 2009). For exploratory purposes, in the present study, however, only balanced scales (cohesion and flexibility), communication, and satisfaction were used.

Coping strategies were assessed by the Coping Response Inventory (CRI, Moss 1993) adapted to Slovenian by Cecic Erpic (2000). The scale consists of 48 items representing cognitive and behavioural strategies of both approach and avoidance. The cognitive approach strategies include Logical analysis and Positive reassessment, while the behavioural approach strategies include Support seeking and Problem solving. Cognitive avoidant strategies are Cognitive avoidance and Indifference, whereas behavioural avoidant strategies are Alternative reward seeking and Emotional reaction. Items refer to the participant's behaviour in the time of stress, for example, "Did you talk to your partner or relative about your problem?" Each participant was asked to respond to each of 48 items on a 4-point Likert-type scale ranging between 0 (not at all) and 3 (very often). Reliability of the Slovenian version of the sub-scales ranges from 0.62 to 0.72 (Cecic Erpic, 2000).

In addition to the measures presented above, we also collected data on age, marital status, number of children, education, religious affiliation, length of treatment, and current status of the illness.

Statistical Analysis

The Statistical Package for Social Sciences (SPSS 19) was used. Initial analyses showed that the data met the requirements for parametric statistics as suggested by Field (2003). Baseline characteristics of the groups were examined by independent t-test and one way ANOVA. Relations between variables were explored by 2 tailed Person's correlation. For mediation analysis (Baron & Kenny 1986, Louis 2009, MacKinnon 2009), we used hierarchical regression analysis. Statistical tests were considered significant if $p<0.05$.

RESULTS

The results are presented in two sections. In the first, we presented PTG as related to demographic factors and status of illness. In the second section, we presented family relationships and coping strategies predicting PTG.

Demographic factors and status of the illness as related to PTG

Initial analyses revealed surprisingly weak relationships between the demographic variables, the current status of illness, and the PTG. In particular, the PTG did not relate to the level of education, $r=-0.02$, $p>0.05$. Also, PTG did not relate to any age-related measures: correlation between PTG and participant's current age was insignificant, $r=-0.11$, $p>0.05$; PTG did not relate to the length of treatment, $r=0.03$, $p>0.05$. In addition, the results indicated weak correlations between PTG and family status: PTG did not relate to whether patients were married $F(4,185)=1.14$, $p>0.05$; PTG did not relate to the number of children, $r=0.13$, $p>0.05$, nor did it relate to whether or not the participants were currently living with their family members or on their own, $t(184)=0.35$, $p>0.05$. Secondly, analyses also yielded weak relationships between PTG and the status of the illness. For example, PTG did not relate to whether patients currently were in the acute or the remission state, $t(184)=0.13$, $p>0.05$, with virtually equal mean PTG scores (72.02 vs. 72.42) in both groups.

In regard to religious affiliation, the analyses yielded weak a relationship between PTG and the patient's religious affiliation or volunteer activities in a breast-cancer related community: PTG did not relate to whether or not the participants were engaged as volunteers in Oncology Patients Society, $t(184)=-0.43$, $p>0.05$. PTG was not related to religious affiliation, $F(5, 180)=0.21$, n.s. In addition, to check whether participation in any religious denomination related to PTG, we computed t-test to compare participants who claimed themselves to be a religious person to those who claimed they were not (14% of the participants claimed to be atheists). The analysis showed the difference between both groups to be insignificant, $t(184)=0.53$, $p>0.05$, with mean PTG scores being very similar, 72.58 vs. 70.15 for believers and non-believers, respectively suggesting religious affiliation failed to predict PTG.

The results indicated that demographic and status related variables did not account for the differences in PTG in breast cancer patients: age, marital status, level of education, religious affiliation, or whether or not participants were currently in acute or remission state, did not account for the differences in PTG. Thus, to further assess the sources of variability in PTG among breast-cancer patients, we focused on more latent dimensions of adjustment to distress in breast cancer patients: coping strategies and family relationships.

Family relationships as predictors of PTG

The central aim of our study was to test the assumption that family relationships predict PTG above and beyond demographic factors such as age, status of illness, and coping strategies. To test this hypothesis, we first computed correlation coefficients between PTG and coping strategies. The results showed overall significant yet weak correlations between approach related strategies and PTG. The correlation coefficients were 0.18, 0.34, 0.17, and 0.20 for logical analysis, positive reassessment, support seeking, and problem solving, respectively, with all p 's < 0.05. The correlations between PTG and avoidant coping strategies were yet weaker, 0.23, $p < 0.01$, 0.01, n.s., 0.21, $p < 0.01$, and .04, n. s., for cognitive avoidance, indifference, alternative reward seeking, and emotional reaction, respectively. Finally, the correlations between PTG and family relationships were all found to be insignificant.

Since the initial analyses yielded overall small yet significant correlations between coping strategies and PTG, we further explored the relative contribution of each of these variables in explaining variability in the PTG. In the next step of the analysis we ran hierarchical regression analysis. The first step of hierarchy included four approach-oriented coping strategies because the previous results indicated that the correlations between PTG and approach-oriented coping strategies were significant. The second step of hierarchy included four measures of avoidance coping strategies and the third step included family-related measures, family cohesion, flexibility, communication, and satisfaction. Due to the exploratory nature of data, enter method was used (Field 2003) in all steps, and change statistics were computed to assess the effects of each additional set of variables in predicting PTG.

The results showed that variables included in the model explained 25% of total variance on PTG. Approach-oriented strategies accounted for 16% of variance, whereas avoidance-oriented coping strategies did not significantly explain the presence of variance. The third block of variables, family-related measures, however, significantly contributed to the variance demonstrated by the model. The results suggested that, contrary to simple marital status, the quality of family relationships seem to account for the differences in the PTG (Table 1).

Closer look at the β values (presented in Table 2) suggested three important findings. First, whereas approach-oriented coping strategies appeared to be very important in the model, the analysis of β values suggested that the major impact of these approach-oriented coping strategies was due to a single strategy, namely positive reassessment. Positive reassessment includes different cognitive strategies which the individual applied while trying to reconstruct the problem and find some positive aspects of the distress (Cecic Erpic 2000).

Secondly, avoidance-oriented coping strategies did not contribute to PTG – none of the measures passed $p < 0.05$ criterion, as indicated in Table 2. The results suggested that avoidance related strategies such as cognitive avoidance, alternative reward seeking, emotional reaction, or indifference did not seem to account for the differences on the PTG. The results are congruent with the findings from previous studies (for example, Bellizi & Blank 2006, Morris et al. 2007, Lechner et al. 2003; for the overview, see Barsakova & Oesterrich 2009) suggesting that particularly positive reappraisal of the cancer experience related to PTG while avoidance coping strategies do not seem to account for the differences in the PTG.

Table 1. Percent of variance explained by coping strategies and family relationships

Variables	R	R ²	R ² Change	F Change	df1	df2	Sig. F Change
Approach related	0.394	0.155	0.155	7.039	4	153	0.000
Avoidance related	0.431	0.186	0.031	1.402	4	149	0.236
Family relationships	0.497	0.247	0.061	2.936	4	145	0.023

Table 2. Relative loads of variables predicting PTG

		Standardised β	t	p
approach related strategies	positive reassessment	0.236	2.564	0.011
	problem solving	0.093	0.995	0.322
	support seeking	0.058	0.648	0.518
	logical analysis	-0.004	-0.040	0.968
avoidance related strategies	cognitive avoidance	0.158	1.883	0.062
	alternative reward seeking	0.060	0.664	0.508
	emotional reaction	-0.058	-0.666	0.506
	indifference	-0.052	-0.612	0.541
family relationships	satisfaction	-0.461	-30.115	0.002
	communication	0.407	2.622	0.010
	flexibility	0.118	1.110	0.269
	cohesiveness	-0.070	-0.573	0.568

Thirdly, as predicted, family factors were found to significantly contribute to PTG. Different dimensions of family relationships had different impact on PTG, however. In the model, cohesion and flexibility were found to be insignificant indicating that neither cohesion nor flexibility was directly related to PTG. On the other hand, communication and satisfaction accounted for about 15% of variance in PTG. To our surprise, the results of the regression analysis showed that communication contributed positively, whereas satisfaction contributed negatively to PTG.

The interpretation of this pattern is not straightforward. A possible explanation could be that correlations between family measures distorted the contribution of each predictor to PTG score (Field 2003). To test this assumption, we computed correlation coefficients between family-related measures. The results confirmed our expectations, the analyses showed that the correlations between family flexibility, cohesion, communication, and satisfaction were all positive, significant at 0.001, and medium to high, ranging 0.64 to 0.84.

Although family measures are partly interrelated, the pattern of correlations does not explain why communication would load positively and satisfaction negatively on PTG. A possible explanation would be that communication has a mediator role between PTG and family satisfaction. Mediation assumes causality implying that independent and dependent variables are connected indirectly, through the third, mediator variable (Hayes 2009, Louis 2009, MacKinnon, 2009). In our case, therefore communication was assumed to be a mediator variable between family satisfaction and PTG.

To test this assumption, we performed analysis of mediator effects in two steps. In the first, we partialled out variability on the communication measure in explaining PTG. The results confirmed our expectations: first, the correlation between PTG and family satisfaction was low, $r=-0.06$, n.s. However, after impact of family communication was partialled out, the correlation between PTG and family satisfaction increased to $r=-0.28$, $p<0.001$, indicating that the relationship between PTG and family satisfaction among participants with equal family communication was small – yet significant and negatively oriented. In other words, if we assumed that all participants have experienced the same quality of communication in their families, then PTG would negatively relate to family satisfaction.

In the second step, we ran additional regression analyses to estimate mediation effects. As suggested by several authors (Louis 2009, MacKinnon 2009), mediation analysis was performed in two sub-steps. In the first, we ran two regression analyses to determine whether satisfaction predicts communication and PTG. In the second sub-step, we performed hierarchical regression analysis; variables were added in two blocks. In the first, we computed present of variance on PTG accounted for by family satisfaction. Communication (mediator variable) was added in Block 2 and change

statistics were computed. The main two assumptions of hierarchical regression analysis to estimate mediation effects were (1) that β coefficient for the mediator variable (communication) should be significant and (2) that β coefficient for the independent variable (satisfaction) be changed from the original block after the mediator variable (communication) was entered into the regression (Louis 2009).

Mediation analysis provided results congruent with previous analyses and supported our prediction on the mediator role of communication. First, family satisfaction initially failed to predict PTG, $R\text{-square}=0.00$, n. s., $\beta=-0.06$, n. s., whereas it greatly predicted communication, $R\text{-square}=0.70$, $F(1, 176)=408.96$, $p<0.001$, $\beta=0.84$, $p<0.001$. Secondly, hierarchical regression analysis yielded communication to explain the unique proportion of variance on PTG, $R\text{-square change}=0.09$, $F\text{ change}(1, 171)=15.58$, $p<0.001$. Thirdly, and the most important finding were the changes in β coefficients after the mediator variable was entered into the analysis (Table 3): the significance of β for satisfaction changed from the original block after communication (mediator) was entered into regression; in Block 1, β for satisfaction was insignificant whereas in Block 2, after communication was entered, it became negative and significant.

Table 3. Change of β ponders in the mediation analysis

Model	Variable	β	p
1	satisfaction	-0.06	>0.05
2	satisfaction	-0.51	<0.001
	communication	0.53	<0.001

Analysis proved both assumptions of mediator variable correct: satisfaction explained the unique proportion of variance in the PTG with β coefficient being positive and statistically significant. Secondly, the β coefficient for satisfaction turned significant after communication was added to the model. As predicted from the partial regression analysis, the β coefficient for satisfaction was negatively oriented suggesting a negative (direct) relation between satisfaction and PTG after the mediator variable (communication) was controlled for.

Mediator analyses suggested two findings of interest. First, communication seems to play a mediator role in the association between family satisfaction and PTG, and secondly, family satisfaction negatively predicts PTG after family communication is controlled for. Implications of these results are discussed in the final part of this article.

DISCUSSION

The present study makes an original contribution to our understanding of post traumatic growth among breast cancer patients in the context of coping strategies and family relationships. A number of studies have been

undertaken to investigate factors and patterns of post traumatic growth in breast cancer patients as well as in other illnesses (see Barsakova & Oesterrich 2009), but this is one of the rare studies that deals specifically with post traumatic growth within the family system. For this reason, the present research is of both theoretical and practical interest in describing the psychological adaptation and coping with breast cancer.

Theoretical interests arise particularly in framing post traumatic growth in the family context. The results clearly indicate that age-, illness-, religious-, and status-related variables did not account for the differences in PTG in breast cancer patients. These results only partly support previous findings regarding demographic and illness-related status predicting PTG. For example, previous studies failed to prove that PTG related to education (for the overview, Barsakova & Oesterrich 2009). However, the authors (Barsakova & Oesterrich 2009) argue that participants often were well educated men and women so that the limitations in the distribution in education may have accounted for the lack of statistically relevant findings. Contrary to their argument, the distribution of educational level in the present study was wide and comparable to the population distribution of this age range. However, regardless of the relatively wide range of educational level of the participants in the current study, the relationship between the level of education and PTG was almost zero, $r=0.02$, ns., supporting Barsakova & Oesterrich's (2009) claim that level of education does not account for the differences in PTG.

On the other hand, the results regarding age- and religious-related variables were incongruent with some previous findings. While some studies (Belizzi 2004, Morris et al. 2007) found younger cancer patients to report a higher level of PTG, the present results suggest nonsignificant relationships between age and PTG. In addition, the present results suggested that none of the age-, time-, and illness-status related measures used in our study accounted for the differences in PTG: participant's age at the time when diagnosis was given, the length of treatment, or the timing since breast cancer was diagnosed – all fell short of relating to PTG, which is also incongruent with the findings of Cordova et al. (2001) or Sears et al. (2003) who found a positive relationship between time elapsed since the cancer was diagnosed and PTG. On the other hand, the results were congruent with Petrie's et al. (1999) findings that PTG was unrelated to illness severity.

Incongruent with the previous findings were also the results regarding religious beliefs as related to PTG. Whereas some previous studies (Barsakova & Oesterrich 2009, Yanez et al. 2009) found religion directly or indirectly to contribute to the level of PTG, the results of the current study revealed a lack of those associations.

The results also demonstrated that social attributes such as presence of family members or marital status alone did not account for the differences in the post

traumatic growth. Rather, latent factors such as communication or satisfaction with family relationships seem to contribute to post traumatic growth in breast cancer patients. These findings are not new, however; they are congruent with the previous literature suggesting that it is emotional support rather than instrumental support or marital status alone which contributes to post traumatic growth (Manne et al. 2004). Barsakova & Oesterrich (2009) argue that availability of emotional support, rather than pure presence of family members, may provide opportunities to disclose anger and fear, and in this way facilitate adjustment to traumatic illness-related experience.

What is new, however, is a surprising finding that communication seems to play a mediation role in the association between family satisfaction and PTG. These findings raised a question regarding mechanisms behind family processes and PTG. Why would communication mediate association between family satisfaction and PTG? Does family satisfaction slow down the process of post traumatic growth? Are changes in the philosophy of life and re-assessment of social relationships associated to PTG changes in the individual's view of their own families? Does PTG make patients see the problems within their own families more clearly and thus make them less satisfied with (existing) family relationships? Or would there be a third factor such as a particular personality trait, coping strategies, experience, or nature of the illness causing variability on both PTG and family satisfaction?

To our knowledge, existing literature does not provide clear answers to these questions. In the context of system family models (Rolland 2003, Segrin & Flora 2005, Walsh 2003) we could possibly argue that family satisfaction may hold back individual's potential to successfully adapt to distress because consolation could be found in perceived subjective well being within the family rather than in launching the individual's own resources to actively cope with distress (Belizzi & Blank 2006, Morris et al. 2007, Lechner et al. 2003) or to change life philosophy (Joseph & Linely 2005). As one of our participants noted, "Cancer gave a strength to stand up against the aggressiveness of my husband. Why should I spend the rest of my life in fear?". On the other hand, communication within the family and emotional exchange may particularly facilitate post traumatic growth with helping patients to actively fight cancer and cope with anger and fear (Barsakova & Oesterrich 2009, Manne et al. 2004).

A possible explanation of communication playing a mediation role between family satisfaction and PTG in breast cancer patients would be of a wider conceptual nature because the context of causal relations between the variables is not clear. In the case of communication, satisfaction, and PTG, we do not know, however, which is the source and which the outcome. In most models, both family satisfaction and PTG are assumed to be outcomes of different psychological processes (Barsakova

& Oesterrich 2009, Mystakidou et al. 2008, Park et al. 2008, Greenstein 2009, Segrin & Flora 2005, Walsh 2003). Therefore, in terms of satisfaction and PTG, we could assume both PTG to cause family satisfaction or vice versa; our data suggested that PTG might be an outcome and satisfaction a source. This data is congruent with Johnson et al. (2010) who found family satisfaction to predict life satisfaction after traumatic brain injury. Clearly, further studies will be needed to yield additional insight into the relationships between family processes and PTG.

Practical interests arise in how these findings may help breast cancer patients, their family members, and professionals to cope with psychological, particularly emotional effects of facing illness and treatment. The findings of this study are encouraging for both patients and their family members; they are congruent with the findings of some previous studies (see Barsakova & Oesterrich 2009) suggesting that qualitative rather than quantitative aspects of relationships contribute to adaptation to distress and post traumatic growth. Emotional support (Barsakova & Oesterrich 2009, Manne et al. 2004) communication, and positive reprisal (Bellizzi & Blank 2006, Morris et al. 2007) provide an encouraging framework, a secure base (Waters et al. 2002, Waters & Cummings 2000), or opportunities to be more actively engaged in coping with distress, disclosing negative emotions, and better adjusting to traumatic experience. The findings are also encouraging for the singles, those whose children are grown up and moved away, whose spouses passed away, or got divorced: the results are congruent with previous findings (Barsakova & Oesterrich 2009, Cohen & Numa 2011, Dunn et al. 2011, Hefferon et al. 2009, Keith et al. 2009, Joseph & Linely 2006, Swickert & Hittner 2009) suggesting that whereas family clearly is a significant source of consolidation in breast cancer patients, other people too may offer considerable emotional support, facilitate individual's active engagement, and aid positive changes after traumatic experience. The findings of the current study imply psychological interventions that include family members or significant others to have broader effects in terms of adjustment, well being, and post traumatic growth than working with the patients alone. However, significant others and family members carry double roles. Family members may offer substantial emotional, instrumental, and social support to the patients, yet they themselves are at the same time those who suffer from distress and exhibit different forms of adaptation behaviour, including PTG (Mosher et al. 2006). Intervention targeting the whole family is likely to have more positive and broad effects on the patient's well being than focusing on the patient's inner strengths alone, regardless of how positive these strengths are. We believe that the processes which stimulate post traumatic growth are likely to be among the most positive ones and thus worth extensive attention in both psychological research and intervention.

CONCLUSIONS

The study makes an original contribution to our understanding of post traumatic growth in the context of family relationships. The results yielded findings of both theoretical and practical interest. Family factors such as communication or satisfaction predicted post traumatic growth in addition to coping strategies. Secondly, communication seems to mediate the association between satisfaction and post traumatic growth; thirdly, family satisfaction negatively predicted post traumatic growth after family communication was controlled for. We argue that family satisfaction may have both positive and negative impact on adaptation after traumatic experience. Mechanisms behind this mediation are not yet clear, however, and further research will be needed to foster our understanding of these issues.

Acknowledgements: None.

Conflict of interest: None to declare.

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