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## Secondary traumatic stress and posttraumatic growth: Social support as a moderator

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### ABSTRACT

This present study examines (1) the relationship between secondary traumatic stress, perceived social support and posttraumatic growth after secondary exposure to traumatic events and (2) the moderating role of perceived social support on the secondary traumatic stress–posttraumatic growth relation. A sample of 135 nurses completed self-reporting measures describing symptoms of secondary traumatic stress, social support, and vicarious posttraumatic growth. The results indicate that secondary traumatic stress negatively correlates with vicarious posttraumatic growth, while social support positively correlates with vicarious posttraumatic growth. Furthermore, persons who self-report less secondary traumatic stress symptoms also report high levels of posttraumatic growth when they perceive to have a high level of social support. These findings emphasize the value of perceived support for persons indirectly exposed to traumatic events.

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### 1. Introduction

The indirect exposure to potentially traumatic situations is common among nurses (Fernández, 2011; Lee, Daffern, Ogloff, & Martin, 2015). The most common result of this exposure is secondary traumatic stress (STS) that involves the same symptoms as posttraumatic stress disorder but has its origins in vicariously experiencing the traumatic events through interactions with persons who are directly affected by these events (Figley, 1995; Shoji et al., 2014). In nursing literature, the occurrence and prevalence of secondary traumatic stress symptoms are reported in various fields like oncology, emergency, heart and vascular fields, children's care etc. (Czaja, Moss, & Mealer, 2012; Dominguez-Gomez & Rutledge, 2009; Duffy, Avalos, & Dowling, 2014; Quinal, Harford, & Rutledge, 2009; Robins, Meltzer, & Zelikovsky,

2009; Young, Derr, Cicchillo, & Bressler, 2011). However, relatively few researchers study a person's capacity to develop healthy personal growth despite adversity after indirect exposure to critical life events (Bonanno, Galea, Bucciarelli, & Vlahov, 2006). Among persons directly exposed to trauma, empirical studies show that an individual may experience negative, as well as positive changes following a traumatic event, such as a greater appreciation of life, strengthening of close relationships, recognition, and elaboration of personal strengths, recognition of new possibilities and spiritual development (Tedeschi & Calhoun, 1996; Tedeschi & Calhoun, 2004). This phenomenon of post-traumatic growth has attracted a good deal of attention in psychology in the last years (PTG; Tedeschi & Calhoun, 1996).

As the number of studies of posttraumatic growth increases, the researchers have begun to recognize that similar positive changes can occur, not only in persons who experience trauma, but also in persons indirectly exposed to trauma, like healthcare personnel (Arnold, Calhoun, Tedeschi, & Cann, 2005). Although less widely

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studied, the researchers recorded this phenomenon of vicarious post-traumatic growth and have moved away from the idea that indirect exposure to potentially traumatic events leads only to negative changes (Arnold et al., 2005; Hyatt-Burkhart, 2014; Taku, 2014). Consequently, the need appears for studying simultaneously different positive as well as negative pathways in the aftermath of indirect trauma exposure (Shakespeare-Finch & Lurie-Beck, 2014; Ssenyonga, Owens, & Olema, 2013).

## 2. Secondary traumatic stress and posttraumatic growth

After several years of separately studying positive and negative consequences of trauma exposure, researchers are beginning to ask about the relationship between these variables. Even from the first studies on posttraumatic growth, Tedeschi and Calhoun (1996) identified a significant positive relation between growth and distress. Some level of distress is initially developed, and it requires the integration of the traumatic experience to one's basic beliefs about the self and the world (Janoff-Bulman, 2004; Tedeschi & Calhoun, 2004). Moreover, this initial stress may serve as a catalyst for finding benefits after trauma (Kashdan & Kane, 2011), including the development of posttraumatic growth (Tedeschi & Calhoun, 2004). Based on these findings, we may conclude that even if a person experiences considerable distress, at the same time he/she will continue to function and grow. More recently, studies have confirmed these positive relations between growth and distress (Blix, Hansen, Birkeland, Nissen, & Heir, 2013; Bluvstein, Moravchick, Sheps, Schreiber, & Bloch, 2013; Jin, Xu, Liu, & Liu, 2014). However, other researchers present data showing a negative association between these two phenomena (Hagenaars & van Minnen, 2010), while others find no relationship between posttraumatic growth and negative stress-related outcomes (Boals, Steward, & Schuettler, 2010; Kunst, 2010). Studies using samples of participants indirectly exposed to trauma report the same pattern of results. While some studies have shown that higher cumulative levels of vicarious exposure to trauma are associated with higher levels of growth (Brockhouse, Msetfi, Cohen, & Joseph, 2011; Samios, Rodzik, & Abel, 2012), other studies do not find evidence for the fact that greater exposure would produce more growth (Linley & Joseph, 2007). The inconsistent results reported during the last two decades suggest that other psychosocial factors moderate the relationship between trauma exposure and growth.

## 3. The role of social support

Several studies underline the vital role of social support when it comes to adjustment after exposure to trauma (Zhao, Wu, & Xu, 2013). Among the benefits associated with perceived social support, we can mention a high level of well-being, and lower levels of traumatic stress (Adriaenssens, de Gucht, & Maes, 2012a). In their theoretical model, Tedeschi and Calhoun (1996) argue that social support is very helpful in coping with emotional distress and finding the meaning of the traumatic life events. Lately,

several empirical studies have shown that strong support systems is associated with perceptions of growth (Linley & Joseph, 2007; McDonough, Sabiston, & Wrosch, 2014; Prati & Pietrantonio, 2009; Ramos & Leal, 2013; Yu et al., 2014). In the context of healthcare, recent studies show the importance nurses place on social support, especially in relation to daily work conditions and organizational circumstances (de Boer, van Rikxoort, Bakker, & Smit, 2014; Duffy et al., 2014; Rodwell & Munro, 2013). Regardless of the level of STS, having a supportive social network and being able to talk about stressful experiences with colleagues, is helpful when it comes to managing stress and coping with the strong emotions experienced after exposure to a traumatic event (Duffy et al., 2014).

## 4. The present study

There is a substantial amount of literature to support posttraumatic growth in the general population but less addressing vicarious growth among workers indirectly exposed to trauma. The first aim of this present research is to study the relation between STS and vicarious posttraumatic growth in a sample of medical nurses. As mentioned in the introduction, there has been no consensus regarding the relationship between traumatic stress and posttraumatic growth. Therefore, we did not anticipate the nature (positive or negative) of the relation between these variables. Further, because previous studies have identified social support as a potential predictor of vicarious posttraumatic growth (Linley & Joseph, 2007), the second aim of this present study is to highlight the relation between different forms of perceived social support and growth, in the context of vicarious exposure to stress and trauma.

Mixed findings regarding the relation between traumatic stress and posttraumatic growth suggest that the lack of consistency is due to the failure to test for moderation by a third variable (Helgeson, Reynolds, & Tomich, 2006). As there are no doubts that STS is an occupational risk when it comes to helping professions (Shoji et al., 2014), it is important to know what variables may be involved in translating the negative outcome into personal growth. Therefore, the third aim of this present study is to assess the moderating effect of perceived social support on the relation between STS and vicarious posttraumatic growth. Although we identify only one study on the moderating role of social support in this relation, there is some evidence showing that social support moderates the relation between traumatic stress symptoms and posttraumatic growth. If a moderate level of traumatic stress is best for PTG development (Kleim & Ehlers, 2009) and social support alleviates the intensity of traumatic stress (Adriaenssens, de Gucht, de Exel, & Maes, 2012b), we can assume that perceived social support reduces the intensity of perceived stress, allowing for the development of posttraumatic growth.

Based on empirical and theoretical evidence, we hypothesized that: (1) secondary traumatic stress correlates with vicarious posttraumatic growth; (2) social support positively correlates with vicarious posttraumatic growth; and (3) social support moderates the relationship

between secondary traumatic stress and vicarious post-traumatic growth.

## 5. Method

### 5.1. Participants

The convenient sample consists of 147 nurses from four hospitals in Romania, two of them being teaching hospitals. Participants who provide incomplete data are not included in the analysis. The final sample is comprised of 135 participants, aged between 20 and 65 years old ( $M = 31.28$ ;  $SD = 10.77$ ). Our research sample is largely comprised of women (89.4%). From the total sample, 16.3% of the nurses are from Surgery (22 nurses), 10.4% are from Intensive Care (14 nurses), 12.6% from Emergency (17 nurses), 21.5% from Neurosurgery (29 nurses), 14.8 from Cardiology (20 nurses), 13.3% from Pediatric (18 nurses) and 11.1% from Oncology units (15 nurses). The experience in the health-care field ranges from one to 40 years ( $M = 7.46$  years,  $SD = 6.22$ ) and they work with patients between 15 and 50 h per week ( $M = 33.36$ ,  $SD = 7.85$ ).

### 5.2. Measures

The *Secondary Traumatic Stress Scale* (STSS; [Bride, Robinson, Yegidis, & Figley, 2004](#)) is a 17-item scale designed to measure secondary trauma on three dimensions: intrusion, avoidance, and arousal. On a 5-point Likert scale, the respondents indicate their agreement with items that reflect specific responses related to their work with victims of trauma. A higher total score indicates higher secondary traumatic stress. The cut-off score for the STSS is 38. The participants who score 38 or above on this scale meet the core criteria for posttraumatic stress, and the participants with a score below 38 do not ([Bride, 2007](#)). Cronbach's Alphas for this current sample is .73 (intrusion), .78 (avoidance), respectively .90 (arousal).

*Posttraumatic Growth Inventory* (PTGI; [Tedeschi & Calhoun, 1996](#)) assesses the perceived posttraumatic growth. It is a 21-item scale designed to measure posttraumatic growth on five dimensions: interpersonal relationships, new possibilities, personal strength, spiritual changes, as well as the appreciation of life. Each item is rated from one (strongly disagree) to five (strongly agree). This current study modifies the instructions and asks the participants to indicate the degree to which each change occurred because of their professional experience as a nurse. Cronbach's Alphas for this current sample is .82 (interpersonal relationships subscale), .75 (new possibilities subscale), .72 (personal strength subscale), .69 (spiritual changes subscale), respectively .70 (appreciation of life subscale).

*The Medical Outcomes Study Social Support Survey* (MOS; [Sherbourne & Stewart, 1991](#)), a brief multidimensional self-administered instrument, was selected to assess perceived social support. The original 19 items, rated from one (never) to five (always), measure: (1) emotional informational support; (2) tangible support (the provision of material aid or behavioral assistance); (3) positive social interaction (the availability of other persons to talk and do

fun things with you); and (4) affectionate support. Cronbach's Alphas for this current sample are .92 for emotional informational support subscale, .91 for tangible support subscale, .94 for positive social interaction subscale, and .90 for affectionate support subscale.

We have collected *demographic variables* via a questionnaire that covers age, gender, hospital unit, hours of work per week and work experience.

### 5.3. Procedure

We use a self-selection sampling where the participants volunteer to take part in research of their own accord. During a series of brief oral presentations delivered within each hospital unit, a researcher presents the research as an exploration study of the employers' view regarding the confrontation with different traumatic situations. We inform the participants that their participation is voluntary, that the information is confidential and would not become part of their performance evaluation. We give the questionnaires only to nurses who met the inclusion criteria: (a) working at least one year as a nurse; (b) indirectly exposed to trauma through interaction with their patients. Therefore, we include only workers from the units characterized by frequent interactions with patients with different medical conditions. There is no other exclusion criteria, including restrictions based on demographic variables. Because the workload in the workplace is very high, the participants have one week to complete the survey and to leave it in a box placed within each unit. Of the 267 surveys distributed, 147 (55.05%) are returned. All the participants sign an informed consent and then complete all measures anonymously in the following order: demographics, MOS, PTG, and STSS. The university's review board approve the study. We do not remunerate the participants, but we tell them that we can inform them about the results of the study.

### 5.4. Overview of the statistical analyses

We have conducted the current analyses using a structural equation model (SEM) framework in AMOS Graphics 20 ([Arbuckle, 2011](#)). We enter secondary traumatic stress and posttraumatic growth as endogenous variables and social support as an exogenous variable, in the model. We also create interaction terms of secondary traumatic stress and each of the four social support factors to test the moderation effect on vicarious posttraumatic growth. We enter the four interaction terms as exogenous variables and we allow social support factors to correlate with each other. A latent variable of overall vicarious posttraumatic growth has been fit using interpersonal relationships, new possibilities, personal strength, spiritual changes, and appreciation of life as manifest indicators. For secondary traumatic stress, a latent variable has been fit using intrusions, avoidance, and arousal as manifest indicators.

We have conducted a number of analyses to determine the most appropriate model for the data. First, we conduct preliminary analyses to examine the descriptive statistics and the associations for all analyzed variables in the study. Second, we simultaneously test the main effects of

**Table 1**

Means, standard deviations of scores on the Secondary Traumatic Stress scale, total score.

| Hospital unit  | N   | Secondary traumatic stress |       |       |
|----------------|-----|----------------------------|-------|-------|
|                |     | M                          | SD    | %     |
| Surgery        | 22  | 36.50                      | 11.75 | 36.6  |
| Intensive care | 14  | 36.00                      | 6.20  | 21.42 |
| Emergency      | 17  | 32.60                      | 9.39  | 35.29 |
| Neurosurgery   | 29  | 36.75                      | 17.25 | 24.13 |
| Cardiology     | 20  | 36.50                      | 3.10  | 25    |
| Pediatrics     | 18  | 50.50                      | 18.86 | 44.44 |
| Oncology       | 15  | 37.75                      | 11.95 | 40    |
| Total          | 135 | 38.08                      | 11.90 | 31.85 |

Note: Participants were dichotomously classified in two categories: those who scored 38 or higher on the STSS total score and those who scored less than 38 on the STSS total score. In the last column we present the percentages of participants who scored 38 or higher.

secondary traumatic stress on vicarious posttraumatic growth and the moderation effect of social support factors.

## 6. Results

### 6.1. Preliminary analysis

In Table 1, we present the mean level of secondary traumatic stress across the hospital units and the percentage of participants who meet the core criteria for posttraumatic stress, based on their STSS score. In order to test for a possible bias, we have conducted an analysis of variance (One-way ANOVA) comparing professionals' from different hospital units (Surgery, Intensive Care, Emergency,

Neurosurgery, Cardiology, Pediatric, and Oncology units) means on secondary traumatic stress and posttraumatic growth. The results show no significant differences on any of the aforementioned study variables.

The means, standard deviations, and bivariate correlations for all manifested variables as well as indicators are included in Table 2. Intrusions significantly negatively correlate with new possibilities and personal strength. Avoidance and arousal negatively correlate with three dimensions of vicarious posttraumatic growth: interpersonal relationships, new possibilities, and personal strength. The predictors do not significantly correlate with spiritual changes and appreciation of life subscales. The secondary traumatic stress symptoms negatively correlate with all the four proposed moderators. Specifically, intrusion negatively correlates with affectionate support and positive social interactions, avoidance negatively correlate with emotional/informational support and affectionate support, while arousal negatively correlate with tangible support and affectionate support. On the other hand, all forms of social support correlate positively with interpersonal relationships and personal strength. Moreover, emotional/informational support correlates with spiritual changes, while tangible support correlates with new possibilities and spiritual changes. The experience in the work field negatively correlates with intrusions and arousal and positively correlates with interpersonal relationships subscale. Finally, the hours of work per week negatively correlate with avoidance and arousal. Based on Cohen's (2013) criteria for magnitude of effect sizes, all the above relations are small to medium.

**Table 2**

Means, standard deviations, and bivariate correlations for all manifest variables and indicators.

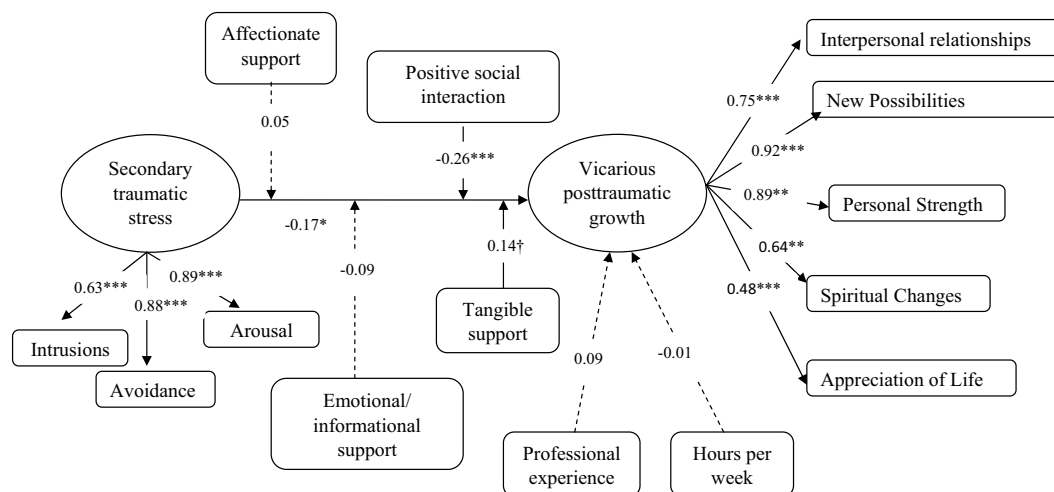
|                                       | 1      | 2      | 3      | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12   | 13   | 14    |
|---------------------------------------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| <i>Secondary traumatic stress</i>     |        |        |        |       |       |       |       |       |       |       |       |      |      |       |
| 1. Intrusions                         | 1      |        |        |       |       |       |       |       |       |       |       |      |      |       |
| 2. Avoidance                          | .55**  | 1      |        |       |       |       |       |       |       |       |       |      |      |       |
| 3. Arousal                            | .56**  | .78**  | 1      |       |       |       |       |       |       |       |       |      |      |       |
| <i>Social support</i>                 |        |        |        |       |       |       |       |       |       |       |       |      |      |       |
| 4. EIS                                | -.17   | -.17*  | -.16   | 1     |       |       |       |       |       |       |       |      |      |       |
| 5. TS                                 | -.10   | -.14   | -.18*  | .62** | 1     |       |       |       |       |       |       |      |      |       |
| 6. AS                                 | -.25** | -.17*  | -.20*  | .56** | .57** | 1     |       |       |       |       |       |      |      |       |
| 7. PSI                                | -.17*  | -.07   | -.09   | .56** | .55** | .79** | 1     |       |       |       |       |      |      |       |
| <i>Vicarious posttraumatic growth</i> |        |        |        |       |       |       |       |       |       |       |       |      |      |       |
| 8. PTG.IR                             | -.17   | -.19*  | -.27** | .29** | .40** | .27** | .27** | 1     |       |       |       |      |      |       |
| 9. PTG.NP                             | -.21*  | -.23*  | -.27** | .09   | .22** | .11   | .13   | .65** | 1     |       |       |      |      |       |
| 10. PTG.PS                            | -.27** | -.32** | -.30** | .19*  | .28** | .18*  | .20*  | .62** | .79** | 1     |       |      |      |       |
| 11. PTG.SC                            | .04    | -.04   | -.07   | .18*  | .28** | .10   | .11   | .58** | .50** | .42** | 1     |      |      |       |
| 12. PTG.AL                            | -.05   | -.02   | .03    | -.02  | .13   | .01   | .07   | .24** | .44** | .25** | .27** | 1    |      |       |
| <i>Control variables</i>              |        |        |        |       |       |       |       |       |       |       |       |      |      |       |
| 13. Experience                        | -.31** | -.15   | -.19*  | .05   | .05   | .07   | .08   | .20*  | .09   | .11   | .17   | .14  | 1    |       |
| 14. Hours per week                    | .03    | -.20*  | -.20*  | -.02  | .02   | .06   | .05   | .07   | .05   | -.01  | .09   | .09  | .16  | 1     |
| M                                     | 9.57   | 14.55  | 10.29  | 31.93 | 15.49 | 12.52 | 12.34 | 26.55 | 19.21 | 15.64 | 6.83  | 7.83 | 7.47 | 34.36 |
| SD                                    | 2.92   | 4.44   | 3.82   | 6.36  | 4.09  | 2.92  | 2.68  | 5.63  | 4.15  | 3.15  | 2.39  | 2.15 | 6.18 | 7.86  |

Note: EIS—emotional/informational support; TS—tangible support; AS—affectionate support; PSI—positive social interaction; PTG.IR—interpersonal relationships; PTG.NP—new possibilities; PTG.PS—personal strength; PTG.SC—spiritual changes; PTG.AL—appreciation of life; N = 135.

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .



**Fig. 1.** Structural equation model and path analysis of the risk factors for and moderation of vicarious posttraumatic growth ( $N = 135$ ). Standardized path coefficients reported. Correlations between exogenous constructs and error variances were omitted from the model for readability. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . Model fit:  $\chi^2(24) = 43.40$ ,  $p = .059$ ;  $\chi^2/df = 1.80$ ; NFI = .92; CFI = .96; GFI = .95; RMSEA = .07 (CI: .03, .10).

## 6.2. Testing for moderation

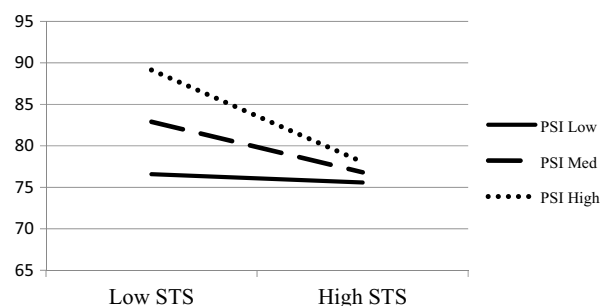
For the SEM model of direct and moderation effects, estimates are derived using maximum likelihood estimations and an overall model fit is assessed with the normative fit index (NFI), goodness of fit (GFI), the comparative fit index (CFI) and the root mean square residual (RMSEA). Acceptable model fit indices are indicated by a  $\chi^2/df < 3$ , a GFI, NFI and CFI  $> .90$ , and a RMSEA  $< .08$  (Hu & Bentler, 1999). The fit for our overall model is good (Fig. 1):  $\chi^2(24) = 43.40$ ,  $p = .059$ ;  $\chi^2/df = 1.80$ ; NFI = .92; CFI = .96; GFI = .95; RMSEA = .07 (CI: .03, .10).

The demographic control for professional experience and hours per week is not significant ( $b = .09$ ,  $p = .790$ , respectively  $b = -.01$ ,  $p = .082$ ). There is a significant, negative link between secondary traumatic stress and vicarious posttraumatic growth ( $b = -.17$ ,  $p = .022$ ). More secondary traumatic stress predicts a lower level of personal posttraumatic growth. Moreover, our results show that only positive social interaction moderates the effect of secondary traumatic stress on vicarious posttraumatic growth. We explore the moderating effect of perceived social support (positive social interactions) by calculating mean growth values for low, medium, and high levels of social support (Fig. 2). Medium value represents the mean; low and high levels of the variable are one standard deviation below and above the mean, respectively (Aiken & West, 1991). Figure two shows that higher levels of positive social interactions are associated with the highest levels of growth, with medium and lower levels of positive social interaction associated with the medium and lower levels of growth, respectively. This difference is most strongly evident with lower levels of secondary traumatic stress. A low level of secondary traumatic stress is associated with a high level of vicarious posttraumatic growth, only for the participants who report a high or medium level of perceived positive social interaction. For the participants with a low level of perceived positive social interaction, there are not visible differences between participants with low and high

levels of secondary traumatic stress regarding the level of vicarious posttraumatic growth.

## 7. Discussion

This study investigates the relation between secondary traumatic stress, social support, and vicarious posttraumatic growth in a sample of Romanian nurses. The results highlights a negative association between vicarious posttraumatic growth and secondary traumatic stress symptoms. These findings are consistent with one possible mode of the association between posttraumatic stress and posttraumatic growth, that is, the lower the distress, the higher the growth (Hagenaars & van Minnen, 2010). However, there is growing literature about the positive association between traumatic stress and personal growth (Blix et al., 2013; Bluvstein et al., 2013; Jin et al., 2014). Because our findings contradict this trend, we consider that the relation between growth and stress may be population dependent. Our study includes people constantly exposed



**Fig. 2.** Presence of vicarious posttraumatic growth as a function of secondary traumatic stress and positive social interaction. Notes: PSI—positive social interactions; STS—secondary traumatic stress. Simple effects were represented with secondary traumatic stress symptoms and positive social interaction defined as at least +1 and -1 standard deviations from the mean, respectively. Medium values for positive social interactions are based on the mean.

to others' trauma, whereas earlier studies typically assess the relation between traumatic stress and posttraumatic growth after a specific trauma. It is possible that in context of continuing exposure to traumatic experiences of others, a high level of stress prevent personal growth, whereas a low level of perceived traumatic stress may encourage personal growth in different domains. Because there are very few studies on the relation between secondary traumatic stress and vicarious posttraumatic growth, we cannot compare our studies to previous studies on the same theme.

Further, the results show that all forms of social support positively correlate with different domains of posttraumatic growth. These results sustain previous studies when it comes to the relation between perceived social support and growth (Ramos & Leal, 2013). Moreover, the present results show that a form of social support – having positive social interactions – moderates the association of secondary traumatic stress symptoms with vicarious posttraumatic growth. The other forms of social support examined in this study (emotional/informational support, tangible support, affectionate support) do not moderate the relation between secondary traumatic stress and vicarious posttraumatic growth. Thus, it seems that supportive interpersonal relationships serve a more complex role than other forms of support. Specifically, our result shows that a low level of secondary traumatic stress is associated with a higher level of vicarious posttraumatic growth only when people report higher scores on a scale measuring positive social interactions. There are few possible explanations of the fact that only positive social interactions play a moderating role in the relationship between secondary traumatic stress and vicarious posttraumatic growth. First, opportunity of social disclosure and significant others' positive reactions for disclosure is vital for personal posttraumatic growth (Taku, Tedeschi, Cann, & Calhoun, 2009). In order to cope with different stressful situations, it is necessary to confront personal reactions to these situations through conversations with other people. Second, daily talking provides the basis for social support for persons exposed to traumatic events (de Boer et al., 2014). Thirdly, it is possible that persons with a solid social network are more able to adopt effective coping strategies when it comes to dealing with daily stress at the workplace, which in turn promotes positive outcomes (Prati and Pietrantonio, 2009).

Although not a specific goal of this study, we have identified the higher level of STS in nurses from pediatrics. This result is not surprising giving the fact that, according to previous studies, working with traumatically injured or dying children is one of the most stressful situations nurses may have to cope with (Fernández, 2011). Although the constant exposure to all kinds of other trauma has a negative effect on health care providers, working within children's hospitals amplifies this effect (Robins et al., 2009). Regarding the other specialties, there are both similarities (Dominguez-Gomez & Rutledge, 2009; Quinal et al., 2009) and discrepancies (Czaja et al., 2012; Duffy et al., 2014) between the levels of STS identified in this study and the levels identified in previous studies. For example, oncology nurses in this study experience twice the level of STS symptomatology when compared with oncology nurses in Czaja et al. (2012). Furthermore, the average score

on the STS for this study is also higher than that reported by Czaja et al. (2012) but lower than those reported by Duffy et al. (2014) and Dominguez-Gomez and Rutledge (2009). The overcrowding and the use of psychological debriefing after trauma exposure could explain these variations. In this context, we want to mention that the lowest density of medical professionals and a high workload (Schafer et al., 2010) characterizes the Romanian health care system.

While this present study contributes to the understanding of vicarious posttraumatic growth by examining its predictors, we should also mention several limitations. First, the sample was one of convenience comprised of nurses from different hospital departments. Although the exposure to STS can vary across different specialties, there are not significant differences in the STS symptom prevalence among the seven surveyed nursing areas. However, the number of nurses from each specialty used in this study could explain the differences between the levels of STS reported in this study and those identified in previous studies. A large sample comprised of nurses from only one specialty may lead to a different level of STS. Because we could not select an adequate sample only from a single unit, we have chosen to form a single sample of nurses, selected from different units, without differentiating them. It would be favorable to examine these moderating relationships using samples that are more specific in order to identify if there are differences among nurses from different hospital units. Second, it is possible that some of the participants experienced personal traumas some time ago; therefore, personal growth as a response to direct exposure to trauma can influence their reports of vicarious posttraumatic growth. Future research should consider personal trauma exposure that is likely to affect vicarious posttraumatic growth. Third, because of this study's cross-sectional research design, it is not possible to discern causal relationships. Fourth, the study's participants volunteered to take part to the study. This can be a limitation, giving the fact that volunteers may not be representative of the target population. Therefore, this fact can limit the generalizability of the results to other settings and their implications may be specific only to the sample used in this study. However, this is a limitation specific to many previous studies, which also used convenient samples.

As a conclusion, we can mention that the results of this study contribute to the theoretical and empirical understanding of vicarious posttraumatic growth in the nursing profession, with implications for training and supervision. Because healthcare workers may be aware of the negative consequences of vicarious exposure to trauma, but less conscious of the potential for growth, organizations should inform them about the multitude of both negative and positive responses to routine and ongoing trauma exposure. Moreover, organizations and their managers should acknowledge the risks of indirect trauma for nurses and healthcare workers in general and should take some preventive measures. For example, effective nurse mentoring programs should aim at enhancing specific positive interaction skills, like open communication, effective teamwork and collaboration, as ways of promoting positive social interactions. They should also educate nurses about the role of these interactions in fostering vicarious posttraumatic

growth. Moreover, based on these results, encouraging nurses in the involvement in diverse relational activities may also contribute to their personal growth. Supportive interactions within an individual's social system, both at work and outside work, provide important opportunities to discuss a critical event and find a meaning to what happens. Because finding meaning in life facilitates the adaptation to different life events, and even personal growth (Kashdan & Kane, 2011), we can conclude that establishing and promoting a social support network is a resilience resource that can buffer the impact of traumatic stress on functional outcomes.

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## References

- Adriaenssens, J., de Gucht, V., & Maes, S. (2012). The impact of traumatic events on emergency room nurses: Findings from a questionnaire survey. *International Journal of Nursing Studies*, 49(11), 1411–1422. <http://dx.doi.org/10.1016/j.ijnurstu.2012.07.003>
- Adriaenssens, J., de Gucht, V. M. J., de Exel, H., & Maes, S. (2012). Do changes in occupational stressors predict work-related and generic stress outcomes in emergency (ER) nurses? *Psychology & Health*, 27(S1), 2.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Arbuckle, J. L. (2011). *AMOS 20 user's guide*. Chicago, IL: AMOS Development Corp.
- Arnold, D., Calhoun, L. G., Tedeschi, R., & Cann, A. (2005). Vicarious post-traumatic growth in psychotherapy. *Journal of Humanistic Psychology*, 45(2), 239–263.
- Blix, I., Hansen, M. B., Birkeland, M. S., Nissen, A., & Heir, T. (2013). Post-traumatic growth, posttraumatic stress and psychological adjustment in the aftermath of the 2011 Oslo bombing attack. *Health and Quality of Life Outcomes*, 11(1), 160.
- Bluvstein, I., Moravchick, L., Sheps, D., Schreiber, S., & Bloch, M. (2013). Posttraumatic growth, posttraumatic stress symptoms and mental health among coronary heart disease survivors. *Journal of Clinical Psychology in Medical Settings*, 20(2), 164–172.
- Boals, A., Steward, J. M., & Schuettler, D. (2010). Advancing our understanding of posttraumatic growth by considering event centrality. *Journal of Loss and Trauma*, 15, 518–533.
- Bonanno, G. A., Galea, S., Bucciarelli, A., & Vlahov, D. (2006). Psychological resilience after disaster: New York City in the aftermath of the September 11th terrorist attack. *Psychological Science*, 17(3), 181–186.
- Bride, B. E. (2007). Prevalence of secondary traumatic stress among social workers. *Social Work*, 52, 63–70.
- Bride, B. E., Robinson, M. R., Yegidis, B., & Figley, C. R. (2004). Development and validation of the secondary traumatic stress scale. *Research on Social Work Practice*, 14, 27–35.
- Brockhouse, R., Msetfi, R. M., Cohen, K., & Joseph, S. (2011). Vicarious exposure to trauma and posttraumatic stress in therapists: The moderating effects of sense of coherence, organizational support, and empathy. *The Journal of Traumatic Stress*, 24(6), 1–8.
- Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*. New York: Lawrence Erlbaum Associates.
- Czaja, A. S., Moss, M., & Mealer, M. (2012). Symptoms of posttraumatic stress disorder among pediatric acute care nurses. *Journal of Pediatric Nursing*, 27(4), 357–365.
- de Boer, J., van Rikxoort, S., Bakker, A. B., & Smit, B. J. (2014). Critical incidents among intensive care unit nurses and their need for support: Explorative interviews. *Nursing in Critical Care*, 19(4), 166–174.
- Dominguez-Gomez, E., & Rutledge, D. N. (2009). Prevalence of secondary traumatic stress among emergency nurses. *Journal of Emergency Nursing*, 35(3), 199–204.
- Duffy, E., Avalos, G., & Dowling, M. (2014). Secondary traumatic stress among emergency nurses: A cross-sectional study. *International Emergency Nursing*. <http://dx.doi.org/10.1016/j.ienj.2014.05.001>. S1755–599X(14)00031–7
- Fernández, P. (2011). Anxiety of nursing staff in the face of death in critical care units and its relationship with the patients' age. *Ansiedad del personal de enfermería*, 22(3), 96–103. <http://dx.doi.org/10.1016/j.enfi.2011.01.004> [not in English]
- Figley, C. R. (1995). Compassion fatigue as secondary traumatic stress disorder: An overview. In C. R. Figley (Ed.), *Compassion fatigue*. New York, NY: Brunner/Mazel.
- Hagenaars, M. A., & van Minnen, A. (2010). Posttraumatic growth in exposure therapy for PTSD. *Journal of Traumatic Stress*, 23, 504–508.
- Hyatt-Burkhart, D. (2014). The experience of vicarious posttraumatic growth in mental health workers. *Journal of Loss and Trauma: International Perspectives on Stress & Coping*, 19(5), 452–461.
- Helgeson, V. A., Reynolds, K. A., & Tomich, P. L. (2006). A meta-analytic review of benefit finding and growth. *Journal of Consulting and Clinical Psychology*, 74, 797–816.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1–55.
- Janoff-Bulman, R. (2004). Posttraumatic growth: Three explanatory models. *Psychological Inquiry*, 15, 30–34.
- Jin, Y., Xu, J., Liu, H., & Liu, D. (2014). Posttraumatic stress disorder and posttraumatic growth among adult survivors of Wenchuan earthquake after 1 year: Prevalence and correlates. *Archives of Psychiatric Nursing*, 28, 67–73.
- Kashdan, T., & Kane, J. (2011). Post-traumatic distress and the presence of post-traumatic growth and meaning in life: Experiential avoidance as a moderator. *Personality and Individual Differences*, 50(1), 84–89.
- Kleim, B., & Ehlers, A. (2009). Evidence for a curvilinear relationship between post-traumatic growth and posttrauma depression and PTSD in assault survivors. *Journal of Traumatic Stress*, 22(1), 45–52.
- Kunst, M. J. (2010). Affective personality type, posttraumatic stress disorder symptom severity and posttraumatic growth in victims of violence. *Stress and Health*, 27, 42–51.
- Lee, J., Daffern, M., Ogloff, J. R., & Martin, T. (2015). Towards a model for understanding the development of post-traumatic stress and general distress in mental health nurses. *International Journal of Mental Health Nursing*, 24(1), 49–58.
- Linley, P. A., & Joseph, S. (2007). Therapy work and therapists' positive and negative well-being. *Journal of Social and Clinical Psychology*, 26(3), 385–403.
- McDonough, M. H., Sabiston, C. M., & Wrosch, C. (2014). Predicting changes in posttraumatic growth and subjective well-being among breast cancer survivors: The role of social support and stress. *Psycho-Oncology*, 23(1), 114–120.
- Prati, G., & Pietrantonio, L. (2009). Optimism, social support, and coping strategies as factors contributing to posttraumatic growth: A meta-analysis. *Journal of Loss and Trauma*, 14, 364–388.
- Quinal, L., Harford, S., & Rutledge, D. N. (2009). Secondary traumatic stress in oncology staff. *Cancer Nursing*, 32(4), E1–E7.
- Ramos, C., & Leal, I. (2013). Posttraumatic growth in the aftermath of trauma: A literature review about related factors and application contexts. *Psychology, Community & Health*, 2(1), 43–54. <http://dx.doi.org/10.5964/pch.v2i1.39>
- Robins, P. M., Meltzer, L., & Zelikovsky, N. (2009). The experience of secondary traumatic stress upon care providers working within a children's hospital. *Journal of Pediatric Nursing*, 24(4), 270–279.
- Rodwell, J., & Munro, L. (2013). Well-being, satisfaction and commitment: The substitutable nature of resources for maternity hospital nurses. *Journal of Advanced Nursing*, 69(10), 2218–2228.
- Samios, C., Rodzik, A. K., & Abel, L. M. (2012). Secondary traumatic stress and adjustment in therapists who work with sexual violence survivors: The moderating role of posttraumatic growth. *British Journal of Guidance & Counselling*, 40(4), 341–356.
- Schafer, W., Kroneman, M., Boerma, W., Van Der Berg, M., Wester, W., Deville, W., et al. (2010). The Netherlands. Health system review. *Health Systems in Transition*, 12, 1.
- Shakespeare-Finch, J., & Lurie-Beck, J. (2014). A meta-analytic clarification of the relationship between posttraumatic growth and symptoms of posttraumatic distress disorder. *Journal of Anxiety Disorders*, 28, 223–229.
- Sherbourne, C. D., & Stewart, A. L. (1991). The MOS social support survey. *Social Science and Medicine*, 32(6), 705–714.
- Shoji, K., Jock, J., Cieslak, R., Zukowska, K., Luszczynska, A., & Benight, C. (2014). Cultivating secondary traumatic growth among healthcare workers: The role of social support and self-efficacy. *Journal of Clinical Psychology*, 70(9), 831–846.

- Ssenyonga, J., Owens, V., & Olema, D. K. (2013). Posttraumatic growth, resilience, and posttraumatic stress disorder (PTSD) among refugees. *Procedia—Social and Behavioral Sciences*, 82, 144–148.
- Taku, K. (2014). Relationships among perceived psychological growth, resilience and burnout in physicians. *Personality and Individual Differences*, 59, 120–123.
- Taku, K., Tedeschi, R. G., Cann, A., & Calhoun, L. G. (2009). The culture of disclosure: Effects of perceived reactions to disclosure on posttraumatic growth and distress in Japan. *Journal of Social and Clinical Psychology*, 29, 1226–1243.
- Tedeschi, R. G., & Calhoun, L. G. (1996). The posttraumatic growth inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress*, 9, 455–471.
- Tedeschi, R. G., & Calhoun, L. G. (2004). Posttraumatic growth: Conceptual foundations and empirical evidence. *Psychological Inquiry*, 15, 1–18.
- Young, J. L., Derr, D. M., Cicchillo, V. J., & Bressler, S. (2011). Compassion satisfaction, burnout, and secondary traumatic stress in heart and vascular nurses. *Critical Care Nursing Quarterly*, 3, 227–234.
- Yu, Y., Peng, L., Chen, L., Long, L., He, W., Li, M., et al. (2014). Resilience and social support promote posttraumatic growth of women with infertility: The mediating role of positive coping. *Psychiatry Research*, 215, 401–405.
- Zhao, C., Wu, Z., & Xu, J. (2013). The association between post-traumatic stress disorder symptoms and the quality of life among Wenchuan earthquake survivors: The role of social support as a moderator. *Quality of Life Research*, 22(4), 733–743.