

Aim of the study: To investigate into the mechanisms of resiliency in women after mastectomy. We hypothesized that the mechanism of resiliency in women with breast cancer would involve facilitation of adaptive coping strategies and inhibition of maladaptive strategies. We tested a mediational model in which resiliency was related to satisfaction with life through coping strategies.

Material and methods: Thirty women after mastectomy aged 28–69 years ($M = 53.23$, $SD = 9.00$) completed the Ego Resiliency Scale, Mental Adjustment to Cancer Scale, and Satisfaction with Life Scale.

Results: The bootstrapping technique revealed that there were significant indirect effects for positive reframing (95% CI: 0.01–0.36), hopelessness/helplessness (95% CI: 0.18–0.83) and anxious preoccupation (95% CI: 0.001–0.55) but not for fighting spirit. The models explained up to 33% of the variance in satisfaction with life.

Conclusions: Coping strategies fully explain the effect of resiliency on satisfaction with life in women after mastectomy. This finding provides additional evidence of the fundamental role of coping strategies in the mechanisms of resiliency. We obtained similar results in patients with type II diabetes and rheumatoid arthritis. The lack of significant associations of fighting spirit with resiliency suggests that this coping strategy may be beneficial for somatic health but its contribution to the mechanisms of psychological resiliency is complex.

Key words: breast cancer, resiliency, positive emotions, coping strategies, satisfaction with life.

Mechanisms of psychological resiliency in women after mastectomy

Łukasz D. Kaczmarek¹, Helena Sęk², Michał Ziarko¹, Marta Marzec¹

¹Institute of Psychology, Adam Mickiewicz University, Poznan, Poland

²Warsaw School of Social Psychology, Department in Wrocław, Poland

Introduction

In recent years there has been a shift in health psychology towards more positive concepts [1, 2]. An increased emphasis has been put on resiliency and protective factors as an approach complementary to the study of risk factors. More researchers have become concerned with the overall satisfaction with life of patients and those factors that help to build psychological resiliency against major threats to well-being [1]. Breast cancer is an oncological disease that poses one such threat for women's health [3, 4].

The association of breast cancer with anxiety and depression has been supported in previous studies [3–6]. However, some women cope more effectively than others with the distress caused by cancer. As a result, they are able to reclaim their life satisfaction and lead a meaningful life despite their illness. In some patients this increase in satisfaction with life goes beyond the previous levels [7, 8]. Understanding the mechanisms behind the ability of quick and long-lasting psychological recovery is critical for providing efficient psychological help to oncological patients.

The mechanism of psychological recovery has been extensively studied within the theoretical framework of resiliency [9–12]. The personality trait of resiliency is associated with high self-regulation competences including adapting one's level of self-control up or down as the situation dictates, and using positive emotions in the coping process [9–12, 14].

The ability of flexible, situation-dependent self-control seems significant for satisfaction with life of oncological patients. On the one hand, this ability might allow high medical compliance requiring high self-control. However, sole preoccupation with symptoms and treatment can lead to a downward spiral of decreased well-being. Therefore on the other hand, patients with high resiliency may be able to loosen up self-control to produce spontaneity and sociability in leisure time. The second component of resiliency, i.e. positive emotions, also has an adaptive function. Positive emotions have an undoing effect on physiological and psychological changes caused by negative emotions [13–15]. Thus they speed up the recovery process. These two components of resiliency can lead to higher satisfaction with life among patients.

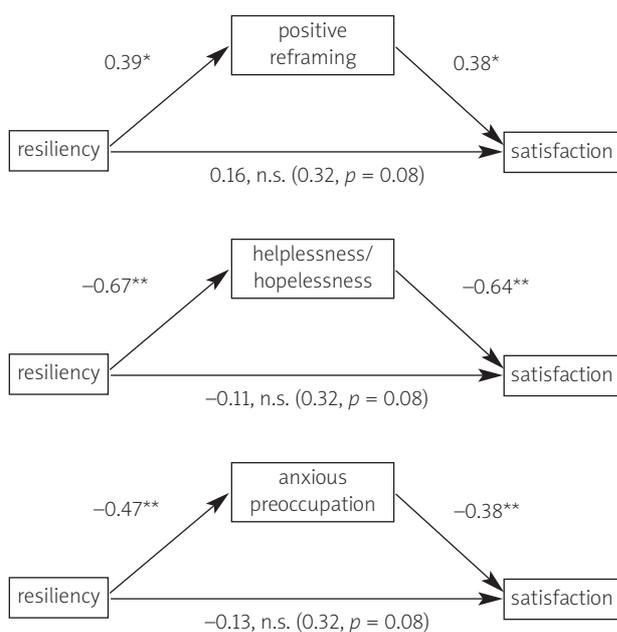
According to Watson *et al.* [16], mental adjustment to cancer consists of cognitive appraisals and behavioural responses. Individual differences in responses to oncological disease have been reduced to a more parsimonious set of dimensions. In the Polish version of the questionnaire that measures the strategies of mental adjustment to cancer (Mini-MAC) [17] there are four strategies: fighting spirit, positive reframing, helplessness/hopelessness, and anxious preoccupation. Fighting spirit characterizes individuals who confront and actively face their illness. Positive reframing reflects the tendency to find positive interpretations of adversities. Individuals high in helplessness/hopelessness have a tendency to adopt a pessimistic attitude towards their illness, whereas patients with anxious preoccupation engage in restless thinking and

Table 1. Descriptive statistics and correlations between variables

	Scale	M ^a	SD	1	2	3	4	5
1. satisfaction	1–7	4.68	1.17					
2. resiliency	1–4	3.12	0.43	0.32†				
3. helplessness	1–4	1.70	0.48	–0.57**	–0.68**			
4. anxious preoccupation	1–4	2.15	0.57	–0.45*	–0.47**	0.59**		
5. fighting spirit	1–4	3.18	0.50	0.10	0.11	–0.08	0.12	
6. positive reframing	1–4	3.25	0.52	0.45*	0.40*	–0.38*	–0.24	0.54**

^aThe total scores were divided by the number of items in each scale. The means represent the average scores on a respective scale.

† $p \leq 0.08$, * $p \leq 0.05$, ** $p \leq 0.01$

**Fig. 1.** The indirect effect of resiliency on satisfaction with life through coping strategies

Note. Numbers in brackets represent the association of resiliency and satisfaction without controlling for the mediator.

* $p \leq 0.05$, ** $p \leq 0.01$

worrying about their symptoms. Out of these four strategies it is positive reframing that seems to be the most important active ingredient of resiliency. First, it is a cognitive regulatory strategy, and second, it is associated with positive emotions. As previously noted, resiliency seems to be inversely related to anxious preoccupation due to the cognitive flexibility as the core of resiliency.

In the current study we hypothesized that the mechanism of resiliency in women after mastectomy would involve facilitating adaptive coping strategies and inhibiting maladaptive strategies. More specifically, we expected a mediation [18] in which resiliency would be related to life satisfaction through coping strategies.

Material and methods

The study was carried out in a group of women who were attending meetings of the 'Amazons Club' associating

women after mastectomy. There were 30 participants in our study aged 28–69 years ($M = 53.23$, $SD = 9.00$). The duration of the illness ranged from 1 to 13 years ($M = 3.68$, $SD = 3.25$). The study was conducted in accordance with ethical standards of the authors' institution and each participant gave informed consent.

The participants completed a set of psychometric questionnaires:

- Ego Resiliency Scale [9, 10] – this questionnaire has 14 items that measure resiliency as a personality trait; the participants answer on a four-point scale ('1 – does not apply at all', 4 – 'applies very strongly'); the internal consistency of the scale in the current study was satisfactory with Cronbach's $\alpha = 0.79$;
- Mini-Mental Adjustment to Cancer Scale [16, 17] – this scale measures strategies of mental adjustment to cancer; it comprises four subscales that were reliable in the current study: anxious preoccupation ($\alpha = 0.82$), fighting spirit ($\alpha = 0.69$), helplessness/hopelessness ($\alpha = 0.79$), and positive reframing ($\alpha = 0.72$); the participants use a four-point scale ('1 – definitely disagree'; 4 – 'definitely agree');
- Satisfaction with Life Scale [19] – this instrument comprises 5 items that ask about the global satisfaction with life; the answers are given on a scale ranging from 1 'strongly disagree' to 7 'strongly agree'; the internal consistency of the scale was satisfactory, with Cronbach's $\alpha = 0.83$ in this study.

To test the hypothesis that coping strategies mediate between resiliency and satisfaction with life we used a mediational model [18]. Mediational models, besides the independent (X) and the dependent variable (Y), include the mediating variable (M). The mediator explains the relationship between the independent and the dependent variable ($X \rightarrow M \rightarrow Y$). Mediational models allow for better understanding of mechanisms in which variables are expected to form a sequence of causal relationships. To test for mediation we used Sobel's test [20] and the product-of-coefficients strategy with bootstrapping [18]. The bootstrapping method does not assume normal distribution of variables in the model and as such is regarded as more robust than common statistical analyses especially with small sample sizes [18]. In bootstrapping an effect is significant if the produced confidence interval (CI) does not contain zero. We used SPSS 18.00 with the INDIRECT macro [18] for the computations. Before the analysis the variables were standardized.

Results

As an overview, descriptive statistics and correlations between the variables are presented in Table 1.

The model with path coefficients for positive reframing is presented in Fig. 1a. As hypothesized, positive reframing seems to mediate the relationship between resiliency and satisfaction with life, $\beta_a = 0.39, p = 0.02$; $\beta_b = 0.38, p = 0.04$; $\beta_c = 0.32, p = 0.08$, $\beta_c = 0.16, p = 0.37$, 95% CI: 0.01–0.36. The model explained a significant amount of the variance in satisfaction with life, $R^2 = 0.23, F(2, 27) = 3.99, p = 0.03$.

The model for helplessness/hopelessness (Fig. 1b) indicated that this variable is negatively related to resiliency and negatively related to satisfaction with life. Consequently, resiliency seems to increase satisfaction with life by inhibiting helplessness/hopelessness, $\beta_a = -0.67, p < 0.01$; $\beta_b = -0.64, p < 0.01$; $\beta_c = 0.32, p = 0.08$, $\beta_c = -0.11, p = 0.58$, 95% CI: 0.18–0.83. This model also explained a significant amount of satisfaction with life, $R^2 = 0.33, F(2, 27) = 6.71, p < 0.01$.

Anxious preoccupation might serve as the third mediator in the relationship between resiliency and satisfaction with life (Fig. 1c), $\beta_a = -0.47, p < 0.01$; $\beta_b = -0.38, p = 0.05$; $\beta_c = 0.32, p = 0.08$, $\beta_c = 0.13, p = 0.47$; 95% CI: 0.001–0.55. Anxious preoccupation, as an analogy to helplessness/hopelessness, was inversely related to resiliency and satisfaction with life. This suggests that resiliency has a positive indirect effect on satisfaction with life by means of inhibiting anxious preoccupation. The model was significant, $R^2 = 0.21, F(2, 27) = 3.75, p = 0.03$.

Fighting spirit was not related to satisfaction with life or resiliency (see Table 1). Therefore we did not test it for mediation.

Discussion

The results of this study suggest that higher satisfaction with life is observed among those women after mastectomy who have higher levels of resiliency. We investigated a step further into the process of resilience and observed that mental adjustment was critical for resiliency in its effect on satisfaction with life. The results suggest that mental adjustment fully explained the effect of resiliency on satisfaction with life. More specifically, the indirect effect of resiliency on satisfaction includes utilization of positive reframing and avoiding preoccupation with pessimistic and anxious thoughts.

We observed the association of resiliency with positive emotions in our previous studies with patients suffering from other medical conditions such as diabetes or rheumatoid arthritis [21]. This finding is in line with the idea that positive emotions not only indicate recovery but also influence health and speed up the recovery [13, 14, 22].

Mastectomy produces severe stress and increases anxiety and depression [5, 6]. However well-being and depression are not two poles of the same dimension [23]. Many studies have supported the relative independence of well-being and ill-being [24] and satisfaction with life versus dissatisfaction with life [25]. Some studies with people in crisis have shown that activation of positive emotions (such as love, hope, or gratitude) in the context of negative emotions may be crucial for resilience [26].

The co-activation of positivity and negativity may lead to higher satisfaction with life and to development of coping resources and competences such as optimism or the ability to remain calm in times of crisis. Consequently, the function of peer-support organizations such as the Amazons Club is not only to decrease depression [27] but also to infuse lives of women with meaning, engagement, and positive emotions. These three elements are among the main factors contributing to subjective well-being [28]. The opportunity to socialize was indicated as one of the most highly rated benefits of the Amazons Club [27]. As such, attending such clubs has the potential to promote resilience.

We did not expect the obtained result that fighting spirit would not be associated with resiliency or satisfaction with life. It showed that some women with high resiliency and high satisfaction may have low and some may have high levels of fighting spirit. Our *ad hoc* hypothesis would be that this strategy of active coping with illness may put too much strain on some individuals. For instance, in a recent study it was revealed that women with higher scores for fighting spirit engaged in many forms of physical activity such as tourist trips, water exercises, dance, etc. [29]. Physical activity has favourable medical and psychological effects [30]. However, our study suggests that the effect of fighting spirit on satisfaction with life may be complex.

Although the dimensions of mental adjustment fully accounted for the effect of resiliency on satisfaction with life in women after mastectomy, the models explained only up to 33% of the variance in satisfaction with life. Therefore there definitely are factors other than resiliency and coping strategies that determine satisfaction with life among women with mastectomy.

In sum, our study is an initial step towards a more comprehensive understanding of mechanisms of psychological resiliency in women after mastectomy. The complex statistical models of mediation can shed new light on sequential relationships between variables. Building such functional models may serve as a basis for more efficacious psychological help provided by psychologists working with oncological patients.

References

1. Psychologia zdrowia w poszukiwaniu pozytywnych inspiracji. Heszten I, Życińska J (eds.). Wydawnictwo SWP Academica, Warszawa 2008.
2. Heszten I, Sęk H. Psychologia zdrowia. Wydawnictwo Naukowe PWN, Warszawa 2007.
3. Horner MJ, Ries LAG, Krapcho M, Neyman N, Aminou R, Howlader N, Edwards BK. SEER Cancer Statistics Review 1975–2006. National Cancer Institute 2006.
4. Ell K, Sanchez K, Vourlekis B, Lee PJ, Dwight-Johnson M, Lagomasino I, Muderspach L, Russell C. Depression, correlates of depression, and receipt of depression care among low-income women with breast and gynecologic cancer. *J Clin Oncol* 2005; 23: 3052–60.
5. Wimberly SR, Carver CS, Laurenceau JP, Harris SD, Antoni MH. Perceived partner reactions to diagnosis and treatment of breast cancer: Impact on psychosocial and psychosexual adjustment. *J Consult Clin Psychol* 2005; 73: 300–11.
6. Andrykowski MA, Cordova MJ, Studts JL, Miller TW. Posttraumatic stress disorder after treatment for breast cancer: prevalence of diagnosis and use of the PTSD Checklist-Civilian Version (PCL-C) as a screening instrument. *J Consult Clin Psychol* 1998; 66: 586–90.

7. Lechner S, Antoni MH. Posttraumatic growth and group-based intervention for persons dealing with cancer: What have we learned so far? *Psychological Inquiry* 2004; 15: 35-41.
8. Tomich PL, Helgeson VS. Is finding something good in the bad always good? Benefit finding among women with breast cancer. *Health Psychol* 2004; 23: 16-23.
9. Block J, Kremen AM. IQ and ego-resiliency: conceptual and empirical connections and separateness. *J Pers Soc Psychol* 1996; 70: 349-61.
10. Kaczmarek Ł. Kwestionariusz Sprężystości Psychiczej – polska adaptacja Ego Resiliency Scale. *Czasopismo Psychologiczne* 2011; 17: 263-5.
11. Kaczmarek Ł. Resiliency, stress appraisal, positive affect and cardiovascular activity. *Polish Psychological Bulletin* 2009; 40: 46-53.
12. Fredrickson BL, Mancuso RA, Branigan Ch, Tugade MM. The undoing effect of positive emotions. *Motivation and Emotion* 2000; 24: 237-58.
13. Pressman S, Cohen S. Does positive affect influence health? *Psychol Bull* 2005; 131: 925-71.
14. Fredrickson BL, Levenson RW. Positive emotions speed recovery from the cardiovascular sequelae of negative emotions. *Cogn Emot* 1998; 12: 191-220.
15. Levenson RW. The intrapersonal functions of emotion. *Cogn Emot* 1999; 13: 481-504.
16. Watson M, Law M, Santos M, Greer S, Baruch J, Bliss J. The Mini-MAC: further development of the Mental Adjustment to Cancer Scale. *J Psychol Oncol* 1994; 12: 33-46.
17. Juczyński Z. Narzędzia pomiaru w promocji i psychologii zdrowia. Pracownia Testów Psychologicznych PTP, Warszawa 2001.
18. Preacher KJ, Hayes AF. Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods* 2008; 30: 879-91.
19. Diener E, Emmons RA, Larson RJ, Griffin S. The Satisfaction with Life Scale. *J Pers Assess* 1985; 49: 71-5.
20. Sobel ME. Asymptotic confidence intervals for indirect effects in structural equations models. In: *Sociological methodology*. Leinhardt S (ed.). Jossey-Bass, San Francisco 1982; 290-312.
21. Kaczmarek Ł, Sęk H, Ziarko M. Sprężystość psychiczna i zmienne pośredniczące w jej wpływie na zdrowie. *Przegląd Psychologiczny* 2011; 54: 29-46.
22. Sęk H. Udział pozytywnych emocji w osiągnięciu zdrowia. In: *Psychologia zdrowia. W poszukiwaniu pozytywnych inspiracji*. Heszen I, Życińska J (ed.). Academica Wydawnictwo SWPS, Warszawa 2008; 73-88.
23. Larsen JT, Hemenover, SH, Norris CJ, Cacioppo JT. Turning adversity to advantage: on the virtues of the coactivation of positive and negative emotions. In: *A psychology of human strengths: Fundamental questions and future directions for a positive psychology*. Aspinwall LG, Staudinger UM (eds.). American Psychological Association. Washington 2002; 211-26.
24. Larsen JT, McGraw AP. Further evidence for mixed emotions. *J Pers Soc Psychol* 2011; 100: 1095-110.
25. Mazaheri M, Theuns P. Structural equation modeling (SEM) for satisfaction and dissatisfaction ratings; multiple group invariance analysis across scales with different response format. *Social Indicators Research* 2009; 91: 203-21.
26. Fredrickson BL, Tugade MM, Waugh ChW, Larkin GR. What good are positive emotions in crises? A prospective study of resilience and emotions following the terrorist attacks on the united states on September 11th, 2001. *J Pers Soc Psychol* 2003; 84: 365-76.
27. Kozela M, Stepniak U, Pająk A. Membership in a breast cancer peer-support organization (Amazons Club) and depression. *Współczesna Onkol* 2011; 15: 55-8.
28. Kaczmarek LD, Stanko-Kaczmarek M, Dombrowski S. Adaptation and Validation of the Steen Happiness Index into Polish. *Polish Psychological Bulletin* 2010; 40: 98-104.
29. Malicka I, Szczepańska-Gieracha J, Jankowska E, Woźniowski M, Rymaszewska, J. Physical activity, life satisfaction and adjustment to illness in women after treatment of breast cancer. *Współczesna Onkol* 2011; 15: 180-5.
30. Malicka I, Pawłowska K. Aktywność ruchowa w prewencji pierwotnej i wtórnej raka piersi. *Rehabilitacja Medyczna* 2008; 12: 32-8.

Address for correspondence

Łukasz D. Kaczmarek

Department of Health Psychology and Clinical Psychology
Institute of Psychology
Adam Mickiewicz University
Szamarzewskiego 89
60-568 Poznań
tel./fax +48 61 829 21 07

Submitted: 3.10.2011

Accepted: 19.03.2012