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Social-cognitive variables as predictors of intention to undergo breast reconstruction

Abstract: The aim of the study was to determine the role of self-efficacy, outcome expectancies, and risk perception (including consequences of mastectomy) in formulating the intention to undergo breast reconstruction in 178 women after total mastectomy. The social-cognitive variables were measured in the context of breast reconstruction, while depression was assessed using the Beck Depression Inventory. The structural equation modeling revealed that among the predictors there were only two that accounted for the intention to undergo breast reconstruction, i.e. self-efficacy and outcome expectancies ($R^2 = .67$). Subsequent analyses of the related moderators, i.e. depression, age, and duration of the disease indicated a good fit to the data. Nevertheless, in subgroups with poorer resources (older age, depression, and longer duration of the disease) the direct effects of self-efficacy on intention were less noticeable or non-existent. The results suggest that self-efficacy may play the regulating role in making a breast reconstruction decision if individual resources are taken into account.

Key words: self-efficacy, outcome expectancies, intention, depression, breast cancer

Introduction

Over the last decade the incidence of breast cancer, the leading malicious neoplasm in European Union women, has been on the increase. The mortality due to breast cancer, however, has been on the decrease (Wojtyniak, Goryński, Moskalewicz, 2012), most probably as a result of more and more effective secondary prevention of breast cancer, a process during which women are offered reconstructive treatment. It is essential, then to study the conditions under which women decide to undergo breast reconstruction so that they can be offered adequate care (see Chen, Malin, Ganz, Ko, Trisnado, Tao, Timmer, Adams, Kahn, 2009; Keith, Walker, Walker, Heys, Sarkar, Hutcheon, Eremin, 2003).

The results of the studies conducted in the 1990s clearly indicated that the women that opted for breast reconstruction were usually younger, married, and better educated, and also enjoyed a higher social-economic status (Harcourt and Rumsey, 2001). The ensuing educational and social campaign aimed at providing every post-mastectomy woman with equal access to breast reconstruction did not result in a significant increase in the number of surgeries

of this kind being performed (Chen *et al.*, 2009; Fallbjörk, Karlsson, Salander, Rasmussen, 2010; Giroto, Schreiber, Nahabedian, 2003; Lim, Low, Hoe, 2001; Maly, Liu, Kwong, Thind, Diamant, 2009). A subsequent study evaluating outcomes of the campaign concluded that the reasons why women decided to undergo breast reconstruction were most probably to be sought among psychological variables.

Predictors of breast reconstruction decision

Social cognition models reflect the decision-making process in health issues (Heszen, Sęk, 2007). The most advanced among them are the multi-stage models, which consist of at least two stages: the motivational stage, in which the intention is formulated, and the volitional stage, i.e. postintentional motivation processes that lead to an action (Armitage, Conner, 2002). A good intention, providing the answers to the questions of when, where, and how a person is going to introduce a change, constitutes the basis for setting up a plan increasing the probability of undertaking and maintaining action (Gollwitzer, 1999; Sheeran, Milne, Webb, Gollwitzer, 2005).

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Motivational variables determine the formulation of a good intention. Considering the situation of post-mastectomy women contemplating a decision to undergo breast reconstruction, it is advisable to take into account the variables of the Health Action Process Approach (HAPA, Schwarzer, 2008; Schwarzer, Lippke, Luszczynska, 2011), or, to be more specific, its motivational phase. HAPA is a multi-stage model, which is based on the following - most empirically documented - theories: social-cognitive theory (SCT, Bandura, 1997; see Bandura, 2004; Bandura and Lock, 2003), and Heckhausen's (1991) volition theory (cf. Sheeran, Milne, Webb, Gollwitzer, 2005). According to the HAPA assumptions, the intention is formed by three variables: self-efficacy, outcome expectancies, and risk perception. These variables should be redefined so that they can reflect a specific task, in this case the breast reconstruction decision.

Self-efficacy is a construct that comes from SCT (see Bandura 1997); in HAPA it is adjusted to the stages of the process of change (Schwarzer, 2008). In the motivational phase related to the making of a decision to introduce a change it determines an optimistic belief that an action can be performed even if obstacles are encountered. If a given individual's self-efficacy is strong then s/he is willing to invest more effort in order to initiate an action (Luszczynska, Schwarzer, 2008). Self-efficacy in making a decision to undergo mastectomy reflects a woman's confidence that she is capable of undergoing breast reconstruction and that can overcome difficulties before, during, and after the treatment, which may include: immobilization of the arm on the treated side, complications, additional medical check-ups, or her friends' failure to understand her decision.

The definition of outcome expectancies reflects a construct introduced by Bandura (1997) in SCT, and it is related to the balance of the expected positive as well as negative results of an action, i.e. the balance of pros and cons. In HAPA, unlike SCT, the pros are emphasized as satisfactory predictors of an intention, since the cons do not increase the level of explained variance (see Schwarzer, 2008). The results of the studies involving women after breast reconstruction provide data on the most commonly encountered positive outcome expectancies that result from the treatment, including: regained womanhood and natural appearance, satisfaction with sexual life and with the social tasks performed, feeling healthy that reduces somatic symptoms such as pain (see Denford, Harcourt, Rubin, Pusic, 2011; Eltahir, Werners, Dreise, van Emmichoven, Jansen, Werker, de Bock, 2013; Tykkä, Asko-Seljavaara, Hietanen, 2001; 2002), and a decrease of objective indicators such as hazard of death (Agarwal, Agarwal, Pappas, Neumayer, 2012). Focusing only on advantages and disregarding possible losses is also justified from the ethical point of view, as it helps protect the patients against the information on the negative outcomes that may result from breast reconstruction.

Risk perception, the third variable explaining the intention in HAPA, is related, in case of a disease, to the occurrence of possible complications if a current course of action is maintained. In HAPA the risk perception

is seen as the more distal antecedent of the patient's outcome expectancies. When a post-mastectomy woman contemplates breast reconstruction, she first evaluates possible future hazards that may result from her deciding against the reconstruction. Risk perception may then affect the assessment of the experienced consequences of mastectomy, which include prosthesis effects (back pain, intertrigo, being ashamed of one's nudity, also in front of the sexual partner), a feeling of disability affecting the social roles a woman fulfils, and mental disorders (e.g. depression). However, risk perception alone is insufficient to enable a person to formulate an intention, since it may precede the motivational stage, in which the proper predictors are outcome expectancies and self-efficacy (Scholz, Shüz, Ziegelmann, Lippke, Schwarzer, 2008; Schwarzer, 2008).

Aims of the study

The aim of the study was to determine the role that self-efficacy, outcome expectancies, and consequences of mastectomy as well as related hazards (risk perception) play in the process of making a decision to undergo breast reconstruction. Additionally included, as moderators of the relation between the variables, were: depression, age and durability of the disease.

The empirical evidence indicates that if women more susceptible to depression decide to undergo breast reconstruction (Keith, Walker, Walker, Heys, Sarkar, Hutcheon, Eremin, 2003), then the satisfaction with the outcome is lower, in comparison with non-depressive women (even after control of sociodemographic variables - see Roth, Lowery, Davis, Wilkins, 2007). The high level of depression is then considered to be a contra-indication for breast reconstruction (Montebarocci, Lo Dato, Baldaro, Morselli, Rossi, 2007). According to the known impact of sociodemographic variables and disease-related variables, it is the age and duration of the disease that may - to the highest degree - influence the decision to undergo breast reconstruction (e.g. Fallbjörk, Karrlson, Salander, Rasmussen, 2010; Giroto, Schreiber, Nahabedian, 2003; Lee, Hultman, Sepucha, 2010; Zycinska, Gruszczynska, Choteborska, 2014). Older women and those with a longer duration since diagnosis of the disease are less likely to opt for breast reconstruction.

Methods

Participants

The study comprised 178 women after total cancer-related mastectomy, aged between 27 and 80 ($M = 53.36$, $SD = 10.55$), the majority being married or cohabiting with a partner (71.1%). Almost half of the participants, i.e. 48.9%, had high school education, 27.2% - university education, 23.9% - basic vocational and elementary school education. The average time after diagnosis of the breast nipple tumour was 51.2 months ($SD = 69.7$), the range was from 2 to 322 months. At the time of the study, most of the women were not receiving treatment (62.4%). Patients under treatment

during the previous month reported a loco-regional stage of illness as well as similar frequency of chemotherapy (14.4%), radiotherapy (13.3%) and hormonal therapy (19.4%). Exclusion criteria were: age below 18 years, partial mastectomy, immediate reconstruction, metastases and currently ongoing psychiatric treatment.

The study was carried out according to the guidelines of the institutional ethics committee for human research, all the participants gave informed consent.

Measurement of the HAPA variables

The examples of psychometric scales of social-cognitive variables were taken from Schwarzer (2008) and Schwarzer, Lippke, & Luszczynska (2011), and tailored to the context of the present study, i.e. to the process of making the decision about breast reconstruction. A pilot study using own tools was conducted on a group of four women after mastectomy and breast reconstruction, in order to eliminate ambiguous or incomprehensible items, while the items validity was assessed by a psycho-oncologist.

The self-efficacy was assessed by eleven items. The item stem "To what extent could you overcome the following difficulty? I am able to undergo breast reconstruction ..." was followed by the confidence in being capable of overcoming difficulties related to breast reconstruction, for example "...even if the arm on the treated side will remain immobile for a certain period of time". Cronbach's alpha for the present study was .97.

Positive outcome expectancies regarding breast reconstruction were measured by nine items. All the items had the stem "What might help you decide to undergo breast reconstruction? I am able to undergo reconstructive breast surgery ..." followed by beneficial results, such as "...to become more attractive" or "...to feel secure in sexual relations". Cronbach's alpha for the present study was .98.

The consequences of mastectomy were evaluated by twenty-two items. The participants were asked to indicate the extent of negative results of mastectomy they currently experienced, for example: "I now have a distorted silhouette" or "I experienced difficulties in accomplishing life aims". The response format for all the scales (also self-efficacy and positive outcomes expectancies) was a five-point rating scale ranging from 1- *definitely not* to 5- *definitely yes*. Cronbach's alpha for the present study was .96.

The risk perception was measured by twenty-two items addressing long-term threats resulting from consequences of mastectomy, the stem being, "In comparison with the women after mastectomy, the probability that ...", which was followed by the item such as "...I will feel inferior as a human/person". The response format was a seven-point rating scale ranging from (-3) - *much below average* to (+3) - *much above average*. On the grounds of an analysis of representations of all possible responses, 11 items were excluded from the scale and from further analyses. The corrected coefficient of correlation between the particular items and the global score for the present study was over $r = .70$, and the Cronbach's $\alpha = .95$ was satisfactory.

The intention to undergo breast reconstruction was measured by five items, beginning with the stem that gave a specified time frame for the intended action: "During the next six months I intend to ...", which was finished by the items such as "...seek medical consultation considering reconstructive breast surgery" or "...talk with a woman after breast reconstruction". The response format for this scale was also a five-point rating scale ranging from 1 - *definitely not* to 5 - *definitely yes*. Cronbach's alpha for the present study was .96.

Measurement of depression

The Beck Depression Inventory (BDI, by A. Beck, Polish adaptation: Parnowski, Jernajczyk, 1997), one of the most widely used self-report scales for depression, was chosen because of its particular focus on cognitive attitudes rather than due to somatic symptoms. BDI contains 21 items with a total score from 0 to 63. Cronbach's alpha for the present study was .93. This tool was validated among cancer patients, including post-mastectomy women (Berard, Boormeester, Viljoen, 1998), therefore the optimum cut-off point of 16 for the BDI total score was used for further analyses.

Data analysis

Structural equation modeling (SEM) with AMOS 6.0, using maximum likelihood, was employed to test the variables of structural assumptions. Bootstrapping procedure was used to assess the indirect effects. This procedure did not impose the assumption of normality of sampling distribution of indirect effects, and the analyses could be conducted on relatively small samples. Featuring higher power, it still maintained adequate control over Type I error rate (Preacher, Hayes, 2008). An indirect effect was considered to be significant if the 95% bootstrap confidence interval of estimate from 5000 bootstrap samples did not include zero.

All the variables in the hypothesized model were specified as latent variables using the above-mentioned items as manifest indicators of the HAPA motivational constructs. Risk perception was included into HAPA as threats resulting from the refraining from breast reconstruction. It was a predictor of positive outcome expectancies and perceived consequences of mastectomy. Risk perception, positive outcome expectancies and self-efficacy were all inter-correlated and considered to be predictors of intention to undergo breast reconstruction. It was this model that was used if depression, age of the participants, or duration of the disease were moderators.

Results

All the mean values, the standard deviations and the inter-correlation between the social-cognitive variables of HAPA are displayed in Table 1. Almost all the variables were significantly associated with each other. Moreover, all the variables except risk perception were significantly related to the intention to undergo breast reconstruction.

Table 1. Inter-correlation between latent variables included in the study.

Variables	2	3	4	5	M	SD
1. Self-efficacy	.72***	.53***	.14	.74***	2.63	1.32
2. Positive outcome expectancies		.65***	.14	.78***	3.13	1.46
3. Consequences of mastectomy			.44***	.54***	2.77	1.02
4. Risk perception				.14	.32	1.20
5. Intention					2.47	1.46

Note. *** $p < .001$.

Predicting the intention to undergo breast reconstruction

The model tested whether the motivational HAPA variables and consequences of mastectomy predicted the intention to undergo breast reconstruction (see Figure 1). The model fit was satisfactory and fit indices are presented in Table 2. The risk perception addressing long-term threats as results of refraining from breast reconstruction and consequences of mastectomy were not directly related to the intention, but they predicted positive outcome expectancies (respectively: $\beta = -.15, p < .05$ and $.70, p < .001$). Among the variables mentioned above, only the consequences of mastectomy had indirect effect on the intention via positive outcome expectancies ($\beta = .27, p = .003$). The direct effect of positive outcome expectancies explained the variance for the intention to undergo breast reconstruction to a larger extent ($\beta = .50, p < .001$), in comparison with self-efficacy. Self-efficacy was also closely and significantly related to the intention (only the direct effect was observed: $\beta = .38, p < .001$). All in all, 67% of the variance in the intention was accounted for.

Differences in the prediction patterns depending on depression, age, and duration of the disease

The next step was to test the relationships of the motivational HAPA variables from the model for all the participants if depression, age, and duration of the disease were moderators. The analysis of fit indices showed that all the models were well fitted to the data (see Table 3), with the model related to the duration of the disease due to the RMR (root mean square residual, see Hu, & Bentler, 1998; 1999) showing the best fit. The results obtained indicated that, irrespectively of the selected groups, the obtained structure of the basic model was preserved. The consequences of mastectomy and the risk perception did not have a direct effect on the formulation of intention. The outcome expectancies and self-efficacy directly explained the variance of the intention to undergo breast reconstruction. It is worth emphasizing that the risk perception was directly related to outcome expectancies, and was decisively weaker than consequences of mastectomy, which explain their variance to a larger extent. This was confirmed in further, more detailed analyses; first of all in the groups

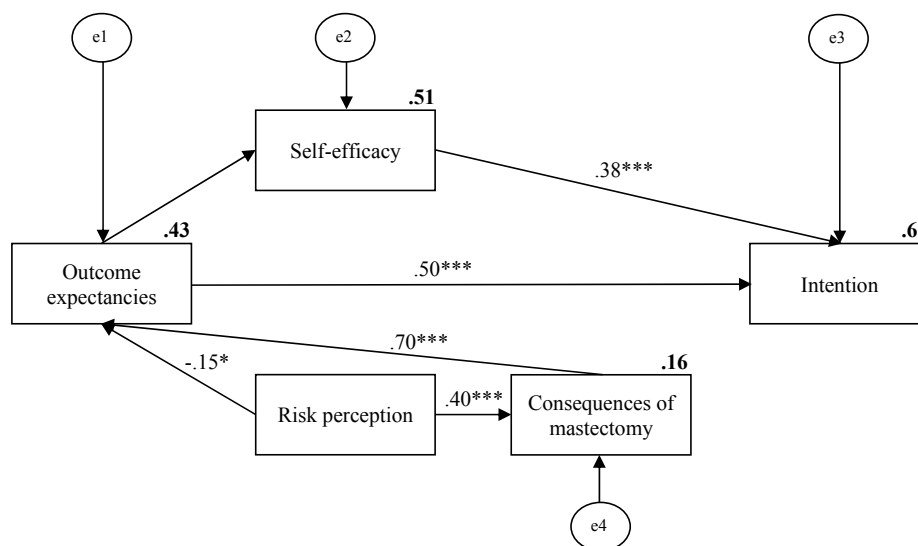


Figure 1. SEM for the hypothesized model (only statistically significant paths are shown).

Note. * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 2. Goodness-of-fit indices for the hypothesized model.

Basic model	χ^2	df	p	χ^2/df	RMR	GFI	CFI	RMSEA ^a	TLI	NFI
	3.15	4	.53	.79	.32	.99	1.00	.00 (.11)	1.00	.99

Note. ^a The upper bound in 90% confidence interval is shown in brackets.

Table 3. Goodness-of-fit indices for the model tested whether depression, age, and duration of disease were moderators.

Model (moderator)	χ^2	df	p	χ^2/df	RMR	GFI	CFI	RMSEAa	TLI	NFI
Depression	9.86	8	.28	1.23	.55	.98	.99	.04 (.10)	.99	.98
Age	11.29	8	.19	1.41	.32	.98	.99	.05 (.11)	.98	.97
Duration of disease	2.90	8	.94	.36	.24	.99	1.00	.00 (.02)	1.00	.99

Note. ^a The upper bound in 90% confidence interval is shown in brackets.

with lower probability of taking the decision to undergo breast reconstruction (composed of women suffering from depression, being at a more advanced age, or those suffering from the disease for a longer period of time, see Table 4).

In the models with depression as moderator, it was found that in the group of patients with depression (BDI ≥ 16) the path between the risk perception and outcome expectancies was not statistically significant. It should be added that the main effect of the expectancies (despite the less profound impact of the consequences of mastectomy) was stronger, the role of self-efficacy being simultaneously diminished. In both groups (including the group of women without the symptoms of depression: BDI < 16) the consequences had comparable indirect effects on self-efficacy and intention ($p \leq .003$). The level of the explained variance for both models was similar and close to that of the basic model, i.e. 68% and 69%. Of interest is the fact that the difference between the mean results of intention for both groups was statistically insignificant ($t = .27$; $df = 176$; $p > .05$).

The test of the basic model with the age of the examined women as moderator produced the most surprising dependencies. In the younger age group (≤ 50 years of age) the highest level of the explained variance was reached – 75%, the highest direct effect being related not to the outcome expectancies, as was the case in the previous models, but to self-efficacy (respectively: $\beta = .28$, $p < .001$; $\beta = 0.64$, $p < .001$). Additionally, the outcome expectancies had indirect effect on intention via self-efficacy ($\beta = .50$, $p = .002$). The path structure was different in the group of women above the age of 50. Apart from the fact that risk perception did not have a direct and statistically significant effect on the outcome expectancies, the path between self-efficacy and intention to undergo breast reconstruction was also insignificant. This can only mean that self-efficacy did not explain intention, the latter being directly explained only by the outcome expectancies. The indirect effect of the consequences of mastectomy on intention was not significant here, either. The explained intention variance in the group of women above the age of 50 reached 57%

Table 4. Intention and its predictors for the model tested whether depression, age, and duration of disease were moderators.

Paths (β)	Moderators					
	Depression (BDI total score)		Age (years)		Duration of disease (months)	
	<16 N = 50	≥ 16 N = 128	≤ 50 N = 73	>50 N = 105	≤ 36 N = 97	>36 N = 83
Risk perception → Consequences of mastectomy	.34***	.43***	.38***	.41***	.42***	.31**
Risk perception → Outcome expectancies	-.17*	-.02	-.15	-.15	-.16	-.16
Consequences of mastectomy → Outcome expectancies	.72***	.63***	.68***	.65***	.57***	.71***
Outcome expectancies (R^2)	.47	.38	.41	.36	.28	.45
Outcome expectancies → Self-efficacy	.78***	.54**	.69***	.66***	.67***	.68***
Self-efficacy (R^2)	.61	.30	.48	.43	.45	.46
Outcome expectancies → Intention	.43***	.64***	.28**	.67***	.46***	.60***
Self-efficacy → Intention	.44***	.28**	.64***	.12	.40***	.27**
Intention (R^2)	.68	.69	.75	.57	.61	.65

Note. * $p < .05$; ** $p < .01$; *** $p < .001$.

and was the lowest among all the tested models. However, unlike in the previous groups, the mean results for intention were statistically significantly different, being – predictably – higher in the group of younger women than in the group of older women ($M_{<50} = 16.42$; $M_{>50} = 9.97$, respectively; $t = -6.27$; $df = 115,96$; $p < .001$).

The final model to be tested featured the duration of disease as moderator. In this model, the path from risk perception to outcome expectancies was not significant; risk perception had only an indirect effect on the outcome expectancies via the consequences of mastectomy, irrespectively of the examined group of women ($p < .05$). Not surprisingly, the effect of mastectomy on the outcome expectancies was stronger in case of women with a longer duration of the disease. As was the case with the previous model, (age as a moderator) in the group with a longer duration of the disease (exceeding 36 months), i.e. with a lower probability of taking a decision to undergo reconstruction, the role played by the outcome expectancies in explaining the variance increased, while the role of self-efficacy was less important ($\beta = .60$, $p < .001$; $\beta = 0.27$, $p < .01$, respectively). Also in this model women with a shorter duration of disease (less than 36 months) evaluated the intention significantly higher than the women with a longer duration ($M_{<36} = 15.14$; $M_{>36} = 9.25$, respectively; $t = -5.95$; $df = 171.82$; $p < .001$).

Discussion

The tested model based on social-cognitive HAPA variables after the introduction of moderators made it possible to explain variances ranging from 57% to 75%, concerning intention to undergo breast reconstruction. Only two variables had a direct effect on intention, i.e. self-efficacy in the process of initiating actions aimed at the reconstruction, and the outcome expectancies related to these actions. The obtained results may indicate prevailing beliefs among women in this respect (see Schwarzer, 2008), and remain cohesive with the results verifying HAPA in the examinations of patients that suffered from a heart attack (Schwarzer, Luszczynska, Ziegelman, Scholz, Lippke, 2008) or obese patients (Lippke, Plotnikoff, 2014). Without a direct effect on intention, risk perception only played a role in the formation of outcome expectancies and in the assessment of the negative consequences of mastectomy. The latter variable explained the intention to undergo breast reconstruction only indirectly, via the outcome expectancies. The obtained results, therefore, confirm the distant role of risk perception and consequences of mastectomy in forming the outcome expectancies, which effectively means that both variables lose their significance as predictors of intention once the outcome expectancies become fully formulated. On the same basis it may also be stated that the women who participated in the study had considered breast reconstruction earlier, and that their motivation was a result of the fact that they felt competent to achieve the intended results of the reconstruction.

It should be underlined one more time that the consequences of mastectomy, unlike risk perception,

influenced indirectly the intention to undergo breast reconstruction. It was easier for the examined women to assess the present negative effects of mastectomy than to predict what these effects might be in the future, should breast reconstruction not take place. It seems, therefore, that the experienced difficulties resulting from the disease may constitute a better predictor of the intention than risk perception. Such a solution had been previously put forward by Bandura (1997), who enhanced STC by the addition of socio-structural factors, which may concern both the patient and her surroundings (e.g. health care system). The definition of this construct, however, is very wide and its significance has so far rarely been verified in studies. The present study indicates that the experienced symptoms of the disease (e.g. pain, tiredness, intertrigo, etc.) may influence the decisions regarding further treatment. The significance of risk perception cannot be diminished, however, since one's own beliefs concerning possible hazards, along with implementation intentions, can contribute to the undertaking of a desired action, i.e. in the volitional stage (Leventhal, Singer, & Jones, 1965, after: Leventhal & Mora, 2008).

The introduction of such moderators as depression, age, or duration of the disease does not alter the relationship between the variables, but it does change the significance of the variables that directly influence the intention, i.e. self-efficacy and the outcome expectancies. In case of models verified in the groups with poorer resources (women showing symptoms of depression, older women, and those with a longer duration of the disease), like in case of the basic model, the influence of outcome expectancies on the intention to undergo breast reconstruction is greater, but the role of self-efficacy is less significant, and in the model for older women even insignificant. This fact can be explained in the following two ways: on the one hand women with poorer resources form inadequate, wishful outcome expectancies regarding breast reconstruction. Wishful thinking may be treated here as a strategy for coping with the disease, enabling the patient to preserve her sense of self-esteem or to remain in control of her own fate. On the other hand, however, if one takes into account the fact that wishful thinking occurs in the decision making process, then it can result in a patient opting for an action that exceeds her capabilities and, eventually, may lead to failure (see Kofta, 2001). This may explain the dependency discussed above, in which depressive women deciding to undergo reconstruction were less satisfied with the outcome (Roth, Lowery, Davis, Wilkins, 2007).

Self-efficacy in the process of making a decision regarding breast reconstruction does not mediate between the outcome expectancies and intention, when the resources are poor. This may lead to the conclusion that low resources play a preventive role, guarding the patient against the feeling of dissatisfaction with breast reconstruction (see Życińska, Gruszczynska, Choteborska, 2014). In view of the previously discussed conclusions and the contextual character of the examined variables, it is more justified to state that self-efficacy is a regulator in forming the intention and then in implementing it. According to the assumptions posed by SCT (Bandura, 1997) or HAPA (Schwarzer,

2008), it is self-efficacy that initiates and then monitors action. The fact that it does not affect the intention or that it forms it to a smaller extent only means that despite the high outcome expectation, there is less probability that the action will be initiated. If, nevertheless, the action is undertaken, then there is a reasonable chance that it will be abandoned once the first obstacles are encountered along the way (e.g. the patient finds out that breast reconstruction surgery is not offered in the hospitals near her place of residence). Under these conditions patients may attempt to work out adequate outcome expectancies regarding breast reconstruction and strengthen self-efficacy even before the surgery takes place, adjusting these actions to their age. The studies conducted among women above the age of 65 are promising, since it was these patients that were most satisfied with the breast reconstruction outcome in comparison with younger women or post-mastectomy women (Giroto, Schreiber, Nahabedian, 2003). The older patients, however, complain more often of post-treatment somatic symptoms (ibid.), and - from the point of view of the preparations for the reconstruction - they require depression evaluation by means of tools adjusted to this age group.

To sum up, one needs to indicate the limitations of this study, resulting from the use of a cross-sectional design, which does not reflect the dynamics of the process of change (Sutton, 2000). In view of the fact that - at this point - there are no guidelines on the preparation of post-mastectomy women for breast reconstruction, the obtained results may be used as a good foothold for further research in the longitudinal design, taking intervention into account. As it was mentioned earlier, such studies would be aimed at forming adequate outcome expectancies, as well as strengthening self-efficacy prior to reconstructive treatment. The research of this kind should look at the kind of breast reconstruction (delayed or immediate) and the age of women; it should also evaluate post-treatment health related quality of life and satisfaction from breast reconstruction.

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