

## The role of resiliency in the process of adaptation to life after heart transplantation

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### Summary

**Aim.** The aim of the research was to find out if resiliency is a potentially significant factor in the process of adaptation after heart transplantation.

**Material and methods.** The research included 53 people after heart transplantation, hospitalized in the John Paul II Hospital in Kraków. Measures included a self-made interview questionnaire; the Acceptance of Illness Scale, the Polish Resiliency Assessment Scale SPP-25. The necessary statistics were conducted by means of SPSS program.

**Results.** Examined group of heart transplant patients appeared to be well adapted to living with a transplanted heart and was characterized by an average level of resiliency. The results supported the hypotheses regarding the relationship between resiliency and adaptation after heart transplantation. Personal skill to cope, to tolerate negative emotions and failures as well as the ability to view life as a challenge seem to play a special role in the process of adapting to life with a new heart.

**Conclusions.** Resiliency is a factor significantly related to adaptation after heart transplantation, and it has implications for clinical practice, especially for the rehabilitation of patients after transplantation. It seems to be important to shape and develop these elements of resiliency which are mostly related to positive adaptation after heart transplantation.

resiliency / adaptation / heart transplantation

### INTRODUCTION

The notion of resiliency refers to the ability of an entity to separate himself/herself from negative experience and resilient adaptation to changing living conditions [1]. Initially researches on this construct applied to children and youth who could function well in unfavourable conditions despite difficult living conditions and traumatic experiences [2]. Due to the adaptive function of the resiliency, showed in researches, there is a slow increase in the interest in that notion concerning adult people. Researchers started to search for relationships between resiliency,

health and a quality of life of the individual indicating its protective function in situations of stress, including stress related to permanent breakdown of health [4-5].

The term resiliency/resilience derives from Latin terms “salire” and “resilire”, which mean to spring, to rebound and to return to the previous state [3, 6]. The researches on resiliency have been carried out since 1950's [3], however they have not yielded final results and an agreement on the substance of this construct. Luthar, Cicchetti and Becker [7] note that in the literature devoted to this subject there are two different concepts: (ego-)resiliency and resilience. The first notion refers to the feature, personal characteristics or individual resources. In this approach this term was introduced by Block [3, 8] in researches concerning youth personality and it has been used to identify individual, dynamic ability to modi-

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fy behaviour in the situation of change of living conditions [1]. The second notion, introduced to a dictionary of the social science by child development researchers: Garemzy, Werner and Rutter [2], is used to determine dynamic and protective process that reduces individual maladjustment in the situation of difficult experience and unfavourable conditions. In this approach the fact of co-occurrence of risk factors, vulnerability and protective factors, that this process comprises of [2], together with the necessity of an occurrence of a difficult situation, adversities or danger is emphasised for this process, so that it can be activated [7]. However, the review of articles on the notion of resilience shows that the term "resilience" is also used to determine certain personality characteristics, ability or skill [9-12], which indicates certain inconsistency in the use of these terms.

The understanding of the term resilience, more precisely resiliency, proposed by Ogińska-Bulik and Juczyński [3], has been adopted to this study. They use this term to determine theoretical construct that consists of different personality characteristics including: (1) persistence and determination in action, (2) openness towards new experiences and a sense of humour, (3) personal skills to cope and tolerance to negative emotions, (4) tolerance to failure and view life as a challenge, (5) an optimistic attitude towards life and the ability to self-mobilization in difficult situations. Such an understanding of resiliency constitutes a self-regulation mechanism protecting against negative experience and seems to be closely related to other personal resources, including optimism, emotional stability or a sense of self-efficacy. However, according to Ogińska-Bulik and Juczyński [6], it is a broader concept, superior to them, it is a kind of metaresource similar to the sense of coherence due to the cognitive-emotional and behavioural components of this construct in Antonowski's conception [13].

Previous studies conducted on resiliency within health psychology show that this is a resource related to better condition of physical and mental health, and wellbeing of different groups of people, e. g. patients with ischemic heart disease, women with the diagnosis of breast cancer or people with schizophrenia [14-16]. Due to the role of resiliency in the process of resilient adaptation to changing living conditions [1, 11,

17], proven in studies, its relationship with the life after the heart transplantation has been assumed in this research project.

People who had heart transplantation are in a special situation. Transplantation as a treatment allows recipients to return to normal functioning in the family, at work, in society, but under certain conditions. The moment of transplantation is not the end of the recipient's way to recovery but it is the beginning of a long period of rehabilitation and learning how to function with a new heart which requires submission to the post-transplantation rigorous recommendations and the reorganization of the whole former life of the person after the transplantation and his/her family [13, 17-18]. However, positive adaptation after transplantation concerns not only adherence to medical recommendations. It is a multidimensional process taking place on the level of physical, mental (cognitive, emotional and behavioural) and social functioning of the heart recipient. It includes the process of taking control of vital functions by a new heart and stabilization of a circulatory system; building a new identity of the heart recipient; developing new goals and life plans, and taking actions related to them: achieving and maintaining emotional balance; building positive social relationships [13-18].

Proper adjustment to life after the heart transplantation is also conditioned by a number of factors involving not only the state of somatic health and mental functioning, but also living conditions of people after transplantation. For psychologist working with heart recipients identification of factors which can be helpful in the process of effective adaptation after heart transplantation, particularly those referred to as health potentials, is essential [19]. The knowledge about what determines the fact that some people manage with difficulties related to transplantation and others do not, can help in designing effective supporting and therapeutic actions, giving the heart recipients the chance for both longer survival after the surgery and obtaining feeling of satisfaction with life. Previous studies on resiliency suggest that it can be such a protective factor which supports the process of learning how to live with new heart and it can also be a crucial resource facilitating coping with

this new and challenging situation by heart recipients.

### AIM OF THE STUDY

The aim of this study was to determine the importance of resiliency for the proper adaptation to life after the heart transplantation. It was assumed that those who are more resilient will have a better somatic health as well as a higher degree of psychosocial adjustment to life with a new heart, expressed in: acceptance of their situation by the heart recipients, adherence to medical recommendations, engagement in social or professional activity adjusted to the possibilities of heart recipients, leading a healthy lifestyle, achievement of emotional balance and the ability to control emotions, as well as the ability to establish positive social relationships and the readiness to use social support. An important element of the study was also to find which of resiliency factors play the greatest role in the process of proper adaptation to life with the new heart.

### MATERIAL AND METHODS

The study was carried out in Clinical Department of Cardiovascular Surgery and Transplantation, Jagiellonian University Medical College John Paul II Specialized Hospital in Krakow. 53 persons after a heart transplantation aged 22 to 75 years (mean age:  $54.5 \pm 12$  years) participated in the study. The study included all patients who underwent transplantation in this hospital together with those who were present on the ward during the periodic control hospitalization in the period from January to June 2010. Excluding criterion was a medical condition that made the participation in the survey impossible. The group of subjects consisted of 15 women (28.3%) and 38 men (71.7%) which reflects the population of heart recipients, which is dominated by men [16]. Heart recipients at the time of the study were from 4 months to 18 years after transplantation (mean 10 years after transplantation), and among the diagnoses leading to heart transplantation were successively as follows: cardiomyopathy, post-inflammatory cardi-

omyopathy, and heart diseases unresponsive to surgical correction. Mean left-ventricular ejection fraction of subjects at the time of the study amounted at 57 (SD=9.34). The majority of subjects had a professional (47.2%) and secondary (35.8%) education level. The majority of the examined heart recipients live in a city with more than 100 thousand inhabitants, are married and have children.

The study was carried out in the time when the approval from Ethic Commission in the Institute of Psychology on Jagiellonian University was not demanded but the research made every effort to ensure the performance research in accordance with the rules of ethics.

Each examined person consciously and voluntarily agreed to participate in the study after being informed about the aim of the study and the possibility of resignation from this participation at any time, without consequences for the process of treatment. After the interview, depending on the somatic and mental health of the examined person, further tests were performed alone or with the help of the examiner who was reading the questions and marking the answers on the test sheets. If there was such a necessity, due to the nature of the place in which the study was conducted as well as the condition of the patient, examination of one person was carried out for several days. The information taken from patients during interviews were additionally supplemented with the information taken from the analysis of medical documentation, especially information referring to somatic health of examined heart recipients.

The self-made structured interview questionnaire was used in this study. This questionnaire consists of three parts: (1) particulars; (2) questions concerning health condition before and after the transplantation, and diagnosis leading to transplantation, and (3) a series of questions about indicators of psychosocial adaptation after heart transplantation. In the third part of the interview 4 point scale on the basis of which the Indicator of psychosomatic adaptation after heart transplantation (WAP, Wskaźnik adaptacji psychospołecznej po przeszczepie serca) was used. Moreover on the basis of the interview and the information taken from patients' medical documentation the Indicator of somatic health condition (WSZS, Wskaźnik st-

anu zdrowia somatycznego) was calculated. It was assessed on the basis of experiencing organ failure or not, complications, infections, diseases after transplantation and the level of left-ventricular ejection fraction.

As an indirect measure of assessing adaptation to living with a transplanted heart the Acceptance of Illness Scale (AIS) created by Felton, Revenson and Hinrichsen in the Polish adaptation of Juczyński [19], which allows the measurement of the degree of acceptance to the disease and adaption to it, was also used. It contains eight statements describing consequences of poor somatic health condition which the examined person assesses using the five-point scale ranging from "1" - "strongly agree" to "5" - "strongly disagree". The subjects can score from 8 to 40 points. The high score indicates an acceptance of their condition, better adaptation and lower sense of psychological discomfort. Low score indicates a lack of acceptance of the disease expressed in experiencing negative emotions related to the disease. Cronbach's alpha coefficient for the Scale is 0.85, and the stability of the scale in the double study, 4 weeks apart - 0.64.

The third tool used in the study was the Polish Resiliency Assessment Scale - SPP-25 (Skala Pomiaru Prężności) created by Ogińska-Bulik and Juczyński [3]. It consists of 25 statements on a variety of personality characteristics included in resiliency, which the examined person assesses using the five-point scale ranging from "0" that means "definitely not" to "4" - "definitely yes." The result is calculated for the whole scale and 5 factors included in the scale: (SPP1) Persistence and determination in action, (SPP2) Openness to new experiences and a sense of humour, (SPP3) Personal skills to cope and tolerance to negative emotions (SPP4) Tolerance to failure and view life as a challenge, (SPP5) An optimistic attitude towards life

and the ability to mobilize themselves in difficult situations. The greater number of points obtained, the greater the intensity of resiliency. The general result can be presented on a standard ten point scale in which results from 1 to 4 indicate low, from 7 to 10 average, and from 7 to 10 high level of resiliency. The scale possesses satisfactory psychometric properties: reliability measured by Cronbach's alpha coefficient amounts at 0.89, the absolute stability measured by test-retest after 4 weeks - 0.85.

To make statistical analysis of the collected material a statistical package SPSS v. 19.0.0 was used and the following methods were applied: descriptive statistics, the Shapiro-Wilk test (to check the normal distribution of measured variables), Pearson r correlation matrix. Results at  $p < 0.05$  were considered as statistically significant.

## RESULTS

The first step of the analysis was to assess the level of biological and psychosocial adaptation of the examined heart recipients. The results showed that the subjects are characterised with good (50.9% of subjects) and, in many cases, very good (30.2% of subjects) health condition (assessed using WSZS). Health condition of 8 heart recipients (15.1% of subjects) can be described as average, and only of 2 persons (3.8% of subjects) can be described as bad. Mean level of WAP in the examined group of people after heart transplantation amounts at 21.7 (SD=3.3), and AIS at 27.7 (SD=6.7)

The mean result of the examined heart recipients in the SPP-25 amounts to 70.2 (SD=14.6). This is an average result and reaches 5 on the standard ten point scale. Detailed distribution of results for the variable resiliency and its factors are presented in Tab. 1.

**Table 1.** Descriptive statistics for the variable factors of resiliency

Variable	Mean	SD	Min.	Max.
SPP – Resiliency	70.16	14.63	38	99
SPP1 - Persistence and determination in action	15.32	3.15	7	20
SPP2 - Openness towards new experiences and a sense of humour	14.98	3.48	5	20
SPP3 - Personal skills to cope and tolerance to negative emotions	12.40	4.32	2	20
SPP4 - Tolerance to failure and view life as a challenge	14.28	3.31	6	20
SPP5 - An optimistic attitude towards life and the ability to self-mobilization in difficult situations	12.89	3.60	3	20

Next step of the analysis was to examine whether the level of adaptation after the heart transplantation (measured using WSZS, WAP and AIS) and the level of resiliency are related to the age of subjects and the time that elapsed since the transplantation. Analyses made after checking the normality of distribution of variables using Pearson's  $r$  correlation coefficient showed no statistically significant associations between these variables.

Then it was analyzed whether resiliency and its factors are related with adaptation after the heart transplantation. Pearson  $r$  correlation analysis showed no relationships between the level of resiliency and biological adaptation after heart transplantation. However, it was showed that with the increase in the number of points obtained in the SPP-25 increases the level of WAP. The Pearson correlation coefficient  $r$  was 0.58 ( $p = 0.00$ ) indicating a strong relationship between the analyzed variables. Further analysis presented a positive correlation between WAP and the all factors of resiliency; for SPP2, SPP3, SPP4 this is a strong correlation, for SPP5 this is moderate correlation, and for SPP1 this is poor correlation. The detailed results of the analyzes are presented in Tab. 2

## DISCUSSION

Persons from the examined group can be described as well-adapted to life with a new heart. Both somatic health condition (measured using WSZS), which can be an indirect measure of biological adaptation after heart transplantation and other used measures of psychosocial adaptation (AIS and WAP) confirm this conclusion. The average result in Acceptance of Illness Scale appears to be even higher than the results obtained by other groups of patients, including diabetics, dialysis patients with multiple sclerosis or myocardial infarction [19]. The level of adaptation was not related to age of the examined persons or the time that elapsed since the transplantation.

Subjects were characterized with an average level of resiliency – reaching 5 on the standard ten point scale. Persons after heart transplantation obtained average result in SPP-25 scale which was similar to the average result obtained in other groups examined using this tool, e.g.: students ( $M=69.8$ ,  $SD=13.0$ ), paramedics ( $M=69.8$ ,  $SD=11.9$ ), diabetics ( $M=72.7$ ,  $SD=9.7$ ) or people in mourning ( $M=71.3$ ,  $SD=11.0$ ) [3, 15]. Examined people obtained the highest score on the Persist-

**Table 2.** Resiliency and the indicator of psychosomatic adaptation

Variable	The Indicator of psychosomatic adaptation after heart transplantation (WAP)	
	$r$	$p$
SPP – Resiliency	0.58	$p=0.00$
SPP1 - Persistence and determination in action	0.23	$p=0.05$
SPP2 - Openness towards new experiences and a sense of humour	0.52	$p=0.00$
SPP3 - Personal skills to cope and tolerance to negative emotions	0.55	$p=0.00$
SPP4 - Tolerance to failure and view life as a challenge	0.56	$p=0.00$
SPP5 - An optimistic attitude towards life and the ability to self-mobilization in difficult situations	0.47	$p=0.00$

\* $N=53$ ,  $p<0.05$  (one-way)

At the same time it was failed to prove that with the increase in the number of points obtained in the SPP-25, increases the number of points obtained in the AIS scale. There was a positive, but poor, relationship between the level of SPP3, SPP4 and the level of acceptance of the illness. Detailed results are presented in Tab. 3 – *next page*.

ence and determination in action scale, and the lowest on the Personal skills to cope and tolerance to negative emotions scale. The level of resiliency was correlated with the age of subjects or with the time that elapsed since the transplantation. It appears that these results did not confirm the thesis reported in the literature [20], that the resiliency is developing due to the difficulties experienced by the individual, the number of which is correlated with the time that elapsed

**Table 3.** Resiliency and the Acceptance of Illness

Variable	The Acceptance of Illness (AIS)	
	r	p
SPP – Resiliency	0.23	0.05
SPP1 – Persistence and determination in action	0.09	0.27
SPP2 – Openness towards new experiences and a sense of humour	0.16	0.12
SPP3 – Personal skills to cope and tolerance to negative emotions	0.27	0.02
SPP4 – Tolerance to failure and view life as a challenge	0.25	0.03
SPP5 – An optimistic attitude towards life and the ability to self-mobilization in difficult situations	0.13	0.18

\* N=53, p<0.05 (one-way)

since transplantation. This would suggest that the resiliency in the aspect proposed by Ogińska-Bulik and Juczyński [3] is a relatively stable system of personal characteristics.

The study did not confirm that there was a relationship between the level of resiliency and the degree of biological adaptation after heart transplantation. However, the weakness of the tool to assess somatic health - based on an arbitrary assessment of the researcher - should be taken into consideration. It would be valuable to conduct further research in this area, using other measures of somatic health assessment of heart recipients, for example, use the assessment of somatic health made by competent judges - members of the treatment team. Moreover, subjects which participated in this study mainly were characterized with good and very good health conditions, which could also affect the result indicating a lack of relationships between the level of resiliency and somatic health condition of examined hear recipients. Unfortunately, this limitation is difficult to overcome.

However, the study confirmed that there is a relationship between the intensity of resiliency and the degree of psychosocial adaptation to life with a new heart. The level of resiliency was strongly related to the Indicator of psychosomatic adaptation after heart transplantation. Study showed that resilient people in contrast to those with the so-called "fragile personality" [8] are more likely to meet medical recommendations, care for a healthy and active lifestyle, better cope with negative emotions and can make positive relationships.

The results confirm the characteristics of resilient individual as a person who copes better with stressful situations, feels less anxiety, is

able to arouse positive emotions in themselves even in difficult moments, is persistent in action, looks for new experiences, with optimistic forward-looking and easily wins over other people [6]. Features such as the ability to tolerate negative emotions and failures, possessing individual skills to cope, and openness to new experiences were closely related to the proper psychosocial adaptation after heart transplantation.

There was no relationships found between resiliency and the acceptance of the illness, which is indirect measure of psychosocial adaptation after heart transplantation, though, some factors of resiliency (personal ability to cope and the tolerance to negative emotions and tolerance to failure and view life as a challenge) correlated with it on the statistically significant level. However, in this case the relationships were poor. This suggests that resiliency is not that much associated with cognitive adaptation, which, in particular, is assessed using AIS, as it is - in contrast - with the behavioral and emotional aspects - which were assessed using WAP to the greater extend. However it is important to conduct further research in this area and examine how the level of resiliency is related to the degree of self-acceptance and self-esteem in people after heart transplantation, and whether it is important to the ability to build a new identity and a stable self-image with the transplanted heart. It would also be valuable to check whether resiliency in groups of people after different types of transplantation (e.g. kidney or liver transplantation) – as a control group for heart transplanted patients – is also a factor significantly associated with adaptation on different levels of functioning (physical, mental and social) after transplan-

tation. However, according to the aims of this study, the control group in presented research was not necessary.

## CONCLUSIONS

Previous studies on resiliency [21-22] show its positive relationship with individual's health, particularly in unfavourable and difficult situations that require coping with significant ballast and stress. One of such difficult and highly stressful situations is the need to undergo a heart transplant surgery and the subsequent period of rehabilitation and return to everyday life related to this. The study confirmed that resiliency is an important resource related to positive adaptation after heart transplantation. Such personal characteristics as the ability to tolerate negative emotions and to cope with difficult situations, in particular related to the experience of failure, as well as openness to new experiences are particularly important in learning how to live with a new heart.

Results showing the relationships between resiliency and the psychosocial adaptation after the heart transplantation, can outline practical implications for persons working with heart recipients, at least in some of its aspects. Oleś [23] indicates a predictive role of resiliency in determining the degree of adaptation in the situation of the mid-life crisis. By contrast, Connor's study [24] shows that the opportunity to restore health of people with posttraumatic stress disorder can be determined on the basis of the diagnosis of resiliency. The relationship between resiliency and adaptation, showed in the study, can suggest that the assessment of the level of resiliency before transplantation may be important for assessing the degree of adaptation after transplantation. Confirmation of this assumption requires further research, particularly longitudinal studies examining the level of time invariability of intensity of resiliency (which seem to be indicated by the above analysis).

On the other hand, assuming that, as it is reported by some authors [20] resiliency can be developed, an attempt to strengthen those features which are related to the greatest extent to successful psychosocial adaptation after heart transplantation, should be an important psycho-

logical impact area in both the period of preparation for the transplantation and during rehabilitation. Emerging researches on the effectiveness of training resiliency [25] can bring significant indication for psychological work in this area. They can determine areas of potential actions to enrich individual resources which support coping and successful adaptation after heart transplantation. Forming of such resources may be important not only for the current functioning after transplantation, but can also fulfil protective function in the situation of experiencing negative events that may occur in one's life in the future.

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