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## Resilience and Coping with Stress vs. Trauma Effects in People Living with HIV

### ABSTRACT

There are approximately 38 million HIV-positive patients in the world. The effectiveness of antiretroviral therapy has significantly increased the life expectancy of infected patients. The objective of this study was to observe the relationship between resilience (assessed using the SPP-25 Scale), coping strategies (Mini-COPE Scale) as well as trauma effects (SF-CiOQ Scale) and quality of life (SWLS Scale) in people living with HIV. The study included 78 individuals (26 women and 52 men) aged 18–65 years. Significant relationships between resilience and coping strategies were demonstrated in people living with HIV. Resilience and active coping were conducive to positive trauma effects and satisfaction with life. Non-adaptive coping strategies favored negative trauma effects. The strategy of positive reframing acted as a mediator in the relationship between resilience vs. positive and negative trauma effects in people living with HIV. The scores indicate the need for practitioners to focus on interventions which elevate resilience and active coping to improve mental health in people living with HIV.

### Keywords:

HIV, resilience, satisfaction with life, coping with stress, trauma effects, life with HIV

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There are approximately 38 million people living with HIV (PLWH) in the world (WHO, 2021). Thanks to effective antiretroviral therapy, the life expectancy of seropositive people is nearing the life expectancy of the general population (Samji et al., 2013). This leads to a change in the epidemiological presentation of HIV. Aging is becoming typical for infected patients, while the epidemic itself is not limited only to small groups of increased risk. HIV is increasingly affecting heterosexual women and men, as well as children.

### **HIV INFECTION AS A SOURCE OF STRESS**

Due to its complex nature, HIV infection may be a source of trauma for individuals. In UK studies, more than half of people found awareness of HIV to be the most stressful event in their lives (Theuninck, Lake, & Gibson, 2010). The experience of such intense trauma may carry with it negative consequences for psychological functioning (negative trauma effects). The most frequent effects of stress reaction in PLWH include: susceptibility to anxiety, emotional arousal, and submissiveness (Dobrakowski & Skalski, 2019). Despite being distressed, PLWH may also declare certain psychosocial benefits (positive trauma effects). This phenomenon is referred to as post-traumatic growth (PTG) and it pertains to positive transformations as a result of struggling with a problematic experience (Folkman & Moskowitz, 2007). Psychosocial benefits include: valuing life, changing one's life philosophy and improving interpersonal relations. PTG is a popular phenomenon among seropositive people. It may affect up to 83% of those infected with HIV (Milam, 2004).

### **RESILIENCE**

Resilience and Ego-resiliency refer to flexibility in the process of adapting to situational requirements (Letzring, Block, & Funder, 2005). These constructs describe the possibility of modulation with a level of self-control. They explain the functioning of people who cope with stress despite unfavorable conditions. Due to the theoretical differences underlying the individual constructs, distinctions were introduced between them. The term 'Ego-resiliency' is considered to be a basic, relatively permanent personality trait which determines motivational, emotional and behavioral processes (Luthar, Cicchetti, & Becker, 2000; Nadolska & Sęk, 2007). The notion describes human activity and the resulting everyday challenges. The construct concerns people without the experience of a traumatic event. Resilience is considered a dynamic process with the aim of adapting to a stressful event and it involves the activation and coordination of resources (Luthar et al., 2000). Elements significant for this process include dis-

tancing oneself from negative experiences and moving towards more adaptive ways of coping with stress. Resilience factors include perseverance or optimistic attitude to life, among others (Ogińska-Bulik & Juczyński, 2008). These findings have been confirmed in empirical studies – researchers observe strong relations between resilience and adaptive (positive) coping strategies (Campbell-Sills, Cohan, & Stein, 2006; Ogińska-Bulik & Juczyński, 2008). Garrido-Hernansaiz and Alonso-Tapia (2017) have thus far revealed a moderate negative correlation between the level of experienced HIV-related stress and resilience. Previous studies have shown mixed results in this respect (Westphal & Bonanno, 2007). Further research is needed in order to better understand the relations between resilience and PLWH psychosocial functioning.

### **COPING WITH STRESS**

The concept of coping strategies classifies human activity in order to reduce or cope with stress effects. Lazarus and Folkman (1984) concluded that the phenomenon of coping with stress is of a dynamic nature. The strategies themselves may be freely changed or replaced with others. An individual may use several methods at the same time. Lazarus and Folkman distinguished between two functions for the phenomenon of coping with stress: instrumental and expressive. The first one focuses on the problem and aims to reduce the impact of stressors. The second one is emotional and fulfills adaptive functions. The construct of stress coping strategy has been thoroughly documented and described in literature, including the exploration of factors (strategies) (Carver, Scheier, & Weintraub, 1989; Ogińska-Bulik & Juczyński, 2012). Research until now recognizes the key role of coping strategies in predicting trauma effects, also among PLWH (Dekel et al., 2016; Marotta-Walters, Choi, & Shaine, 2015; Ye, Chen, & Lin, 2018). Moreover, it is believed that adaptive coping strategies may mediate the link between resilience vs. PTG and PTSD intensity (Thompson et al., 2018; Yu et al., 2014). Similar studies have not been conducted in PLWH thus far.

### **SATISFACTION WITH LIFE**

Satisfaction with life involves referring one's own situation to subjectively set standards (Diener et al., 1985; Juczyński, 2001). Next to self-esteem, it is considered to be the main component for the general indicator of individual well-being (Kaduvettoor-Davidson & Inman, 2013). Research on the relation between resilience and satisfaction with life is consistent. Fredrickson et al. (2003) stated that resilience correlates with satisfaction with life. Similar conclusions were presented by King (2000) in regards to people who experienced divorce. According to Frain

et al. (2008), family resilience may predict life satisfaction in PLWH. Moreover, researchers observed the link between adaptive (positive) coping strategies and life satisfaction (Hamarat et al., 2001).

## **MATERIALS AND METHODS**

### **RESEARCH PROBLEM**

The changing epidemiological presentation of HIV requires empirical research on the quality of life and psychosocial functioning in seropositive people. Based on the cited articles, we decided to formulate the following research questions:

1. Is there a positive relation between resilience factors and coping strategies in PLWH?
2. Do resilience and coping strategies allow for predicting trauma effects (PTG or PTSD symptoms) and satisfaction with life in PLWH?
3. Can coping strategies act as a mediator in the relation between resilience vs. trauma effects and satisfaction with life in PLWH?

It is believed that the activation of selected resilience dimensions (factors) and types of coping strategies is determined by the type (source) of the upsetting experience (Ogińska-Bulik, 2014). Therefore, the study is of an exploratory nature and no detailed working hypotheses have been formulated. The obtained data will allow for a better understanding of the link between resilience, coping and mental functioning in PLWH.

### **PARTICIPANTS AND PROCEDURE**

The study was conducted in the spring of 2019. The selection of the cohort was intentional, i.e., people living with HIV. The health condition of infected respondents and antiretroviral treatment did not constitute recruitment criteria. Information about the study was disseminated thanks to announcements in clinics treating acquired immunodeficiencies and at associations for the benefit of PLWH or people with AIDS from the Mazowieckie, Małopolska, Silesian and Lower Silesian provinces in Poland. The study was anonymous and voluntary.

The study included 78 patients with HIV (26 women and 52 men). The average age in the group equaled  $M = 34$  ( $SD = 6.56$ ). The study controlled the following: education, marital status, place of residence, as well as information on health

status, i.e., antiretroviral drug intake, viral load<sup>4</sup> and CD4<sup>5</sup> cell count according to the latest medical examination. A detailed distribution of the group is presented in Table 1. Each respondent expressed their consent to participate in the study. The test procedure involved filling out questionnaires with regard to resilience, coping and trauma effects.

**Table 1. Group Distribution Due to Sociodemographic Data and Health Status (N=78)**

	N	%
<b>Education</b>		
Primary	6	7.7
Secondary	50	64.1
University	22	28.2
<b>Marital Status</b>		
Single	30	38.5
Married	20	25.6
Informal relationship	24	30.8
Widow(er)	4	5.1
<b>Place of residence</b>		
Village	16	20.5
Town up to 100 ths residents	30	38.5
City above 100 ths residents	32	41
<b>Intake of antiretroviral drugs</b>		
No intake	6	7.7
Taking drugs for less than a year	26	33.3
From 1 to 2 years	14	18
Above 2 to 5 years	22	28.2
Above 5 years	10	12.8
<b>Viral load</b>		
Detectable	26	33.3
Non-detectable	52	66.7
<b>CD4 cell count</b>		
Less than 200/ $\mu$ l	10	12.8
Between 200/ $\mu$ l and 350/ $\mu$ l	10	12.8
Above 350/ $\mu$ l	58	74.4

Key: N= number of observations.

<sup>4</sup> The viral load determines the number of virus copies in the blood. Thanks to the effectiveness of antiretroviral therapy in 50–90% of patients, the viral load is less than 50 copies/ $\mu$ l of blood - i.e., undetectable viral load (Sweet, 2002).

<sup>5</sup> Antiretroviral therapy leads to an increase in the number of CD4 cells. A level above 350/ $\mu$ l reduces the risk of HIV-related diseases and infections (Samji et al., 2013).

## MEASURES

In the course of seeking an answer to the aforementioned research questions, the following were used:

- **Resilience Measurement Scale SPP-25** (Ogińska-Bulik & Juczyński, 2008) for measuring resilience as a process. The questionnaire consists of 25 items, arranged in 5 factors. An examined patient expresses their attitude towards statements on a 5-point Likert scale, where 0 – “strongly disagree”, and 5 – “strongly agree”. Cronbach’s alpha is .89 for the overall result and ranges from .67 to .75 for individual factors.
- **Mini-COPE** (Carver et al., 1989) in the Polish adaptation by Ogińska-Bulik and Juczyński (2012) for measuring the applied coping strategies. The questionnaire consists of 28 items, arranged in 14 strategies (2 statements for each strategy). An examined patient expresses their attitude towards statements on a 4-point Likert scale, where 0 – “almost never”, and 5 – “almost always”. Cronbach’s alpha ranges from .48 to .94 for individual factors.
- **The Satisfaction with Life Scale SWLS** (Diener et al., 1985) in the Polish adaptation by Juczyński (2001) for assessing life satisfaction. The questionnaire consists of 5 items. The tool is single-factor. An examined patient expresses their attitude towards statements on a 7-point Likert scale, where 1 – “strongly disagree”, and 7 – “strongly agree”. Cronbach’s alpha is .81.
- **Short form of the Changes in Outlook Questionnaire SF-CiOQ** (Joseph et al., 2006) in the Polish adaptation according to Skalski (2019) for measuring positive (PTG) and negative (PTSD symptoms) trauma effects. The questionnaire consists of 10 items, arranged in 2 scales. An examined patient expresses their attitude towards statements on a 6-point Likert scale, where 1 – “strongly disagree”, and 6 – “strongly agree”. Cronbach’s alpha is .85 for the scale of positive effects and .83 for the scale of negative effects.
- **Author’s survey** for collecting basic sociodemographic data and health information.

## STATISTICAL ANALYSES USED

Data from the carried out study were analyzed using SPSS ver. 25. The Kolmogorov-Smirnov test was used to check the normality of distribution. Levene’s test was used to verify the homoscedasticity of variance. The obtained results were of a normalized distribution nature, so it was possible to use parametric tests. Pearson’s *r* correlation coefficient was used to determine the relations between the variables. A step-version of the linear regression analysis was used for the purpose

of determining predictors for dependent variables. Mediation analysis was used to verify the mediation role of preventive strategies in the relation between resilience and dependent variables. The significance of the model was verified using the Sobel test.

## RESULTS

The resilience test returned an average score of 62.92 ( $SD = 14.49$ ). The highest values were obtained for factor 1, i.e., perseverance and determination in acting ( $M = 13.99$ ,  $SD = 3.63$ ). The lowest results were obtained for the 5<sup>th</sup> parameter of resilience, i.e., optimistic attitude to life and ability to mobilize in case of difficulties ( $M = 11.09$ ,  $SD = 3.12$ ). In the coping strategies study, high results were obtained regarding: planning ( $M = 1.97$ ,  $SD = .75$ ) and active coping ( $M = 1.89$ ,  $SD = .67$ ). Low results were obtained regarding: substance use ( $M = .75$ ,  $SD = .72$ ) and behavioral disengagement ( $M = .77$ ,  $SD = .75$ ). In the positive trauma effects study, an average score of 17.28 ( $SD = 5.30$ ) was obtained. In the negative trauma effects study, an average score of 14.67 ( $SD = 6.40$ ) was obtained among PLWH. In the satisfaction with life study, an average score of 18.62 ( $SD = 6.59$ ) was obtained. Set against standards, this score should be considered average, i.e., 5 sten. The mean results, standard deviation, minimum and maximum scores of the study variables are presented in Table 2.

**Table 2. Mean Test Results (N=78)**

	<i>Min</i>	<i>Max</i>	<i>M</i>	<i>SD</i>
<b>SPP-25</b>				
Resilience (general indicator)	24	86	62.92	14.49
1. Perseverance and determination in acting	6	19	13.99	3.63
2. Openness to new experiences and sense of humor	5	19	12.77	3.84
3. Personal competence to overcome adversities and tolerance for negative emotions	4	18	12.51	4.02
4. Tolerance of failure and treating life as a challenge	5	17	12.56	2.97
5. Optimistic attitude to life and ability to mobilize in case of difficulties	3	17	11.09	3.12
<b>Mini-COPE</b>				
1. Active coping	0	3	1.89	.67
2. Planning	0	3	1.97	.75
3. Positive reframing	0	3	1.17	.72
4. Acceptance	0	3	1.52	.79

	<b>Min</b>	<b>Max</b>	<b>M</b>	<b>SD</b>
5. Sense of humor	0	3	1.03	.64
6. Turning to religion	0	3	1.12	.74
7. Seeking emotional support	0	3	1.62	.91
8. Seeking instrumental support	0	3	1.51	.82
9. Self-distraction	0	3	1.83	.85
10. Denial	0	3	.96	.68
11. Venting	0	3	1.26	.75
12. Substance use	0	3	.75	.72
13. Behavioral disengagement	0	3	.77	.75
14. Self-blame	0	2.5	1.07	.73
<b>SF-CioQ</b>				
Positive trauma effects	5	25	17.28	5.30
Negative trauma effects	5	28	14.67	6.44
<b>SWLS</b>				
Satisfaction with life	5	35	18.62	6.59

Key: *Min*=minimum value, *Max*=maximum value, *M*=mean value, *SD*=standard deviation.

Age, sex and sociodemographic data were found to have no statistically significant impact on the obtained results. Information regarding the participants' health condition were linked with positive trauma effects (viral load:  $r = .25$ ,  $p = .027$  [0 = detectable, 1 = non-detectable]; CD4 cell count:  $r = .28$ ,  $p = 0.13$  [0 = Less than 350/ $\mu$ l, 1 = Above 350/ $\mu$ l]), negative trauma effects (viral load:  $r = -.27$ ,  $p = .017$ ; CD4 cell count:  $r = -.29$ ,  $p = .010$ ), and satisfaction with life (viral load:  $r = .24$ ,  $p = .034$ ; CD4 cell count:  $r = .23$ ,  $p = .043$ ).

## RESILIENCE AND COPING STRATEGIES

The correlation matrix revealed links between resilience and coping strategies. The overall resilience indicator had a statistically significant positive correlation with active coping forms (active coping, planning, positive reframing) and with the acceptance strategy. The overall resilience indicator had a statistically significant negative correlation with forms of helplessness (substance use, behavioral disengagement, self-blame), as well as with evasive behaviors (denial). Similar relations applied to the specific dimensions of resilience. Moreover, factors 2. (openness to new experiences and sense of humor), 3. (personal competence to overcome adversities and tolerance for negative emotions), 4. (tolerance of failure and treating life as a challenge) had a statistically significant positive correlation with sense of humor. Factor 2 also had a statistically significant negative correlation with venting. The correlation coefficient between resilience and coping strategies was presented in Table 3.



**Table 3. Mini-COPE and SPP-25 Correlation Coefficient in PLWH (N=78)**

Coping	Resilience	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
1. Active coping	.31**	.30**	.28*	.30**	.28*	.31**
2. Planning	.33**	.34**	.29**	.37**	.35**	.27*
3. Positive reframing	.33**	.45***	.26*	.35**	.44***	.30**
4. Acceptance	.32**	.29**	.29**	.33**	.35**	.28*
5. Sense of humor	.20	.19	.38**	.29**	.25*	.20
6. Turning to religion	.01	.07	.06	.09	.01	.09
7. Seeking emotional support	-.11	-.04	-0.13	-.15	-.11	-.12
8. Seeking instrumental support	-.17	-.11	-.18	-.13	-.07	-.11
9. Self-distraction	-.05	-.17	-.22	-.15	-.02	.11
10. Denial	-.28**	-.24*	-.29**	-.27*	-.26*	.26*
11. Venting	-.19	-.11	-.25*	-.12	-.20	-.11
12. Substance use	-.43***	-.34**	-.36**	-.39***	-.45***	-.26*
13. Behavioral disengagement	-.32**	-.36**	-.28*	-.31**	-.32**	-.27*
14. Self-blame	-.27*	-0.26*	-.29**	-.31**	-.37**	-.32**

Significance level: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

Key: *Resilience*=general indicator, *Factor 1*=Perseverance and determination in acting, *Factor 2*=Openness to new experiences and sense of humor, *Factor 3*=Personal competence to overcome adversities and tolerance for negative emotions, *Factor 4*=Tolerance of failure and treating life as a challenge, *Factor 5*=Optimistic attitude to life and ability to mobilize in case of difficulties.

### RESILIENCE AS A PREDICTOR OF TRAUMA EFFECTS

Regression analysis showed that perseverance and determination in acting (as an expression of resilience) allowed for predicting positive trauma effects in PLWH. This model accounted for 13% of the variance of the dependent variable. This means that the remaining percentage was clarified by other factors which were not included in the analysis. Meanwhile, tolerance of failure and treating life as a challenge allowed for predicting negative trauma effects (this model accounted for 15% of the variance). The same factor also accounted for satisfaction with life (the model accounted for 14% of the variance). Results of the conducted regression analysis were presented in Table 4.

**Table 4. Expressions of Resilience and Coping Strategies as Predictors of Trauma Effects and Satisfaction with Life in PLWH (N=78)**

<b>Expressions of resilience as predictors of trauma effects and satisfaction with life</b>					
Positive trauma effects					
	<b>B</b>	<b>SE</b>	<b><math>\beta</math></b>	<b>t</b>	<b>p</b>
1. Perseverance and determination in acting	.52	.16	.36	3.33	.001
Constant	10.00	2.26		4.43	< .001
<i>R</i> = .36, <i>R</i> <sup>2</sup> = .13, <i>Adjusted R</i> <sup>2</sup> = .12, <i>F</i> (1,76) = 11.09, <i>p</i> = .001					
Negative trauma effects					
	<b>B</b>	<b>SE</b>	<b><math>\beta</math></b>	<b>t</b>	<b>p</b>
4. Tolerance of failure and treating life as a challenge	-.85	.23	-.39	-3.69	< .001
Constant	25.29	2.96		8.55	< .001
<i>R</i> = .39, <i>R</i> <sup>2</sup> = .15, <i>Adjusted R</i> <sup>2</sup> = .14, <i>F</i> (1,76) = 13.61, <i>p</i> = .001					
Life satisfaction					
	<b>B</b>	<b>SE</b>	<b><math>\beta</math></b>	<b>t</b>	<b>p</b>
4. Tolerance of failure and treating life as a challenge	.84	.24	.38	3.55	.001
Constant	8.09	3.04		2.66	.010
<i>R</i> = .38, <i>R</i> <sup>2</sup> = .14, <i>Adjusted R</i> <sup>2</sup> = .13, <i>F</i> (1,76) = 12.62, <i>p</i> = .001					
<b>Coping strategies as predictors of trauma effects and satisfaction with life</b>					
Positive trauma effects					
	<b>B</b>	<b>SE</b>	<b><math>\beta</math></b>	<b>t</b>	<b>p</b>
3. Positive reframing	4.66	.61	.63	7.62	< .001
1. Active coping	2.55	.66	.32	3.87	< .001
Constant	6.94	1.52		4.56	< .001
<i>R</i> = .70, <i>R</i> <sup>2</sup> = .49, <i>Adjusted R</i> <sup>2</sup> = .47, <i>F</i> (2,75) = 35.62, <i>p</i> = .001					
Negative trauma effects					
	<b>B</b>	<b>SE</b>	<b><math>\beta</math></b>	<b>t</b>	<b>p</b>
13. Behavioral disengagement	3.85	.80	.45	4.77	< .001
14. Self-blame	3.16	.82	.36	3.85	< .001
Constant	8.32	1.02		8.16	< .001
<i>R</i> = .70, <i>R</i> <sup>2</sup> = .45, <i>Adjusted R</i> <sup>2</sup> = .43, <i>F</i> (2,75) = 30.44, <i>p</i> = .001					
Satisfaction with life					
	<b>B</b>	<b>SE</b>	<b><math>\beta</math></b>	<b>t</b>	<b>p</b>
2. Planning	4.46	.74	.51	6.01	< .001
3. Positive reframing	3.48	.78	.38	4.49	< .001
Constant	5.72	1.49		3.84	< .001
<i>R</i> = .74, <i>R</i> <sup>2</sup> = .55, <i>Adjusted R</i> <sup>2</sup> = .53, <i>F</i> (2,75) = 44.86, <i>p</i> < .001					

Key: *B* = non-standardized factor, *SE* = standard error *B*,  $\beta$  = standardized factor, *t* = *t*-student statistic, *p* = significance level, *R*/*R*<sup>2</sup> = determination factor, *F*(*df*) = *F* statistic (degrees of freedom).

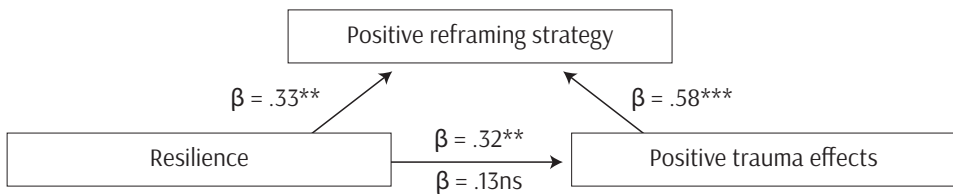
## COPING STRATEGIES AS PREDICTORS OF TRAUMA EFFECTS

Based on the regression analysis, coping strategies were determined as predictors of trauma effects and satisfaction with life. Positive reframing and active coping allowed for predicting positive effects of an HIV infection. This model accounted for 47% of the variance. Behavioral disengagement and self-blame allowed for predicting negative trauma effects. The model accounted for 43% of the variance. Satisfaction with life was predicted by: planning and positive reframing. The model accounted for 53% of the variance. Results of the conducted regression analysis were presented in Table 4.

### MEDIATION ROLE OF COPING STRATEGIES

In the mediation analysis, the general indicator of resilience was used as an independent variable. An analysis of the relationship between resilience vs. trauma effects and satisfaction with life, including coping strategies, revealed only 2 statistically significant mediation models.

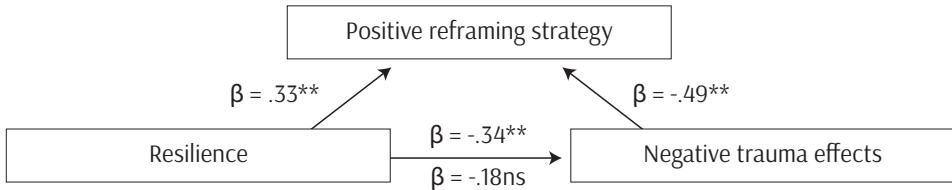
The first model concerned the relationship between resilience vs. positive trauma effects, taking into account the positive reframing strategy as the mediator (Figure 1). The overall effect equaled  $\beta = .32$  ( $t = 2.96$ ,  $p = .004$ ). The regression coefficient of the independent variable to the mediator equaled  $\beta = .33$  ( $t = 3.06$ ,  $p = .003$ ), while the regression coefficient of the mediator to the dependent variable, with a simultaneous control of the independent variable, equaled  $\beta = .58$  ( $t = 6.08$ ,  $p < .001$ ). Mediation lowered the strength of the relationship between the independent and dependent variables to a statistically insignificant one. The direct effect, i.e., the regression coefficient of the independent variable to the dependent variable, with a simultaneous control of the mediator, equaled  $\beta' = .13$  ( $t = 1.37$ ,  $p = .17$ ). The Sobel test value  $z = 5.78$  ( $p < .001$ ) confirmed a full mediation role of positive reframing in the impact of resilience on positive trauma effects.



**Figure 1. Positive Reframing Strategy as a Mediator in the Link between Resilience and Positive Trauma Effects (N=78)**

Key:  $\beta$  = standardized regression factor, \*\*\*  $p < .001$ ; \*  $p < .05$  (significance level), ns = not significant.

The positive reframing strategy played a similar function in the relation between resilience vs. negative trauma effects (Figure 2). The overall effect equaled  $\beta = -.34$  ( $t = -3.16, p = .002$ ). The regression coefficient of the mediator to the dependent variable, with a simultaneous control of the independent variable, equaled  $\beta = -.49$  ( $t = -4.89, p = .001$ ). The direct effect equaled  $\beta' = -.18$  ( $t = -1.78, p = .08$ ). The full mediation model confirmed the Sobel test result  $z = -4.83$  ( $p < .001$ ).



**Figure 2. Positive Reframing Strategy as a Mediator in the Link between Resilience and Negative Trauma Effects (N=78)**

Key:  $\beta$ =standardized regression factor, \*\*  $p < .01$  (significance level), ns=not significant.

## DISCUSSION

The authors of the study attempted to observe the relationship between resilience, coping mechanisms and trauma effects as well as satisfaction with life in PLWH.

The obtained results reveal a low intensity of resilience and positive trauma effects, as well as a high level of negative effects in PLWH. An average level of satisfaction with life was shown as well. The resilience indicator was found to be similar to the results of oncology patients (Ogińska-Bulik, 2011). The results obtained regarding coping strategies correspond to the previous research among PLWH and other clinical groups (Kobosko, 2014; Kossakowska & Zielazny, 2013; Ogińska-Bulik & Kraska, 2017). In the case of satisfaction with life in PLWH, the obtained results are of a replication value compared to the study conducted by Żebrowska, Rzeszutek and Firląg-Burkacka (2014), who achieved an indicator of  $M = 18.22, SD = 7.12$  (in our study:  $M = 18.62, SD = 6.59$ ).

The correlation matrix pointed to the existence of links between resilience and coping strategies in PLWH. A high resilience level was characteristic for active coping strategies (active coping, planning, positive reframing) and acceptance. A low resilience level was associated with helplessness (substance use, behavioral disengagement, self-blame, as well as with evasive behavior (denial)). The obtained results correspond to previous studies in this field (Campbell-Sills et al., 2006; Ogińska-Bulik & Juczyński, 2008).

Previous studies have suggested an ambiguous relationship between resilience and trauma effects (Westphal & Bonanno, 2007). Murphy and Hevey (2013), as well as Spies and Seedat (2014) observed such dependencies. Meanwhile, the Garrido-Hernansaiz and Alonso-Tapia study (2017) did not reveal any significant dependencies in PLWH. This research has provided support for the former studies. The obtained regression model allowed for predicting 13% of variance of positive trauma effects, 15% of variance of negative trauma effects, as well as 14% of variance of satisfaction with life. Perseverance and determination in acting were conducive to positive trauma effects. Tolerance of failure and treating life as a challenge countered negative effects and fostered satisfaction with life. The results of this study may be placed between those achieved in studies by Duan, Guo and Gan (2015) and Ogińska-Bulik (2014). According to the first study, resilience allowed for predicting 38% of variance of post-traumatic growth in people experiencing various traumatic events. In the second study, resilience accounted for only 8% of post-traumatic growth variance and 13% of negative effects in cardiology patients. Ogińska-Bulik's research was conducted using the same tool for measuring resilience. However, the author indicated other factors as components for predicting trauma effects. It seems, therefore, that individual expressions of resilience may predict post-traumatic changes, however with a difference in their source.

A model based on coping strategies proved to be more effective in predicting trauma effects than resilience. It accounted for 49% of variance of positive trauma effects, 45% of negative effects and 55% of satisfaction with life. Active coping and positive reframing favored positive trauma effects. Behavioral disengagement and self-blame were conducive to negative effects. Planning and positive reframing favored satisfaction with life. The obtained results correspond to the studies by Ogińska-Bulik and Juczyński (2012) among mothers of children with leukemia, where coping strategies predicted 44%–58% variance of PTSD dimensions. The authors indicated different strategies for predicting trauma effects, which is probably due to the different specificity of the studied groups. This study is coherent also with the research on predicting positive trauma effects, including among PLWH (Dekel et al., 2016; Marotta-Walters et al., 2015; Ye et al., 2018). Moreover, Leserman et al. (2002) suggest that, apart from predicting positive trauma effects, the use of active coping mechanisms may be associated with lower cortisol levels, which ultimately has a positive impact on the health status of HIV-infected people.

Due to the unclear relation between resilience and trauma effects in the literature on the subject, the authors of this study decided to verify whether coping strategies may act as a mediator in this relationship. The studies conducted thus far have managed to indicate the mediation role of social withdrawal strategies in

the relation between resilience and PTSD symptoms (Thompson et al., 2018). This study revealed that the positive reframing strategy may act as a mediator between the resilience vs. trauma effects. This means that people with a higher level of resilience may present a tendency to cope through positive reframing, which may reinforce positive trauma effects (PTG) and reduce the negative effects (PTSD symptoms). The results are consistent with the theoretical construct of traumatic growth. PTG is considered to be the effect of adaptive coping forms and is the result of positive transformations of life assumptions (Folkman & Moskowitz, 2007). This study did not manage to build a statistically significant model using other coping strategies, nor did it manage to find a significant mediator for the relation between resilience vs. satisfaction with life.

## **LIMITATIONS**

The study was of a cross-sectional nature. It is difficult to unambiguously state the causes and effects (despite applying predictive analyses). The study was conducted on a small group of individuals. Further tests are needed for generalization of conclusions. The study was carried out in the form of a self-description. The assessment of behavior examples may differ from the point of view of an uninvolved observer. The study did not verify the coexistence of other traumatic events (other than HIV infection). All examined participants were under the care of specialists from clinics treating acquired immunodeficiencies. Such clinics offer access to free psychological care. It should be recognized that the participants assumed the social role of patients and undertook broadly understood activity to improve their health. The results of people not under specialist care may differ from the data obtained in the study. Despite the indicated limitations, this study introduced new data regarding the relation between resilience, coping mechanisms and trauma effects as well as satisfaction with life in PLWH.

## **CONCLUSIONS**

1. Significant relations were demonstrated between resilience and coping in PLWH. Resilience correlates positively with active coping strategies and negatively with evasion strategies in PLWH.
2. Resilience and coping mechanisms allow for predicting trauma effects and life satisfaction in PLWH. Resilience and active coping are conducive to posi-

tive trauma effects and life satisfaction in PLWH. Behavioral disengagement and self-blame are conducive to negative effects of trauma in PLWH.

3. The positive reframing strategy acts as a mediator in the relation between resilience and positive and negative effects of trauma in PLWH.

The obtained conclusions have an implied value in therapeutic work with HIV patients. Due to their universal character, they may also be used to work in other clinical groups.

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