

## The role of resiliency and coping strategies in occurrence of positive changes in medical rescue workers



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### ABSTRACT

**Background:** Working in the emergency services entails exposure to traumatic events; however, their effects can be both negative and positive. Among the factors determining posttraumatic growth (PTG) after an experienced trauma are the personal resources and coping strategies. The purpose of the research was to investigate the role of resiliency and coping strategies with stress in posttraumatic growth in a group of medical rescue workers. **Materials and methods:** Data of 80 male medical rescuers who have experienced traumatic event in their worksite were analyzed. The Posttraumatic Growth Inventory, Resiliency Measurement Scale and Inventory to Measure Coping Strategies with Stress – Brief-Cope were used in the study. Statistical tests such as *t* test, correlation and path analysis were used. **Results:** The tested medical rescue workers revealed the medium level of PTG. Active coping, planning, turning to religion, seeking of social support, both emotional and instrumental, and self-distraction positively correlated with posttraumatic growth. A more significant role in the process of PTG appeared to be played by avoidance and emotional-focused strategies. Although resiliency does not directly affect posttraumatic growth, it may strengthen it through the choice of coping strategies. **Conclusions:** In the process of posttraumatic growth avoidance strategies seem to play more important role than strategies focusing on the problem.

### 1. Introduction

#### 1.1. Posttraumatic growth as a positive effect of experiencing traumatic events

It is accepted that workers in the emergency services, firefighters, police officers and medical rescue workers, are at risk of experiencing traumatic events as part of their professional duties. These are most commonly associated with the need to save lives and health, or confront death. The Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition-Text Revision (DSM-IV-TR) classification [1] regards a traumatic event is a stressor, either in terms of it being a direct experience with death, a threat to life, or a witness to such events. Most importantly, this stressor evokes a range of strong emotions in the individual, such as intense fear, powerlessness and feelings of being threatened. The most recent classification, the DSM-V [2], also includes exposure to work-related trauma, such as complex or repeated trauma, or extreme exposure to the aversive details of events, which are known to be experienced by policemen, firefighters or medical rescue workers.

Many studies have examined the occurrence of this type of event in groups of medical rescue workers, both in Poland [3] and elsewhere

[4,5]. Potentially traumatic events entail many negative consequences, relating primarily to the mental health of the individual, including the symptoms of posttraumatic stress disorder (PTSD).

Studies conducted in recent years have indicated that the experience of the traumatic event may also foster the development of posttraumatic growth (PTG), a phenomenon thought to entail the appearance of positive changes in self-perception, relationships with others and appreciation of life [6,7]. These changes do not occur as a result of the trauma or simply with the passing of time, but as a consequence of attempts to cope with the experienced traumatic event. In this way, some of those who have experienced trauma become stronger and more mature; they notice an increased ability to cope and survive in extremely harsh conditions, recognise new opportunities in life and assign themselves new objectives. The observed forms of positive posttraumatic changes include gains in self-esteem, effectiveness, self-confidence and belief in their own potential, and these changes may carry over to future events. Many survivors of trauma have demonstrated positive changes in their relationships with others and existential (religious) beliefs, which translates into a greater appreciation of life and a desire to live it in a more conscious way.

PTG entails more than a simple return to a balance point following a

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traumatic event. Instead, the individual undergoes some form of transformation as a result of surviving the situation, thus achieving a higher level of functioning than before the trauma. The emergence of positive changes following the trauma is regarded as a result of effective coping. However, individuals experiencing growth can also experience a distressed state and reduced sense of well-being brought on by the trauma, as well as the appearance of other symptoms associated with PTSD, and as such, it is essential to adapt the subject to the new circumstances and favour the emergence of positive changes. Positive posttraumatic changes have already been identified in the representatives of the emergency services in Poland [3,8,9] and in other countries [5].

### 1.2. Resiliency, coping strategies and positive posttraumatic changes

Among the factors affecting the occurrence of positive posttraumatic changes, particular significance has been attributed to the personal resources and strategies adopted for coping with stress. Model of posttraumatic growth developed by Calhoun, Cann and Tedeschi [10] stress that personality traits and coping strategies are important factors which determine the level of posttraumatic positive changes.

Many studies have confirmed the significance of personal resources in the process of PTG [11,12]. One such personal resource whose role in PTG has not been precisely determined is resiliency. It is understood as a personal resource and represents the presence of a group of personality characteristics, allowing for the effective coping with highly stressful events. It is understood as a personal resource which represents the presence of a group of personality characteristics; it enables effective coping with highly stressful events, thus promoting perseverance and flexible adaptation to the demands of life, enabling the individual to mobilise and take remedial action in difficult situations, and increasing the tolerance of negative emotions and failure [13]. This personal resource develops throughout life, and may be strengthened further by psychological interventions [14].

However, it is important to note that the relationship between resiliency and PTG is not unequivocal, which is associated chiefly with the divergent understanding of resiliency (process, personality characteristics). Some authors assume that PTG is a form of resiliency in itself [15] and others that PTG is something more than resiliency: its role is more overarching [16].

The authors of the PTG construct [6] clearly differentiate it from resiliency, stressing that the growth following trauma results from transformation and can appear suddenly and unexpectedly. Resiliency, when treated as a property of the personality, is more of a stable character and represents the culmination of the many experiences of the individual. Furthermore, Tedeschi and Calhoun note that more resilient people may not experience PTG, since the traumatic event may not have enough impact to have any effect on them.

Many recent studies focus on the role of resiliency in predicting posttraumatic growth in different groups, but their findings are varied. Resiliency may prevent adverse outcomes of trauma [17] but its relationship between PTG may be positive [18], curvilinear [19] or insignificant [20].

Studies have indicated the presence of a weak relationship between resiliency and PTG in representatives of the emergency services [21]. In another study of a group of medical rescue workers, no direct link was found between resiliency and the degree of PTG [8].

However, there is evidence of the importance of stress coping strategy. Among the coping strategies favouring PTG are acceptance, positive reframing, task-oriented coping and coping based on religion [11,22,23]. The relation between stress coping strategies and PTG may depend on the occupational specificity [20].

In an earlier study of medical rescue workers, Ogińska-Bulik [3] found active coping, planning, turning to religion, seeking emotional and instrumental support and self-distraction to be strategies positively associated with PTG. The main predictor of PTG was found to be the

adoption of a strategy based on turning to religion. Similar results showed study of medical rescue workers conducted by Jurisowa [24].

The studies indicated that both resiliency and the choice of coping strategy were associated with the appearance of PTG, with this relationship being of either a direct or indirect character. In the case of the latter, it can be expected that resiliency, as a personal resource activated primarily in situations of extreme stress, will support the adopted coping strategies, thus further influencing the occurrence of positive changes.

As a previous study of a group of medical rescue workers showed [8], some of the coping strategies taken by examined employers played the role of mediators or suppressors in the relationship between specific dimensions of resiliency and posttraumatic growth. However, little is known about the whole structure of relationships between those variables.

## 2. Aim and research method

The aim of the present study was to determine the impact of resiliency and coping strategies on the occurrence of PTG in a group of medical rescue workers who have experienced traumatic events associated with their work. The study addresses the following research questions:

- What is the level of positive changes in the tested medical rescue workers?
- Are resiliency and the chosen strategies of coping with stress associated with the degree of PTG, and how are they manifested?

It is expected that resiliency has mostly indirect impact on posttraumatic positive changes through coping strategies.

Purposive sampling was used. The main selection criterion was profession and employment. Research was conducted in central Poland (Łódź city region) in the public emergency service centres. Another inclusion criteria was reporting experiencing traumatic event associated with their duties in the previous five years (the criterion was used to reduce the influence of forgetfulness). Newly hired personnel was excluded. Eighty medical rescue workers (66.6% of 120 covered by the research) fulfilled these criteria. The group comprised only men (due to the presence of mainly one gender among this typical male profession). The study was performed during the duties of the medical rescue workers, with the permission of their employers and with the consent of the subjects. All employees who gave their consent were examined in the workplace. The subjects were informed of the purpose of the study and were assured of their anonymity. The age of the subjects ranged from 21 to 67 years ( $M$  35.47,  $SD$  10.21). The study employed the Post-Traumatic Growth Inventory (PTGI), the Resiliency Measurement Scale and the Inventory for Measuring Coping with Stress (Brief-Cope).

The PTGI was adapted for Polish conditions by Ogińska-Bulik and Juczyński [25] from the original version prepared by Tedeschi and Calhoun [6]. The tool is composed of 21 statements describing a range of positive changes occurring as a result of an experienced traumatic event. The Polish version of the inventory measures four factors influencing PTG: changes in self-perception, changes in relations with others, greater appreciation of life and changes in the spiritual sphere. The overall result is the sum of these four factors. Its reliability was 0.93, as measured by Cronbach's  $\alpha$ .

The Resiliency Measurement Scale, authored by Ogińska-Bulik and Juczyński [13], measures the overall level of resiliency, treated as a personal trait, and its five component parts: 1. Determination and persistence in action, 2. Openness to new experiences and sense of humour, 3. Competencies to cope and tolerance of negative affect, 4. Tolerance of failures and treating life as a challenge and 5. Optimistic life attitude and ability to mobilize in difficult situations. The overall result of the scale was given as the sum of the five component factors. The reliability

analysis found Cronbach's  $\alpha$  to be satisfactory (0.89).

The Brief-Cope Inventory is an abbreviated version of the Multidimensional Inventory for the Measurement of Coping with Stress, also known as COPE (The Coping Orientations to Problems Experienced). Its Polish adaptation by Juczyński and Ogińska-Bulik [26] comprises 28 statements, with two statements applying to each of 14 coping strategies: active coping, planning, positive reframing, acceptance, sense of humour, turning to religion, seeking emotional support, seeking instrumental support, self-distraction, denial, venting, use of psychoactive substances, behavioural disengagement and self-blame. Cronbach's  $\alpha$  ranged from 0.69 to 0.89 for each strategy.

All scales have satisfactory psychometric properties, which means they are reliable and accurate measurement tools.

In accordance with the study aim, the Pearson's correlation coefficients and structural equation modelling (path analysis) were used to identify relationships between variables. Path analysis was intended to determine the direct influence of resiliency, and its indirect influence through the choice of coping strategy, on the appearance of PTG.

### 3. Results

As the results obtained from the tested group had a normal distribution, parametric tests were used for the subsequent analysis. Table 1 presents the mean value and standard deviation of the PTG achieved by the study group.

The level of PTG corresponded to normative data, which indicates the medium level of positive posttraumatic changes. Based on the norms designed for the Polish version of PTGI [25], a low level is associated with scores between 0 and 53, a medium level between 54 and 72 and high scores between 73 and 105. A high level of PTG was demonstrated by 37 workers (46.2%), a medium level by 27 (33.8%), and a low level by 16 (20%). To identify in which sphere the greatest changes occurred, the mean scores of the individual components of the PTGI were divided by the number of statements. Significantly greater changes ( $p < 0.01$ ) were found to be associated with factor 1 – changes in self-perception ( $M$  3.43,  $SD$  0.85) and factor 3 – appreciation of life ( $M$  3.43,  $SD$  1.17) than in factor 4 – changes in the spiritual sphere ( $M$  2.55,  $SD$  1.45).

Regarding the age of the subjects, no significant differences in the degree of positive posttraumatic changes or any of its component factors were found between younger, i.e. those aged below 36 years ( $M$  65.91,  $SD$  19.60) and older subjects, i.e. those aged 36 years and older ( $M$  72.43,  $SD$  14.70) ( $t = -1.61$ ). The two age subgroups were divided by the mean age of the whole group ( $M$  35.47).

The degree of resiliency identified in the participating medical rescue workers ( $M$  75.17,  $SD$  11.48) should be regarded as medium: indicated by a corresponding normative data. The most commonly employed coping strategies were active coping and planning. The least common strategies were behavioural disengagement, the use of psychoactive substances and denial. The mean of the individual components of strategies for coping with stress was presented in another paper [3].

The obtained Pearson's correlation coefficients are given in Table 2.

The data in Table 2 indicates that resiliency is weakly associated

**Table 1**  
Mean values of posttraumatic growth.

	M	SD
Posttraumatic growth – Total	68.52	17.99
F. 1. Changes in self-perception	30.87	7.66
F. 2. Changes in relations to others	22.60	7.04
F. 3. Appreciation of life	10.30	3.52
F. 3. Spiritual changes	5.11	2.91

Note:  $M$  – mean;  $SD$  – standard deviation.

**Table 2**  
Correlation coefficient between resiliency and coping strategies and posttraumatic growth.

	PTGI	F. 1	F. 2	F. 3	F. 4
Resiliency – total	0.15	0.28**	0.07	0.15	-0.13
1. Determination and persistence in action	0.31**	0.37***	0.28**	0.15	0.04
2. Openness on new experiences and sense of humour	0.15	0.28**	0.09	0.17	-0.15
3. Competencies to cope and tolerance of negative affect	0.04	0.19	-0.06	0.03	-0.16
4. Tolerance of failures and treating life as a challenge	0.14	0.24†	0.04	0.22	-0.15
5. Optimistic life attitude and ability to mobilize in difficult situations	0.06	0.17	-0.01	0.06	-0.10
Active coping	0.22*	0.22†	0.18	0.12	0.06
Planning	0.25*	0.24†	0.23*	0.34**	0.03
Positive reframing	0.15	0.18	0.13	0.18	-0.04
Acceptance	0.10	0.10	0.13	0.24*	0.05
Sense of humour	0.08	0.12	0.07	0.04	-0.03
Turning to religion	0.44***	0.33**	0.47***	0.23*	0.54***
Seeking of emotional support	0.26*	0.13	0.38***	0.12	0.16
Seeking of instrumental support	0.25*	0.17	0.36***	0.04	0.22
Self-distraction	0.36***	0.27*	0.43***	0.31**	0.15
Denial	0.16	0.09	0.17	0.09	0.33**
Venting	0.15	0.06	0.25*	0.11	0.19
Substance use	-0.01	-0.04	0.06	-0.13	0.19
Behavioural disengagement	0.05	0.04	0.06	-0.10	0.13
Self-blame	0.05	0.01	0.10	0.06	0.13

PTGI – general score of Posttraumatic Growth Inventory; F – factor.

F.1. Changes in self-perception; F.2. Changes in relations to others; F.3. Appreciation of life; F.4. Spirituals changes.

Note:

\*\*\*  $p < 0.001$ .

\*\*  $p < 0.01$ .

\*  $p < 0.05$ .

with PTG: the overall score of the resiliency correlating only with changes in self-perception. Although the more determinant and persistent in action the person is (factor 1 of resiliency), the more likely to develop PTG, especially changes in self-perception and good relations with others. It is important to note that factors 3 (competencies to cope and tolerance of negative affect) and 5 (optimistic attitude towards life and the ability to mobilise in difficult situations) were not associated with any form of positive posttraumatic changes.

The overall result of the PTGI positively correlated with active coping, planning, turning to religion, seeking support, both emotional and instrumental, and distracting attention from the stressor. It is important to note that higher correlation coefficients were found for the avoidance and emotion-focused coping strategies, particularly turning to religion and self-distraction. Examining the individual components of posttraumatic growth, it can be seen that the strongest relationship was associated with turning to religion. The more the person turns to religion, the more likely is to develop all aspects of PTG. Planning and self-distraction were associated with three of the four dimensions: i.e. all but changes in the spiritual sphere. In turn, seeking emotional and instrumental support were only found to be significantly associated with positive changes in relationships with others, and active coping with changes in self-perception.

The next step was to analyse the data associated by checking the dependency structures between variables using structural equation modelling (path analysis). Based on the goodness of fit indicators between the observed variance-covariance matrix and proposed alternative models, various models were tested. Selected variables were added to the model to identify the structure of dependencies influencing the overall level of PTG. A model was selected that fulfilled the theoretical plausibility and economical requirements, and which complied with the established empirical measurements (Fig. 1).

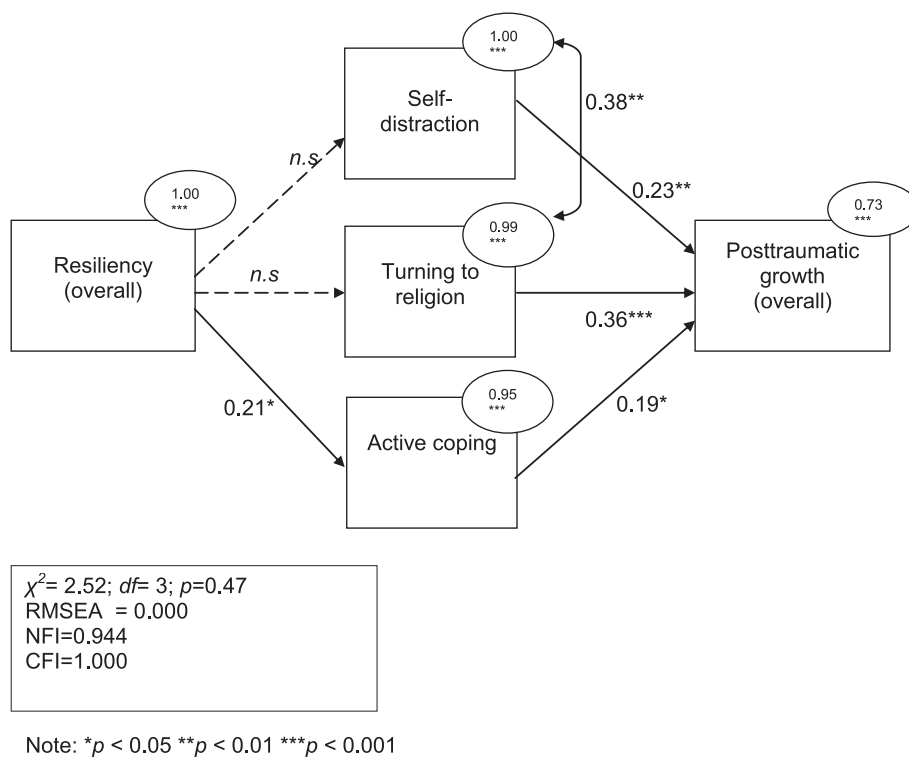


Fig. 1. Results of structural equation modelling. Note: \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

With all the indicators taken into consideration, the model was found to be well fitted and acceptably reflected the theoretical structure of the data set. Coping strategies such as turning to religion (the path factor 0.36,  $p < 0.001$ ) and self-distraction (0.23,  $p < 0.005$ ) were found to directly influence the dependent variable (PTG), and were positively correlated with each other. An active coping strategy also influenced overall PTG, although to a lesser extent (0.19,  $p < 0.05$ ). Strengthening this strategy revealed the impact of the level of overall resiliency on the dependent variable. However, no significant relationship was found between resiliency and other strategies, or any direct effect of resiliency on PTG.

#### 4. Discussion

The studied medical rescue workers quite effectively cope with traumatic events in the course of their duties. This effectiveness is reflected in the presence of positive changes, principally in terms of self-perception and appreciation of life. It should be noted that the emergence of positive changes do not rule out the appearance of negative effects stemming from the trauma, for example, symptoms of PTSD. This is indicated by the results of an Australian study, which showed a positive relationship between the negative and positive effects of traumatic experiences [5].

Resiliency was weakly associated with PTG: Although, the more resilient the person is (especially determined and persistent in action), the more likely to develop PTG (mostly self-perception and relations with others). It is important to emphasize that resiliency does not necessarily lead to the appearance of positive posttraumatic changes. In fact, it could be regarded as an obstacle in its emergence. Resiliency, understood as a property of the personality, has a rather static nature; hence, a resilient person, i.e. someone with a flexible response to the challenges of life, does not necessarily experience the destruction of cognitive schemata following trauma, and therefore does not experience any consequent growth. In this sense, resilience may rather act as a buffer, protecting against the adverse effects of stress, than a factor encouraging growth. In addition, as indicated by

Hochhalter et al. [27], its role in the process of adaptation can weaken over time, leaving behind the negative effects of the trauma.

PTG positively correlates with the use of coping strategies including active coping, planning, turning to religion, seeking support, both emotional and instrumental, and self-distraction. Therefore, the more the studied paramedics take action to resolve a stressful situation (active coping), plan what to do (planning), seek help, understanding and encouragement from others (seeking social support), pray and meditate to provide stress relief (turning to religion), or distracting themselves to avoid thinking of the stressful event, the more likely it is that PTG will emerge.

An important role in PTG appears to be played by turning to religion, which is in line with the results of previous studies carried out on representatives of the emergency services [9], which found that spirituality played a significant role in the emergence of positive posttraumatic changes. Moreover, research on prayer and posttraumatic growth indicates that those who pray report more PTG [28]. However, our findings poorly correspond with those of an Australian study [5] which found that the primary predictive role for PTG in this group was fulfilled by adaptive coping strategies. It is worth to remember that terms adaptive and maladaptive are inconclusive. Strategy effectiveness is dependent on context of the situation (experienced event). It means that maladaptive strategy may be beneficial in dealing with some specific situations, such as experienced trauma.

Our findings also indicate that an important role in the appearance of positive posttraumatic changes appears to be played by avoidance strategies, such as self-distraction, rather than problem-focused strategies, although they too contribute to the emergence of PTG, albeit to a lesser extent. The role played by these strategies has also been emphasised in previous studies [20,22–24].

Most importantly, different coping strategies seem to foster different dimensions of PTG. This diversity in the role played by coping strategies in the occurrence of positive posttraumatic changes was also highlighted by the Australian study above [5].

Path analysis confirmed that avoidance and emotional-focused strategies such as turning to religion and self-distraction play a direct

role in the strengthening of PTG. Active coping also has a certain impact, which in turn depends on the general level of resiliency. The identified relationships between variables indicate that although resiliency does not directly affect PTG, it may strengthen it through the choice of active coping strategies.

Finally, the study does have some limitations. The sample size was quite small and included only men. As the positive effects of the experienced traumatic events were assessed by self-reporting, it is not possible to exclude the impact of social approval, i.e. recording positive changes, even if they had not occurred. In addition, the negative effects associated with the experienced traumatic events were not evaluated in the test group. Furthermore, the significance of the time elapsed since the traumatic events took place was not analysed. It was only assumed that they had occurred in the previous five years. The study focuses on traumatic events related to the performance of official duties and does not address traumatic personal experiences; this may have occurred at least on some of the rescue workers and may affect the instance of positive changes. The tools used to measure coping strategies concern a range of situations (dispositional coping), and not specifically with coping with experienced trauma. Finally, the study is of a cross-sectional nature, which does not allow the presence of cause-and-effect relationships to be unequivocally confirmed.

Despite the limitations of the study, the research is distinguished from previous study and indicates for indirect impact of resiliency through coping strategies on posttraumatic positive changes. It presents the structure of relationships between important coping strategies, resiliency and posttraumatic changes. Our results can be used in clinical practice and to inspire further research. Future studies should consider the role played by the cognitive processing of trauma, and especially the role of rumination, which are both related to the positive and negative consequences of trauma. An interesting, and important aim would be to confirm whether the achieved changes persists over time; however, this would require the use of a longitudinal study.

## 5. Conclusion

The following conclusion can be taken from this study:

1. The average level of PTG in the group was a medium score. Positive posttraumatic changes can be seen especially as better self-perception and appreciation of life.
2. The more the person use active coping, planning, turning to religion, seeking of social support, both emotional and instrumental, and self-distraction, the more likely is to develop posttraumatic growth.
3. The effects of coping strategies varied according to the individual components of PTG.
4. Avoidance and emotional-focused coping strategies, particularly religious coping, played more important role for posttraumatic growth than problem-focused strategies.
5. Resiliency exerts its greatest effect on PTG through the use of active coping.

## 6. Implications for practice

The results indicate the merits of psychological counselling and psychoeducation in the environment of paramedics. Building self-awareness and strengthening personal resources, such as resiliency and effective coping with stress, are significant goals from the perspective of quality and safety in this profession. Their significance for posttraumatic positive changes confirms the value of intervention programmes for people dealing with various traumatic experiences [14]. It is worth and possible to strengthen posttraumatic positive adjustment [29].

## Conflict of interest

Not applicable.

## Ethical statement

Not applicable.

## Funding source

Not applicable.

## Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.ienj.2018.02.004>.

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