The relationship of proactive coping and severity of symptoms of post-traumatic stress disorder

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Abstract. **The goal of this study was to examine the relationship between proactive coping strategies and post-traumatic stress disorder (PTSD). The study used Proactive Coping Inventory to measure the severity of proactive coping strategies. ICD-11 criteria were used to study the symptoms of PTSD. Data was collected through an anonymous online survey. Results: The most significant levels of coping strategies reducing the likelihood of PTSD for people who survived a traumatic situation: high levels of proactive coping and planning. The probability of PTSD is also reduced by a high level of planning, a medium level of proactive coping, a high level of search of instrumental support seeking. Slightly reduce the likelihood of PTSD high level of preventive coping.**

Keywords. Coping with difficulties, proactive coping, coping strategies, post-traumatic stress disorder (PTSD)

I. INTRODUCTION

The relationship of coping with difficult life situations and the level of human adaptation to stress is already a well-known fact. The greatest amount of empirical data on possible constructive and destructive strategies for overcoming a person's life difficulties, on personal and social resources of coping and on the role of features of a person's perception of a difficult situation is accumulated in clinical psychology. Much less studied patterns of proactive coping - as those cognitive, affective and behavioral efforts that a person takes preventive, to the occurrence of certain difficulties. To the maximum extent this applies to the possible interaction of certain strategies of proactive coping, characteristic of the subject, and its adaptive capabilities, changing as a result of stress. Meanwhile, the relevance of this kind of research for specialized care and prevention of post-traumatic disorders (PTSD) is difficult to overestimate.

II. THEORETICAL BACKGROUND

A. PTSD criteria

PTSD arises as a delayed or protracted response to a stressful event or situation of an exceptionally threatening or catastrophic nature, which is likely to cause pervasive distress in almost anyone. Usually, PTSD is characterized by re-experiencing trauma in obsessive memories or dreams, detachment from other people, immunity to the environment, avoidance of actions and situations reminiscent of trauma, insomnia, increased fear response [1]. The new edition of The International Classification of Diseases (ICD-11) proposed another criterion - the duration of symptoms for at least a month [2]. In addition, in the new classification, instead of 17 qualifying symptoms of PTSD, it was proposed to use only 6. This is done to reduce the risk of diagnosing false-positive cases and standardizing the clinical practice of treating this disease [3].

B. Proactive coping strategies

In most studies, coping is considered as various adaptation strategies — psychological purpose of this process of overcoming a person's difficulties. The main goal of coping is to reduce stress, to ensure psychological well-being, to maintain a high quality of life [4]. This idea is based on a modern model of proactive, future-oriented coping, which has become the modern understanding of the dynamic model of Lazarus-Folkman [5]. The main differences of proactive coping from all other forms of it (for example, reactive coping, avoidance coping, humor) are in the organization of a time perspective. Proactive copying is focused on the future; a person creates his own resources for future coping [6].

Proactive coping, from the point of view of researchers, also has some internal structure. So, it identifies five interrelated components: 1) the accumulation of various resources (social, financial, time etc.), which can later be used to prevent or neutralize future losses; 2) understanding, awareness of potential stressors; 3) assessment of potential stressors at the initial stage; 4) advance, preparatory attempts at coping; 5) receiving a conclusion and providing feedback on the success of perfect attempts to solve a difficult life situation [4].

Ambiguous empirical data was obtained when trying to study the interconnection of proactivity in coping with the level of human subjective well-being: some researchers note that not all aspects of proactive coping positively correlate with a high level of subjective well-being [7]. Similar empirical data on the relationship between proactive coping and subjective life satisfaction. A study on a sample of students from French and Romanian universities found no relationship between these indicators [8].

Several studies have shown that reactive coping strategies are linked to the risk of PTSD. Social support and emotional expression are correlated with lower levels of

stress hormones and decreased risk for stress-related psychopathology [9]. Resilience after the traumatic event positively correlated with active coping strategies and negatively correlated with avoidant coping strategies and future PTSD symptoms [10]. Coping flexibility was associated with a reduced level of PTSD or depressive symptoms [11]. Higher perceived social support was associated with higher positive emotions in earthquake survivors. The presence of a goal in life was interrelated with less severe symptoms of PTSD and a higher level of positive emotions. In contrast, negative religious coping was associated with the level of PTSD symptoms and negative emotions [12]. In a longitudinal study of soldiers, positive interrelationships of the combat stress reaction with the emotional coping style and low use of problem-oriented problem solving were found [13]. Unfortunately, proactive coping strategies are much less well understood.

III. METHOD

The empirical study investigated the relationship between proactive coping strategies and the severity of traumatic stress symptoms. This methodological tool is based on one of the most detailed models of proactive coping developed today, according to which future-oriented coping integrates planning and preventive strategies with proactive self-regulation to achieve goals, the use of social resources and emotional self-regulation of activities in General.

A. Procedure/participants

The study sample consisted of 367 women and 139 men aged 18 to 76 years (M=21, SD=9). Of these, according to self-reports, 74 people did not face life with traumatic situations, 432 people reported having a traumatic event in their experience, of which 240 people in the experience were presented with the majority of PTSD criteria (with the obligatory condition of the duration of symptoms for more than a month).

B. Measures

For the diagnosis of proactive coping strategies was used adapted the earlier methodology of E. R. Greenglass " Proactive Coping Inventory ", consisting of scales that reflect possible strategy of proactive coping []. Proactive Coping Inventory contains 58 statements divided into 7 scales. Proactive coping measures a person's attitude to a difficult situation as a source of positive experience and confidence in a successful decision due to his efforts. Reflective coping measures the presentation of possible behaviors, cognitive assessment of resources, and prediction of results. Strategic planning measures the ability to plan future actions with the differentiation of individual tasks. Preventive coping measures the ability to anticipate difficult situations based on past experience. The search for instrumental support focuses on the respondent's search for information from other people to solve a difficult life situation. The search for emotional support measures the ability to regulate one's emotional state through communication with other people. Avoidance coping measures a person's desire to postpone decision making and avoid activity.The response scale contains 4 options: "Absolutely disagree", "Partially agree", "Rather agree, than disagree", "Fully agree", which are assigned 1, 2, 3 or 4 points during processing, respectively [14].

According to the results of a meaningful analysis of the scales and confirmatory factor analysis, the full version of the questionnaire on the Russian-language sample showed unsatisfactory psychometric indicators (χ^2(df) 3025,73(1259); p). Analysis of standardized factor loadings showed that some of the items have loadings less than 0,3. Due to the fact that the original questionnaire shows unsatisfactory psychometric indicators, it was decided to exclude items with strong covariance and similar in meaning or heavily loaded on other scales to improve the psychometric performance of the questionnaire. The short version includes 27 points and demonstrated good quality of the model (χ^2 (df) 509,05 (307); CFI 0,95; TLI 0,94; RMSEA 0,04). Due to the fact that the avoidance strategy is not related to proactive coping strategies, they were excluded from further analysis [15].

To diagnose the symptoms of traumatic stress and PTSD, the following criteria were used: recurrent, distressing dreams of the event; dissociative flashback episodes; efforts to avoid thoughts, feelings, or conversations associated with the event; efforts to avoid activities, places, or people associated with the event; hypervigilance; exaggerated startle response [2]. Respondents were asked to answer the question of whether the situation in their lives was extremely threatening or catastrophic and asked to evaluate the duration of symptoms on the Likert scale: from 0 - no symptom was observed, up to 7 symptoms appeared very often. It was also indicated that this symptom should have appeared after the traumatic event and in the previous experience it was not. For each symptom, it was proposed to evaluate its duration.

Results

Descriptive statistics of scales of proactive coping strategies are presented in the Table I.

TABLE I. DESCRIPTIVE STATISTICS OF SCALES OF PROACTIVE COPING STRATEGIES

	M	**SD**	**Skewness**	**Kurtosis**
Proactive coping	2,96	0,57	-0,44	0,16
Reflective coping	2,88	0,64	-0,15	-0,39
Strategic planning	2,51	0,79	-0,03	-0,66
Preventive coping	2,83	0,60	-0,11	-0,27
Instrumental support seeking	2,77	0,68	-0,12	-0,51
Emotional support seeking	2,76	0,77	-0,23	-0,65

The obtained data are consistent with data from previous studies[14, 15].

TABLE II. PAIRWISE CORRELATIONS OF PROACTIVE COPING SCALES (METOD: SPEARMAN)

Coping strategy 1		**Coping strategy 2**		**r**	**p**
Proactive coping	-	Reflective coping		0,258	***
Proactive coping	-	Strategic planning		0,285	***
Proactive coping	-	Preventive coping		0,357	***
Proactive coping	-	Instrumental support seeking		0,062	
Proactive coping	-	Emotional support seeking		0,081	
Reflective coping	-	Strategic planning		0,466	***
Reflective coping	-	Preventive coping		0,610	***
Reflective coping	-	Instrumental support seeking		0,034	
Reflective coping	-	Emotional support seeking		0,019	
Reflective coping	-	Preventive coping		0,473	***

Coping strategy 1		Coping strategy 2		r	p
Reflective coping	-	Instrumental support seeking		0,103	*
Strategic planning	-	Emotional support seeking		0,091	*
Preventive coping	-	Instrumental support seeking		0,080	
Preventive coping	-	Emotional support seeking		0,043	
Instrumental support seeking	-	Emotional support seeking		0,561	***

[a.] * p < .05, ** p < .01, *** p < .001

Table 2 presents the pairwise correlations of the scales of the proactive coping technique. The largest positive correlations were obtained for the scales of reflective and proactive coping. The scales have questions of similar content, so respondents answered them in a similar way. The scales of reflective coping and strategic planning are also positively correlated. Both strategies are aimed at preparing for life difficulties in the future. Positive correlations between search support scales and the absence of correlations with other scales suggest that there are two strategies for coping with difficulties. The first strategy is characterized by high life activity, the search for resources to solve problems in the future. The second strategy is characterized by the search for support from others.

The main hypothesis of the study was the assumption that the traumatic event worsens the mechanisms of proactive, future-oriented coping with emerging difficulties. The distribution of data on a scale of proactive coping is statistically significantly different from the normal (Shapiro-Wilk criterion 0,97, p<0.001), therefore, the non-parametric Mann-Whitney test was chosen to compare groups. The results are presented in Table III.

TABLE III. COMPARISON OF THE LEVEL OF PROACTIVE COPING IN THREE GROUPS: WITHOUT TRAUMATIC EVENTS, WITH INJURIES WITHOUT PTSD SYMPTOMS, WITH PTSD SYMPTOMS

Mann-Whitney U test		
Groups	***W***	***p***
No trauma - Trauma	7431	0,560
Trauma - PTSD	20795	0,040

The hypothesis that a traumatic event worsens the mechanisms of proactive coping was not confirmed. In the group of respondents who reported traumatic events and the group in whose experience traumatic events in the level of proactive coping did not reveal differences. Significant differences were found between the groups of respondents in whose experience there was a traumatic event without PTSD symptomatology and a group with symptomatic PTSD. It should be noted that the resulting difference in the level of proactive coping is small (mean in the group with trauma 3.00 and in the group with PTSD 2.89). We assume that in order to effectively overcome a traumatic situation, the level of proactive coping strategies should be high. For further analysis, we translated our scales into ordinal: values less than one standard deviation from the mean — low level, values more than one standard deviation from the mean — high level, the other values — medium level.

The results obtained can be explained by a more complex proactive coping mechanism in a traumatic situation. in a traumatic situation, proactive coping mechanisms are activated. Thus, the transition of a traumatic situation in PTSD can be determined by the level of formation of mental mechanisms aimed at overcoming stress [16]. To test this hypothesis, the method of regularized logistic regression was chosen. This method of statistical analysis allows us to estimate the relationship of the predictors to the target variable by introducing a penalty coefficient that reduces the problem of multicollinearity. We used the R software package GLMNET with lasso regularization, which allows excluding statistically insignificant predictors from the analysis [17]. The results are presented in Table IV.

TABLE IV. REGULARIZED LOGISTIC REGRESSION RESULTS. THE TARGET VARIABLE IS THE PRESENCE / ABSENCE OF PTSD IN THE GROUP OF RESPONDENTS IN WHOSE EXPERIENCE THERE WAS A TRAUMATIC EVENT

Predictors	b	exp (b)
(Intercept)	1,10	3,00
Proactive coping medium level	- 0,34	0,71
Proactive coping high level	- 0,54	0,58
Reflective coping medium level	0	1,00
Reflective coping high level	0	1,00
Strategic planning medium level	- 0,49	0,62
Strategic planning high level	- 0,34	0,71
Preventive coping medium level	0	1,00
Preventive coping high level	- 0,19	0,82
Instrumental support seeking medium level	0	1,00
Instrumental support seeking high level	- 0,31	0,73
Emotional support seeking medium level	- 0,15	0,86
Emotional support seeking high level	0	1,00
Lambda = 0,01, AUC = 0,61		

In the proposed regression model all predictors are compared with an intercept that includes low levels of proactive coping strategies. The most significant levels of coping strategies reducing the likelihood of PTSD for people who survived a traumatic situation: high levels of proactive coping (reduces the likelihood of PTSD by 42%), medium planning level (38%). The probability of PTSD is also reduced: a high level of planning (29%), a medium level of proactive coping (29%), a high level of search for instrumental support (23%). Slightly reduce the likelihood of PTSD high level of preventive coping (18%) and the medium level of search tool support (14%). Reflective coping according to the results of our study is not linked to the risk of PTSD.

Interesting is the non-linear nature of the relationship of individual coping strategies and the likelihood of PTSD. The medium level of planning reduces the risks of PTSD more than a high level of planning. It can be assumed that for people who are highly planning-oriented, non-standard situations (for example, traumatic events) are a threat because they violate their plans. For people who are less planning-oriented, unexpected events cause less stress. On the other hand, for those who do not have planning skills (low planning level), a traumatic event also poses a threat, since they cannot plan their activities to address the situation. Similar results were obtained for seeking emotional support. The medium search level of emotional support reduces the

risks of PTSD, but a high level does not. Such results can be explained by the fact that people who are strongly oriented towards finding emotional support most likely do not receive it in full, which increases the level of stress.

The study tested the hypothesis of the relationship of combinations of proactive coping strategies and PTSD. The decision trees method was used. We used the R software package RPART with cross-validation, since this method is prone to overfitting. A higher node level indicates a higher predictor value [18]. The results are presented in Fig.1.

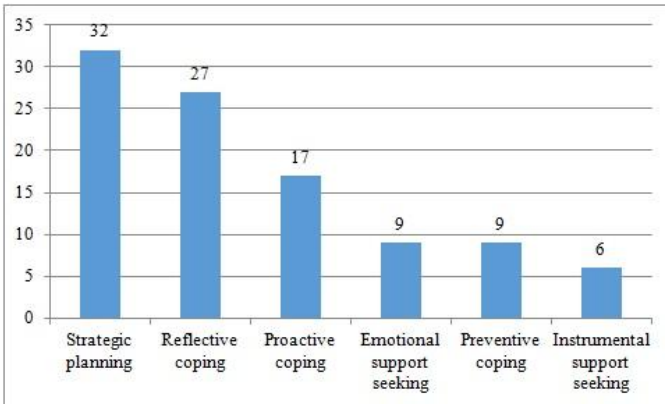

Fig. 1 Variable importance of decision tree. The target variable is the presence / absence of PTSD in the group of respondents in whose experience there was a traumatic event. Predictors are levels of coping strategies

The most significant predictors of PTSD is Strategic planning and reflective coping. Proactive and reflective coping are aimed at analyzing future strategies of behavior in a difficult situation, finding the necessary resources to overcome difficulties. These strategies of proactive coping are positively correlated with an active lifestyle and, according to the results of some studies, are positively linked to self-efficacy. The high level of proactive and reflective coping allows a person to analyze a difficult situation, which can prevent the emergence of such symptoms of PTSD as an exaggerated startle response, over-alertness. These strategies for proactive coping are negatively correlated with the avoidance strategy, which reduces the likelihood of the PTSD symptom "avoiding thoughts, feelings, actions, and people associated with traumatic events."

TABLE V. DECISION TREE RESULTS.

Conditions	***Result***	***Node level***
planning (low)	PTSD	1
planning (low) + proactive coping (low)	PTSD	2
planning (medium or high) + proactive coping (medium or high) + search for instrumental support (high) + reflective copying (high)	no PTSD	5
planning (medium or high) + proactive coping (medium) + search for instrumental support (low or medium) + reflective copying (low)	PTSD	5
planning (medium) + proactive coping (medium) + search for instrumental support (high) + search for emotional support (high)	no PTSD	5
planning (medium) + proactive coping (medium) + search for instrumental support (high) + search for emotional support (low or medium)	PTSD	5
planning (medium or high) + proactive coping (high) + search for instrumental support (low or medium) + reflective copying (medium or high)	no PTSD	5
planning (medium or high) + proactive coping (medium) + search for instrumental support (low or medium) + reflective copying (low)	PTSD	5
CP = 0.019, AUC = 0.65		

With a low level of planning and a low level of proactive coping, the likelihood of PTSD is highest. With medium levels of planning and proactive coping, a high level of search for instrumental support, a low or medium level of search for emotional support, PTSD increases. This can be explained by the fact that people who carry out only the search for an instrumental support and who are not and are not looking for a search for emotional support do not cause sympathy and can be perceived by others as manipulators. This results in less instrumental support. Indirectly, this assumption can be confirmed by the correlation between the scales of search of instrumental and emotional support (Spearman's rho 0,55, $p<0.001$).

The coping strategy through planning is in some cases ineffective. For example, a medium or high level of planning combined with a medium level of proactive coping, a low or medium level of search for instrumental support and a low level of reflective overcoming increases the likelihood of PTSD. The combination of coping strategies described is typical for people who do not highly estimate their ability to seek out instrumental support from other people and low estimate their cognitive ability to assess resources and their ability to predict the results of their actions. In this situation, planning and proactive coping skills are not used effectively.

IV. CONCLUSION

The most pronounced relationship with PTSD symptoms was found for a low level of planning skills and proactive coping, which is indirectly confirmed by the results of clinical studies. The greatest risks of PTSD in a traumatic situation for people with a low level of proactive coping, planning, search for instrumental support. The study showed a possible non-linear relationship between proactive coping strategies with PTSD .

The absence of significant interrelationships of preventive coping with PTSD can be explained by the extraordinary nature of withdrawing negative symptoms. A person does not prepare for such an event in advance and cannot assume when such a meeting will occur.

In general, the results of the study show that some proactive coping strategies (primarily planning strategies, proactive coping, instrumental support seeking) can be considered as factors of successful coping with a traumatic situation. The described groups of strategies can be used in screening studies of representatives of extreme professions, as well as in the development of prevention programs in the field of mental health and adaptation for different risk groups.

V. LIMITATIONS

The model of this study does not allow to definitively confirm or disprove the hypotheses about the nature of the relationship between proactive coping strategies and PTSD. For people with a high level of proactive coping is

characterized by less pronounced symptoms of PTSD and a lesser level of stress experienced. But there is an alternative explanation. The traumatic situation for a part of people decreases the adaptation potential and reduces the ability of proactive coping. It is impossible to exclude the possibility that some people increase their ability to proactively cope with post-traumatic growth.

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VII. FUNDING

Research is supported by Russian Foundation For Basic Research, project 19-013-00612 "Cross-cultural analysis of personal and situational determinants of coping with difficult life situations"