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POSITIVE EFFECTS OF TRAUMA AMONG PEOPLE LIVING WITH HUMAN IMMUNODEFICIENCY VIRUS – THE ROLE OF RUMINATION AND COPING STRATEGIES

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Abstract

Purpose: The study aimed to establish the role of rumination and coping strategies in the occurrence of the positive effects of trauma (in the form of posttraumatic growth) resulting from human immunodeficiency virus (HIV) infection.

Methods: The results of 64 people (out of 120 covered by the study), who indicated that HIV diagnosis was a traumatic event for them, were analysed. The study group consisted of members of the support group for people living with HIV and acquired immunodeficiency syndrome (AIDS) in a city in central Poland, patients participating in therapy at the Centre for Addiction Treatment who reported after obtaining seropositive status, and boarders at the Readaptation Centre. The age of the participants ranged from 20-58 years (M = 38.2, SD = 9.16). The following Polish versions of standardized tools were used: Posttraumatic Growth Inventory – PTGI, Event Related Rumination Inventory – ERRI, measuring two types of ruminations: intrusive and deliberate and short version of Coping Inventory – Mini-Cope.

Results: Ruminations were not directly associated with the intensity of posttraumatic growth. The conducted path analysis indicated that such coping strategies, as the seeking of emotional support, active coping and turning to religion play a mediating role between deliberate ruminations and the prevalence of positive posttraumatic changes in general and in particular factors.

Conclusions: Ruminations do not correlate directly with posttraumatic growth resulting from HIV infection, however they have impact on its level indirectly through the coping strategies.

Key words: HIV, coping strategies, posttraumatic growth, ruminations.

INTRODUCTION

Negative and positive consequences of human immunodeficiency virus infection

Through the development of acquired immunodeficiency syndrome (AIDS), infection with the human immunodeficiency virus (HIV) can have serious, even fatal, consequences on human health. A diagnosis of being HIV-positive generally arouses strong anxiety, depression, helplessness and guilt. More than half of the respondents surveyed in an earlier study indicated that they considered the diagnosis of HIV to be the most stressful event that they had ever experienced [1]. Life-threatening medical illness possesses all of the hallmarks of a potentially posttraumatic stress disorder (PTSD) inducing event, but differs in important ways from external past traumatic events. Unlike the typical traumatic events such as combat, sexual assault or earthquake that have long been known to induce PTSD symptoms, however, medical traumas are rarely discrete events with a defined endpoint. Once an external event has concluded, the physical threat has usually subsided. In contrast, traumatic life-threatening illness is often the acute manifestation of a permanently disrupted physiological system whose consequences may last for years and place an ongoing threat squarely in the body of the survivor [2].

Being HIV-positive has been associated with symptoms of PTSD [1, 3-7]. The prevalence of PTSD among people living with HIV is estimated to range from 5% to 74%, depending on the criteria or measurement tools used [7].

In addition to negative experiences, trauma can also have positive consequences in the form of posttraumatic

growth (PTG). This phenomenon includes changes in self-perception, interpersonal relationships and life philosophy [8, 9]. Positive changes in self-perception are manifested in an increase in emotional maturity, a belief in greater coping efficiency and own competences, a greater sense of self-confidence, self-esteem, and an increased belief in one's own ability to control the situation. In terms of relationships with others, there may be deeper relationships with people, increased family ties, greater openness and sensitivity to the needs of others, and readiness to receive and help others. Changes in life philosophy are expressed in greater appreciation of life, changes in the hierarchy of values, perception of new perspectives and meaning in life, and development of the spiritual sphere [7, 8]. It is also worth mentioning that PTG describes transformational changes that go beyond the process of adaptation to the disease [10]. Adaptation is a return to the level of well-being characteristic of an individual [11], while PTG would include not only quantitative but also qualitative transformations in functioning [12, 13].

Studies have yielded data on the occurrence of positive posttraumatic changes in people living with HIV and AIDS [5, 13-15]. Milam [5] notes that growth following trauma occurred in nearly 83% of AIDS patients and those with HIV infection in the period following diagnosis. A Polish study has also found some evidence of such beneficial growth arising in people with HIV infection and AIDS [16, 17].

The role of rumination and coping strategies in the occurrence of positive consequences of experienced trauma

Among the determinants of the positive changes, an important role is attributed to cognitive engagement, including the ability to process information related to the experienced event and used coping strategies [8, 9, 18-20]. Rumination directly related to the experienced event plays a key role in the cognitive processing of trauma.

Rumination of an experienced event, according Calhoun *et al.* [21], is a process typified by frequently returning thoughts of the trauma, which can have positive, negative and neutral cognitive elements. In confronting with the trauma, the subject experiences not only negative emotions, but also revisits thoughts and memories associated with the situation, and in doing so, discusses and analyses them, and gradually gives them new meaning.

Directly after the traumatic event, intrusive rumination appears. This process is characterized by the automatic appearance of thoughts that the individual is not able to control, and which are not linked to attempts to solve the problem. This kind of rumination favours the appearance and maintaining of posttraumatic stress symptoms [22-24]. Later, while struggling with the traumatic event, the subject may experience a process of deliberate rumination, which serves as a route by which the situation may be analysed and solutions sought. This kind of rumination is regarded as an important factor in the emergence of positive posttraumatic changes [21, 22, 25].

The relationship between ruminating about the experienced negative event and PTG are complex. The revised model of PTG [21] indicates that both types of rumination play an important role in the occurrence of PTG. While intrusive rumination is regarded as a direct consequence of the experienced trauma, this gradually gives way to intentional and reflective rumination, aimed at finding ways to cope with the experienced situation. Intrusive rumination allows the further cognitive activity of the individual to be maintained and paves the way for deliberate rumination. Deliberate rumination, in turn, allows the subject to at least partially regain control of the situation and to find ways of coping with it.

A positive relationship has been revealed between rumination and PTG among people infected with HIV and AIDS [5, 7, 13, 15, 20, 21, 26]. However, other studies reveal no association between PTG and cognitive engagement, expressed mainly in the form of intrusive thinking about an experienced event [27, 28], and suggest that a negative relationship may exist between recurrent thoughts and PTG [29]. Polish studies conducted among people living with HIV have not confirmed any relationship between rumination and PTG [17].

The revised model of PTG [21] indicates that in addition to ruminating over the experienced event, an important role in the occurrence of positive posttraumatic changes is played by coping strategies. Some of the strategies favouring the occurrence of positive posttraumatic changes are acceptance, positive reframing, task focused coping and turning to religion [32] and their importance has been confirmed by meta-analyses of several other studies [33, 34]. Strategies that promote growth after trauma resulting from the struggle with the somatic disease are primarily based around active coping, particularly in people clearly struggling with the disease, as well as positive reframing, a sense of humour and seeking social support [35, 36].

Following an event, rumination typically precedes remedial activity and can be seen as a way of dealing with it [37]. The type of rumination can determine the choice of specific coping strategies. A positive relationship has been found between the occurrence of deliberate ruminating and adaptive coping strategies, and between intrusive rumination and the use of maladaptive strategies [38, 39]. Problem solving and cognitive restructuring was positively related to reflection in a study on adolescents conducted by Burwell and Shirk [40].

So far, little research have been conducted that would include complex relationships between rumination, coping strategies and the positive effects of experienced trauma.

The aim of the study was to determine the role of rumination and coping strategies in the occurrence of positive consequences of experienced trauma resulting from HIV infection. The indicator of the positive effects of the trauma was PTG.

It has previously been assumed that both rumination and coping strategies are linked to PTG [8, 9]. It should also be expected that rumination will affect the level of growth both directly and indirectly after trauma, thus determining the choice of certain coping strategies.

METHODS

The study included 120 HIV-infected subjects. A significant percentage of respondents (39.2%) refused to participate, which in turn limited the study group to 73 people. The final analysis included 64 people (25 women – 39.1%; 39 men – 60.9%), who indicated that they had found the diagnosis of HIV infection to be a traumatic event, and they completed all submitted questionnaires. The respondents were aged 20 to 58 years (M = 38.2, SD = 9.16).

The study group consisted of members of the support group for people living with HIV and AIDS in a city in central Poland, patients participating in therapy at the Centre for Addiction Treatment who reported after obtaining seropositive status, and boarders at the Readaptation Centre. Four of the respondents became ill with AIDS. Respondents completed prepared questionnaires during the meetings with the therapist.

Almost half of the respondents (43.8%) declared that the infection had occurred more than five years previously, 28.1% became infected during the period two to five years previously, 20.3% from two years to one year, and 7.8% in the previous 12 months prior to the conducted survey. The respondents agreed to participate in the study, which was voluntary and anonymous. The study was approved by the appropriate Bioethics Commission. Table 1 presents the characteristics of the sample.

The study used three tools of measurement: the Posttraumatic Growth Inventory, the Event Related Rumination Inventory and the Inventory Measuring Coping Skills – Brief-Cope.

The Posttraumatic Growth Inventory (PTGI), developed by Tedeschi and Calhoun [8], contains 21 statements. The Polish adaptation by Ogińska-Bulik and Juczyński [41] assesses four aspects of growth after trauma, i.e. changes in self-perception, changes in relating to others, a greater appreciation of life and spiritual changes. The reliability of the inventory is high. Cronbach's α coefficient is 0.93 (in the study 0.90).

Event Related Rumination Inventory (ERRI), developed by Cann *et al*., [22] contains 20 statements. The first ten items refer to intrusive/unintentional rumination, the remaining ten to deliberate/intentional rumination.

Table 1. Frequency of sociodemographic variables

Variable	*n*	%
Gender		
Male	39	60.9
Female	25	39.1
Age		
20-29	10	15.6
30-39	25	39.1
40-49	21	32.8
50-58	8	12.5
Time since diagnosis		
Up to 1 year	13	20.3
1-2 years	5	7.8
2-5 years	18	28.1
5 years and more	28	43.8

The results are calculated separately for both scales. The Polish adaptation by Ogińska-Bulik and Juczyński [42] has good psychometric properties. Cronbach's α coefficients are high: 0.96 for the intrusive rumination subscale and 0.92 for the deliberate rumination subscale (in the study 0.95 and 0.89).

The Brief-Cope, developed by Carver [43], is a shortened version of the Multidimensional Inventory Measuring Coping Skills, known as COPE (The Coping Orientations to Problems Experienced). The Polish adaptation of this tool [44] includes 28 statements, which are part of the 14 coping strategies, with two statements for each strategy: active coping, planning, positive reframing, acceptance, sense of humour, turning to religion, seeking emotional support, seeking instrumental support, self-distraction, denial, venting, substance use, behavioural disengagement and self-blame. Cronbach's α coefficients for the individual strategies range from 0.62 to 0.89. The study used a situational version of the tool and, therefore, strategies for coping with HIV infection, not stress in general, were measured. Cronbach's α coefficients for the study range 0.65 to 0.91.

RESULTS

The obtained data provided an insight into the degree of PTG, the type of rumination and coping strategies experienced by the subjects, and allowed us to determine whether a direct or indirect relationship exists between PTG and rumination about the negative event and the use of coping strategies. The influence of sociodemographic variables (sex, age and the time elapsed following diagnosis of HIV infection) on the level of post-traumatic positive changes was monitored. The variables were normally distributed, therefore parametric tests were used for statistical analysis.

The average PTG value displayed by the respondents (M = 59.64, SD = 22.78) corresponded to a value of 5 Sten (average). According to accepted standards expressed on a sten scale [41], 42.2% of the respondents obtained low scores, 28.1% average and 29.7% high. The sex and age of the respondents, and the time elapsed since diagnosis of HIV infection did not significantly differentiate the degree of PTG.

The level of rumination demonstrated by respondents living with HIV was slightly higher than those in clinical normalization (intrusive ruminations men M = 13.27, SD = 8.69; women M = 20.15, SD = 7.74; reflective ruminations men M = 14.16, SD = 7.42; women M = 18.65, SD = 6.68) [42]. The result obtained by men in the field of intrusive ruminations is on the border of 6 and 7 sten, while the reflective 7 sten. In the case of women, intrusive ruminations assume an average value (6 sten), while reflective ones are on the border 6 and 7 sten. Men, compared to women, revealed a slightly lower level of rumination, both intrusive (M = 17.28, SD = 9.32 and M = 21.32, SD = 7.35, $t = -1.82$) and reflective (M = 19.17, SD = 7.99 and M = 21.64, SD = 6.39, $t = -1.89$), but the differences are not statistically significant.

The means of employed coping strategies do not differ from data obtained in standard studies (active coping M = 1.87, SD = 0.79; planning M = 1.89, SD = 0.79; positive reframing M = 1.67, SD = 0.77; acceptance M = 1.78, SD = 0.77; sense of humour M = 0.82, SD = 0.78; turning to religion M = 0.85, SD = 0.85; seeking emotional support M = 1.66, SD = 0.91; seeking instrumental support M = 1.56, SD = 0.93; self- distraction M = 1.34, SD = 0.84; denial M = 0.63, SD = 0.71; venting M = 1.01, SD = 0.69; substance use M = 0.37, SD = 0.65; behavioural disengagement M = 0.58, SD = 0.60; self-blame M = 1.20, SD = 0.76) [44].

The most frequently used coping strategies among respondents were: acceptance (M = 4.22, SD = 1.67), self-blame (M = 3.84, SD = 1.84), active coping (M = 3.83, SD = 1.56) and planning (M = 3.75, SD = 1.78). The least used strategies were sense of humour (M = 2.17, SD = 1.81) and turning to religion (M = 2.42, SD = 2.26). Other strategies were used to an average degree: positive reframing: M = 3.08, SD = 1.89, seeking emotional support: M = 3.36, SD = 1.76, seeking instrumental support: M = 3.40, SD = 1.85, behavioural disengagement: M = 2.76, SD = 2.12, denial: M = 2.76, SD = 2.12, venting:

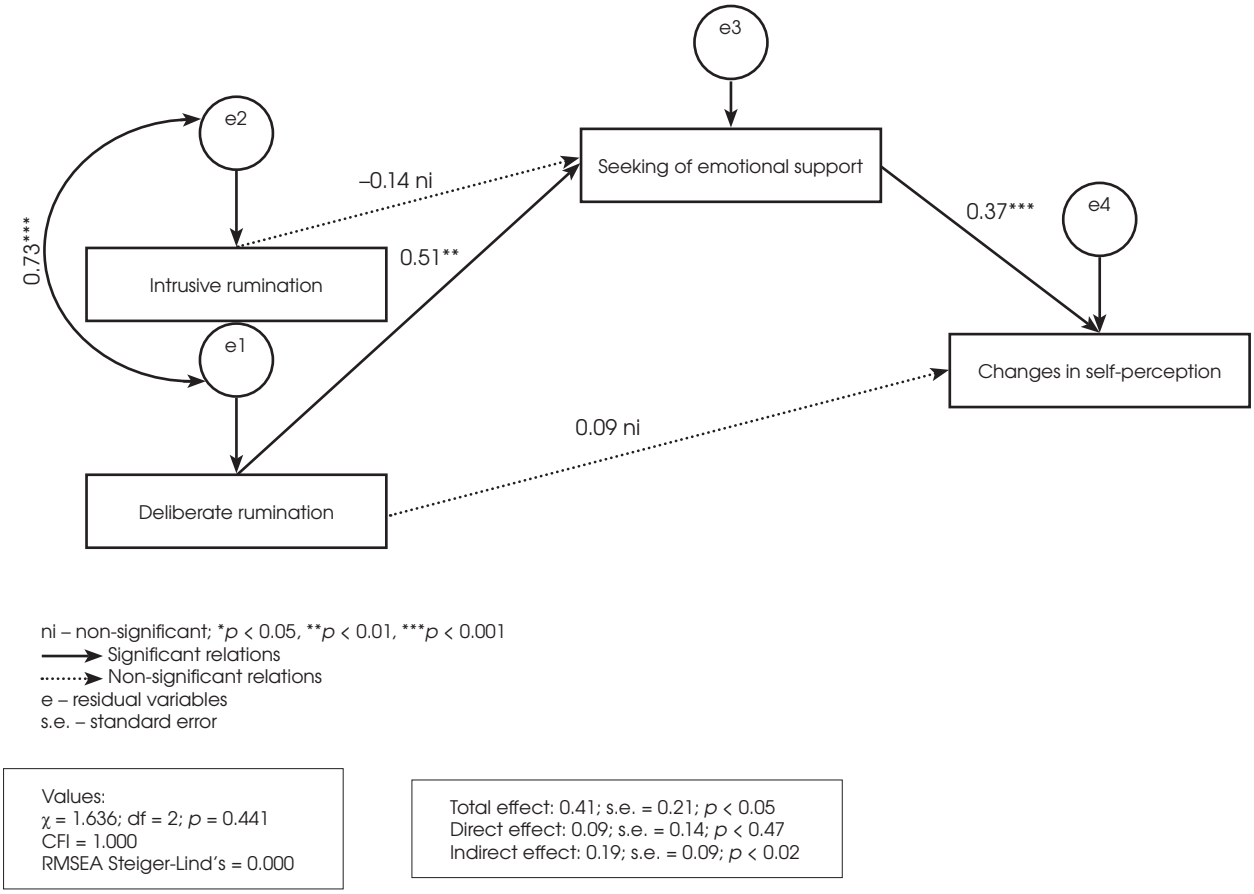

Figure 1. The results of path analysis for changes in self-perception

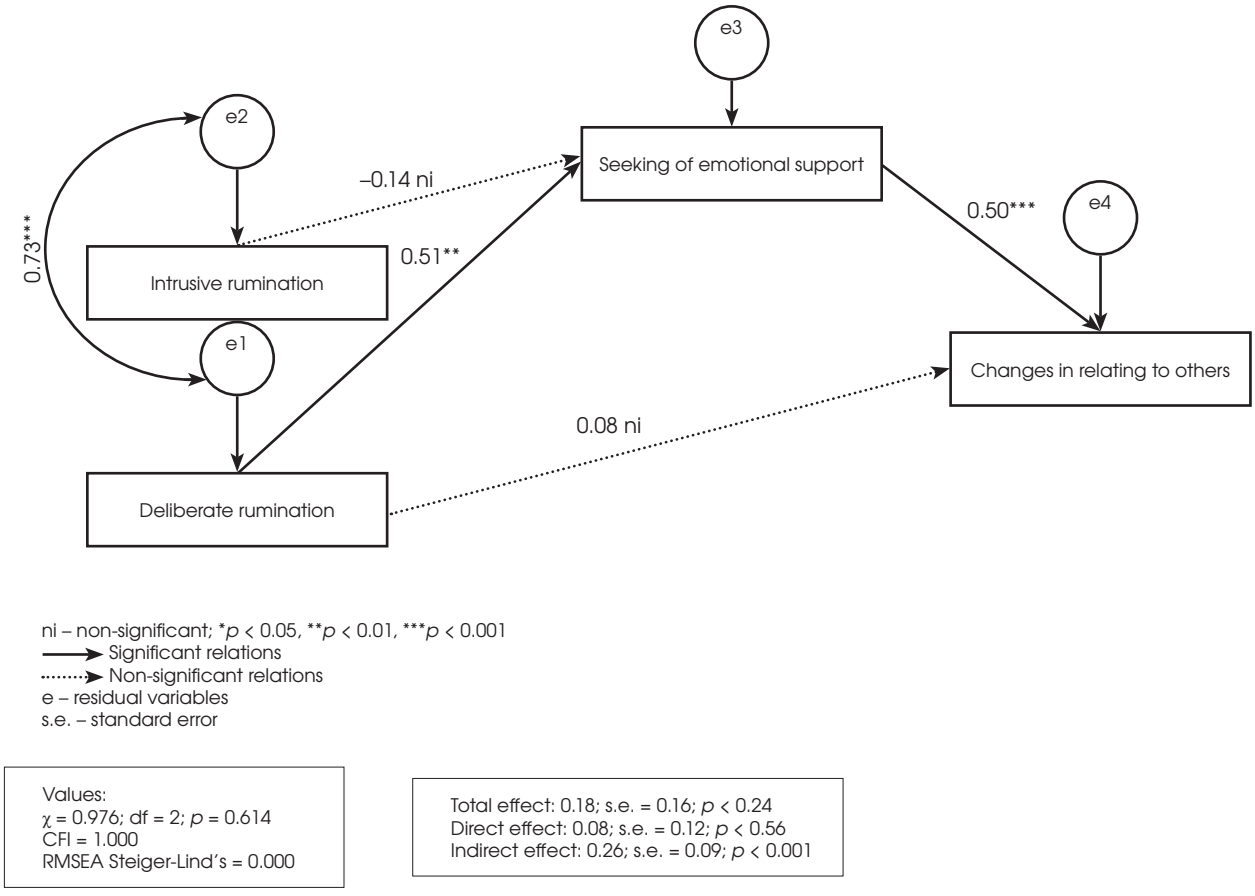

Figure 2. Results of path analysis for changes in relating to others

M = 3.43, SD = 1.82, substance use: M = 3.23, SD = 2.46, self- distraction: M = 2.68, SD = 1.82.

Relationship between rumination, coping strategies and posttraumatic growth

To determine how rumination affected PTG, structural modelling (according Amos) was used. This is a statistical methodology that takes a confirmatory approach to the analysis of a structural theory bearing on some phenomenon. The exogenous variable was PTG, while the endogenous variables were two types of rumination and coping strategies.

The calculated indicators of match for the structural equation are presented in Figures 1 to 4. Each of the presented models meets the criteria for goodness of fit to the empirical data. The arrows in the diagrams, or *paths*, represent assumed causal relationships. Vector arrows reflect the direction of these relationships. The factor causal effect, or *rate path* (path coefficient) is given next to the arrowed values. A dotted line indicates causal relations which turned out to be statistically non-significant [45].

The results of these analyses of structural modelling indicate that the endogenous variables have only indirect relationships. Rumination was not found to have any direct relation on PTG; only deliberate rumination was found to play a mediating role in various areas of PTG. No such relationship was found for the outcome for total PTG.

Deliberate rumination was found to have a relation with PTG indirectly, through the selection of coping strategies such as seeking emotional support, active coping and turning to religion. Hence, deliberate rumination over HIV infection improves the ability to cope with the experienced situation, primarily by seeking emotional support, which then enhances the occurrence of positive PTG in the areas of self-perception, relating to others and appreciation of life. Deliberate rumination also includes religion as a way of coping, which in turn promotes positive changes occurring in the spiritual aspect. This type of rumination is also positively associated with active coping, but the use of this way of coping reduces the level of positive spiritual changes.

DISCUSSION

The PTG value obtained by the respondents living with HIV did not differ from those found in various clini-

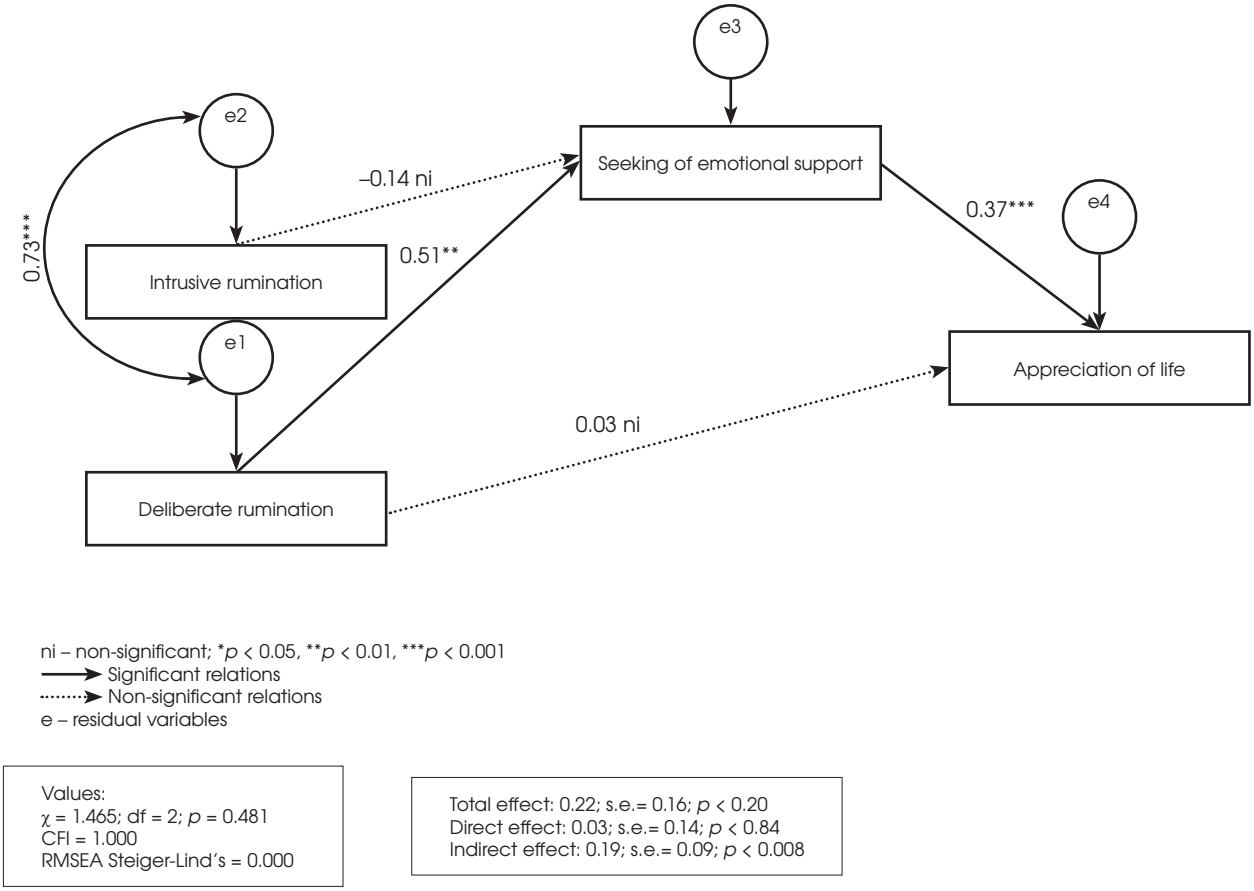

Figure 3. Results of path analysis for a greater appreciation of life

cal groups in the standardization studies [41]. The mean of PTG score was also similar to that obtained by Nightingale *et al.* [15] on HIV-infected subjects (M = 61.1, SD = 28.5). In the group of HIV+ subjects, fewer than 1/3 of respondents experienced a high level of growth following trauma (29.7%).

The presence of positive changes occurring as a result of an experienced trauma seems to play an important role in the process of the development of the disease. It has been shown that positive beliefs, such as the belief in the possibility of finding meaning in threatening events, in patients with AIDS contribute to slowing disease progression and longer survival time [13].

Our findings do not confirm any direct relationship between rumination and PTG. This stands in contrast with the majority of previous studies, which have suggested the existence of such a relationship, especially regarding deliberate rumination. US studies on HIV-positive individuals indicate that both types of rumination are positively associated with PTG [15]. The relationship between PTG and ruminations occurs in the case of typical traumatic events such as violence, traffic accident or earthquake.

Some studies failed to find a relationship between ruminations and PTG [27, 28], while the others found a negative correlation between intrusive ruminations and PTG [29]. There was not relationship between rumination and PTG in Polish study in mothers of children with intellectual disability [30].

For example, in long-term studies conducted among people with leukemia, it was shown that intrusive ruminations occurring during the treatment did not allow to predict posttraumatic growth after the completed treatment process [27]. Similarly, in the group of people struggling with colorectal cancer, the initial level of intrusive and reflective ruminations did not allow to predict posttraumatic growth 3 months later [28]. In turn, in studies by Park *et al.* [29], including oncological patients, showed a negative association of intrusive ruminations with positive changes as a result of experienced trauma.

The absence of those relationships may be related to the nature of stress experienced by the group in the study. As noted by Tedeschi *et al.* [46] the role of rumination in the process of an individual's adjustment depends on the type of traumatic event and its subjective cognitive appraisal by that individual.

In the case of trauma associated with struggling with somatic disease, this relationship may have a different character, that an Enduring Somatic Threat Model of PTSD indicates [2].

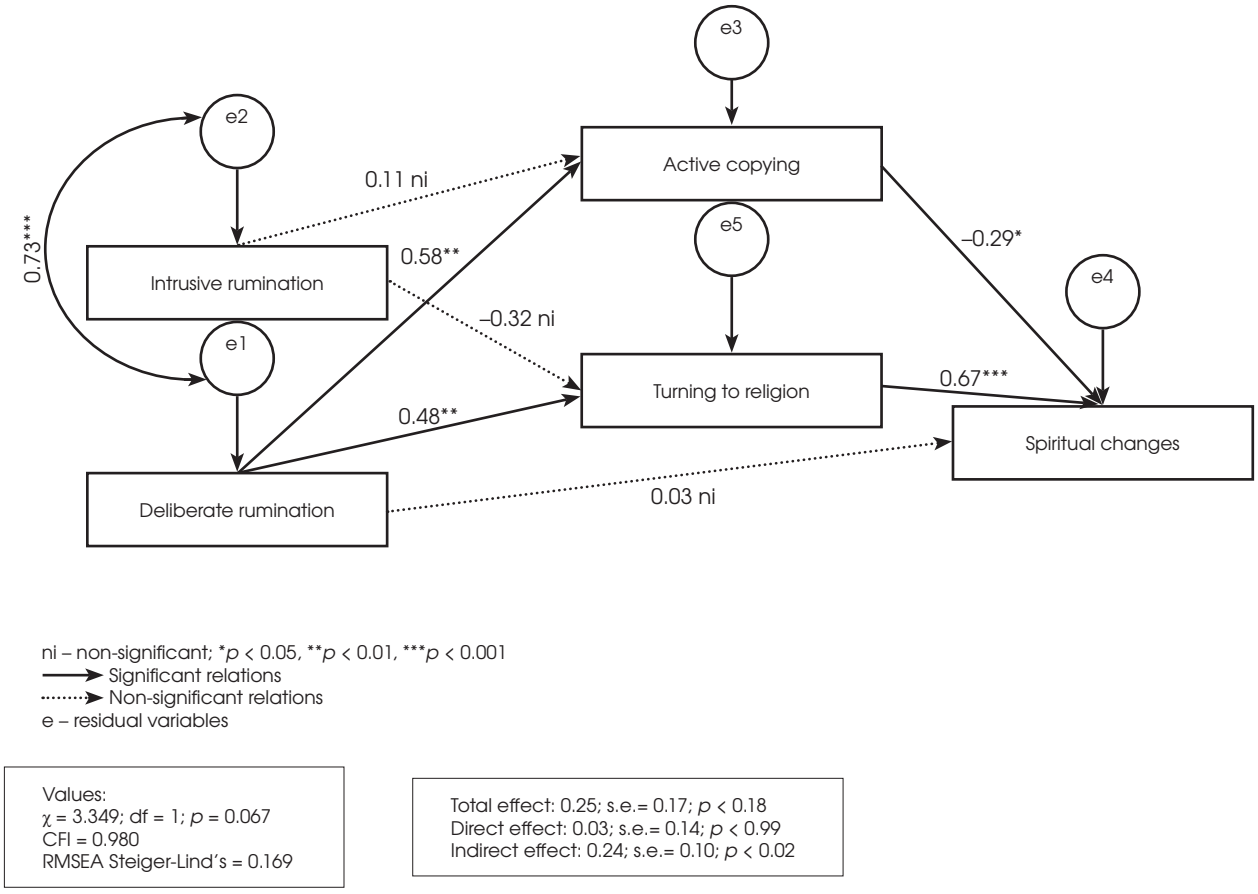

Figure 4. Results of path analysis for the spiritual changes

In addition, the lack of relation between ruminating and PTG may be the result of quite a long time at which the diagnosis of HIV occurred. For over 43% of respondents, this time was more than 5 years.

Deliberate rumination has an indirect effect on PTG through the selection of such coping strategies as seeking emotional support, active coping and turning to religion. On the other hand, seeking emotional support and turning to religion favour the occurrence of PTG in self-perception, appreciation of life, relating to others and the spiritual realm. Particular importance should be attributed to a strategy seeking emotional support.

Seeking emotional support is an emotion-focused coping strategy [31]. It seems to be particularly important among HIV+ individuals, who constitute a highly stigmatized group, mainly due to the form of transmission of the virus [47]. Support received from others may have an advantageous impact on the emergence of positive emotions, or at least reduce the negative ones, which is of pivotal importance in the process of PTG.

Folkman and Moskowitz [31] underline that this kind of coping is particularly useful when the subject has little control over the negative situation. HIV infection seems to be a poorly-controlled situation. This kind of coping encourages individuals to change their view and cognition related to the distress caused by the event, rather than the event itself.

The importance of seeking emotional support as a strategy for positive posttraumatic changes has been also confirmed in research among patients with oncological diseases [34, 35].

The role of the active coping strategy was less significant. Although deliberate rumination is conducive to active coping, the strategy was found to reduce the level of positive changes in the spiritual realm; however, no negative changes were observed in any other area of PTG. This is not in accordance with the results of other studies. Problem-focused coping and deliberate rumination were found to have a direct positive influence on PTG in a study of a group of men and women who experienced the earthquake and tsunami in 2010 in Chile [39].

The results of the study showed that deliberate rumination determines the choice of coping strategy: either problem or emotion-focused strategies. This is largely consistent with the claim that this type of rumination is conducive to adaptive coping strategies [39, 40].

Our findings indicate that any analysis of the impact of rumination on PTG should also take into account

the employed coping strategies. However, the impact of these variables is a complex issue and requires further research.

Study limitations

The study does have certain limitations. The analysed results were obtained from a relatively small number of people: many respondents refused to participate in the study. The used tools are self-reporting, which can be influenced by social approval. Also, it is unknown whether the subjects had experienced other traumatic events in addition to the diagnosis of HIV infection, which could affect the results. Finally, the study is of a cross-sectional nature, which does not allow unequivocal cause-effect relationships to be identified.

CONCLUSIONS

Despite the limitations, the presented results add knowledge regarding the scope of the relationship between rumination over an experienced event, the choice of coping strategy and the consequences of experienced trauma. They highlight the complex roles played by cognitive activity and behaviour in the presence of positive post-traumatic changes. There is, hence, a clear need for further research in this area, which would consider both forms of rumination, occurring immediately after the event and later (current rumination). It should also examine the other form of cognitive activity, for example, any changes to the basic assumptions of the world. Another important issue is to consider the emotional processing accompanying the cognitive processing.

Conflict of interest

Absent.

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