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Original Article

Self-Serving Cognitive Distortions as Predictors of Potential Problem Behaviors among Adolescents in Bosnia and Hercegovina

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Abstract

The young people in transition economies face many problems, in addition to delinquent behavior and substance use/abuse. The aim of this study was to determine the effect of four cognitive distortions (measured with the How I Think Questionnaire), as the predictors of 10 functional adolescent problem areas (measured with the Problem-Oriented Screening Instrument for Teenagers). This research was conducted on a sample of 789 students, 471 of which were primary school students and 318 were secondary school students from Bosnia and Herzegovina (Republic of Srpska entity). Hierarchical multiple regression analysis showed that self-serving cognitive distortions/assuming the worst impacted substance use/abuse (β = .11, p = .03/ β = .20, p = .00), physical health (β = .12, p = .02/ β = .12, p = .02), mental health (β = .18, p = .00/ β = .25, p = .00), family relations (β = .10, p = .04/ β = .23, p = .000), peer relations (β = .14, p = .00/ β = .20, p = .00), educational status (β = .19, p = .00/ β = .22, p = .00), social skills (β =.13, p = .01/ β = .34, p = .00), and aggressive behavior/delinquency (β = .23 p = .00/ β = .15, p = .00). Cognitive distortion of blaming others impacted physical health (β = .14, p = .00), and peer relations (β = .13, p = .00). Cognitive distortions affecting maladaptive behaviors identified in this research are unconscious and negative automatic thoughts. Through cognitive behavioral therapy they can be replaced with more acceptable alternatives. This allows an early identification of children at risk and opens the possibility for early prevention. The results of this research may contribute to a more individualized cognitive behavioral therapy of externalizing disorders and other problematic behaviors in adolescents. This is all the more necessary because human capital is particularly important in Bosnia and Herzegovina, which is a small and underdeveloped country.

In behavioral sciences, sociology in particular, young people are viewed as a special social group that is an integral part of society. This means that young people share certain common characteristics and intergroup social stratification in accordance with the differentiation of a given society. As a social group, the young people, first and foremost, share their belonging to a certain age group, as well as specific social characteristics, appropriate social roles, and behavioral patterns. Research has already demonstrated that they are characterized by insufficient integration into the overall social life and a generally less favorable social status as compared to adults. Unfortunately, today it is found that young people are more interested in activities that are not useful either to them or to the nation. They choose to spend their days doing drugs and playing video games and spend their nights partying and living it

up, so to speak (Sanjoy, 2020). In addition, young people are a highly vulnerable population segment in the modern society because they no longer enjoy the protection they had as children, and, at the same time, they are not yet in the position to use all the opportunities and benefits available to adults.

Adolescence is a period relevant for establishing key foundations necessary for mature, responsible, and autonomous growth. Latest neurological studies are also increasingly emphasizing the fact that, in addition to the first years of life, adolescence is a formative period and crucial for stable maturation because of the rapid growth of brain structures (Dahl et al., 2018). Hormonal changes during puberty are driven by adrenal glands and gonads that alter cognitive, emotional, and motivational processes and significant structural and functional changes occur in the brain (Dahl et al., 2018). These changes in the brain are related to behavioral fluctuations. Sensation seeking has increased, and attention and motivation have shifted to peers, social comparison, status achievement, as well as sexual and romantic interests (Nelson et al., 2016).

Dahl et al. (2018) emphasize two dominant processes. In this developmental period, young people encounter new experiences, feelings and conditions that often overwhelm them, and they are forced to deal with increasing uncertainty, while at the same time they have yet to reconcile newly acquired competencies that are not yet integrated with environmental requirements and personal identity, which is under development. Dahl et al. (2018) emphasize that the discovery of the self and the world "must take place in an entirely new way, through a series of trials and errors, successes and failures, with an increase in independence" (p. 215). It is the acquisition of cognitive, affective, and self-regulatory abilities in adolescence that enables all of us to flexibly, yet persistently, pursue new goals and set priorities that may also be long-term.

It should be noted that the circumstances that hinder adequate social integration of the young people are especially noticeable in transitional societies. This is confirmed by the results of the research on young people in South-East Europe (Lavrič et al., 2019). In such societies, economic developments have shown that labor market demands are becoming so contradictory and changeable that the young people can hardly make rational decisions regarding their education and professional goals. Unemployment and insecurity related to building a professional career are on the rise. Changes in transitional societies are also taking place in the field of education, with emerging forms of education and prestigious educational institutions that are unavailable to many (Lavrič et al., 2019). Globalization is influencing the biggest and most profound changes, such as accelerated development of information and communication technologies, increasing demands for professional flexibility and mobility and intensified population migrations (usually from underdeveloped to more developed parts of the world). These changes are accompanied by an increasing pressure for modernization and multiplication of risk factors, influencing the transformation of existing forms of social reproduction (Ruddick, 2003). (Post)modernization processes in the contemporary world contribute to the weakening of traditional, family and other ties, and of existing ways of transferring values and behavioral patterns to the next generation. The young people are therefore pressured to seek a more uncertain and difficult path to gaining their identity and individual strategies for social integration. All of the identified problems also affect the young people in Bosnia and Herzegovina (Republic of Srpska entity), their position being even more precarious because, due to war, they have an immediate experience of existential vulnerability.

In addition, in most developed countries, as well as in Bosnia and Herzegovina (Republic of Srpska entity), young people – due to negative demographic trends, i.e., absolute and relative decline in the youth population – are becoming an increasingly scarce resource. This is confirmed by the data of the Republic of Srpska Institute of Statistics (2020). Young people should be observed as the bearers of dominant values, but also as the representatives of dominant values, i.e., of the desirable changes and innovations. They can change the future of the society with their well-being and courageous behavior (Sanjoy, 2020). In this regard, it is necessary to ensure optimal social conditions for youth development since they are relevant not only as our future potential for the, but also as our social resource today. The analysis of youth problems in transition countries (Miles, 2000) indicates that, alongside the indicated trends, there is a problem of their greater exposure to health risks and patterns of addictive behavior, as well as their greater tolerance to patterns of deviant behavior.

Literature Review

Problem Behaviors

Factor analytic studies of problem behaviors have consistently revealed two distinct fundamental behavioral syndromes that Achenbach (1998) termed internalizing behavior (e.g. withdrawal, somatic complaints, anxiety, and depression) and externalizing behavior (e.g. aggressive and delinquent behaviors). Antisocial behavior is, among other potential psychosocial issues that will be discussed later, of primary interest in this study. It is conceptualized as outward behavior that harms others, either directly or indirectly, through the violation of important moral or social norms, and includes aggressive and delinquent acts (Barriga et al., 2001). Crick et al. (2006) found that antisocial behavior (physical and relational aggression) in elementary school children predicted future social-psychological adjustment problems. Cognitive distortions are a cause of the onset and continuation of antisocial behavior.

Cognitive Distortions

Cognitive distortions are defined as "inaccurate or biased ways of attending to or conferring meaning upon experiences" (Barriga et al. 2001), and the term self-serving cognitive distortions was introduced to define cognitive distortions that are specifically associated with externalizing behaviors such as aggression and delinquency (Barriga et al., 2000). They are rationalizations that serve to neutralize conscience, potential empathy, and guilt, and thereby prevent damage to the self-image when an individual engages in antisocial behavior (Barriga et al., 2001).

Theoretical framework

Cognitive distortions have been studied from numerous theoretical vantage points in relation to both externalizing and internalizing symptomatology. They play a role in protecting the self from blame or negative self-concept and facilitate aggression or other antisocial behavior (Barriga et al., 2001). This self-serving role is reflected in the conceptions of cognitive social learning theory (Bandura, 1991) as ego-defense mechanisms in psychodynamic theory (Redl & Wineman, 1957) and as rationalizing attitudes and beliefs in sociological neutralization theory (Sykes & Matza, 1957). Cognitive distortions of externalizing individuals have been described mainly as biased processing tendencies, such as gratuitously attributing hostile intentions to others, in social information processing or cognitive-behavioral theories (Dodge, 1993; Kendall, 1991).

Barriga et al. (2001) have defined a four-category typology of self-serving cognitive distortions: Self-Centered: According status to one's own views, expectations, needs, rights, immediate feelings, and desires to such a degree that the legitimate views, etc. of others (or even one's own long-term best interest) are scarcely considered or are disregarded altogether; Blaming others: Misattributing blame to outside sources, especially another person, a group, or a momentary aberration (he was drunk, high, in a bad mood, etc.) or misattributing blame for one's victimization or other misfortune to innocent others; Minimizing/ Mislabeling: Depicting antisocial behavior as causing no real harm, or as being acceptable or even admirable, or referring to others with a belittling or dehumanizing label; Assuming the worst: Gratuitously attributing hostile intentions to others, considering a worst-case scenario for a social situation as if it were inevitable, or assuming that improvement is impossible in one's own or others' behavior.

Gibbs et al. (1995) introduced a distinction between primary and secondary self-serving cognitive distortions. According to Barriga et al. (2001), the primary cognitive distortions stem from the egocentric bias most prominently found among young children and reflecting less mature moral judgment stages as defined by Kohlberg (1984). An example of a primary cognitive distortion could be the following quote from a male burglar: "My idea in life is to satisfy myself to the extreme. I don't need to defend my behavior. My thing is my thing. I don't feel I am obligated to the world or to anybody" (Samenov, 2004). Primary cognitive distortions comprise the first category (self-centered) in Gibbs and Potter's typological model: the other three categories (blaming others, minimizing/mislabeling, and assuming the worst) constitute secondary cognitive distortions, which serve to support the primary distortions. Gibbs (1991) suggested that secondary distortions reduce the stresses caused by the consequences of the primary distortions. Two such stresses that can stem from one's harm to others are: empathic distress (and possibly empathy-based guilt), and cognitive dissonance between harmful actions and a self-definition as a person who does not harm others unjustifiably.

As outlined in his social cognitive theory of moral agency, Bandura (1999, 2002) describes moral disengagement as the socio-cognitive processes through which the average person can commit appalling acts against others. Through the socialization, people learn acceptable and unacceptable forms of moral behavior. These behaviors are either condoned or sanctioned. Regulation occurs when an individual engages in activities that contravene the standards or conform to these standards. Thus, when individuals believe that something is wrong (contravenes standards), and they engage in such behavior, they may feel guilt or remorse. Conversely, if these individuals engage in a behavior that may contravene standards, but are able to activate their self-regulation, it diminishes the negative affect associated with contravening one's moral standards. Bandura (1999; 2002) describes four major categories of psychological mechanisms by which "good people do bad things", including the cognitive restructuring of harmful behavior, obscuring or minimizing one's role in causing harm, disregarding or distorting the impact of harmful behavior, and blaming and dehumanizing the victim.

Hymel et al. (2005) investigated whether Bandura's theory of moral disengagement provides a useful framework for understanding bullying, peer harassment and problem behavior among youth. Moral disengagement was measured with the Moral Disengagement Scale (MDS; Bandura et al., 1996). The researchers found that 38% of the variance in reported bullying could be accounted for by students' self-reported endorsements of moral disengagement strategies (cognitive restructuring, minimizing agency, distortion of negative consequences, blaming/dehumanizing the victim). Hymel et al. (2005) concluded that: "clearly, processes of moral disengagement play a potentially significant role in the development of repeated bullying" (p. 7).

The theoretical background of cognitive distortions associated with antisocial behavior stems from the social information processing theory (Crick & Dodge, 1994), in which cognitive distortions are characterized as biases in the processing that mediates between incoming stimuli and behavioral responses. Social information processing theory suggests that children with disruptive behavior problems perceive, interpret, and make decisions about social information in ways that increase their likelihood to engage in aggressive behaviors (Dodge & Crick, 1990). Thus, they are more likely to attribute hostile intentions to their peers.

For example, if a child is pushed by another child in the lunch line, he/she may be more likely to assume the other child did it intentionally to hurt them, rather than assume that it was an accident, particularly if they are likely to turn around and notice other children laughing (vs. an apologetic expression facial on the face of the child who pushed them). Second, children with externalizing problems generate fewer possible responses in these situations and are more likely to generate responses that are aggressive (vs. nonaggressive). For example, in the previous example, such a child may be more likely to push back, rather than ask the other child what is going on or ignore it. Third, children with externalizing problems often evaluate aggressive behavior more favorably, expect more favorable outcomes from aggressive behaviors, and have more confidence in their ability to enact aggressive (vs. more prosocial) behaviors. Likewise, they often evaluate prosocial behavior less favorably, expect less favorable outcomes from submissive or prosocial behaviors, and have less confidence in their ability to withdraw or inhibit an aggressive response. So, in this example, a child who was pushed in the lunch line may decide they need to stand up for themselves by pushing back because they believe that any other response will make them a target in the future. These social information processing deficits seem to arise from early adversity, including family problems at home, including parental modeling and encouragement of aggression (Dodge, 2003).

In sum, children with externalizing problems seem to exhibit several social information processing problems. They are more likely to attribute hostile intentions to their peers, and they attend to fewer and more hostile cues. They generate fewer and more aggressive responses. Finally, they often evaluate aggressive responses more favorably and prosocial responses less favorably – behaviors they may have learned at home (Martel, 2019).

Related Studies

Results of several studies show correlations between cognitive distortions and antisocial behavior (Barriga & Gibbs, 1996; Barriga et al., 2008). It was also found that delinquent adolescents exhibit more cognitive distortions than nondelinquent adolescents (Nas et al., 2008; Barriga et al., 2000). The findings of these studies also indicate that the self-serving cognitive distortion, as

a predictor, accounted for a significant proportion of the variance in externalizing behavior. Findings also emphasize that proactive and reactive aggression in elementary school children was predicted by self-serving cognitive distortions (Koolen et al., 2012). Children's and adolescent's personal competencies and problems (externalizing and internalizing) were measured with the Youth Self-Report (YSR; Achenbach, 1991), Aggression Questionnaire (AQ; Buss & Perry, 1992) and with the teacher-report Instrument for Reactive and Proactive Aggression (IRPA; Polman et al., 2009). In addition, the How I Think Questionnaire (HIT-Q; Barriga et al., 2001) has proven to be a reliable and valid measure of self-serving cognitive distortions in these studies.

The Present Study

Even though both biological and social developmental tasks are already complex enough, developmental pathways to adulthood are marked by many risks with far-reaching implications for the health, career, and economic status of that individual in the future (Patton et al., 2016).

If all this is considered in the context of the young generation's growing up in Bosnia and Herzegovina (Republic of Srpska entity), the situation becomes even more complicated, and the outcomes of growing up are extremely uncertain. Namely, it can be assumed that some parents of the younger generation - especially those who lived in war zones as children and spent most of their childhood as the exiled or refugees - still suffer the consequences of trauma caused by the war. Therefore, children and the young people in Bosnia and Herzegovina constitute a vulnerable population, as they live with their parents, some of whom, having gone through a four-year war (1991-1995), suffer from untreated PTSD. Given that the mentioned circumstances make them susceptible to problems in numerous areas of psychosocial functioning, they need continuous monitoring in this context. In this regard, children and the young people face a myriad of social, economic and psychological problems in this area that can result in delinquency and antisocial behavior. Potential problems at home, school and their immediate environment, together with dangers to physical and mental health and development, have put a significant proportion of young people at risk. It is important to point out that not all problems faced by the young people are expressed to the extent that requires clinical assessment, so the focus of this research is on primary and secondary prevention.

The POSIT (Problem Oriented Screening Instrument for Teenagers; Rahdert, 1991) is used in this research, which covers a wider range of potentially problematic areas in adolescents – health (physical and mental), family and peer relations, social skills, leisure and recreation, and educational and vocational status, in addition to aggressive behavior, delinquency and substance use/abuse.

The POSIT was developed as a key component of the Adolescent Assessment/Referral System (AARS), undertaken by the National Institute on Drug Abuse (NIDA) in April 1987, under contract to the Pacific Institute for Research and Evaluation, Inc. (Rahdert, 1991). The POSIT was designed to be administered by a variety of assessors, including school personnel, court staff, medical care providers, and staff in alcohol or other drug abuse treatment programs. Development of the POSIT was informed by the experience that troubled youths meeting clinicians and a range of official agencies (e.g., school truancy offices, treatment programs, or juvenile justice authorities) often have problems in numerous areas of psychosocial functioning. Development of the POSIT was also informed by the awareness that many points of agency contact for troubled youths lack resources for clinical assessment, and not all youths have problems of sufficient magnitude to require such assessment. Hence the instrument's intent is to identify youth with potential problems in psychosocial functioning, who can then undergo essential in-depth assessments in areas with the highest potential for functioning difficulties (Dembo & Anderson, 2005).

The POSIT is generally used as a screening instrument in juvenile justice settings, followed by referral (if indicated) for an in-depth assessment with appropriate referrals to needed services (Dembo et al., 1997; Dembo et al., 1995; Dembo et al., 1994). The results of research suggest that the POSIT can serve as a useful screening instrument to identify adolescents in need of further drug abuse assessment (Kelly et al., 2017; Latimer et al., 1997; Knight, 1997; Weinberg et al., 1998). It has also been used in the ethnic comparison model on a sample of 217 students in Southeast Europe, Bosnia and Herzegovina and Serbia. The POSIT is administered collectively to a sample of various ethnic adolescent populations within a heterogeneous milieu, and gender differences are then compared both within an ethnic group as well as within the various groups involved in the study (French et al., 2013). The

POSIT has not been associated with cognitive distortions so far. In this regard, apart from delinquent/antisocial behavior tested on a sample of incarcerated adolescents, no other potential problems in psychosocial functioning of younger or older non-delinquents have been tested.

Therefore, the aim of the research is to gain insight into the nature and structure of the relationship between delinquent/antisocial behavior and substance use/abuse and other potential functional problems (physical and mental health, family relations and peer relations, social skills, leisure/recreation as well as educational status and vocational status), on the one hand and cognitive distortions, on the other hand. Taking into account the multivariate approach of examining potential predictors of delinquent behavior and other potentially functionally problematic areas, the results of this paper could clarify the contribution of cognitive distortions to explaining the criterion variable of delinquent/ antisocial behavior (i.e. potential problems in adolescent functioning), which can contribute to better understanding of the conditions that increase or decrease the likelihood of delinquent/ antisocial behavior or problematic functioning.

The research question arising from this formulated goal is whether cognitive distortions can predict delinquent/antisocial behavior and substance use/abuse and other potential functional problems (physical and mental health, family relations and peer relations, social skills, leisure/recreation as well as educational status and vocational status. To date, there have been no studies that have treated other potentially problematic areas in adolescents (physical and mental health, family relations and peer relations, social skills, leisure / recreation as well as educational status and vocational status) in relation to cognitive distortions, in addition to antisocial behavior (delinquency) and substance use/abuse. Therefore, hypotheses cannot clearly be set out in this part. This research is partially exploratory.

Method

Subjects

The research involved 789 students as participants, 471 of which were primary school students and 318 were secondary school students from Bosnia and Herzegovina (Republic of Srpska entity) in Southeast Europe. The sample included 53.7% boys and 46.3% girls. The ages of the participants ranged from 12 to 19 years old (M = 14.92, SD = 1.79). 51.8% of respondents were from urban areas and 48.2% from rural areas. Most of them come from two-parent (86.2%), two-child (63.2%) families, and according to the self-report, most of them were financially well off (76%). The parents' educational level is mainly secondary (70.1% mothers and 76.2% fathers).

Instruments

Potentially problematic areas in adolescents were measured with the *Problem-Oriented Screening Instrument for Teenagers* (POSIT; Rahdert, 1991), which is a youth self-report screening instrument designed to identify potential problems in psychosocial functioning in 10 areas requiring a more thorough assessment. The POSIT is a self-administered questionnaire with 139 «yes–no» items which are scored by 0–1 system, for use with male and female adolescents (12–19 years of age). Fourteen of these items belong to more than one subscale. The instrument has 10 subscales, probing the following areas of psychosocial functioning: substance use/abuse, (17 items), physical health (10 items), mental health (22 items), family relations (11 items), peer relations (10 items), educational status (26 items), vocational status (18 items), social skills (11 items), leisure/recreation (12 items), and aggressive behavior/delinquency (16 items).

Internal consistency for the POSIT was verified by calculating mean inter-item correlations (MICs). In our study, the value of MIC for substance use/abuse is R=.46, for physical health status R= .19, for mental health status R=.33, for family relations R=.15, for peer relations R=.18, for educational status R=.18, for vocational status R=.27, for social skills R=.13, for leisure and recreation R=.14, and for aggressive behavior and delinquency R= .28. All mean inter-item correlations fall within the recommended range of .15-.50 (see Briggs & Cheek in Clark & Watson, 1995) except for mean inter-item correlation for the social skills and leisure and recreation subscales which are something lower.

The values of the obtained Cronbach's alpha for individual subscales, as well as for the entire POSIT scale, are shown in Table 1.

Table 1

Descriptive Statistics and Correlations between the Problem-Oriented Screening Instrument for Teenagers (POSIT) and the (How I Think Questionnaire) HIT

	Variables	Cronbach's Alpha	Descriptive Statistics		Correlation Table									
			M(SD)	Range	5	6	7	8	9	10	11	12	13	14
1	Self-centered	.61	24.92(7.53)	9-54	.34**	.31**	.33**	.25**	.39**	.36**	-.07	.28**	.09**	.46**
2	Blaming others	.66	25.05(7.70)	10-60	.29**	.30**	.28**	.17**	.36**	.31**	-.03	.23**	.10**	.39**
3	Minimizing/ mislabeling	.61	25.11(7.68)	9-54	.28**	.26**	.25**	.20**	.31**	.30**	-.01	.21**	.09**	.39**
4	Assuming the worst	.64	27.24(8.19)	11-66	.34**	.30**	.35**	.27**	.39**	.37**	-.05	.35**	.11**	.41**
	HIT-Q Total	.85												
5	Substance use/abuse	.82	1.75(2.93)	0-17										
6	Physical health status	.65	2.88(1.78)	0-10										
7	Mental health status	.78	7.85(4.25)	0-22										
8	Family relations	.60	2.44(2.19)	0-11										
9	Peer relations	.65	2.37(1.83)	0-9										
10	Educational status	.61	9.40(4.03)	0-22										
11	Vocational status	.67	7.26(2.67)	0-14										
12	Social skills	.59	3.11(1.89)	0-10										
13	Leisure and recreation	.57	4.89(1.63)	1-11										
14	Aggressive behaviour and delinquency	.67	4.85(2.73)	0-16										
	POSIT Total	.86												

** p<. 01.

Cognitive distortion variables were measured with the How I Think Questionnaire (HIT-Q; Barriga et al., 2001), which consists of 54 items. Only 39 of them actually measure self-serving cognitive distortions. The HIT-Q is based on the four-category typology of cognitive distortions: self-centered (9 items), blaming others (10 items), minimizing/mislabeling (9 items) and assuming the worst (11 items). The remaining 15 items are not included in the HIT-Q total score. Eight of these make up the social desirability scale measuring socially desirable responding. The other seven are prosocial items acting as positive fillers. Participants rate the items on a six-point Likert scale (1 = strongly disagree and 6 = strongly agree). A high score indicates a stronger adherence to self-serving cognitive distortions.

Internal consistency for the HIT-Q was also verified by calculating mean inter-item correlations. In our study, the value of MIC for the self-centered, subscale is R=.29, for blaming others R=.33, for minimizing/mislabeling R=.16, and for assuming the worst R=.16. All mean inter-item correlations fall within the recommended range of .15–.50 (Clark & Watson, 1995).

The values of the obtained Cronbach's alpha for individual subscales, as well as for the entire HIT-Q, are shown in Table 1.

Procedure

Students were informed about the study by their teachers, after which the parents received written information about the research and gave written consent for their child's participation in the study. Respondents filled out the questionnaires in their classrooms at the time when they were free of their regular school duties and tasks. They were provided with basic information on what is being researched, and it was emphasized that the research is anonymous and that the results will be used exclusively for research purposes. Students received no payment for completing the questionnaires and their participation was strictly voluntary, with the right to withdraw at any time without penalty. While filling in the questionnaires, the respondents asked the authors for interpretation of individual items in both questionnaires and continued their work after receiving it. On average, it took 45 minutes for respondents to complete the questionnaires. The research was carried out in the period November 2019 - January 2020.

Research Ethics

Pursuant to the Instruction on the Manner of Implementation of Programs, Projects and Other Activities in the Schools of Republic of Srpska, the Ministry of Education and Culture (Department for Preschool, Primary and Secondary Education) was submitted a request to approve the research. After the Ministry's approval (No. 07.042/059-2438-1/19, date: 6 November 2019) the research was carried out. It was necessary to obtain written parental consent for student testing, which was also done.

Data analysis

Preliminary analyses included descriptive statistics, reliability, and correlations. Cronbach's alpha and average inter-item correlation are used to calculate internal consistency for the POSIT and the HIT-Q. Zero-order correlation was calculated to understand the relationship between 10 functional adolescent problem areas and 4 cognitive distortions. Nine multiple hierarchical regression analyses were then applied to calculate the contribution of four self-serving cognitive distortions as predictors in explaining the variance of nine criterion variables – potentially problematic areas in adolescents controlling the impact of other variables (gender, age, place of residence and financial situation). The coding of all control variables is summarized in Table 2.

Results

Zero-order correlation was calculated to gain insight into the nature of correlations between 10 functional adolescent problem areas and 4 cognitive distortions. Descriptive statistics and correlations for the potentially problematic areas in adolescents (POSIT) and the cognitive distortions (HIT-Q) are listed in Table 2. Nine out of ten potentially problematic areas in adolescents positively correlate with four cognitive distortions.

In this way, we analyzed the strength and direction of correlations among the variables, but we did not analyze cause-and-effect relationships. The contribution of four self-serving cognitive distortions as predictors in explaining the variance of ten criterion variables – potentially problematic areas in adolescents controlling the impact of other variables (gender, age, place of residence and financial situation) was verified by nine multiple hierarchical regression analyses. Preliminary analyses indicated that the assumptions about the adequacy of distribution, linearity, multicollinearity,

Table 2

Description and coding of control variables

Variable	Coding
Gender	Men were coded 1 and women were coded 2.
Age	Age was treated as a continuous variable.
Place of residence	The response options included urban, 1, and suburban/rural, 2.
Financial situation	The response options included good, 1, satisfactory, 2, and poor, 3.
Family structure	The response options included two-parent families, 1, single-parent families (widowers or divorced parents or divorced parents who have not remarried, or parents who have never married) 2.
Mother's / father's education level	The response options included primary education, 1, secondary education, 2, bachelor's degree, 3 and master's degree /doctor's degree, 4.
Number of children in the family	The response options included one child, 1, two children, 2, and three and more children, 3.

and variance homogeneity were not distorted. The results of these hierarchical multiple regression analyses are presented in Table 3.

After statistical depreciation of the influence of control variables (gender, age, place of residence and financial situation), the significance of predictive variables was established in eight out of nine regression models. The four HIT-Q subscales were simultaneously entered as predictors into the second block of the regression model. Results are summarized in Table 3.

The first model indicated that control variables explained 10% of the variance in POSIT – substance use/abuse subscale scores, F (9, 778) = 9.92, p < .001. The addition of the HIT-Q subscales to the model resulted in R^2 change that equaled .11, contributing to an overall prediction of 22% of the variance in substance use/abuse, (ΔF (4, 774) = 28.15, p <.001).

Control variables in the second model explained 5% of the variance in physical health status subscale scores, F (9, 778) = 4.20, p < .001. The addition of the HIT-Q subscales to the model resulted in R^2 change that equaled .11. The resulting model predicted 15% of the variance in physical health status (ΔF (4, 774) = 24.57, p <. 001).

The third model indicated that control variables explained 5% of the variance in POSIT – mental health status subscale scores, F(9, 778) = 5. 09, p < .001. The addition of the HIT-Q subscales to the model resulted in R^2 change that equaled .15, contributing to an overall prediction of 20% of the variance in mental health status, (ΔF(4, 774) = 35.76, p <.001).

Control variables in the fourth model explained 6% of the variance in family relations subscale scores, F(9, 778) = 5.83, p < .001. The addition of the HIT-Q subscales to the model resulted in R^2 change that equaled .07. The resulting model predicted 13% of the variance in family relations (ΔF (4, 774) = 16. 19, p <. 001)

The fifth model indicated that control variables explained 10% of the variance in POSIT – peer relations subscale scores, F(9, 778) = 9.64, p < .001. The addition of the HIT-Q subscales to the model resulted in R^2 change that equaled .15, contributing to an overall prediction of 25% of the variance in peer relations, (ΔF(4, 774) = 40.05, p <.001).

Table 3

Summary of five HMRA for HIT Variables – Self-Centered, Blaming Others Minimizing/Mislabeling, and Assuming the Worst predicting the result of POSIT – Substance Use/Abuse, Physical Health Status, Mental Health Status, Family Relations, Peer Relations

Predictor variable	Model 1 Substance Use/Abuse			Model 2 Physical Health Status			Model 3 Mental Health Status			Model 4 Family Relations			Model 5 Peer Relations		
	B	*SE* B	ß	B	*SE* B	ß	B	*SE* B	ß	B	*SE* B	ß	B	SE B	ß
Step 1															
R^2		.10			.05			.05			.06			.10	
Gender	-.98	.21	-.17***	.08	.13	.02	1.41	.31	.17***	-.25	.16	-.06	-.51	.13	-.14***
Age	.30	.11	.19**	.08	.07	.07	-.13	.17	-.05	.09	.09	.07	.15	.07	.15*
Place of residence	-.13	.21	-.02	.10	.14	.03	.26	.32	.03	-.58	.16	-.13***	.07	.13	.02
Financial situation	.10	.22	.02	.36	.14	.09*	1.06	.34	.11**	.61	.17	.13***	.34	.14	.08*
Step 2															
R^2		.22			.15			.20			.13			.25	
ΔR^2		.11			.11			.15			.07			.15	
Gender	-.76	.20	-.13***	.19	.13	.05	1.77	.29	.21***	-.10	.16	-.02	-.36	.12	-.10**
Age	-.30	.11	.18**	.07	.07	.07	-.14	.16	-.06	.10	.08	.07	.15	.06	.14*
Place of residence	-.28	.20	-.05	.02	.13	.01	-.00	.30	.00	-.69	.16	-.16***	-.03	.12	-.01
Financial situation	.02	.21	.00	.32	.13	.08*	.93	.31	.10**	.56	.17	.12**	.28	.13	.07*
HIT Self-centered	.04	.02	.11*	.03	.01	.12*	.10	.03	.18**	.03	.01	.10*	.03	.01	.14**
HIT Blaming others	.03	.02	.07	.03	.01	.14**	.02	.03	.03	-.02	.02	-.06	.03	.01	.13**
HIT Minimizing/mislabelling	.00	.02	.00	-.01	.01	-.00	-.01	.03	-.03	.00	.02	.02	-.01	.01	-.03
HIT Assuming the worst	.07	.02	.20***	.03	.01	.12*	.13	.03	.25***	.06	.01	.23***	.05	.01	.20***

Note. HMRA = hierarchical *multiple* regression analysis; Entering family structure, mother's education level, father's education level and number of children in the family, as control variables in any model did not change the result pattern.

Table 3 *(Continued)*

	Model 6 Educational Status			Model 7 Social Skills			Model 8 Leisure and Recreation			Model 9 Aggressive Behavior and Delinquency		
Predictor Variable	ß	*t*	*p*	ß	*t*	*p*	ß	*t*	*p*	ß	*t*	*p*
Step 1												
R^2		.03			.01			.04			.05	
Gender	.01	.38	.70	.05	1.31	.19	.07	1.87	.06	-.03	-.72	.47
Age	-.18	-2.46	.01	-.05	-.77	.44	-.25	-3.48	.00	.11	1.55	.12
Place of residence	.03	.80	.42	-.03	-.87	.38	-.02	-.55	.59	-.00	-.13	.89
Financial situation	.10	2.75	.00	.04	1.18	.24	.05	1.37	.17	.04	1.10	.27
Step 2												
R^2		.23			.15			.05			.27	
ΔR^2		.20			.14			.02			.22	
Gender	.06	1.72	.09	.09	2.52	.01	.08	2.29	.02	.03	.84	.39
Age	-.18	-2.76	.00	-.06	-.84	.40	-.25	3.46	.00	.10	1.69	.09
Place of residence	.00	.00	.99	-.07	-1.87	.06	-.03	-.82	.41	-.04	-1.05	.29
Financial situation	.09	2.61	.00	.03	.83	.41	.05	1.24	.22	.03	.87	.38
HIT Self-centered	.19	3.75	.000	.13	2.44	.01	-.01	-.12	.91	.23	4.61	.000
HIT Blaming others	.04	.85	.40	-.04	-.73	.47	.05	.87	.38	.08	1.74	.08
HIT Minimizing/mislabeling	-.00	-.01	.99	-.07	-1.26	.21	.03	.63	.53	.08	1.64	.10
HIT Assuming the worst	.22	4.31	.000	.34	6.59	.000	.07	1.19	.24	.15	2.99	.00

Note. Entering family structure, mother's level of education, father's level of education and number of children in the family, as control variables in any model did not change the pattern of results.

Control variables in the sixth model explained 3% of the variance in educational status subscale scores, F (9, 778) = 2.26, $p < .05$. The addition of the HIT-Q subscales to the model resulted in R^2 change that equaled .20. The resulting model predicted 23% of the variance in educational status (ΔF (4, 774) = 50.52, $p <. 001$).

The seventh model indicated that control variables explained 1% of the variance in POSIT – social skills subscale scores, F (9, 778) = 1.25, $p <$ .05. The addition of the HIT-Q subscales to the model resulted in R^2 change that equaled .14, contributing to an overall prediction of 15% of the variance in social skills, (ΔF (4, 774) = 30.31, $p <.001$).

Control variables in the ninth model explained 5% of the variance in aggressive behavior and delinquency subscale scores, F (9, 778) = 4.87, $p <$ .001. The addition of the HIT-Q subscales to the model resulted in R^2 change that equaled .22. The resulting model predicted 27% of the variance in aggressive behavior and delinquency (ΔF (4, 774) = 56.09, $p <.001$).

Discussion

In this exploratory research on a sample of students from several primary and secondary schools in Bosnia and Herzegovina, aimed at identifying negative automatic thoughts (cognitive distortions) in adolescents and verifying their association with potential problematic adolescent functioning, we have attempted to gain an insight into the nature of the correlations between cognitive distortions on the one hand, and the POSIT results on the other. To date, according to our knowledge, the POSIT has not been considered in the context of the cognitive distortions. The results indicate that nine out of ten potential adolescent problem areas (substance use/abuse, physical health status, mental health status, family relations, peer relations, educational status, social skills, leisure and recreation and aggressive behavior and delinquency) are, from the statistical point of view, significantly positively correlated with four cognitive distortions. Vocational status was not identified in this sample, so no statistically significant correlations were obtained with respect to the self-serving cognitive distortions. This result can be attributed to the fact that the respondents in this sample have not completed their education yet, so they could not have acquired a suitable profession.

The results of nine multiple hierarchical regression analyses indicate that the HIT questionnaire (having control over the variables such as gender, age, place of residence and financial situation) can be a successful predictor of a potential problem in eight out of ten functional areas covered by the POSIT – substance use/abuse, physical health status, mental health status, family relations, peer relations, educational status, social skills and aggressive behavior and delinquency, since certain categories of cognitive distortions provide a statistically significant (7% - 22%) explanation for a part of the variance of these 8 criterion variables.

In accordance with the findings of the previous research (Barriga & Gibbs, 1996; Barriga et al., 2000; Barriga et al., 2008; Nas et al., 2008) mentioned in the introductory part, the biggest contribution of the self-serving cognitive distortions to this sample has been proven in explaining the criterion variable of aggressive behavior and delinquency (22%). The interesting finding is that the tendency to rationalize behavior or neutralize guilt explains a significant percentage of the variance of the educational status criterion variable (20%). Given that negative automatic thoughts "come rapidly, automatically, and involuntarily to mind when a person is stressed or upset and seem plausible at the time" (Neenan & Dryden, 2006) this finding shows that this functional area is especially problematic for the young people in this sample. In difficult circumstances in the course of education, these distorted thoughts can significantly impede the functioning in this area.

Self-centered and assuming the worst have proven to be the most important predictors in this study since they significantly contribute to the explaining of all eight criterion variables, while the cognitive distortion of blaming others can successfully predict the results of POSIT – physical health status subscale and the result of POSIT – peer relations subscale. The strength of the primary self-centered cognitive distortions is reflected in the sentence of Yochelson and Samenow (1976; 1977) who termed such attitudes as "ownership", defining them as a sense of entitlement to whatever one desires. Furthermore, the young people in this research, with pronounced problems in the mentioned said functional areas, appear to agree that others are out to harm them. In addition, according to current findings, the cognitive distortion of blaming others to some extent determines the level

of functional difficulties in their relation to the peers and physical health status, measured by the mentioned instruments. Not only does blaming others make one's own actions excusable, but one can even feel self-righteous in the process. According to the social-cognitive theory of moral thought and action (Bandura, 1991), mentioned in the literature review, the fact that attribution of blame can give rise to devaluation and moral justification illustrates that the various disengagement mechanisms are often interrelated and work together to weaken internal control. The described disengagement devices will not instantaneously transform a considerate person into an unprincipled, insensible one. Rather, the change is usually achieved through gradual reduction of self-sanctions and people may not fully recognize the changes they are undergoing. Their discomfort decreases through repeated performance of questionable acts, until, in the end, the behavior originally regarded as abhorrent can be exhibited without much anguish.

Further research is needed and additional factors, which may contribute to the explanation of these 8 criterion variables, need to be included. In addition, the idea is to determine the difference in the level of expression of four cognitive distortions and ten functional areas covered by the POSIT in relation to age, gender, urban/rural place of residence, financial situation, ethnicity and other sociodemographic variables considered significant by the authors. This information can also contribute to the individual approach to the treatment. With respect to that, a potential limitation of the present study concerns the generalizability of our findings. The other two main ethnic groups, Bosniaks and Croats, were not taken into account, so the survey results cannot be applied to all young people in Bosnia and Herzegovina. The second limitation is that we have no empirical evidence to compare the obtained findings with.

On the other hand, the results of this research may contribute to the cognitive behavioral treatment of adolescents with externalized disorders as well as of those with problematic functioning in different areas. In this regard, treatment would be more individualized according to individual needs. Cognitive techniques focus on changing distorted thoughts related to social situations that cause frustration in children and adolescents (Kendall, 1991) and are the basis of inadequate and aggressive behaviors in adolescents with externalized disorders and problematic functioning in various areas. Namely, adolescents associate a trigger situation with an effective response and learn to recognize their negative automatic thoughts in those situations. This allows adolescents to identify the connection between their thoughts, feelings, and behaviors even better. By identifying negative automatic thoughts, adolescents are encouraged to replace them with alternative, more realistic and more functional thoughts. Cognitive behavioral treatment, awareness and reduction of cognitive distortions is especially important to enhance the effect of protective factors that are of exceptional developmental importance, such as quality and stable family ties, or parental supervision over the activities of children and the young people, which is another potentially problematic area in adolescents treated by the POSIT.

It is noteworthy that self-serving distortions seem to apply to a wide range of potentially problematic functional areas exhibited by the young people in this sample. The results suggest that cognitive distortions constitute an important factor not only in delinquent and aggressive behavior and substance use/abuse problems, but also in their daily functioning. That is why our study constitutes an important step toward an overarching theory of cognitive distortions. However, more research on different samples is needed to generalize the obtained results.

Finally, it is clear that young people also belong to the risk population, with an emphasis on various forms of socially deviant behavior. At the same time, it is considered that young people are significantly more exposed to various negative influences due to their social immaturity, therefore society should protect them. More precisely, the results of this study indicate that it is necessary for interested behavioral science researchers to examine the needs and problems of young people from different perspectives in order to achieve a far-reaching effect. Comprehensive, interdisciplinary studies on the well-being of children and young people can serve as a starting point for planning science-based policies and interventions in Bosnia and Herzegovina (Republic of Srpska entity).

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