

Original Article

The role of early maladaptive schema domains and childhood trauma in predicting cognitive distortions

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Abstract

As a negative thinking and dysfunctional attitude, cognitive distortion is considered an important factor in the etiology of mental disorders. The aim of this study was to determine the role of early maladaptive schema domains and childhood trauma in predicting cognitive distortion. The research method was descriptive-correlational and the target population was all students of Urmia University in the first semester of the academic year 2020-2021. In this regard, 285 students were selected by availability sampling and were evaluated by Young's maladaptive schema (1998), Noorbakhsh's child abuse (2012) and cognitive distortions of Abdullah Zadeh and Salar (2010) questionnaires. The results of correlation coefficients showed that cognitive distortion has a positive relationship with the dimensions of childhood trauma and areas of early maladaptive schema. Also, the results of multiple regression analysis showed that early maladaptive schemas and childhood trauma significantly explain 0.63% of the total variance of cognitive distortion and primary maladaptive schema domains have a higher power in predicting cognitive distortion. The results of this study support the key role of early maladaptive schemas and childhood trauma with emphasis on the field of disconnection and rejection and the dimension of emotional child abuse as a vulnerability to cognitive distortion.

Keywords

Schema, child trauma, cognitive distortions.

Received: 2022/01/08

Accepted: 2022/02/06

Available Online: 2022/05/22

Introduction

Cognitive distortions are characterized by irrational and exaggerated thoughts which lead to misperceptions of reality (Steel, Newman, O'Rourke & Quayle, 2020). In other words, they are cognitive structures arising when information processing is inefficient, and information analysis is distorted in individual minds (Schluter, Kim, Poole, Hodgins, McGrath et al., 2019). Prominent cognitive distortions include mind reading, catastrophizing, all-or-nothing thinking, emotional reasoning, labeling, mental filtering, over-personalization, overgeneralization, "should be better" statements, and discounting positives. (Kuru, Safak, Ozdemir, Tulaci, Ozdel & et al., 2018). Those with cognitive errors perceive events and experiences about themselves, others, and the future through incorrectly biased and negatively distorted lenses (Fortune & Goodie, 2012). Additionally, cognitive distortions have been identified as important contributors to mood disorders, emotional distress,

maladaptive problem solving, suicide, delinquency, and violence (Covino, 2013). Multiple factors can lead to cognitive distortions. In this respect, the early maladaptive schema appears to be an effective dynamic cognitive factor.

Early maladaptive schemas are self-harming emotional and cognitive patterns that develop from childhood and continue throughout life (Zeynel & Uzer, 2020). In other words, maladaptive schemas are very resilient and enduring structures that consist of memories, feelings, cognition, and real emotions about oneself and one's relationship with others, and from which one interprets environmental stimuli. (Khosravani, Mohammadzadeh & Sheidaei Oskouyi, 2019).

Early maladaptive schemas are classified into five categories: Disconnection and Rejection, Impaired Autonomy and Performance, Impaired Limits, Other-Directedness, Overvigilance/Inhibition (Gong & Chan, 2018). The activation of early maladaptive schemas can result in emotional distress, leading to improper interpersonal interactions and maladaptive coping

mechanisms (Simons, Sistad, Simons & Hansen, 2018). Thus, it creates specific vulnerabilities to a variety of psychological disorders (Shorey, Stuart & Anderson, 2014). In the study of Mokhbere-Dezfuli, Rezaei & Sadeghi (2017), early maladaptive schemas are found to guide cognitive superficial processing.

Contrary to this, childhood trauma is a static risk factor that can affect cognitive distortion. Child trauma is conceptualized in the form of all forms of physical, emotional, sexual abuse, neglect or negligent behavior or commercial exploitation and other abuses, leading to actual or potential harm to health, survival, growth and self-esteem. (Kuzminskaite, Penninx, Harmelen, Elzinga, Hovens & et al., 2021). In 2018, child abuse and neglect rates were estimated at 9.2 percent per 1,000 children (U.S. Department of Health and Human Services, 2018). Childhood trauma negatively impacts the mental health of individuals for life (Tian, Li, Zhang, Wang, Liu & et al., 2021) and leads to significant neurological changes and changes in brain development. (Lecei & Winkel, 2020). Hence, it affects emotion control and cognitive function (Klaming, Spadoni, Veltman & Simmons, 2019). Additionally, childhood trauma increases the risk of negative life events, such as suicide, sleep problems, and cognitive difficulties (Angelakis, Gillespie & Panagioti, 2019). According to Lakshman, Murphy, Mekawi, Carter, Briscione & et al. (2020), childhood injuries are associated with attention bias. Distortion is a vulnerable factor for depression, anxiety and other psychological problems (Fortune & Goodie, 2012) and causes problems in self-acceptance and problem-solving skills (Covino, 2013). It also leads to the destruction of interpersonal relationships (Weismore & Esposito-Smythers, 2010). It has been demonstrated that cognitive distortion plays a central role in the development and persistence of symptoms associated with mental disorders and is associated with negative consequences; identifying the factors underlying cognitive distortion can help develop new approaches to treat and prevent distortion.

Consequently, it is thought that maladaptive schemas and childhood traumas may explain cognitive distortion, according to previous research. Therefore, due to the lack of research in the area of the etiology of cognitive distortion and the lack of research that is similar to this study, addressing these relationships is highly necessary. This study is intended to examine the role of all types of early maladaptive schemas and dimensions of early childhood trauma as predictors of cognitive distortion. It is also intended to determine the most significant factors and the contribution of each component. By doing so, cognitive distortion theories are confirmed and expanded. Accordingly, the study's main hypothesis is that: There is a significant positive relationship between the components of early maladaptive schemas and the components of childhood trauma with cognitive distortion.

Method

Taking into account the nature of the purpose, this research was a descriptive-correlational study.

Participants

In this study, all students at Urmia universities in the first semester of the academic year 2020-2021 comprised the population. 285 people were selected by availability sampling and studied based on research questionnaires.

Procedure

For this purpose, a questionnaire was designed and compiled, and then administered online. After designing the program, an online questionnaire was uploaded and implemented in the student groups and channels of Urmia Universities. Then, after the online questionnaire had been completed within the required amount of time, we evaluated the obtained data to extract the most accurate sample data for the selected community. A descriptive indices test, a Pearson correlation coefficient test, and an analysis of multiple regressions were performed based on the collected data after the data collection. According to ethical standards, all participants in this study, while having the right to participate, were assured that their information is protected and would only be used for research purposes.

Instrument

Young Schema Questionnaire (SQ-SF):

This 75-item questionnaire was created by Young (1998). This questionnaire evaluates 15 schemas under the form of five schema domains. Thus, the area of disconnection and rejection with questions 1 to 25; Impaired autonomy and performance with questions 26 to 45; Other-directedness with questions 46 to 55; Overvigilance/inhibition with questions 56 to 65; and the area of Impaired limits with questions 66 to 75. Scoring based on a 6-point Likert scale ranges from 1 (completely false about me) to 6 (completely true about me). With a Cronbach's alpha coefficient of 0.96, Waller, Meyer and Hanian (2001) determined that this instrument is reliable. Based on the psychometric properties of the Persian version of this questionnaire, the Cronbach's alpha coefficient of schemas was determined to be 0.69 to 0.83 (Ahi, Mohammadifar, Besharat, 2007). In the present study, using Cronbach's alpha coefficient, the reliability of this instrument was 0.94. It was 0.91 for disconnection and rejection areas, 0.88 for impaired autonomy and performance, 0.81 for other-directednessfor, 0.8 for overvigilance/inhibition, and 0.71 for impaired limits.

Child Abuse Questionnaire (self-report scale):

The 25-item Child Abuse Questionnaire was developed by Noorbakhsh in 2012. This questionnaire assesses five dimensions of physical, sexual, emotional, neglect and

malnutrition child abuse. Subjects answer questions based on a five-point Likert scale of 1 (very low) to 5 (very high). The score analysis of the questionnaire is as follows: Score between 25 and 50: The person was slightly abused during childhood. Score between 50 and 75: The child is moderately abused during childhood. Score above 75: The person was abused a lot during childhood. Noorbakhsh (2012) Cronbach's alpha coefficient in the dimension of physical child abuse 0.69, in the dimension of child sexual abuse 0.72, in the dimension of neglect 0.70, in the dimension of malnutrition 0.82 and in the dimension of emotional child abuse Calculated 0.77. In the present study, the reliability of this scale was 0.90, indicating that this measurement tool is optimally valid.

Standard questionnaire for measuring cognitive distortions of Abdullah Zadeh and Salar:

This 20-item questionnaire was developed by Abdullah Zadeh and Salar in 2010 to measure 10 dimensions of cognitive distortion. The participant answers the questions based on a five-point Likert scale of 1 (strongly agree) to 5 (strongly disagree). In this questionnaire, each irrational thought is accompanied by

two questions. Thus evaluated all-or-nothing thinking, overgeneralization, mental filter, discounting positives, fortune telling, catastrophizing, emotional reasoning, the phrase should be better, labeling, personalization. According to the scoring, anyone who scores above 66 has a high level of cognitive distortion. According to Farmani Shahreza (2014) research, Cronbach's alpha coefficient is 0.80. Cronbach's alpha coefficient in the present study is 0.84.

Results

The results of statistical analysis of data showed that among 285 students participating in the study, most participants were in the age group of 20-21 years (33.3) and least participants were in the age group of 24-25 (10.2). 249 female participants (87.4%) and 36 male participants (12.6%) took part in this study. In terms of education, 215 people (73.4%) were studying at the undergraduate level, 58 people were studying at the master's level (19.8%) and 12 people were studying at the doctoral level (4.1%). Also, 251 people (88.1%) were single and 34 people (11.9%) were married. Table 1 presents descriptive indicators of research variables.

Table 1. Descriptive indicators of research variables

Variables / components	M	SD
Cognitive distortion (total)	52.23	12.18
All-or-nothing thinking	6.55	1.39
Overgeneralization	5.74	1.89
Mental filter	4.50	2.02
Discounting positives	4.60	2.25
Fortune telling	5.32	2.05
Catastrophizing	5.64	2.14
Emotional reasoning	4.37	1.73
should be better	6.59	1.96
Labeling	4.27	2.05
Personalization	4.65	2.04
Child trauma (total)	36.36	12.19
Physical abuse	6.18	2.33
Emotional abuse	9.29	4.54
Sexual abuse	5.80	1.62
Neglect	8.42	3.72
Malnutrition	6.67	2.72
maladaptive schema(total)	211.20	52.58
Disconnection and Rejection	67.77	22.08
Impaired autonomy and performance	41.39	16.18
Other- directedness	29.54	9.39
over vigilance/inhibition	36.61	9.83
Impaired limits	35.89	8.39

A Pearson correlation coefficient was used to investigate the relationship between early maladaptive schemas and childhood trauma, as well as their subscales involving cognitive distortions. And the statistical assumption of data normality was confirmed by Kolmogorov-Smirnov test.

Table 2 shows that early maladaptive schema and childhood trauma and their subscales are positively correlated with structural distortion and are statistically significant.

Table 2. Results of correlation coefficients of the studied variables and its components

	Cognitive distortion (total)	All-or-nothing thinking	Overgeneralization	Mental filter	Discounting positives	Fortune telling	Catastrophizing	Emotional reasoning	should be better	Labeling	Personalization
Child trauma (total)	.40**	.11	.22**	.20**	.26**	.32**	.35**	.17**	.30**	.19**	.30**
Physical abuse	.21**	.07	.14*	.17**	.18**	.12*	.17**	.10	.11	.06	.18**
Emotional abuse	.40**	.10	.19**	.15*	.25**	.31**	.37**	.19**	.35**	.24**	.31**
Sexual abuse neglect	.16**	.04	.08	.13*	.13*	.17**	.12*	.04	.02	.08	.16**
Malnutrition	.39**	.10	.26**	.19**	.21**	.31**	.35**	.16**	.32**	.18**	.28**
maladaptive schema(total)	.30**	.10	.16**	.18**	.22**	.26**	.27**	.10	.23**	.11	.19**
Disconnection and Rejection	.77**	.19**	.44**	.34**	.52**	.62**	.54**	.35**	.55**	.56**	.57**
Impaired autonomy and performance	.70**	.19**	.45**	.28**	.45**	.56**	.50**	.32**	.51**	.53**	.50**
Other- directedness	.63**	.12	.33**	.25**	.49**	.53**	.41**	.30**	.40**	.49**	.46**
overvigilance/inhibition	.52**	.24**	.23**	.23**	.31**	.42**	.38**	.19**	.37**	.34**	.50**
Impaired limits	.57**	.14*	.30**	.31**	.37**	.45**	.37**	.13*	.34**	.36**	.41**
Impaired limits	.57**	.05	.35**	.27**	.36**	.39**	.40**	.38**	.53**	.37**	.36**

* P< 0.05 ** P< 0.01

In order to evaluate the predictive power of cognitive distortion based on the early maladaptive schema and childhood trauma and its subscales, the statistical method of multiple regression analysis was used. Also, the assumption of the absence of multiple alignment was confirmed and confirmed by the tolerance index

and variance inflation factor. Furthermore, Watson's camera test calculated to be 2.20, indicating the predictor variables of the study are independent. The results of the multiple regression analysis are presented in Table 3.

Table 3. Multiple regression results for predicting cognitive distortion based on early maladaptive schema domains with beta coefficients

Model 1	R .79	R Square .63	F 22.42	Sig .00	Disconnection and Rejection		Impaired autonomy and performance		Other-directedness		over vigilance/ inhibition		Impaired limits	
Variables / components	R	R Square	F	Sig	β	Sig	β	Sig	β	Sig	β	Sig	β	Sig
Cognitive distortion (total)	.77	.60	83.48	.00	.33	.00	.20	.00	.15	.00	.08	.08	.20	.00
All-or-nothing thinking	.27	.07	4.21	.00	.16	.07	-.04	.56	.19	.00	.03	.72	-.09	.21
Overgeneralization	.47	.22	15.51	.00	.33	.00	.05	.52	-.02	.72	.04	.52	.13	.04
Mental filter	.36	.13	8.05	.00	.06	.49	.04	.55	.06	.37	.17	.01	.12	.08
Discounting positives	.54	.29	22.48	.00	.12	.09	.31	.00	.03	.62	.10	.09	.07	.23
Fortune telling	.62	.39	35.36	.00	.26	.00	.24	.00	.11	.06	.13	.03	.04	.49
Catastrophizing	.54	.30	23.36	.00	.27	.00	.07	.25	.13	.03	.05	.41	.14	.03
Emotional reasoning	.43	.18	12.49	.00	.15	.06	.11	.14	.03	.59	-.15	.02	.30	.00
should be better	.60	.36	31.61	.00	.25	.00	.02	.69	.13	.02	-.02	.65	.35	.00
Labeling	.57	.32	26.59	.00	.30	.00	.23	.00	.03	.56	.04	.51	.05	.37
Personalization	.59	.35	29.99	.00	.17	.02	.15	.02	.28	.00	.08	.14	.06	.28

As can be seen in Table 3, about 0.63% of the cognitive distortion variance can be predicted by early maladaptive schema variables and childhood trauma. Additionally, the F ratio is significant at the level of p <0.005 indicating that the cognitive distortion multiple regression model based on early maladaptive schema and childhood trauma is significant and predictable.

The contents of Table 3 show that 0.60% of the cognitive distortion variance is explained based on the early maladaptive schema domains at the significant level of P <0.05. In this case, disconnection and rejection with beta 0.33 has a higher share. Next, Impaired autonomy and performance and Impaired

limits with beta 0.20 and other- directedness with beta 0.15 have a significant role in predicting distortion. However, overvigilance/inhibition failed to achieve significant coefficients

Among the dimensions of cognitive distortion, the fortune telling dimension with a variance of 0.39 is predicted more than other dimensions of distortion by the early maladaptive schema domains.

As well, among the schema domains, impaired limits with 0.35 beta and disconnection and rejection with 0.33 beta and impaired autonomy and performance with 0.31 beta have a stronger performance in predicting cognitive distortion dimensions than other domains.

Table 4. Multiple regression results for predicting cognitive distortion based on child trauma components with beta coefficients

Variables / components	R	R Square	F	Sig	Physical abuse		Emotional abuse		Sexual abuse		Neglect		Malnutrition	
					β	Sig	β	Sig	β	Sig	β	Sig	β	Sig
Cognitive distortion (total)	.41	.17	11.51	.00	-.01	.93	.25	.01	-.01	.91	.15	.15	.05	.52
All-or-nothing thinking	.11	.01	.66	.65	.02	.76	.04	.70	-.01	.91	.02	.86	.05	.57
Overgeneralization	.26	.07	4.12	.00	.01	.87	-.09	.42	-.01	.85	.34	.00	-.01	.87
Mental filter	.22	.05	2.89	.01	.08	.26	-.06	.52	.04	.46	.14	.21	.06	.41
Discounting positives	.27	.07	4.28	.00	.06	.38	.20	.05	.01	.89	-.05	.64	.09	.25
Fortune telling	.34	.12	7.30	.00	-.09	.19	.17	.10	.05	.44	.14	.20	.09	.27
Catastrophizing	.38	.14	9.29	.00	-.03	.66	.24	.02	-.03	.61	.14	.19	.06	.44
Emotional reasoning	.19	.04	2.08	.06	.02	.77	.17	.10	-.03	.62	.02	.81	-.01	.84
should be better	.38	.14	9.16	.00	-.06	.33	.29	.00	-.13	.04	.12	.24	.05	.52
Labeling	.25	.06	3.69	.00	-.06	.37	.29	.00	.01	.79	-.00	.98	-.04	.56
Personalization	.31	.10	6.10	.00	.02	.72	.24	.02	.04	.51	.07	.51	-.03	.67

As it can be seen in Table 4, 0.17 of the cognitive distortion variance is predicted by the dimensions of child trauma at a significant level of $p < .005$. And emotional child abuse dimension with beta 0.25 plays a major role in predicting cognitive distortion. In other words, no significant coefficients are assigned to other dimensions of trauma. Among the dimensions of cognitive distortion, Catastrophizing and should be better with 0.14 variance, better than other dimensions of distortion by the dimensions of child trauma can be predicted. In the meantime, only the all-or-nothing thinking and emotional reasoning dimension based on the dimensions of childhood trauma cannot be predicted. Among the dimensions of child trauma, child physical abuse, child sexual abuse and malnutrition cannot predict the dimensions of distortion. But emotional child abuse at a significant level, the ability to predict the dimension should be better and labeling dimension are at a significant level $p < .005$. Moreover, personalization dimension and catastrophizing and discounting positives dimension are at a significant level of $p < .05$. Furthermore, neglect predicted an overgeneralization with a beta of 0.34.

Discussion

In this study, we examined the role of early maladaptive schemas and childhood trauma in predicting cognitive distortion. The results of this study suggest that cognitive distortion based on early maladaptive schemas is significantly predicted. The results of this study, in line with research conducted by Sigre-Leirós, Carvalho, and Nobre (2015), Mokhbere-Dezfuli, Rezaei, Sadeghi (2017), and Fazel, Nasiri (2016), indicate that the early maladaptive schemas play an important role in cognitive distortions. Fazel and Nasiri (2016) provide evidence that early maladaptive schemas are associated with cognitive distortion in young people with schizoid personality disorder.

We can explain this finding by considering the framework of Elliott & Lassen (1997) schema polarity model according to which people with inconsistent schemas, or inflexible and negative schemas, are unable to integrate conflicting or extreme information. They do

not have a schema and often interpret information about themselves and others in a biased way. They also have very diverse views about themselves and expectations of others. According to cognitive theories, schemas are silent and external stressors trigger them. One of the basic structures involved in schema is biased information processing that distorts people's thoughts and perceptions (Melling & Alden, 2000). Therefore, the person's maladaptive schemas are formed as a result of a series of childhood mistakes. There seems to be only one stress that breaks the schema out of silence, and it does not seem to be able to process the information properly. This in itself contributes to cognitive distortions. In vague, worrying situations, people tend to interpret and draw conclusions based on their own biases. Biased information processing can also lead to emotional reasoning, which is a cognitive distortion. On the other hand, individuals through the process of cognitive distortion and with a biased interpretation of situations, strengthen the early maladaptive schema. In particular, dysfunctional and maladaptive schemas are more likely to lead to cognitive distortion, in other words, to a biased interpretation of external events (Ling, 2018).

Another finding of the study was the role of childhood trauma in predicting cognitive distortion. Although very few studies have been conducted on the relationship between childhood injuries and cognitive distortion, and so far no study on this topic has been available in Iran. In this arena, however, the results of Lakshman et al. (2020), Fang and Chung (2018) as well as Poletti, Colombo and Benedetti (2014) are similar to the findings of this study. These studies have shown that childhood trauma is a risk factor for cognitive distortion. The findings of Poletti et al. (2014) emphasize the positive relationship between adverse childhood experiences and the total score of cognitive distortion.

In addition, by examining all the assessed dimensions of cognitive distortion, they found that only the generalization situations dimension was significantly related to childhood trauma.

Children's trauma is a significant predictor of cognitive distortion as Briere (1996) explains. This model argues that past trauma, like unfavorable

childhood experiences, can distort victims' identities. By changing the schema with which he perceives himself as well as interprets external, it leads to self-blame, self-criticism, feelings of helplessness or despair, and oversight of the world. These dysfunctional thought patterns may have significant effects on internal mental states and psychological distress. Traumatic experiences are one of the risk factors for mental illness.

However, adverse experiences, if they occur in childhood, have a higher impact and predict poorer mental health (Bevilacqua, Kelly, Heilmann, Priest & Lacey, 2021). Thus, people who have been exposed to childhood abuse and experienced more negative life events appear to have greater cognitive vulnerability. Therefore, they may believe that negative events are persistent and have lasting negative consequences, perpetuating a persistent negative cognitive style.

And leads to dysfunctional cognitive processing and in particular the generalization of frustration that can increase the risk of mental disorders. As a result of this, a history of childhood adversity as an unfavorable factor in the developmental environment has consistently been associated with cognitive distortion throughout one's lifetime.

Conclusion

In general, the general results obtained in this study indicate that the two variables of early maladaptive schemas and childhood trauma predict 0.63% of the variance of cognitive distortion. And among these two variables, the most predictive share is related to the variable of early maladaptive schemas, which has a higher explanatory power.

The present study indicates, however, that all components of cognitive distortion have predictive value by schema domains. And Fortune telling dimension seems to be more vulnerable to schema domains than other dimensions of cognitive distortion. Also, the field of disconnection and rejection has a higher power in predicting cognitive distortion. As opposed to this, the research findings indicate that among the dimensions of cognitive distortion, the dimension should be better and the Catastrophizing dimensions show more obvious changes than the components of childhood trauma. Moreover, emotional child abuse has the best ability to predict cognitive distortion.

This study was associated with limitations such as conducting research in non-clinical population, mere use of self-assessment tools to collect information and little research background in the field of research. As a result of the limited sample, the generalization of results may also be limited, so future research should focus on larger scales.

Taking into account that early maladaptive schemas and childhood trauma play a crucial role in cognitive distortion etiology, it is suggested to examine the modifiable nature of early maladaptive schemas and to identify specific schematic areas that are most

associated with cognitive distortion. Treatments that specifically addressed disconnection and rejection were effective at improving patients' cognitive distortion. Also, individual therapeutic interventions are suggested for people with adverse childhood experiences with the goal of reducing severe and long-term cognitive effects of childhood trauma so as to improve the treatment process for people with childhood injuries.

Disclosure Statement

The authors of this article declare that there was no conflict of interest.

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