

Study of Dark Triad Personality and its relationship with Warm Empathy through Mediating Role of Affective-Cognitive Theory of Mind in Individuals with Borderline Personality Disorder Symptoms

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Abstract

Borderline personality disorder is a severe mental disorder. The aim of this study was to investigate the relationship between dark personality traits and warm empathy mediated by affective-cognitive theory of mind in people with symptoms of borderline personality disorder. The present study is an applied study with a descriptive-survey nature. The statistical population of the present study included all students with symptoms of borderline personality disorder in the Islamic Azad University of Tabriz in the year 1998-99. Were. In order to collect data, Borderline Personality Questionnaire (BPI), Dark Personality Quadruple Questionnaire (SD4), Baron-cohen Empathy Scale (EQ), Faux Pass Test (FPT) and Adult Form of Revised Eye Test (ET-R) were used. The results showed that there is a significant relationship between dark personality traits and warm empathy ($p < 0.01$); there is a significant relationship between dark personality traits and the theory of affective and cognitive mind ($p < 0.01$) and dark personality traits have an indirect effect on warm empathy through the mediation of affective and cognitive theory of mind ($p < 0.01$). Based on the findings, it is inferred that the ability of mind theory can be used to influence the warm empathy of people with dark personality traits.

Keywords: Dark Personality Traits, Warm Empathy, Mind Theory, Borderline Personality Traits

INTRODUCTION

Borderline personality disorder (BPD) is considered as an intricate mental diseases that there individuals with BPD could not feel or see themselves from outside view and others from their inside view. In other words, they have no self-consciousness and empathy senses. It lead to they have no ability to communicate with others and have no emotional relationship successfully (Xinyi-Li & Tianwei Du, 2020). Empathy is a fundamental concept in psychology which has introduced by Theachner (1909) (Morelli et.al, 2015). It is defined as a capacity to create a relationship between others' emotional situations and its allocation to various areas of cognitive and behavioral abilities which allow to resolve conflict

behaviors more friendly (Bennik et.al, 2019). Empathy is categorized into two dimensions including cognitive and affective empathy. affective empathy is defined as the individuals' emotional responses to others' emotional states (Nezam & Rezaiee, 2018). The underlying assumption of the impact of warm empathy on individuals' behavior refers to the extent that high warm empathy lead to suppress the anti-social behaviors and increase the possibility of pro-social behaviors. As an emotional response arisen from emotional perception or others' conflict, warm empathy is considered as a stimulus to drive individuals to help others (Arefi & Latifyan, 2011).

Literature suggested that individuals with BPD indicated the symptoms of dark triad personality (Coolidge et.al, 2017) in addition to deficit in warm empathy (Xinyi-Li & Tianwei Du, 2020). Further, empathy significantly and positively related to personality (Bloxsom et.al, 2020). Dark triad personality are a set of personality traits serve to control and exploit others (Webster et.al, 2014). Psychologists categorized dark triad personality into four traits including Machiavellianism, narcissism, psychopathy and sadism. These traits lead to negative social and personal achievements (Jonason, Li & Buss, 2010). The central elements of dark triad personality include high impulsivity, sensation seeking, lack of empathy and anxiety. Literature showed that dark triad personality negatively related to warm empathy (Nadja Heym, 2019). Furthermore, given to the important function of social cognition in individuals with BPD, mentalization or theory of mind is an important issue in the individuals with BPD, because they have no ability to mentalize things in addition to their lack of empathy (Gambin & sharp, 2018). It means that they have no ability to think about others' psychological situations (Choi-Kain & Gunderson, 2003). Theory of mind is defined as a continuous representation of self and others' mind status (Kalager & Frice, 2003) and individuals with BPD have some problems which are related to their childhood caring with lack of mentalization ability growth. Theory of mind is fundamentally related to empathy and the dark triad personality related to empathy (Bloxsom et.al, 2020). Further, it has been showed that empathy related to theory of mind (Rezaiee mir Hesari et.al, 2014) and dark triad personality related to theory of mind (Kurt et.al, 2013). However, what this research seek to study is to consider the mediating role of affective-cognitive theory of mind in the relationship between dark triad personality and warm empathy which has been ignored in the literature. Actually, the mediating role of theory of mind is significant because individuals with BPD expect to be excluded with hatred sense and they could not evaluate others' benevolent behaviors in social interactions as a friendly behavior (Ghiassi & Brune, 2010). It could arise from the damages in their social cognition that should be considered in detail. Accordingly, and

given to the possibility direct and indirect relationships between mentioned variables with empathy in individuals with BPD, this research attempts to clear theoretical ambiguities and fill the research gaps through responding to the question that if theory of mind could play a mediating role on the relationship between dark triad personality and empathy in individuals with BPD?

Materials and Method

This study was an applied one objectively and a correlation-survey one in nature. Population consisted of psychology students of Islamic Azad University of Tabriz (N=1400) from them 303 students were selected as sample size using Morgan table and purposeful non-randomly sampling method. Then, 115 students were identified as individuals with BPD through border line disorder inventory (BPI) among the 303 students. Inclusion criteria include (1) being in the age range of 19 to 50 years old, (2) willingness to participate in the study and (3) not having epilepsy (because of possible effect of epilepsy on BPD symptoms), (4) not have Schizophrenia (Mokhber et.al, 2012) and finally (5) they should not use of psychiatric medications. The exclusion criteria include unwillingness to continue to participate in the study. It should be noted that data was gathered online with the cooperation of psychological institution of Tabriz Aramesh Andisheh because of covid-19 outbreak. Primary information including the subject and objectives of the study were presented to participants to meet ethical considerations. Then, they were asked to respond to the questions honestly. Their consent was sought to participate in the research. Variables of the study were measured using the following tools:

Borderline Personality Inventory (BPI): This scale has 53 items developed by Lisherning (1999) and it is responded as "yes" or "no" responses. Its 20 questions have the highest value to determine personality status that the score higher than 10 means the symptoms of BPD and the score less than 10 means lack of symptoms of BPD. Its reliability was calculated by Lisherning (1999) in the range of 0.68 to 0.91 and its test-retest correlation value was obtained between 0.73 to 0.89 values. Further, its simultaneous validity was obtained 0.72 (Lishnernig, 1999). In Iran, its simultaneous validity was obtained 0.70 and its

validity was calculated as 0.80, 0.83 and 0.85 using test-retest method, split half method and internal homogeneity respectively (Mohammadzadeh & Rezaiee, 2011).

Dark Triad Personality Inventory (SD4): This scale was developed by Jones & Paulhus (2015) and has 37 items. It has been scored using five points LIKERT method from 1 (strongly disagree) to 5 (strongly agree). Jones & Paulhus (2015) screened a group of adults during two months to be able to determine its validity. They calculated its reliability for Machiavellianism, narcissism, psychopathy and sadism as 0.71, 0.74, 0.77 and 0.84 respectively. In Iran, its reliability was calculated as 0.84 through Cronbach Alpha and its validity was confirmed using CFI=0.95, RFI=0.96, NNFI=0.93 and RMSEA=0.060 (Atadokht et.al, 2019).

Empathy Questionnaire (EQ): This test was developed by Baron-cohen & Welright (2004) with 40 items. It was scored using four-point LIKERT degree from 1 (strongly disagree) to 4 (strongly agree). From 40 items, 28 items were normalized in Iran from which the items of 3, 12, 13, 16, 18, 19, 27, 28, 31, 33 and 39 related to warm empathy. Its internal and test-retest reliability was reported as 0.90 and 0.79, respectively (Baron-cohen & Welright (2004). Lawrence et.al. (2004) reported its internal homogeneity as 0.83. In Iran, Mosavi et.al. (2017) reported its reliability as 0.97 and its validity as CFI=0.91. In this study, the reliability of this scale reported 0.84.

Fallacy Personification Test (FPT): This test was developed by Stone & Baron-cohen (1998) with 20 short stories about ordinary life issues. Misbehaviors occur only in 10 cases. At the end of each story, 6 questions related to theory of mind and 2 control questions were asked from participants. The fallacy occurs only in stories of 2, 4, 7, 11, 12, 13, 14, 15, 16, 18 (10 stories). The scoring method is to give a score to the right responses in the stories that misbehaviors occur in them. The score in fallacy test is from 0 to 60. Zala, Chan, Bilbo, Potts, Nelson & Penn (2008)

Table 1. Descriptive findings and results of K-S and Sh-W tests for research variables

Variable	N	Mean	SD	Skewness	Kurtosis	K-S	Sh-W	Sig	Sig

reported its reliability as 0.95 through testing it between evaluators. They reported its correlation coefficient (test-retest) as 0.716 and calculated its reliability through Cronbach's alpha as 0.84 (Khanjani et.al, 2012). In this research, the reliability was calculated by Cronbach's alpha and reported as 0.79.

Eyes Test-Revised (ET-R): This test was developed by Baron-cohen et.al. (1997) to measure affective theory of mind including 36 white and black pictures of male and females. The pictures are about eyes of individuals from the middle section of nose to the top of eyebrows. The testees should identify the emotional state of the picture using the four words written under the picture. Each right response gives 1 score and the sum of all scores is considered as the total score of participants. The simultaneous validity of the scale was measured using revised test of "mind reading through sound" test and reported as 0.391. Its reliability was measured through test-retest with three weeks interval and the correlation coefficient was reported as 0.637. Further, the Cronbach's alpha was reported as 0.71. In Iran, the reliability of this scale was measured through Cronbach's alpha and reported 0.77 and its validity was reported 0.73 (Hodavandkhani, 2012). In this research, reliability was measured through Cronbach's alpha and reported 0.92.

At last, it should be noted that data was analyzed using structured equations modeling method with least partial squares through Smart PLS-3 software.

Results

Descriptive results showed that 38% (n=115) of participants have BPD symptoms and 62% (n=188) have no symptoms of BPD. Therefore, 115 students were selected as sample size. Among them, 88.7% (n=102) were female and 11.3% (n=17) were male students. 69.6% (n=80) were grouped in the age range of 18 to 22 years old, 14.8% (n=17) at the age range of 22 to 26, 7.8% (n=9) at the age range of 26 to 30 and 7.8% (n=9) were grouped in the age range of more than 30 years old. The descriptive findings related to research variables are provided at the table 1.

Dark Triad Personality	1 1 5	10 3. 37	2 3. 3 4	- 0.06	- 0.1 5	0. 5 5 3	0. 9 2 0	0 . 9 8	0. 3 8 0
Warm Empathy	1 1 5	32 .6 3	3. 5 2	- 0.02	- 0.1 3	0. 8 6 5	0. 4 4 3	0 . 9 8	0. 3 3 8
Affective Theory of mind	1 1 5	22 .6 6	8. 4 2	- 0.46	- 0.7 1	1. 0 9 7	0. 1 8 0	0 . 9 5	0. 0 0 1
Cognitive theory of mind	1 1 5	32 .0 1	7. 6 3	- 0.30	0.0 1	0. 9 7 5	0. 2 9 8	0 . 9 8	0. 3 3 0

According to table 1, mean of “dark triad personality”, “warm empathy”, “affective theory of mind” and “cognitive theory of mind” are 103.37, 31.63, 22.66 and 32.01, respectively. Standard deviations of these variables are 22.34, 3.52, 8.42 and 7.63, respectively. Their skewness values are -0.06, -0.02, -0.46 and -0.30, respectively and their kurtosis values are -0.15, -0.13, -0.71 and 0.01, respectively. According to results of Kolmogorov-Smirnov (K-S) and Shapiro-Wilk (Sh-W) tests, the sig value for all variables is more than 0.05 and therefore distribution of data related to four variables is normal.

To test data, we made use of structured equations modeling with least partial squares. Table 2. Reliability test of Research Variables

Variables	Compositional Reliability	Cronbach's Alpha	AVE
Dark Triad Personality	0.952	0.948	0.643
Warm Empathy	0.782	0.770	0.518
Affective Theory of mind	0.842	0.789	0.508
Cognitive theory of mind	0.928	0.919	0.504

According to table 2, the compositional reliability value and cronbach's alpha are higher than 0.7 and AVE is higher than 0.5 for four variables. Therefore, all structures of this research have enough reliability. Table 3 shows

Therefore, we consider its pre-assumptions. At first, Variance Inflation factor (VIF) test was used that VIF value for all variables was less than 5 suggesting there was no multicollinearity problem (Table 1). Regarding the validity of each item, the absolute value of the factor load equal with 0.4 and more in the confirmatory factor analysis indicates a relatively good defined structure. Standard absolute value factor load for all items of questionnaires were higher than 0.4 and their t value were higher than 2.58. Consequently, the items of this scales have good validity. Table 2 shows the compositional reliability, Cronbach's alpha and average variance extracted (AVE).

the Pearson correlation coefficients and discriminant validity index. Values on main diameter of the matrix shows the square root of AVE values. The values on the main diameter

have the highest value suggesting the good validity of the structures.

Table 3. Pearson Correlation Coefficient and Discriminant Validity Index

Value	1	2	3	4
1-Dark Triad Personality	0.802**			
2- Cognitive theory of mind	-0.716**	0.713**		
3- Affective theory of mind	-0.786**	0.689**	0.710**	
Warm Empathy	-0.751**	0.661**	0.611**	0.720**

*Main diameter, square root of adjusted variance (AVE)

** Sig <0.01

In next step, it was necessary to test the relationship between hidden variables. To this

end, tested model of research is provided based on path coefficients and t value (Figures 1 and 2).

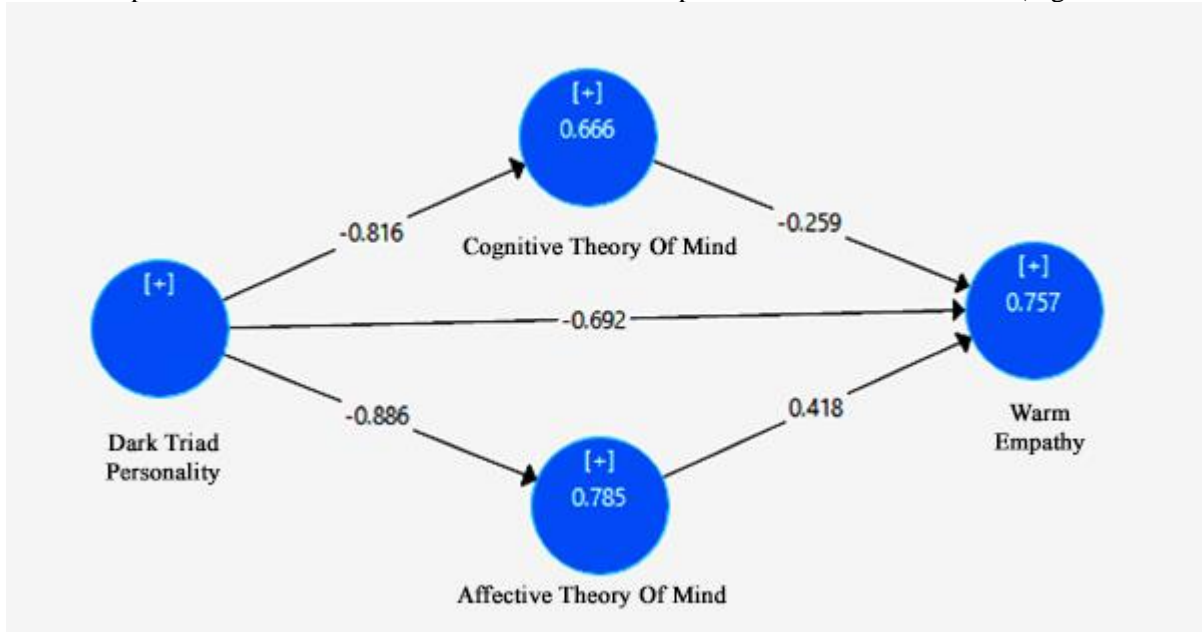


Fig 1. Tested research model based on path coefficients

The reliability of the model was determined using determination coefficient (R^2). Fig 1 shows that R^2 for dependent variable (warm empathy) is equal with 0.757 suggesting that 75.7% of warm empathy has been adjusted by dark triad personality and cognitive and affective theory of mind. Furthermore, R^2 for

cognitive theory of mind is equal with 0.666 suggesting that 66.6% of cognitive theory of mind is adjusted by dark triad personality. At last, R^2 for affective theory of mind is equal with 78.5 meaning that 78.5% of affective theory of mind is adjusted by dark triad personality.

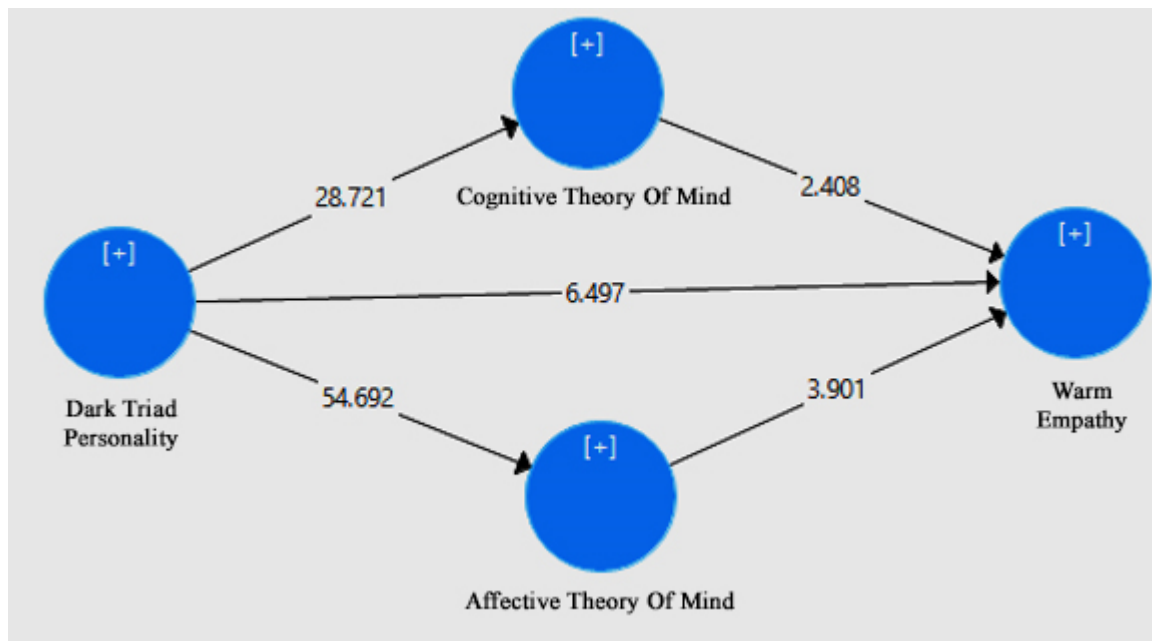


Fig 2. Tested mode of Research based on t test

Table 4 show the results of direct impact of dark triad personality on warm empathy and cognitive and affective theory of mind in individuals with BPD using structured modeling: Table 4 Path Coefficient and t test related to the impact of Dark triad personality on warm empathy, cognitive and affective theory of mind

	Path Coefficient (β)	t test
Impact of Dark triad personality on warm empathy	-0.692	6.497
Impact of Dark triad personality on cognitive theory of mind	-0.816	28.721
Impact of Dark triad personality on affective theory of mind	-0.886	54.692

According to table 4, path coefficients and t test of the impact of dark triad personality on warm empathy are equal with -0.692 and 6.497, respectively. t value is higher than 2.58, therefore, we can state that dark triad personality directly impacted on the warm empathy ($p < 0.01$). Path coefficient and t test related to the impact of dark triad personality on cognitive theory of mind are equal with -0.816 and 28.721, respectively. t value is higher than 2.58, therefore we can conclude that dark triad personality directly impacted on the cognitive theory of mind ($p < 0.01$). Finally, path coefficient and t test for the impact of dark triad

personality on affective theory of mind are equal with -0.886 and 54.692, respectively. t value is higher than 2.58 Therefore, we can conclude that dark triad personality directly impacted on the affective theory of mind ($p < 0.01$).

In next step, we made use of Sobel test to measure the indirect impact of dark triad personality on the warm empathy through mediating role of cognitive and affective theory of mind. Results are provided in tables 5 and 6. In this table, the “c” suggests path coefficient of “dark triad personality” on the warm empathy. VAF imply that what ratio of total effect could be attributed to indirect effects.

Table 5. Results of Sobel test to consider the indirect impact of dark triad personality on warm empathy through mediating role of cognitive theory of mind

Variable	Value	Z test	VAF index
a (path coefficient of “dark triad personality” on “cognitive theory of mind”)	-0.816	2.389*	0.234
b (path coefficient of “cognitive theory of mind” on “warm empathy”)	-0.259		
S _a	0.028		
S _b	0.108		
c (path coefficient of “dark triad personality” on “warm empathy”)	-0.692		

* p<0.05

According to table 5, dark triad personality significantly impacted on warm empathy through mediating role of cognitive theory of mind (p<0.05). Z value (2.389) is higher than 1.96. Therefore, we can conclude that dark triad

personality impacted indirectly on the warm empathy through mediating variable of cognitive theory of mind. It should be noted that 23.4% of total effect of dark triad personality on warm empathy is adjusted through mediating variable of cognitive theory of mind (VAF=0.234).

Table 6. Results of Sobel test to consider the indirect impact of dark triad personality on warm empathy through mediating role of affective theory of mind

Variable	Value	Z test	VAF index
a (path coefficient of “dark triad personality” on “emotional theory of mind”)	-0.886	3.896**	0.349
b (path coefficient of “affective theory of mind” on “warm empathy”)	0.418		
S _a	0.016		
S _b	0.107		
c (path coefficient of “dark triad personality” on “warm empathy”)	-0.692		

* p<0.05

According to table 6, dark triad personality significantly impacted on warm empathy through mediating role of affective theory of mind (p<0.01). Z value (3.896) is higher than 2.58. Therefore, we can conclude that dark triad personality impacted indirectly on the warm empathy through mediating variable of affective theory of mind. It should be noted that 34.9% of total effect of dark triad personality on warm empathy is adjusted through mediating variable of affective theory of mind (VAF=0.349).

Discussion and Conclusion

This research aims to consider the dark triad personality and its relationship with warm empathy emphasizing on the mediating role of cognitive and affective theory of mind in students with BPD. Results showed that dark triad personality directly impacted on the warm empathy of students with BPD which are

consistent with the results of Yosefi & Imanzadeh (2018), Amiri & Jamali (2019), Shimenti et.al. (2019) and Justice (2016). To explain our results, we could state that individuals with BPD have some problems in social relations because of deficiency in some sections of social cognition (Pajovik et.al, 2018). Deficiency in social cognition do not allow individuals to create empathy and have effective relations with others. In the other hand, related theories to dark triad suggested that dark triad personality can be due to incompatible aspects of personality. They pointed out that individuals with dark triad personality are not able to empathize. They could not see beyond their needs and they lack affective empathy which explain our results theoretically.

Furthermore, results showed that dark triad personality directly impacted on the cognitive theory of mind of individuals with BPD which are

consistent with the results of Alavi (2017), Dziobek et.al. (2011), Vonk et.al. (2015). To explain our results, it can be said that theory of mind closely related to cognitive empathy, however, individuals with weak cognitive mind are less likely to read others' feelings and intentions that could be attributed to their behaviors or their dark triad personality. For example, the positive relationship between cognitive mind and mental disorders (Dolan & Fullam, 2004) and borderline disorder (Schilling et.al, 2012) has been confirmed in literature that could be attributed to the different conceptualization of dark triad personality and theory of mind. According to our results, it can be stated that theory of mind allows individuals to predicate the subsequent behaviors of others based on their internal states. It could be to the benefit or detriment of others. Because, researches have recently found that individuals with high score in dark triad personality make use of high emotional intelligence to manipulate in the others' behaviors (Vonk et.al, 2015) that explain the significant relationship between dark triad personality and cognitive theory of mind.

Furthermore, results suggested that dark triad personality directly impacted on the affective theory of mind of individuals with BPD which is consistent with results of Dziobek et.al. (2011), Vonk et.al. (2015) and Lyons et.al. (2010). We could explain that dark triad personality has always negative outcomes for individuals (Jonason, Li & Buss, 2010) and come from personality incompatible aspects that has been observed in individuals with BPD showing deficiency in theory of mind. In other hand, researchers (Gambin & Sharp, 2018) found that individuals with BPD have some deficiencies in mentalization in addition to empathy problems. Therefore, our results related to the direct impact of dark triad personality on the emotional theory of mind could be explained completely.

Also, results showed that dark triad personality indirectly impacted on the warm empathy through mediating role of affective and cognitive theory of mind. Literature has ignored this area. However, to explain our results, we could state that our results showed that dark triad personality directly impacted on the warm

empathy of individuals with BPD, yet we could explain about the mediating role of cognitive theory of mind that individuals with BPD have deficiencies in cognitive theory of mind and also have severe problems in interpersonal relations and emotional functions (Dadashi et.al, 2018). Furthermore, cognitive theory of mind was defined as cognitive understanding the difference between speaker knowledge and listener knowledge and as the individuals' knowledge about believes. Therefore, when individuals with BPD could not perceive the listener knowledge due to their dark triad personality, and understand them cognitively, they have deficiency in warm empathy and could not participate in the received emotions from others. It explain our results and the mediating role of cognitive theory of mind on the impact of dark triad personality on the warm empathy.

Related to the mediating role of affective theory of mind could be described as such because individuals with dark triad personality suffer from mentalization capacity problems and theory of emotional mind, in addition to the ability to be aware of beliefs, requires an empathetic understanding of the listener's emotional state (Kalbeh et.al, 2010). Therefore, given that affective theory of mind directly related to warm empathy, the mediating role of affective theory of mind is justifiable and if individuals with dark triad personality could improve their emotional mind, they could increase their empathy. The most important limitation of this study was the outbreak of Covid-19 and limited access to students. Furthermore, because dark triad personality is very different in non-clinical settings and this study conducted using non-clinical sample, it is recommended that further studied be conducted on clinical samples. In addition, according to our results, it is recommended that psychological experts and clinical experts take into account the role of theory of mind in the relationship between dark triad personality and warm empathy, as ignorance of some psychological variables could influence on the speed and quality of the treatments.

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