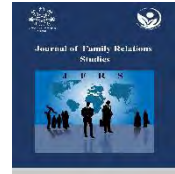




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Research Paper

The Mediating Role of Metacognitive Beliefs in the Relationship between Family Communication Patterns and Perfectionism



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ABSTRACT

Objective: The Present Study was Conducted to investigate the Mediating Role of Metacognitive Beliefs in the Relationship Between Family Communication Patterns and Perfectionism. The Current Research was a Correlational and Structural Equation Type.

Methods: The Statistical Population of the Research Included All Male and Female Undergraduate, Master's and Doctoral Students at the University of Guilan who were Studying in 2022-2023. 204 People were Selected by Random Sampling Method and Answered the Perfectionism, Metacognitive Beliefs and Family Communication Patterns Questionnaires. Data Were Analyzed Using Structural Equation Modeling with SPSS-27 and SMART-PLS-3 Statistical Software.

Results: The Results of Structural Equations Showed that the Fit of the Structural Model of the Family Communication Pattern with The Mediating Role of Metacognitive Beliefs on Perfectionism is Optimal so that Communication Orientation and Conformity Through Metacognitive Beliefs Have an Indirect Relationship with Perfectionism.

Conclusion: According to the present study, the metacognitive beliefs of students are affected by the family communication pattern, which affects their perfectionism.

1. Introduction

Perfectionism is common among students who see their personal development as dependent on high academic performance. Perfectionist learners are determined by consistently setting high standards, critically judging their behavior, and making extreme efforts to be flawless (Yiend et al., 2011). Perfectionism is a personality trait that sets high standards for performance, evaluates oneself critically, evaluates family members critically, worries about mistakes, and evaluates people critically (Hoffmann et al., 2015). In addition to encouraging a person to strive

for progress, perfectionism can be a promise of harm because it brings problems. Because perfectionist people are surrounded by their dos and don'ts and evaluate accordingly. In other words, perfectionism involves expansion and growth and maintaining psychological problems and health in different dimensions (Nasirzadeh & Nargesian, 2018). Perfectionism is a variable that is defined as the desire and expectation of exceptionally high results that are associated with certain personal standards (Kurtovic et al., 2019).

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Perfectionism is a multidimensional personality trait whose two main dimensions include perfectionistic efforts and concern. Perfectionistic strivings involve the desire to achieve perfection, which has a maladaptive aspect. However, perfectionistic concern includes self-criticism and fear of making mistakes (Vicent et al., 2020), both of which dimensions are often associated with various pathological psychological conditions (Prnjak et al., 2019). In general, Perfectionists are often described as pessimistic people who tend to exaggerate and criticize themselves too much (Kretavik et al., 2019).

In a systemic view of the family, a problem for a family member will affect the whole family members (Varaei & Karami, 2023). Parents may face challenges that can increase their stress levels and negatively affect their emotional health (Osouli et al., 2022). Communication is an essential factor in each family member's performance, mental health, and well-being (Olton et al., 2020). However, parents play an essential role in children's understanding of social relations, phenomena, and reality. The interaction with their parents strongly influences children's attitudes, thinking, and personality (Jeskiweeks et al., 2017). Communication patterns in a family determine how members interact with each other to process information and form beliefs and attitudes toward various phenomena (Young & Schrodt, 2016). Family Communication Patterns Theory (FCPT) identifies two communication patterns that govern all interactions within the family (Koerner & Fitzpatrick, 2002; Hesse et al., 2017). The first, a conversational pattern, involves family members in open, accessible, collaborative, and frequent conversations to explore the meanings of various phenomena. Second, the adaptation model is hierarchical and promotes and strengthens the homogeneity of family values, beliefs, and attitudes (Çini, 2020). FCPT believes that these communication patterns are not unique, and a family can choose both for their communication simultaneously (Koerner & Schurdt, 2014).

Based on this, families use each of these two patterns to form four types of communication styles (low or high):

1. Consensual families that adopt high levels of both patterns. Consensus families engage in dialogue to develop a shared understanding of values and beliefs among family members. Parents play the main role in making decisions and setting family goals, but they also listen to their children for the basic reasons they bring and respect their point of view.

2. In pluralist families, the family relies on the dialogue model and is low in the conformity model. In a pluralist family, family members engage in free conversations with each other and, at the same time, are free to make their own decisions and act independently.
3. The protective family has a low conversation pattern and relies more on the conformity pattern.
4. Neutral families are low in both models; they rarely enter open conversations and are less supported.

However, they are independent in their life decisions and do not have any restrictions from the family. Based on social learning theory and modelling research (Bandura, 1986; Gibson, 2004), researchers concluded that children produce similar characteristics and behaviors by observing the role models of their parents and learning from their behaviors (Chlosta et al., 2012; Fellnhofner & Pomelnin, 2017; Hoffman et al., 2015), for example, conflict resolution, satisfaction, well-being and shaping children's characteristics such as Cognitive complexity, self-esteem, sociability and perfectionism that continue into adulthood can be formed under the influence of these patterns (Koesten et al., 2009; Oltean et al., 2020). Therefore, the communication pattern of the family can cause perfectionism in the members (Babakhani & Saeedfar, 2014). Wang (2010) also found in his research that parents directly affect the perfectionism levels of their children.

Metacognition is a multifaceted concept and includes processes and strategies that evaluate, monitor, and control cognition (Wells, 2002; Rabiei et al., 2015). Metacognitive beliefs can effectively affect people's positive or negative performance (Oltean et al., 2020). Therefore, metacognitive beliefs seem to factor in predicting vulnerability to psychological problems. On the other hand, a person's metacognitive beliefs can be affected by the family's functioning, including the family's communication pattern. So, in research, Eghdami (2017) found that the direction of conversation and listening, one of the components of communication patterns, negatively predicts the dimensions of metacognitive beliefs. On the other hand, conformity orientation, another component of communication patterns, is the pressure the family exerts on members to unify metacognitive tendencies, values, and beliefs. In such families, children usually have weaker self-concepts and self-efficacy, and as a result, they will influence the negative metacognitive beliefs of the person (Rostami et al., 2015).

Metacognition, as a multifaceted concept, can be considered an internal cognitive factor that controls and evaluates thinking (Tamannaefar & Abdul Maleki, 2017). Research has also shown that metacognitive beliefs can positively or negatively affect people's reactions, and since *perfectionism* is defined as a cognitive pattern of expectations characterized by inflexible goals, worry about mistakes, uncertainty about actions, and high standards, it can be related to metacognitive beliefs from a negative aspect (Tamannaefar & Abdul Maleki, 2017). For example, Al-Sadik and Seyedabadi found in their research that metacognitive beliefs and perfectionism are related to each other in the field of education (ElSadik & Seyedabadi, 2019). Similarly, metacognitive beliefs can affect people's perfectionism (Jajermi & Zahtekesh, 2014).

In this model, metacognitive beliefs facilitate the understanding of the role of perfectionism in creating family communication patterns. In this model, family communication patterns are independent variables, metacognitive beliefs are mediator variables, and perfectionism is dependent. The main goal of this research was to examine whether family communication patterns significantly predict perfectionism through metacognitive beliefs. The research hypothesis was presented so that the family's communication patterns to metacognitive beliefs are significant predictors of perfectionism.

2. Materials and Methods

The current research was descriptive and correlational regarding the type of structural equations. The analysis method of this research was modelling, which was used to examine the causal relationships of research variables. In this model, family communication pattern is an endogenous variable, metacognitive beliefs are a mediating variable, and perfectionism is an exogenous variable. The data was analyzed with SPSS-27 and smart PLS 3 software. The statistical population of this research was all male and female undergraduate, graduate, and doctoral students of Gilan University who were studying in the academic year 2022-2023. Among them, 204 people were randomly selected as a sample and answered the questionnaires in the research. Students were selected as samples because perfectionism is common among students (Yiend et al., 2011). The criteria for entering the sample into the present study was being a student at Gilan University. While studying, ethical principles were considered in all stages of the research, and no student was forced to study.

Perfectionism Questionnaire: The new

perfectionism scale of Hill et al. (2004) was used to measure perfectionism. This questionnaire has 59 questions that evaluate eight dimensions of perfectionism (Negative perception of self, order, and organization, purposefulness, perception of pressure from parents, striving for excellence, high standards for others, negative perfectionism, and positive perfectionism). The items are scored on a 5-point Likert scale: 5 completely agree to 1 completely disagree. 9 scores are obtained from the current questionnaire, eight are related to subscales, and 1 is a general score. The range of questionnaire scores is between 59 and 295. The Cronbach's alpha coefficient calculation indicates an acceptable reliability of 0.80 for the questionnaires.

Moreover, the scale's validity was confirmed despite the relationship between the negative dimensions of perfectionism and validity. Moreover, the reliability of this questionnaire was calculated in Motamedi's research (2017) using Cronbach's alpha coefficient of 0.82. The reliability of this questionnaire in the present study was calculated using Cronbach's alpha coefficient of 0.83.

Metacognition Questionnaire: Wells's (1997) metacognition scale was used to measure metacognition. This scale has 30 questions that measure people's beliefs about their thinking. Answers are calculated using a 4-point Likert scale from 1 strongly disagree to 4 strongly agree. The questionnaire has five subscales, including positive beliefs about worry, negative beliefs about the controllability of thoughts and risks related to worry, cognitive uncertainty, the need to control thoughts, and metacognitive processes of cognitive self-awareness. Wells et al. (2004), for the reliability of this scale, the range of Cronbach's alpha coefficient for the total scale and subscales is from 0.76 to 0.93, and the retest reliability is 0.75.

Furthermore, for the subscales, they have reported 0.59 to 0.87. Cronbach's alpha coefficient of the whole scale was reported as 0.91 in the Iranian sample, and for the subscales, it was reported as 0.71 to 0.87 (Shirinzadeh, 2015). The total reliability of this scale in the present study was calculated using Cronbach's alpha of 0.89 and subscales between 0.70 and 0.86.

Family Communication Pattern Questionnaire: Fitzpatrick's (1994) family communication pattern scale was used to measure the family communication pattern. This scale has 26 questions and is set on a 5-point scale from 1 completely disagree to 5 completely agree. The said scale measures two sub-scales: communication orientation and conformity. In the study of Lotfian and

Kuroshnia (2006), the validity of the criterion in the dimension of conversation and listening orientation was 0.74. The dimension of conformity orientation was 0.49, and the reliability of this dimension was obtained with Cronbach's alpha equal to 0.87. In the research of Hashemi and Lotfian (2012), the reliability of the dialogue dimension was 0.90, and the conformity dimension was 0.91. In the present study, Cronbach's alpha coefficient was 0.86.

3. Results [A1]

The present study [a2] was conducted on 204 people; regarding gender, 58.8% of the respondents were male

and 41.2% were female. Most of the respondents, equivalent to 69.1%, were single. The educational level was 54.9% of undergraduate students, 36.8% of master's students, and 8.3% of doctoral students. Regarding age, 43.6% were less than 25 years old, 35.3% were between 25 and 30 years old, 14.7% were between 30 and 35 years old, and 6.4% were older than 35. According to the faculty, 53.4% were humanities, 25.5% were technical engineering, 10.8% were architecture and art, 6.4% basic sciences, and 3.9% were agriculture. Research indicator variables were obtained in the descriptive section, as shown in Table 1.

Table 1. Descriptive statistics and evaluation of convergent validity and reliability

Variables	Mean	Standard deviation	skewness	kurtosis	Average-variance extracted	Composite Reliability	Cronbach's alpha
Dialectical orientation	57.78	18.59	-1.37	0.62	0.85	0.93	0.89
Conformity orientation	23.40	11.19	1.51	1.16	0.77	0.90	0.88
Positive beliefs about worry	12.52	4.57	1.34	0.81	0.65	0.82	0.81
controllable thoughts	9.30	4.72	1.43	0.86	0.68	0.74	0.75
Cognitive uncertainty	10.26	4.21	1.63	1.55	0.71	0.86	0.86
The need to control thoughts	10.09	5.29	1.80	1.86	0.59	0.77	0.74
Self-awareness processes	15.23	3.81	0.62	-1.09	0.66	0.87	0.85
Metacognitive beliefs	57.40	21.9	1.61	1.36	0.61	0.85	0.83
Perfectionism	140.59	28.33	0.91	-0.87	0.54	0.92	0.91

Table 1 shows the descriptive statistics, skewness, and kurtosis indices to check the questionnaire's normality validity and reliability tests. It should be noted that univariate normality was checked with skewness and kurtosis indices. Because the values of skewness and kurtosis of all variables were obtained approximately in the range of +2 to -2 and did not differ much from the intended range, The normality of the distribution of the variables was confirmed. As a result, Pearson's parametric correlation test was used to check the relationship between the variables. Multivariate normality, the assumption of the structural equation modelling test, was checked with the Merdia coefficient. The obtained coefficient was equal to 8.43, which, based on criterion 5 for the Merdia coefficient (Byrne, 2010), can be concluded that there was a degree of deviation from the multivariate normal distribution. Based on this, the non-parametric partial least squares method, resistant to the multivariate non-normality assumption, was used to test the model.

The findings (Table 1) showed that the average

dialectical orientation was equal to 7.78, and the conformity orientation was equal to 23.40. The total average of metacognitive beliefs was 57.40, and perfectionism was 140.59. The confirmatory factor analysis technique evaluated the validity and reliability of the questionnaire, and a factor loading criterion of 0.40 was included for the questions of the questionnaires, and the questions that had a factor loading less than 0.40 were excluded from the analysis. Convergent validity was assessed with the Average Variance Extracted (AVE) index, which was higher than 0.50 for all variables, and the convergent validity of the scales was confirmed. The reliability of the measurement tools was checked with combined reliability tests and Cronbach's alpha. Because all the obtained values were greater than 0.70, the reliability of the measurement tools was confirmed. Table 2 shows the results of the Pearson correlation test. Also, divergent validity was evaluated using the Fornell and Larcker method based on Table 2.

Table 2. Pearson correlation test between research variables

Variables	1	2	3	4	5	6	7	8	9
1. Dialectical orientation	0.92								
2. Conformity orientation	-0.36**	0.88							
3. Positive beliefs about worry	0.41**	0.42**	0.81						
4. Controllable thoughts	0.38**	0.32**	0.73**	0.82					
5. Cognitive uncertainty	0.41**	0.45**	0.73**	0.68**	0.84				
6. The need to control thoughts	0.11	0.13	0.56**	0.53**	0.52**	0.77			
7. Self-awareness processes	0.32**	0.24**	0.60**	0.71**	0.64**	0.33**	0.81		
9. Metacognitive beliefs	0.40**	0.37**	0.88**	0.89**	0.86**	0.67**	0.78**	0.78	
9. Perfectionism	0.36**	0.18*	0.42**	0.24**	0.36**	0.29**	-0.09	0.45**	0.73

Note: p * = ≥ 0.05 and p = ≥ 0.01 **

The results of Pearson's correlation test (Table 2) showed that there was a significant correlation between Dialectical orientation, conformity orientation, and metacognitive beliefs with perfectionism ($p < 0.05$). The direction of the relationship between dialectical orientation and metacognitive beliefs was positive with perfectionism, and the direction of the relationship between conformity orientation and perfectionism was positive. The strongest correlation with perfectionism was related to metacognitive beliefs, with a coefficient of -0.45. Moreover, there was a positive relationship between the independent variables of dialectical orientation and conformity with the dependent variable of metacognitive beliefs ($p < 0.05$). The correlation intensity between dialectical orientation and metacognitive beliefs was equal to 0.40, and between conformity orientation and metacognitive beliefs was equal to 0.37.

Examining the correlation intensity between independent and mediating variables (dialectical orientation, conformity orientation, and perfectionism) showed that the intensity of

correlations was moderate and less than 0.70, which showed no strong correlation or problem between independent variables, and the hypothesis of multiple non-collinearity was maintained. To check the divergent validity, Fornell and Larcker method was used, which can be deduced from the results of the correlation table. In Table 2, the main diameter corresponds to the average root of the extracted variance (AVE), and the other numbers in the table correspond to the correlation between the variables. As can be seen, all the values of the root mean of the extracted variance of each variable are greater than the correlation of that variable with other main variables, which indicates the confirmation of divergent validity.

The conceptual model of the research was tested using the structural equation modelling technique (SEM) in Imus software. Figure 1 is the experimental model in the form of standardized coefficients, and the significance of the main relationships is marked with an asterisk. One asterisk means the relationship is significant at the 95% confidence level ($p < 0.05$), and two asterisks mean the relationship is at the 99% confidence level ($p < 0.01$).

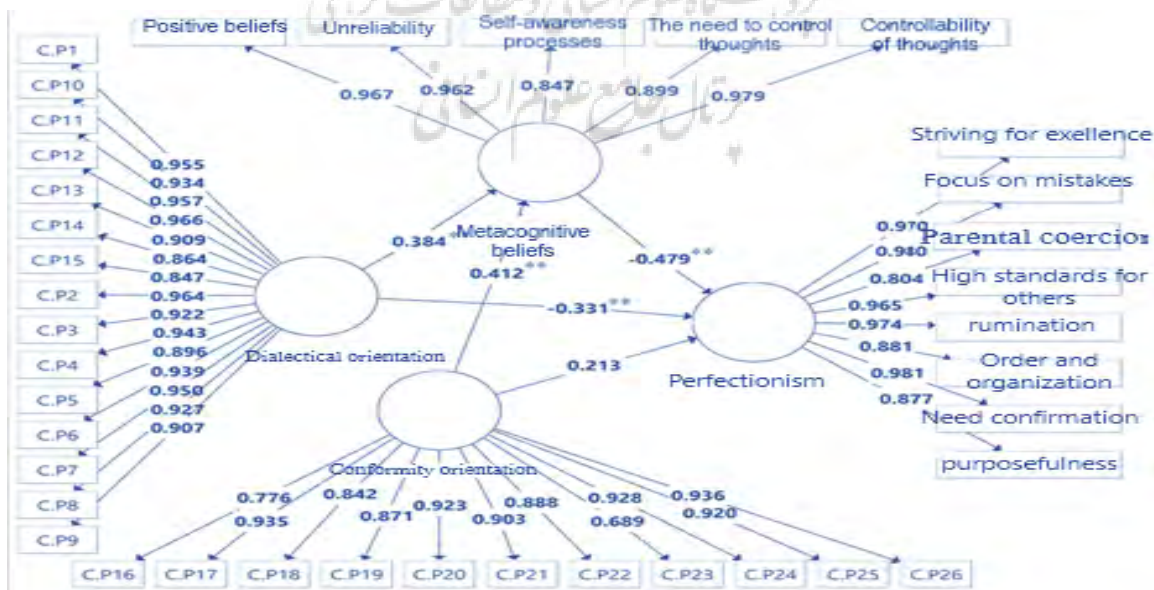


Figure 1. Experimental model in the case of standard path coefficients

Figure 1 is the model in standard mode, based on which the strongest effect in the model is related to the effect of metacognitive beliefs on perfectionism with a coefficient of -0.479. Moreover, the results showed that four out of five relationships between hidden constructs were confirmed ($p < 0.05$). The model fitting was checked using the coefficient of determination index (R²) and overall index of fit (GOF). Chin et al. (1988) describe the determination coefficient values of 0.67, 0.33, and 0.19 in the PLS path model as significant, moderate, and weak, respectively (Davari & Rezazadeh, 2012). If the overall fit index is greater than 0.36, the research model has a good fit (Tenenhaus et al., 2005). The findings showed that the

coefficient of determination obtained for the dependent variable of perfectionism was equal to 0.47, which showed that the predictor variables of the model were able to predict 47% of the variance of perfectionism, which is higher than average and appropriate. The value of the GOF index, which measures the model's overall fit, was found to be 0.34 for the research model, which is close to the desired value. Overall, the results showed that the model fitting is higher than the average and close to the desired value, and the model's fit can be generally confirmed. Table 3 shows the results of the model's direct relationship test.

Table 3. Test results of structural relationships in the model (direct effects)

Relationship	Standard coefficient	standard error	T value	P value
Dialectical orientation → Metacognitive beliefs	0.384	0.092	4.17	<0.001
Conformity orientation → Metacognitive beliefs	0.412	0.085	4.85	<0.001
Dialectical orientation → Perfectionism	-0.331	0.089	3.72	<0.001
Conformity orientation → Perfectionism	0.213	0.124	1.72	00.087
Metacognitive beliefs → Perfectionism	-0.479	0.049	9.78	<0.001

The results of direct effects (Table 3) showed that the influence of dialectical orientation and conformity orientation on metacognitive beliefs was confirmed ($p < 0.05$). The intensity of the influence of communication orientation on metacognitive beliefs was equal to 0.384, and conformity orientation on metacognitive beliefs was equal to 0.412. The findings showed that the direct effect of conformity orientation

on perfectionism was rejected ($p < 0.05$). However, the direct effect of the two independent variables of dialectical orientation and metacognitive beliefs on perfectionism was confirmed, and the direction of the effects was negative ($p < 0.05$).

Table 4 shows the results of the mediation role test. The mediator role was analyzed using the bootstrapping method (standard error estimation).

Table 4. The results of the mediation test of metacognitive beliefs using the bootstrapping method

Kind of relationship	Indirect effect	Standard error	T value	P value
Dialectical orientation → Metacognitive beliefs → Perfectionism	-0.184	0.047	3.91	<0.001
Conformity orientation → Metacognitive beliefs → Perfectionism	-0.197	0.044	4.48	<0.001

According to Table (Table 4), the mediating role of metacognitive beliefs was confirmed in the relationship between dialectical orientation and perfectionism and the relationship between conformity orientation and perfectionism ($p < 0.05$). The VAF statistic was used to determine the intensity of the mediation effect. This statistic has a value between 0 and 1, and the closer it is to 1, the stronger the effect of the mediating variable (Davari & Rezazadeh, 2013). The findings showed that the VAF statistic in relation to dialectical orientation and perfectionism is equal to 0.36, and in the relationship between conformity orientation and perfectionism, it was equal to 0.48, which showed that a more significant part of the effect of conformity orientation (compared to dialectical orientation) on perfectionism was indirect.

4. Discussion and Conclusion

As mentioned, the current research investigates the

factors affecting people's perfectionism. For this reason, effective family factors such as family communication patterns and personal factors such as metacognitive beliefs on perfectionism were investigated. According to Figure 1, the fit of the structural model of the family communication pattern with the mediating role of metacognitive beliefs on perfectionism is optimal so that communication orientation and conformity through metacognitive beliefs have an indirect relationship with perfectionism that the current research with the research of Wang (2010), Questen et al (2009); Rascher et al. (2020) are aligned.

Researches have pointed to various parenting factors that can be associated with the development of perfectionism and consider the development of perfectionism as a product of parents' interaction with their children. For example, Wang (2010) found that family communication patterns directly affect the

levels of perfectionism. People with aberrant perfectionism may have been exposed to overt or implicit criticism from their parents, and this becomes the basis for the growth of perfectionism in children because they have tried to gain the approval of their parents in such a way that they are willing to set high standards and expectations for themselves so that their parents less criticize them, and this becomes the basis for the growth of perfectionism in them.

On the other hand, since perfectionism has a neurotic aspect along with the normal spectrum, the possibility of causing harm is intensified if the family's interaction pattern is unfavorable. As shown in Table 2, dialectical orientation has a negative relationship with perfectionism, and conversely, conformity orientation has a positive relationship with perfectionism, which aligns with the research of Eghdami (2017) and Sigelman and Reeder (2018). Parents allow their children to express their thoughts and feelings in families with dialectical orientation. They care for them, support them, and act less critically. In contrast, families with a conformity orientation emphasize the similarity of opinions and attitudes, avoid conflict, and encourage members to follow the beliefs and attitudes accepted by those around them. Children also try to gain the approval of others and internalize their parents' expectations, leading them to perfectionism. As mentioned in Figure 1, perfectionism includes subscales such as striving for excellence, focusing on mistakes, parental pressure, high standards of others, rumination, order and organization, need for approval, and purposefulness. Meanwhile, conformity orientation is related to parental pressure and the high standards of others and facilitates the growth of aberrant perfectionistic beliefs.

In addition, it was shown in Table 3 that metacognitive beliefs are affected by the family's communication pattern, and it has an effect on the individual's perfectionism, which is in line with the research of Eghdami (2017), Elsadiq and Seyedabadi (2019), Jajermi and Zhetkesh (2014). Dialectical orientation and conformity are related to metacognitive beliefs. People with metacognitive beliefs have characteristics such as positive beliefs about worry, controllable thoughts, cognitive certainty, and self-awareness processes. The dialectical orientation of the family also affects the formation of metacognitive beliefs so that dialectical-oriented families provide the opportunity for members to talk about their concerns and thoughts and get to know each other's point of view instead of the negative spontaneous thoughts that come to their mind, achieve more positive beliefs

about their concerns as a result of their interactions with each other. At the same time, when the individuality of the members is paid attention to, and the grounds for expressing the opinions and thoughts of the members are provided, A person accepts the responsibility for his choices and has more ability to control his thoughts and actions, with more awareness of himself and his capabilities and limitations, he will make a more effective choice.

On the other hand, it was shown in the table that metacognitive beliefs affect a person's level of perfectionism. The stronger the metacognitive beliefs, the less perfectionism is formed. In the explanation of this hypothesis, it can be said that people with metacognitive beliefs consider a promise due to having more self-awareness about their mental states, better learning speed, and having positive beliefs in achieving their goals and affairs. So, they have choices according to their capabilities and limitations. In response to failure, they are less vulnerable, have special knowledge about their beliefs, adjust their performance, and carry out their affairs with the norm and controlled perfectionism. In this way, metacognitive beliefs affected by family communication patterns can play a moderating role in reducing perfectionism.

5. Ethical Considerations

Compliance with ethical guidelines

All ethical principles were considered in this article. The participants were informed about the purpose of the research and its implementation stages. They were also assured about the confidentiality of their information and were free to leave the study whenever they wished, and if desired, the research results would be available to them.

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Authors' contributions

All authors have participated in the design, implementation, and writing of all sections of the present study.

Conflicts of interest

The author(s) declared no conflicts of interests.

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