



# Relationship of Perfectionism and Body Image Concern in Individuals Demanding Cosmetic Dental Restorations: The Mediating Roles of Psychological Inflexibility and Cognitive Fusion

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## Abstract

**Background:** Perfectionism is increasingly recognized as a contributing factor in the decision to pursue cosmetic dental restorations, yet its psychological pathways remain insufficiently studied.

**Objectives:** The present study examined the association between perfectionism and body image concern among individuals seeking such treatments, focusing on the mediating effects of psychological inflexibility and cognitive fusion.

**Methods:** A cross-sectional study was conducted with 195 adults (mean age =  $31.71 \pm 9.71$  years) in Sanandaj, Iran. Participants completed validated instruments assessing perfectionism, body image concern, psychological inflexibility, and cognitive fusion. Statistical analyses included independent *t*-tests, Pearson's correlations, and mediation analyses using Sobel tests within a structural equation modeling framework. A Bonferroni-adjusted significance threshold of  $P < 0.001$  was applied.

**Results:** Perfectionism demonstrated significant positive correlations with body image concern ( $r = 0.443$ ,  $P < 0.001$ ), psychological inflexibility ( $r = 0.610$ ,  $P < 0.001$ ), and cognitive fusion ( $r = 0.483$ ,  $P < 0.001$ ). Psychological inflexibility fully mediated the relationship between perfectionism and body image concern, whereas cognitive fusion acted as a partial mediator. Model fit indices supported the adequacy of the proposed relationships.

**Conclusions:** The findings suggest that perfectionism contributes to body image concern both directly and indirectly through increased psychological inflexibility and cognitive fusion. Incorporating psychological screening and targeted interventions, such as acceptance and commitment therapy (ACT), into cosmetic dental care may help address unrealistic expectations and improve treatment satisfaction.

**Keywords:** Body Image Concern, Cognitive Fusion, Cosmetic Dentistry, Perfectionism, Psychological Inflexibility

## 1. Background

Facial aesthetics have a profound impact on self-esteem, behavior, and social interactions, leading many individuals to seek ways to enhance their appearance (1). In recent decades, the demand for cosmetic procedures, particularly those involving the face and teeth, has risen sharply. In the United States alone, more than 15.6 million cosmetic procedures were performed in 2020, representing a 222 percent increase compared to 1997 (2,

3). Among the various facial features, the smile is regarded as second only to the eyes in perceived attractiveness (4). As a result, dental aesthetics have become an important focus within clinical dentistry, with patients increasingly requesting treatments that address not only functional concerns but also cosmetic enhancement (5).

In addition to anatomical and physiological considerations, psychological factors play a critical role in both the decision to undergo cosmetic dental

procedures and in post-treatment satisfaction (6). One such factor is perfectionism, a personality trait characterized by striving for flawlessness. Perfectionism can be broadly categorized into normal, or adaptive, and neurotic, or maladaptive, forms (7). Individuals with normal perfectionism aim for excellence while maintaining a healthy self-awareness, whereas those with neurotic perfectionism often experience chronic dissatisfaction due to unrealistic expectations (8).

Another relevant psychological construct is cognitive fusion, which refers to the tendency to become overly entangled with one's thoughts, making it difficult to maintain perspective and flexibility (9). High levels of cognitive fusion can lead to distorted self-perceptions, particularly regarding visible features such as the teeth, smile, or nose. Neurotic perfectionists are especially prone to overestimating perceived flaws and may believe that cosmetic intervention will significantly increase social acceptance (10).

Although the relationship between perfectionism and dissatisfaction has been well documented in the context of general cosmetic surgery, there is limited research examining this link in individuals seeking cosmetic dental restorations (11). Similarly, concerns about body image, which are prevalent among patients undergoing aesthetic treatments, have rarely been explored within dental settings (12). Many of these patients also display psychological inflexibility, which is the inability to adapt to changing circumstances or demands (13). This rigidity can heighten perfectionist ideals and intensify body dissatisfaction, thereby influencing treatment outcomes and overall satisfaction (14). Despite growing evidence that perfectionism, body image, and psychological inflexibility are interrelated, their combined influence in cosmetic dental contexts remains insufficiently studied.

## 2. Objectives

The present study was designed to investigate the relationships among perfectionism, body image concern, psychological inflexibility, and cognitive fusion in individuals seeking cosmetic dental restorations, with a particular focus on the mediating roles of psychological inflexibility and cognitive fusion.

## 3. Methods

This cross-sectional study was conducted with 195 individuals seeking cosmetic dental restorations in

Sanandaj, Iran. Participants were recruited through convenience sampling. The sample size was estimated using a formula based on a 95 percent confidence level,  $P = 0.5$ ,  $q = 0.5$ , and  $d = 0.07$ . Although a formal power analysis was not performed, the calculated sample size was considered sufficient for the study objectives. Eligible participants were between 18 and 50 years of age, had completed at least a high school education, and reported no history of psychological disorders. Individuals who declined to participate or returned incomplete questionnaires were excluded. Data were collected in a controlled setting after obtaining informed consent from each participant. Ethical approval was obtained from the Ethics Committee of Kurdistan University of Medical Sciences (IR.MUK.REC.1402.096).

### 3.1. Instruments

#### 3.1.1. Multidimensional Perfectionism Scale

This 30-item scale measures three dimensions of perfectionism: Self-oriented (items 1 to 10), other-oriented (items 11 to 20), and socially prescribed (items 21 to 30). Responses are scored on a five-point Likert scale ranging from 1 (disagree) to 5 (agree). Total scores range from 30 to 150, with higher scores indicating greater levels of perfectionism. Scores between 30 and 60 represent mild perfectionism, 60 to 90 indicate moderate perfectionism, and scores above 90 indicate high perfectionism. In previous studies conducted by Besharat and Shahidi and Besharat et al., the Cronbach's alpha coefficient was reported as 0.89 (10, 15).

#### 3.1.2. Body Image Concern Inventory

This seven-item scale assesses concerns related to body image. Responses are scored on a four-point Likert scale from 0 (never) to 3 (much more than others). Higher scores indicate greater concern with body image. The scale has demonstrated strong internal consistency, with a Cronbach alpha of 0.78, and excellent test-retest reliability ( $r = 0.92$ ,  $P < 0.001$ ) (16, 17).

#### 3.1.3. Body Image Psychological Inflexibility Scale

This 16-item instrument measures cognitive and emotional inflexibility related to body image. Items are rated on a seven-point scale from 1 (totally wrong) to 7 (totally correct). Higher scores indicate greater psychological inflexibility. The scale has shown excellent

internal consistency (Cronbach's alpha = 0.93) and high test-retest reliability ( $r = 0.90$ ) (18).

### 3.1.4. Cognitive Fusion Questionnaire

This seven-item questionnaire measures cognitive fusion. Responses are rated on a seven-point Likert scale, producing a total score between 7 and 49. Higher scores reflect greater cognitive fusion. Factor analysis confirmed a single-factor structure accounting for 54.89 percent of the variance. The instrument has demonstrated strong psychometric properties, with a Cronbach's alpha of 0.86 and test-retest reliability of  $r = 0.86$  (19).

### 3.2. Statistical Analysis

Data analysis was conducted using SPSS version 25 and AMOS version 23. Descriptive statistics were used to summarize demographic variables. Independent *t*-tests and one-way analysis of variance (ANOVA) with Bonferroni post hoc tests were used to examine associations between demographic variables and perfectionism. Pearson correlation coefficients were calculated to assess relationships among perfectionism, body image concern, psychological inflexibility, and cognitive fusion.

Sobel tests were used to evaluate whether psychological inflexibility mediated the relationship between perfectionism and both body image concern and cognitive fusion. Statistical significance was set at  $P < 0.001$ . Prior to conducting path analyses, assumptions of linearity, normality, and multicollinearity were evaluated. Variance inflation factor (VIF) values were below 10, indicating no multicollinearity, and residuals were normally distributed. Model fit was assessed according to the criteria proposed by Hu and Bentler, with root mean square error of approximation (RMSEA)  $\leq 0.08$ , Comparative Fit Index (CFI)  $\geq 0.90$ , and Goodness of Fit Index (GFI)  $\geq 0.90$ . Bonferroni correction was applied to control the type I error rate (20).

## 4. Results

### 4.1. Descriptive Findings

Of the 195 participants, 71.6 percent were female. The mean age was 31.71 years with a standard deviation of 9.71 years. High levels of perfectionism were observed in 64.6 percent of the sample. Nearly half of the participants (48.9 percent) were younger than 30 years, 47.4 percent were married, 92.6 percent resided in

urban areas, and 59.5 percent had a university-level education (Table 1).

**Table 1.** Demographic Information of the Participants

Variables and Categories	No. (%)
<b>Gender</b>	
Male	54 (28.4)
Female	136 (71.6)
<b>Age (y)</b>	
< 30	93 (48.9)
30 to 40	74 (38.9)
> 40	23 (12.1)
<b>Marital status</b>	
Single	83 (43.7)
Married	90 (47.4)
Divorced	17 (8.9)
<b>Place of residence</b>	
Urban	176 (92.6)
Rural	14 (7.4)
<b>Educational level</b>	
Below high-school diploma	24 (12.6)
High-school diploma	53 (27.9)
University education	113 (59.5)

### 4.2. Correlations Between Study Variables

As presented in Table 2, lower educational attainment was associated with higher perfectionism scores ( $P < 0.001$ ). Women reported higher levels of perfectionism and body image concern compared with men ( $P < 0.05$ ). Perfectionism was positively correlated with body image concern ( $r = 0.443$ ,  $P < 0.0001$ ), psychological inflexibility ( $r = 0.610$ ,  $P < 0.001$ ), and cognitive fusion ( $r = 0.483$ ,  $P < 0.001$ ). The strongest observed correlation was between psychological inflexibility and cognitive fusion ( $r = 0.735$ ; Table 3). Psychological inflexibility also showed strong positive correlations with both perfectionism ( $r = 0.610$ ) and body image concern ( $r = 0.584$ ), suggesting its potential role as a mediator.

### 4.3. Mediating Role of Psychological Inflexibility

Psychological inflexibility was found to significantly mediate the association between perfectionism and body image concern ( $P < 0.001$ ). When psychological inflexibility was included as a mediator, the direct effect of perfectionism on body image concern was no longer statistically significant ( $P = 0.662$ ), indicating full mediation. The results suggest that higher perfectionism leads to increased psychological inflexibility, which in turn elevates body image concern.

**Table 2.** Correlation of Demographic Factors with the Mean Perfectionism Score

Variables and Categories	Perfectionism Score	
	Mean $\pm$ SD	P-Value
<b>Gender</b>		$t = 2.18; P = 0.031$
Female	16.11 $\pm$ 100.74	
Male	16.63 $\pm$ 95.00	
<b>Age group</b>		$F = 6.28; P = 0.002$
< 30	15.79 $\pm$ 99.73	
30 to 40	16.86 $\pm$ 96.84	
> 40	14.93 $\pm$ 86.43	
<b>Marital status</b>		$F = 11.77; P = 0.001$
Single	13.68 $\pm$ 99.01	
Married	17.65 $\pm$ 91.84	
Divorced	14.87 $\pm$ 110.47	
<b>Place of residence</b>		$t = -2.23; P = 0.027$
Urban	16.54 $\pm$ 95.86	
Rural	15.61 $\pm$ 106.07	
<b>Educational level</b>		$F = 14.55; P > 0.001$
Below high-school diploma	7.44 $\pm$ 109.88	
High-school diploma	17.34 $\pm$ 100.13	
University education	15.96 $\pm$ 92.30	

**Table 3.** Correlation Matrix of Perfectionism, Body Image Concern, and Body Image Psychological Inflexibility

Variables	1	2	3	4	5
1	Age	1	-	-	-
2	Perfectionism	-0.294 <sup>a</sup>	1	-	-
3	Body image concern	-0.280 <sup>a</sup>	0.433 <sup>a</sup>	1	-
4	Body image psychological inflexibility	-0.211 <sup>a</sup>	0.610 <sup>a</sup>	0.584 <sup>a</sup>	1
5	Cognitive fusion	-0.316 <sup>a</sup>	0.483 <sup>a</sup>	0.559 <sup>a</sup>	0.735 <sup>a</sup>

<sup>a</sup> The results showed that age had a significant inverse correlation with perfectionism, body image concern, body image psychological inflexibility, and cognitive fusion. In other words, the above-mentioned parameters decreased with age; this correlation was stronger with cognitive fusion. Perfectionism, body image concern, body image psychological inflexibility, and cognitive fusion had significant positive pairwise correlations with each other; the strongest correlation ( $r = 0.735$ ) was found between body image psychological inflexibility and cognitive fusion.

As shown in **Table 4**, perfectionism had a significant direct effect on psychological inflexibility ( $P = 0.006$ ), and psychological inflexibility was a strong predictor of body image concern ( $P < 0.001$ ). The indirect effect was also statistically significant ( $P < 0.001$ ). The model demonstrated acceptable fit indices ( $RMSEA = 0.079$ ,  $CMIND/DF = 3.342$ ,  $CFI = 0.852$ ,  $GFI = 0.935$ ,  $AGFI = 0.903$ ).

#### 4.4. Mediating Role of Cognitive Fusion

Cognitive fusion significantly mediated the relationship between perfectionism and body image concern ( $P < 0.001$ ). However, in contrast to psychological inflexibility, the direct effect of

perfectionism on body image concern remained significant ( $P = 0.048$ ), indicating partial mediation. Higher perfectionism scores were associated with increased cognitive fusion, which in turn heightened body image concern. As indicated in **Table 5**, perfectionism significantly predicted both cognitive fusion ( $P = 0.002$ ) and body image concern ( $P = 0.048$ ). Cognitive fusion was also a strong predictor of body image concern ( $P < 0.001$ ). The indirect effect was significant ( $P < 0.001$ ). Model fit indices ( $CMIND/DF = 3.157$ ,  $RMSEA = 0.07$ ,  $CFI = 0.886$ ,  $GFI = 0.953$ ,  $AGFI = 0.921$ ) indicated a good fit.

#### 5. Discussion

**Table 4.** Effect Size of Direct and Indirect Correlations Between the Variables Regarding the Mediating Effect of Psychological Inflexibility

Effects	Effect	t	P-Value
<b>Direct</b>			
Perfectionism → psychological inflexibility	0.603	2.74	0.006
Perfectionism → body image concern	0.037	0.44	0.662
Body image concern → psychological inflexibility	0.651	4.10	0.001>
<b>Indirect</b>			
Perfectionism → body image concern → psychological inflexibility	0.393	3.11	0.001>

**Table 5.** Effect Size of Direct and Indirect Correlations Between the Variables Regarding the Mediating Effect of Cognitive Fusion

Effects	Effect	t	P-Value
<b>Direct</b>			
Perfectionism → cognitive fusion	0.469	3.13	0.002
Perfectionism → cognitive fusion	0.174	1.99	0.048
Body image concern → cognitive fusion	0.564	6.69	0.001>
<b>Indirect</b>			
Perfectionism → cognitive fusion → psychological inflexibility	0.265	4.20	0.001>

This study explored the relationship between perfectionism and body image in patients seeking cosmetic dental restorations, emphasizing the mediating role of psychological inflexibility. Results showed high perfectionism levels among participants. Negative perfectionism may contribute to psychological disorders and lead individuals to become obsessed with invasive cosmetic procedures, regardless of comorbidities. Hashemi and Jamshidi (11) reported high levels of negative perfectionism in females seeking cosmetic surgery in Tehran, Iran, and similar results were found by Hasani et al. (21). Despite using different assessment tools and classifications of perfectionism, these studies align with our findings.

Perfectionism can be categorized as adaptive (positive) or maladaptive (negative). Adaptive perfectionists set high but attainable goals, while maladaptive perfectionists set unrealistic expectations, often leading to dissatisfaction even after cosmetic procedures. This distinction is particularly important in cosmetic dentistry, where maladaptive perfectionists may exaggerate minor imperfections.

Body image concern among the study population was moderate to low, possibly because cosmetic dental restorations are less prioritized than other cosmetic procedures among younger individuals. Previous studies have shown that higher body image concerns are associated with a greater likelihood of seeking

invasive interventions (22, 23). Ghaffari et al. (23) reported higher body image concern scores in candidates for aesthetic surgery. However, differences in target populations and types of procedures may account for discrepancies with our results.

Cognitive fusion was found to be high in this study population. Individuals with high cognitive fusion tend to rigidly adhere to their thoughts, turning them into actions (24, 25). Payandeh et al. (25) and Parnian Khooy et al. (26) reported high levels of cognitive fusion in cancer patients, while Karami et al. (27) reported high cognitive fusion in patients with borderline personality disorder. Although the mediating effect of cognitive fusion was small, its clinical significance remains important. Patients with high cognitive fusion rigidly adhere to negative self-image thoughts, increasing their risk of dissatisfaction even after objectively successful outcomes. Psychological interventions, such as acceptance and commitment therapy (ACT), may enhance cognitive flexibility and improve self-perception in these.

Perfectionism was higher in females, those under 30, divorced individuals, and those with lower education. Females often have lower self-esteem and more interest in cosmetic procedures, while younger and less-educated individuals may seek treatments due to emotional needs and limited awareness. Divorced individuals may pursue procedures to fill emotional

gaps (25, 28). Ralph-Nearman et al. (29) showed significant correlations between perfectionism, age, and gender in eating disorder patients, and Vecchione et al. (30) found similar correlations in adolescents. These findings align with our results, as Seif et al. (31) noted the significant link between education and perfectionism.

The inverse correlation between age and psychological inflexibility suggests that younger individuals may be more vulnerable to perfectionism and body image dissatisfaction, influenced by social media and cultural beauty standards. This may explain the growing demand for cosmetic dental procedures, particularly among youth exposed to Western beauty ideals (31).

Our results indicated a significant low to moderate correlation between perfectionism and body image concern, similar to findings by Seif et al. (31). However, their study showed stronger correlations, likely due to their focus on patients with skin diseases. Additionally, others reported a significant moderate positive correlation between perfectionism and body image concern (32). A strong positive correlation was found between perfectionism and body image psychological inflexibility, consistent with Ong et al. (33) but differing from Miles et al. (34), likely because Miles et al. studied patients with eating disorders. We also found a moderate positive correlation between perfectionism and body image cognitive fusion, aligning with prior research (35).

The results showed that psychological inflexibility significantly mediated the link between perfectionism and body image concern. Higher perfectionism led to greater psychological inflexibility, which, in turn, increased body image concern. Crosby et al. (36) suggested that perfectionism contributes to psychological inflexibility, mediating the correlation between perfectionism and various outcomes. Gao et al. (37) similarly discussed the mediating role of psychological inflexibility in the perfectionism-body image link. Liang et al. (38) confirmed that higher psychological inflexibility strengthens the connection between perfectionism and body image concern, and several other studies also support this (39). Considering these findings, interventions like cognitive behavioral therapy (CBT) and ACT may benefit individuals with high perfectionism and psychological inflexibility, helping to reduce cognitive distortions and rigid

thought patterns, thus improving patient satisfaction following cosmetic procedures.

The results highlighted cognitive fusion's small but significant mediation in the link between perfectionism and body image concern. Higher perfectionism increased cognitive fusion and body image concern, with cognitive fusion worsening body image concern. Paixao et al. (40) showed that cognitive fusion results in excessive cosmetic procedures among individuals with high perfectionism and body image concerns.

As most participants were female, future research should include both genders. Moreover, it is important to examine the effects of psychological treatments on individuals with high perfectionism, cognitive fusion, and psychological inflexibility seeking cosmetic dental procedures. Investigating psychological factors linked to cognitive fusion and inflexibility in candidates for other dental treatments is also recommended. These results emphasize the need to address psychological inflexibility in therapeutic interventions. Cognitive-behavioral approaches targeting perfectionism and body image concerns may enhance patient satisfaction.

### 5.1. Conclusions

This study showed that maladaptive perfectionism is strongly linked to body image concerns in patients seeking cosmetic dental restorations, with psychological inflexibility fully mediating this relationship and cognitive fusion acting as a partial mediator. Rigid thinking patterns appear to heighten dissatisfaction even after objectively successful treatments. These results highlight the value of integrating psychological assessment and interventions into cosmetic dental care. Approaches that improve cognitive flexibility, such as cognitive behavioral or acceptance-based therapies, may help manage unrealistic expectations and enhance patient satisfaction. Future longitudinal studies should confirm these relationships, test targeted interventions, and explore whether similar patterns exist in other fields of aesthetic dentistry.

### Footnotes

**Authors' Contribution:** Sh. M., M. Z., and A. R. critically revised the manuscript for important intellectual content. Sh. M., M. Z., and A. R. approved the version to be submitted and revised the text. All authors had substantial contributions to conception and design,

and/or acquisition of data, and/or analysis and interpretation of data, as well as drafting the article.

**Conflict of Interests Statement:** The authors declare no conflict of interests.

**Data Availability:** The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

**Ethical Approval:** The present study was approved by Kurdistan University of Medical Sciences, Kurdistan, Iran (IR.MUK.REC.1402.096 ).

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