Research Paper

Emotion Regulation Strategies as a Mediator of the Relationship of Beliefs About Emotion and Emotion Regulation Self-efficacy, and Social Anxiety

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ABSTRACT

Objective: According to cognitive models, maladaptive beliefs play a major role in social anxiety disorder (SAD) and can lead to dysfunctional behavioral reactions and emotion dysregulation. This study aims to examine emotion regulation strategies as a mediator in the relationship of beliefs about emotions and emotion regulation self-efficacy and social anxiety.

Methods: A total of 650 college students from Yazd University (Iran) were selected by cluster sampling and filled out the implicit theories of emotion scale (ITES; 2007), regulatory emotional self-efficacy scale (RESE; 1999), social interaction anxiety scale (SIAS; 1992), and the short-form cognitive emotion regulation questionnaire (CERQ; 2002).

Results: The initial hypothesized model had a poor fit. By merging the manifest variables of refocus on planning with reappraisal, refocusing with putting into perspective (for adaptive emotion regulation), and combining rumination and catastrophizing (for maladaptive emotion regulation), the model fit was optimized, and all the direct paths became significant. The final model was a partial mediation model, confirming the adaptive and maladaptive emotion regulation strategies as a mediating role in the relationship of beliefs about emotions and emotion regulation self-efficacy and social anxiety.

Conclusion: The results showed that beliefs about emotions affect the utilization of efficient emotion regulation strategies and can be a risk factor for social anxiety.

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Highlights

- Beliefs about emotion can affect emotion regulation strategies.
- Emotion regulation self-efficacy is related to emotion regulation strategies.
- Emotional regulation strategies mediate the relationship between emotional beliefs and social anxiety disorder (SAD).
- A new five-factor structure emerged for the cognitive emotion regulation questionnaire (CERQ)-18.

Plain Language Summary

Social anxiety disorder (SAD) is the third most common mental disorder. Maladaptive beliefs play a critical role in SAD. People who believe they cannot change or manage their emotions choose more maladaptive emotion regulation strategies and numerous studies have confirmed the role of maladaptive emotional regulation strategies in the onset and maintenance of anxiety. Therefore, emotional beliefs can be a risk factor for SAD.

1. Introduction

Social anxiety disorder (SAD) is mainly characterized by significant or severe anxiety or fear in social situations that may be scrutinized by others (American Psychiatric Association, 2013). The 12-month prevalence of SAD is reported as 7% in the US (American Psychiatric Association, 2013). Two epidemiological studies in 2011 and 2018 reported the 12-month prevalence of SAD in Iran as 3.2% (Hajebi et al., 2018; Sharifi et al., 2015). Due to its clinical features, this disorder is associated with high dropout rates, diminished well-being, reduced employment, decreased productivity at work, lower socioeconomic status, and poorer quality of life. This disorder also harms interpersonal relationships and other functional areas (American Psychiatric Association, 2013). Given its prevalence rate and the serious dysfunctions in the life of individuals with social anxiety, this disorder demands further research to better identify its dimensions and causes.

Several cognitive models (Leigh & Clark, 2018) have been proposed to address the maladaptive beliefs of individuals with SAD. According to these models, maladaptive beliefs play a main role in SAD and may even lead to dysfunctional and maladaptive behavioral reactions and emotion dysregulation (Wong & Rapee, 2016). A part of these maladaptive beliefs includes the individual's dysfunctional beliefs about their emotion regulation and emotion dysregulation. Goodman et al. argued that individuals with social anxiety have beliefs about emotions that create a no-win situation in emotion regulation. Unlike their healthy peers, these people believe that emotions are relatively uncontrollable (entity belief), yet find emotional control crucial (Goodman et al., 2021). Daniel et al. (2020) reported that people with SAD who believed they could not change or manage their emotions experienced higher levels of stress, anxiety, and negative affect, with lower levels of self-esteem. Besides, perceived control over emotions plays a pivotal role in the treatment process for SAD (Leigh & Clark, 2018).

Beliefs about emotion refer to individuals' views of what emotions they can or should experience or what emotions they can or should change and regulate (De Castella et al., 2018). Beliefs about emotion have two dimensions, beliefs about whether emotions are good or bad, and beliefs about the controllability of emotions (Ford & Gross, 2019). The first dimension refers to the belief that emotions are desirable or undesirable, useful or useless, and helpful or harmful (Ford & Gross, 2019). Regarding the second dimension, research showed that beliefs about emotions are associated with emotion regulation (Ford et al., 2018). The individual's belief in the controllability of emotions affects their motivation for self-regulation (Bandura, 1986). This idea means that implicit beliefs about emotion are also linked to emotion regulation self-efficacy. Emotion regulation self-efficacy is the individual's beliefs about the controllability of their emotions (Caprara et al., 2013). According to De Castella et al., the two constructs of emotion malleability beliefs and emotion regulation self-efficacy are intertwined and complement each other. Therefore, these two constructs were taken as independent or criterion variables in the model. Meanwhile, a review of the literature

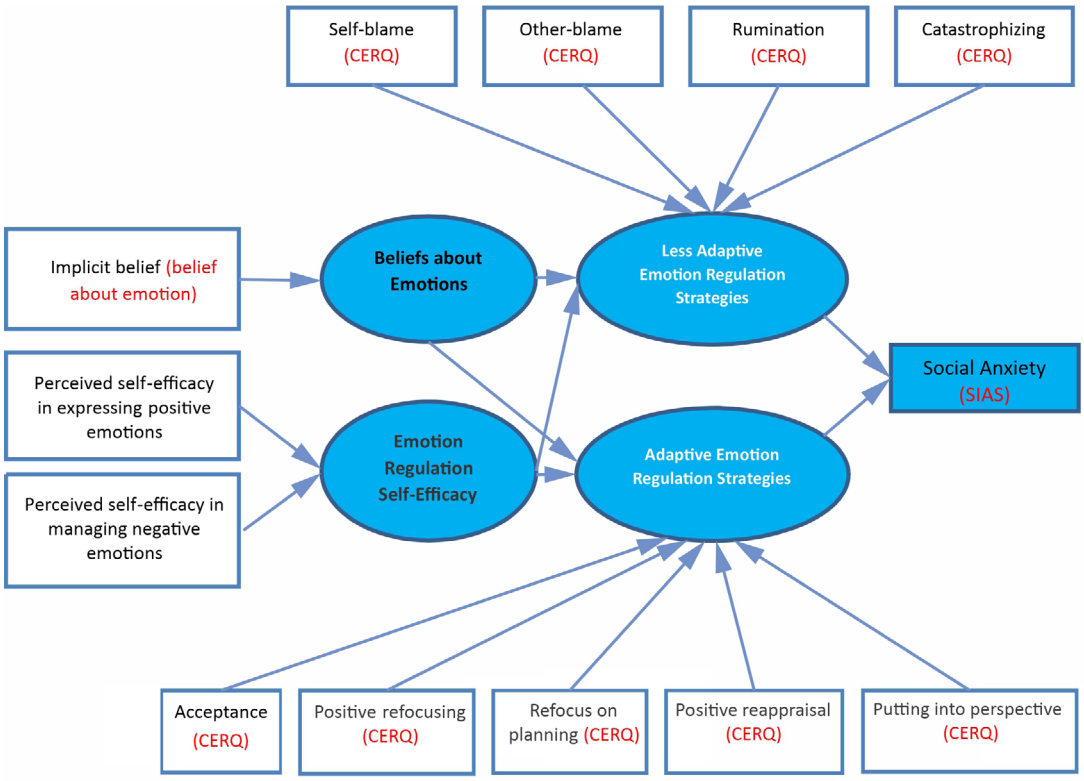

Figure 1. The schematic conceptual modeling of the mediation model

showed that the relationship between beliefs about emotions and social anxiety is not a linear and simple one, and some psychological constructs may mediate this relationship.

Studies demonstrate that beliefs about emotions affect the emotion regulation strategies chosen (Trincas et al., 2016; Deplancke et al., 2022). Furthermore, numerous studies have confirmed the role of maladaptive emotional regulation strategies in the onset and maintenance of anxiety (Jazaieri et al., 2015; Sackl-Pammer et al., 2019; Sarfan et al., 2019). Social anxiety is associated with higher rates of resorting to maladaptive emotion regulation mechanisms (rumination, catastrophizing, self-blame, and other-blame) and lower rates of adaptive emotion regulation (e.g. reappraisal) (Goldin et al., 2014).

Consequently, this study was conducted to investigate the adaptive and maladaptive emotional regulation strategies as a mediating role in the relationship of emotion malleability beliefs and emotion regulation self-efficacy and social anxiety (Figure 1). To the best of the researcher's knowledge, no study has yet examined all these emotion regulation strategies together about social anxiety.

2. Materials and Methods

Participants

This was a descriptive-correlational study in which structural equation modeling was used to investigate the relationships between the variables of the proposed model. The statistical population included all the college students of Yazd University in 2021, of whom a sample of 650 people was selected via cluster sampling.

The sample size for structural equation modeling (SEM) was calculated based on Taylor and Mueller's method (1996) and based on the ratio of sample size to free parameters. The minimum ratio is 5:1 and the maximum is 20:1. The hypothesized model of this study had 91 free parameters, meaning that the minimum required sample size was 455 and the maximum was 1 820. Considering potential dropouts, the researchers recruited a sample of 650, including 296 men (45%) and 354 women (55%). The data were analyzed using SEM.

Inclusion and exclusion criteria

The inclusion criteria included being a college student, and being desired to participate in the study.

The exclusion criteria included not answering more than 10% of the questions in the questionnaires, and unwillingness to follow the research.

Study procedure

First, from all the faculties of Yazd University, ten faculties and then five classes from each faculty and 13 students from each class were randomly selected. After submitting their informed consent, the participants filled out the implicit theories of emotion scale, regulatory emotional self-efficacy scale (RESE), social interaction anxiety scale (SIAS), and the short form of the cognitive emotion regulation questionnaire (18-CERQ).

Study instruments

Social interaction anxiety scale (SIAS)

Heimberg et al. developed a 20-item social interaction anxiety scale (SIAS) (Heimberg et al., 1992) to assess symptoms of anxiety in social interactions. Possible scores range from 0 to 80 and a higher score shows a higher level of anxiety in social interactions. The items are scored based on a five-point Likert scale. The reliability of SIAS has been confirmed in Iran with a test re-test score of 0.79 and Cronbach's α of 0.90. This scale is also correlated with the fear of negative evaluation scale and the social phobia anxiety inventory (Tavoli et al., 2012).

Implicit theories of emotion scale

The implicit theories of emotion scale was developed by Tamir et al. (2007) to measure the extent to which the individual believes that emotions are changeable based on four items. Two of these items measure the malleable mindset of emotions, and the other two measure the fixed view of emotions. The items are arranged on a Likert scale from 0 (strongly disagree) to 5 (strongly agree). Items related to the fixed mindset of emotions are reverse-scored, and the average of all the scores is then calculated to obtain the total score that ranges from 1 to 5. Higher scores imply a more malleable view. The reliability of this questionnaire has been about 0.75 in previous studies and 0.61 in the present study. A positive relationship with the negative affect appraisal and negative relationships with self-esteem and depression indicate the construct validity of the scale (Kappes et al., 2013).

Regulatory emotional self-efficacy scale (RESE)

This regulatory emotional self-efficacy scale (RESE) was originally promoted by Bandura et al. (1999) as cited in caprara, to assess individuals' self-efficacy in regulating emotions on a five-point Likert scale. This scale includes items on the perceived self-efficacy in positive emotion expressions (four items) and in controlling negative emotions (eight items). The total score ranges from 12 to 60 (Caprara et al., 1999). This scale was standardized by Hosseinchari et al. for use in Iran and the relationship between all items with the total score was significant at the level of 0.01. Test re-test reliability was 0.79, indicating an acceptable level of reliability (Hosseinchari et al., 2016).

Cognitive emotion regulation questionnaire (CERQ)

This cognitive emotion regulation questionnaire (CERQ) was established by Garnefski et al. (2002) to evaluate cognitive emotion regulation strategies after experiencing distressful events (Garnefski et al., 2002). The original version of the questionnaire has 36 items, each scored on a Likert scale sorting from (almost) never (1) to (almost) always (5).

Hasani examined the validity and reliability of the short 18-item Persian version of the cognitive emotion regulation questionnaire (CERQ-P-short) among Iranians, and the results showed that the CERQ-P-short has good validity and reliability with the Cronbach's α classifying from 0.76 to 0.89 (Hasani, 2010). This scale has nine subscales, self-blame, other-blame, acceptance, refocus on planning, positive refocusing, rumination, positive reappraisal, putting into perspective, and catastrophizing. In the short form of the scale, the score of each subscale is the sum of the scores of its two items. Therefore, the results of each subscale range from 2 to 10, with the total number of the scale ranging from 18 to 90.

3. Results

The data analysis was conducted using LISREL 10.20. The emotion malleability beliefs, emotion regulation self-efficacy, and adaptive and maladaptive emotion regulation strategies constituted the latent variables. This model was run before implementing the structural model to determine whether the measurement model has a good fit or needs to be modified. In the measurement model, the manifest variables of acceptance, refocus on planning, reappraisal, positive refocusing, and putting into perspective were considered as the adaptive emotion regulation strategies; the manifest variables of rumination, self-blame, other-blame, and catastrophizing were considered the maladaptive strategies; and four items were regarded as the manifest variables for the latent

Table 1. Mean±SD of the manifest variables

Variables	Mean±SD
Expressing positive emotions	13.22±1.9
Managing negative emotions	23.2±7.06
Refocus on planning-positive reappraisal	14.28±3.68
Rumination-catastrophizing	12.35±3.61
Positive refocusing-putting into perspective	4.08±1.65
Other-blame	5.09±2.07
Self-blame	4.32±1.21
Social anxiety	12.7±8.78

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Table 2. Bivariate correlation of the observed variables

Variables	1	2	3	4	5	6	7	8	9
Expressing positive emotions	1								
Managing negative emotions	-0.352**	1							
Refocus on planning-positive reappraisal	0.453**	-0.381**	1						
Rumination-catastrophizing	-0.481**	0.532**	0.351**	1					
Positive refocusing-putting into perspective	0.371**	-0.410**	-0.422**	0.379**	1				
Other-blame	-0.422**	-0.521**	-0.373**	0.429**	-0.473**	1			
Self-blame	-0.531**	0.439**	-0.419**	0.352**	-0.426**	0.527**	1		
Acceptance	0.374**	-0.372**	0.317**	-0.409**	0.528**	-0.511**	-0.601**	1	
Social anxiety	-0.338**	0.419**	-0.488**	0.573**	-0.409**	0.401**	0.611**	-0.601**	1

**P<0.01, *P<0.5.

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variable of beliefs about emotions. In addition, the two subscales of perceived capabilities to express positive emotions and control negative emotions were identified as the manifest variables for the latent variable of regulatory emotional self-efficacy.

After completing and finalizing the indices of the latent variables, SEM was performed using the maximum likelihood estimation method with 1000 bootstrap samples. To determine the significance of the indirect effects, a bootstrap approximation was used for P with a bias-corrected confidence interval at the significance level of 0.05.

SEM was performed to examine the theoretical relationships among the individual's emotional beliefs, regulatory emotional self-efficacy, adaptive and maladaptive emotion regulation strategies, and social anxiety (the manifest variable).

SPSS software (IBM CORE, 2016) was used to check the missing data. It was found that 2% to 8% of the data were missing. Little's missing completely at random (MCAR) tests were run to ensure that this missing was completely at random. All of these tests presented non-significant results, denoting that the data went missing completely at random (P>0.223).

Table 1 presents the descriptive findings (Mean±SD) and Table 2 presents the bivariate correlation of the manifest variables.

Structural equation models

To evaluate the fit of the structural model with the data, the following goodness of fit indices were applied, the comparative fitness index (CFI) with values >0.9, root mean square error of approximation (RMSEA) with a value 0.1 (Meyers et al., 2016), standardized root mean square residual (SRMR) with a value <0.1 (Kline, 2016), and X^2 (chi-square) were insignificant. Since the X^2 value is sensitive to sample size (Kline, 2016), we used the normalized chi-square (X^2/df) with a value <3.

Measurement and structural model

In the initial hypothesized model, the manifest variables of acceptance, refocus on planning, reappraisal, positive refocusing, and putting into perspective (for the latent variable of adaptive emotion regulation), the manifest variables of rumination, self-blame, other-blame, and catastrophizing (for the maladaptive emotion regulation strategy), self-efficacy in showing positive emotions and managing negative emotions (as the manifest variables for emotion regulation self-efficacy), and four items (as manifest variables for beliefs about emotions) were entered into the model. The paths from beliefs about emotions to social anxiety and from self-efficacy to emotion regulation were not significant. The X^2 value was significant, the normalized X^2 was >5. Other indices were obtained as follows: CFI=0.641, SRMR=0.216, RMSEA=0.371, and the fit of the model was very poor. By combining the manifest variables of refocus on planning with reappraisal, positive refocusing with putting into perspective (for adaptive emotion regulation), and rumination with catastrophizing (for maladaptive emotion regulation), the fit of the model became desirable, and all the direct paths became significant. Figure 2 shows the final modified model.

Table 3 presents the general fit indices. The X^2 value (59)=171.38 is significant (P=0.001), but since this index is sensitive to sample size (Kline, 2016), other indices were used. Other fit indices support the goodness of fit of the model (CFI=0.907, SRMR=0.049, RMSEA=0.063). Based on the results regarding the multivariate normality, the assumption of multivariate normality of this mod-

Table 3. Final model fit indices

Fit Indices							Multivariate Normality Mardia's Coefficient			
Parsimony-based		Comparative		Absolute			P	Kurtosis	P	Skewness
RMSEA	CMIN/df	CFI	TLI	P	df	CMIN				
0.063	2.90	0.91	0.91	0.001	59	171.38	0.43	4.35	0.61	1.83

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Abbreviations: RMSEA: Root mean square error of approximation; TLI: Tucker-Lewis index; CMIN: Chi-square minimumCFI: Comparative fitness index.

Table 4. Non-standard and standard coefficients of the direct paths in the model

Path	B	β
Beliefs about emotions→adaptive strategies	0.43	0.43
Beliefs about emotions→maladaptive strategies	-0.71	-0.34
Emotion regulation self-efficacy→adaptive strategies	0.64	0.64
Emotion regulation self-efficacy→maladaptive strategies	-1.01	-0.51
Adaptive strategies→social anxiety	2.46	-0.46
Maladaptive strategies→social anxiety	6.75	0.45

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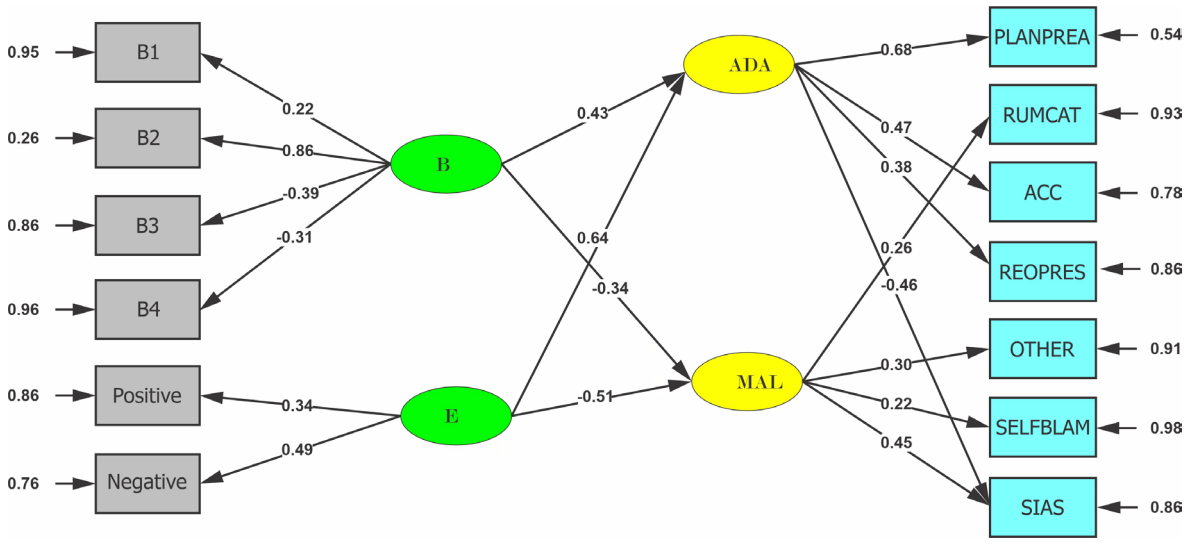

Figure 2. A visual representation of the final fitted model

el is confirmed. Table 4 presents the path coefficients of the structural equation model.

We found significant effects for the direct path from emotional beliefs to adaptive strategies (B=0.43, P<0.0001) and maladaptive strategies (B=-0.34, P<0.0001), from maladaptive strategies to anxiety (B=0.45, P<0.0001), from adaptive strategies to anxiety (B=-0.46, P<0.001), and from emotion regulation self-efficacy to maladaptive strategies (B=-0.51, P<0.001) and adaptive strategies (0.46).

Also, a significant indirect effect was observed from emotional beliefs to anxiety through maladaptive strategies (B=0.153, P<0.001), from emotional beliefs to anxiety through adaptive strategies (B=0.197, P<0.001), from emotion regulation self-efficacy to anxiety through maladaptive strategies (B=0.229, P<0.001), and from emotion regulation self-efficacy to anxiety through adaptive strategies (B=0.294, P<0.001), demonstrating a partial mediation model (R^2=63.253).

4. Discussion

This study was conducted to examine the mediating role of emotion regulation strategies in the relationship among beliefs about emotion, emotion regulation self-efficacy, and social anxiety in a comprehensive model using SEM.

The final model was a partial mediation model, confirming that adaptive and maladaptive emotion regulation strategies mediate the relationship between beliefs about emotions and emotion regulation self-efficacy with social anxiety. The mediating role of emotion regulation strategies in the relationship between beliefs about emotion regulation, anxiety, and depression has been previously confirmed (De Castella et al., 2018; Ford & Gross, 2019; Ford et al., 2018). Ford et al. (2018) reported that adolescents with higher entity belief (EB) experience more severe depressive symptoms because they use less reappraisal strategy (Ford et al., 2018). Previous studies have paid more attention to the role of some strategies, such as reappraisal. In this study, a set of emotion regulation strategies were studied together in a comprehensive model. In the following, we address the research hypotheses and compare the findings with the results of previous studies.

The path from beliefs about emotions to emotion regulation strategies was significant, and belief in the malleability of emotions had a positive correlation with adaptive strategies and a negative relationship with maladaptive emotion regulation strategies. The results of this study support previous results suggesting a significant relationship between higher entity belief (EB) and less use of the adaptive strategies of reappraisal and putting into perspective. People who have a more fixed mindset about emotions have less motivation for self-regulation (Burnette et al., 2013). That is, they only engage in emotion regulation in the later stages of the emotion generative process, i.e. when the emotion is fully felt (later stage, response-focused emotion regulation) and experience more emotion regulation difficulties (Kneeland et al., 2016b).

The results revealed that emotion regulation self-efficacy has a significant positive relationship with adaptive emotion regulation strategies and a negative relationship with maladaptive strategies. Consistent with this result, previous studies have shown that lower self-efficacy is correlated with higher cardiovascular activity (Blascovich, 2013), and physiological symptoms are interpreted to increase negative emotions, hypervigilance, and dysfunction (De Castella et al., 2018). Moreover, low self-efficacy is associated with recurrent emotion regulation problems (De Castella et al., 2018).

In this paper, acceptance (as an adaptive strategy) and self-blame (as a maladaptive strategy) showed a significant relationship with beliefs about emotions. The results of previous studies on these strategies are contradictory; for example, Kneeland et al. (2016a) reported that the group receiving information about the malleability of emotions was less likely to show self-blame and had greater acceptance when a negative mood was induced. This result contradicts the results of the present study and some previous research. This discrepancy may be because different measures conceptualize emotion regulation strategies differently; besides, an emotion regulation questionnaire may measure different constructs in different groups, such as in clinical groups with different symptom profiles. For example, acceptance in people with a history or experience of depressive symptoms may assess another construct. Conceptually, for people with depression, acceptance indicates "accepting the conditions" or " inability to change anything about it", which is very similar to hopelessness and learned helplessness (Maier & Seligman, 2016) in depression (instead of satisfactory self-acceptance).

To assess emotion regulation strategies, the CERQ was administered to measure five adaptive and four maladaptive strategies. The factor analysis of this questionnaire showed that the items related to reappraisal and refocus on planning, rumination, and catastrophizing, as well as the two strategies of refocusing and putting into perspective should be combined in one factor. In most previous studies, the factor analysis of this questionnaire has revealed nine subscales; however, in a study that examined the psychometric properties of this questionnaire in adults with recurrent depression, a five-factor structure fit the data best (McKinnon et al., 2020). The different factor structure of this questionnaire in different populations and settings can be because measures, such as CERQ can only detect the habitual and inflexible use of certain strategies while newly-emerging theoretical frameworks pay attention to the capacity for making choices and applying strategies suitable for a given situation that is vital to mental health instead of individual strategies (Silvers & Moreira, 2019). McKinnon et al. suggest that it is better to define some or all of the CERQ subscales as individual constructs rather than grouping them under an overarching emotion regulation construct (McKinnon et al., 2020).

These results also showed that the path from maladaptive and adaptive emotion regulation strategies to social anxiety is significant. Consistent with this result, the results of previous studies have shown that people with social anxiety have emotion regulation difficulties on both intra- and interpersonal levels (Dryman & Heimberg, 2018). Compared to healthy adults, these individuals show a limited repertoire of strategies (Jazaieri et al., 2015) and are less skilled at using cognitive change strategies (Dryman & Heimberg, 2018).

5. Conclusion

The results of this study denoted that beliefs about emotions affect the employment of efficient emotion regulation strategies and can be a risk factor for poorer mental health. Thus, interventions focusing on changing negative beliefs about emotions can be essential to the formation of a healthy repertoire of strategies for the individual.

Meanwhile, given the strong link between psychological health in childhood and adulthood, improving the entity beliefs in childhood appears to yield significant cumulative benefits.

Limitations and future directions

The results of this study should be explained regarding the research limitations. Due to the cross-sectional nature of this study, no claim can be made about the causality or direction of the model. An alternative model can be suggested as follows: Individuals with social anxiety symptoms experience greater emotional intensity, and may be more pressed by emotions, and therefore use less adaptive emotion regulation strategies, and due to failure in emotion regulation, they are more expected to have stronger entity beliefs.

Emotion regulation strategies are very diverse, and different categories of emotion regulation strategies have been presented so far. For example, the strategies examined in this study aim to control emotional experience. Examining other strategies in future research can broaden our understanding of the underlying factors that explain the relationship between beliefs and emotion

regulation strategies. Besides, in the reality of emotional life, we use a variety of strategies in response to a single emotional episode, and how these strategies work in tandem with each other is an issue that should be considered in future studies.

Furthermore, this study and most other studies on emotion regulation use trait questionnaires that describe a person's approach across time and context. Future studies should evaluate emotion regulation strategies at different levels of analysis (e.g. using the experience sampling methodology (ESM) and state measures).

Future studies should examine the origins of beliefs about emotions, whether intense emotional experiences lead to the formation of beliefs about the uncontrollability of emotions (bottom-up), and whether these beliefs are learned from the people around through clear messages, socialization, etc. (top-down), and how emotions and emotion regulation change over time.

Since age affects the choice of strategies is essential to examine the relationship between the variables and the mediating model in other age groups.

Ethical Considerations

Compliance with ethical guidelines

All ethical bases were regarded in this article. The participants became aware of 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 wanted, and if desired, the research results would be accessible to them.

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Authors' contributions

Conceptualization, supervision, methodologyand data collection: Shekoofeh Dadfarnia; Data analysis: Hojjatollah Farahani; Writing the original draft, All authors; Review & editing: Shekoofeh Dadfarnia.

Conflict of interest

The authors declared no conflict of interest.

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