Research Paper

The Psychometric Properties Analysis of the Persian Emotion-focused Regulation Questionnaire

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ABSTRACT

Objective: Emotions and emotion regulation strategies (ERSs) have a determinant role in maintaining people's mental health. The emotion focused regulation questionnaire (EFRQ) is a new process tool based on a process model that demonstrates a replicable structure consisting of five emotion-focused strategies (EFS) (distraction, brooding, acceptance, cognitive rethinking (reflection and reappraisal), rumination, and expressive suppression (ES). Therefore, this study was conducted to investigate the psychometric properties analysis of the EFRQ scale in Iranian society.

Methods: The current study was descriptive. The sample of the present study included 300 Iranian adults who were selected using the convenience sampling method. The Persian version of the scale was implemented along with the difficulties in emotion regulation scale (DERS) and emotion regulation questionnaire (ERQ). To check the validity of the ERQ, confirmatory factor analysis (CFA) and convergent and divergent validity were used by calculating the Pearson correlation. Cronbach's α coefficient method was also used to check its reliability.

Results: The results of the CFA indicated the fit and desirability of the five-factor model. The significant correlations between this scale (EFRQ) and the DERS and ERQ confirmed the divergent and convergent validity of this scale. Internal consistency reliability (ICR) confirmed the EFRQ reliability with Cronbach's α coefficients ranging from 0.83 to 0.85. Additionally, the values of Cronbach's α coefficient and McDonald's omega of all the factors of the new scale were higher than 0.7, which indicates the validity of this scale in Iranian society.

Conclusion: The psychometric properties analysis of the Persian EFRQ showed suitable results. This scale can be used to measure people's adaptive and maladaptive coping strategies and also as a reliable scale in clinical or research projects.

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Highlights

- Emotion-focused regulation questionnaire (EFRQ) has acceptable and good psychometric properties.
- Adaptive emotion regulation strategies (ERSs) include distraction, reappraisal, and acceptance.
- Maladaptive ERSs include expressive suppression (ES) and brooding.

Plain Language Summary

The present research performed the psychometric analysis of the Persian version of the EFRQ. It can assess the process model-based emotion-focused strategies (EFS). Emotions and ERSs have a determinant role in a person's mental health and lifestyle. The scientific background shows that when people cannot effectively manage their emotions or use inconsistent EFSs, problems in this area lead to various forms of psychological symptoms, such as anxiety and depression. Since emotions and their regulation determine people's behavior to a large extent, it is crucial to study them.

Introduction

Emotion regulation (ER) refers to monitoring, evaluating, modulating, and managing emotional responses (Gross, 1998). It is a process that affects people's emotions, as well as when and how they experience and express them (Aldao et al., 2010). ER is a crucial metacognitive process (Kraft et al., 2023), which plays a critical role in maintaining the mental health of people, and the onset and continuation of emotional disorders (Foroughi et al., 2023). It is linked to some disorders, including psychological symptoms (depression and anxiety), borderline personality, substance abuse, and eating disorders (Aldao et al., 2010; Sloan et al., 2017; Ahmadi et al., 2022). Individuals often use various strategies to regulate their emotion regulation strategies (ERSs); therefore it is assumed that ERSs can be a risk factor, perpetuating or protecting against psychopathology (McRae & Gross, 2020).

ERSs have been introduced in different models. The most influential model of ERS is Gross's process model-based ERS, which provides a theoretical framework for common ERS (Gross, 2015). According to this model, five emotion-focused strategies (EFS) have been identified, which are in two classes, adaptive strategies, including acceptance, cognitive-rethinking (integration of reappraisal and reflection), and distraction, and maladaptive strategies, including rumination and expressive suppression (ES) (McRae & Gross, 2020).

Distraction is considered an adaptive emotion regulation strategy and includes the mind's inherent tendency to conflict and activity (Webb et al., 2012; McRae & Gross, 2020). Cognitive reappraisal (CR) as an adaptive strategy, involves the reinterpretation or reevaluation of emotional situations. According to research, people who make extensive use of CR have greater resilience, improved mental health, better interpersonal functioning, higher academic achievement, more positive social outcomes, greater psychological well-being, and less psychopathology (Aldao et al., 2010; Gross, 2003; Schäfer et al., 2017). On the other hand, acceptance denotes the process of embracing emotional situations and experiences without cognitive judgments; nonetheless, it is still the main theme of many psychological treatments, such as dialectical behavior therapy and acceptance and commitment therapy (ACT) (Malivoire, 2020; Twohig et al., 2019). Much research indicates the inhibitor effects of ACT against psychopathology (Schäfer et al., 2017). Rumination can be adaptive or maladaptive as it involves a repetitive focus on the causes and effects of a person's emotions (Song et al., 2022). ES includes attempts to control the behavioral aspect of emotion and refers to hiding the external manifestations of emotion. Persistent use of ES is linked with more psychopathology, lower psychological well-being (Dryman, 2018), worse physical health, and less relationship satisfaction (Cameron et al., 2018; England-Mason, 2020, Garnefski, 2017). In addition, in a meta-analysis by Aldao et al. (2010), which examined the relationship between ERS and psychopathological symptoms, the results indicated that rumination, avoidance, and suppression were considered maladaptive strategies, while acceptance and CR were regarded as adaptive (Kraft et al., 2023).

The process model of Grass's ERS is of great importance in theoretical development and has inspired new research areas (Gross & Jazaieri, 2014; Perbandt et al.,

2007). As ERS plays a crucial role in psychological well-being (Ahmadi et al., 2022), it is essential to have psychometric instruments to assess the various ERS that individuals can employ.

Although numerous instruments have been developed to assess ERS, these can be classified into two types, competency and process measures (Preece et al., 2018). Competency measures aim to assess an individual's overall emotion-regulation ability. Regarding the ideal examples for the overall measurement of the emotion regulation competency inventory, it can refer to the Perth emotion regulation competency inventory (Preece et al., 2018) and the difficulties in emotion regulation scale (DERS) (Gratz & Roemer, 2004). On the other hand, process measures assess an individual's willingness to use different ERSs, such as emotion regulation questionnaire (ERQ) (Gross & John, 2003), which is essential for clinical research in the field of ERS (Gross & John 2003). For instance, process measures can be employed to assess the adaptive or maladaptive functioning of ERS and the effectiveness of emotion regulation interventions (De France et al., 2017; Kim et al., 2022, Eadeh et al., 2021). Despite the crucial role that existing process measures play in clinical research, they also have some flaws and limitations.

The prevailing multistrategy process measures focus on the structure of rumination without differentiating between its two subtypes, reflection and brooding. Even though both subtypes refer to focused attention on emotions or emotional situations, each has its specific role in mental health (Treynor et al., 2003). Brooding is the tendency to concentrate on negative aspects of oneself, negative interpretations of life, negativity, and self-criticism. It is linked with negative consequences/outcomes, such as attempted suicide, or even suicide, lower psychological well-being, and depression (Rogers et al., 2017; Treynor et al., 2003). In contrast, reflection involves the active examination of emotion or emotional problems, and a purposeful turning inward. It is considered an ERS strategy (whether neutral or adaptive) that can result in constructive outcomes, affecting psychological well-being, adaptive preparedness, effective coping, and greater mindfulness (Kim et al., 2022, Treynor et al., 2003; Newman et al., 2019). Despite the many distinctions between brooding and reflection, few instruments have considered rumination subscales separately (De France et al., 2017; Garrido-Hernansaiz, 2022), and some common ERS are absent in the process measures. Additionally, some commonly used instruments assess only one or two items, such as CR and ES in ERQ (Gross & John, 2003). Also, other multi-strategy instruments have not used all five emotion-focused strategies. For example, following the Garrido-Hernansaiz et al. (2022), emotion self-regulation questionnaire (ESQ), the strategy of unhealthy behaviors was added and two strategies of acceptance and distraction were removed. Similarly, distraction was absent in the Heidelberg form for ERS (Izadpanah et al., 2019). In addition, the cognitive ERQ (Garnefski et al., 2001) and the behavioral ERQ (Kraaiij et al., 2019) did not consider ES. Therefore, a new scale was needed to assess the five Gross's process model-based emotion-focused strategies (EFS).

Song et al. (2022) developed the emotion-focused regulation questionnaire (EFRQ) scale, which assesses five EFS, distraction, brooding, acceptance, cognitive rethinking (reflection and reappraisal), rumination, and ES. Song et al. (2022) confirmed the five-factor structure of the EFRQ scale. However, more studies in different countries and cultures are needed to determine the psychometric properties of EFRQ. Therefore, considering that cultural factors significantly affect ERS (Nozaki et al., 2018), and since emotion dysregulation is one of the main characteristics of psychological disorders (Tilsh et al., 2015), examining strategies emotion regulation is essential for clinical purposes, and the process of diagnosis and treatment. Therefore, this study was conducted to investigate the psychometric properties analysis of the EFRQ scale in Iranian society.

Materials and Methods

The current study was descriptive. The statistical population under examination included all individuals aged between 18 and 65 years, residing in Gorgan City, Iran, from September to January 2023 (32.52±9.51). In this research, considering the possibility of conducting the research and observing the minimum suitable sample, the sample size was determined to be at least 300. A total of 300 Iranian adults were selected using the convenience sampling method.

Inclusion and exclusion criteria

The inclusion criteria included to be at least 18 years old, a resident of Gorgan City, and having informed consent to participate in the research. The exclusion criteria included severe psychiatric diseases, substance abuse, and providing incomplete information.

Instruments

To collect data for this research, the following questionnaires were used, EFRQ, DERS, and ERQ.

Instruments

EFRQ

Song et al. (2022) developed the eEFRQ to assess five EFSs, distraction, brooding, acceptance, cognitive rethinking (reflection and reappraisal), rumination, acceptance, and ES. This scale is a self-report instrument that evaluates individuals' willingness to use a range of ERSs. This 22-item scale covers five common EFSs that can directly show a person's ability to regulate emotions and is highly beneficial for research and clinical settings. Also, some commonly used instruments only assess one or two ERSs, such as CR and ES, and most of the common ERSs were not present in the existing instruments. Each item is rated on a 7-point Likert scale (from 1=strongly agree to 7=strongly disagree). Based on hierarchical multivariate regression analysis, the EFRQ has demonstrated incremental validity beyond that of the ruminative response scale, ERQ, and CERQ. The scale also has good internal consistency reliability (ICR), with a Cronbach's α coefficient of 0.726-0.869 and its test retest reliability has been reported to be between 0.531-0.668 (Song et al., 2022). In this study, Cronbach's α coefficient was estimated as 0.875.

DERS

The DERS is a 36-item scale and was created by Gratz and Romer (2004). It measures the levels of emotional regulation problems in six subscales. These subscales include non-acceptance of negative emotions, difficulty engaging in goal-directed behavior, impulse control disorders (ICDs), lack of emotional awareness, limited access to ERSs, and lack of emotional clarity. The items are rated on a 5-point Likert scale ranging from 1 (rarely) to 5 (always). Items 1, 2, 6, 7, 8, 10, 17, 20, 22, 24, and 34 are reversely scored. In this scale, a total score is obtained for all the subscales, and a separate score is obtained for each subscale, where higher scores mean more problems in regulating excitement. In the research of Gratz and Romer (2004), the ICR of the DERS is 930 and the Cronbach's α coefficients of the subscales are more than 0.80. In Iran, Khanzadeh et al. (2012) examined the psychometric properties of DERS in clinical and non-clinical samples and obtained the following Cronbach's α coefficients: non-acceptance of negative emotions (73%-88%), difficulty engaging in goal-directed behavior (72%-89%), impulse control difficulties (75%-90%), limited access to ERSs (76%-85%), lack of emotional awareness (72%-86%), lack of emotional clarity (77%-90%), and the total questionnaire (79%-92%).

ERQ

Gross and John (2003) developed the ERQ to assess two ERSs, reappraisal and suppression. This self-report measure comprises 10 items and two subscales, including reappraisal (six items) and suppression (four items), rated on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). Cronbach's α coefficients for reappraisal and ES were reported as 0.79 and 0. 73, respectively. A three-month follow-up re-test reliability for the whole scale was obtained at 0.69. In a study conducted by Foroughi et al., Cronbach's α coefficients for CR and ES (with item 9 removed) were 0.76 and 0.72, respectively (Foroughi et al., 2023). The results proved the reliability and validity of Persian ERQ with good ICR, making it a valuable resource for research on emotion regulation.

Procedure

According to the instructions of Gjersing et al. (2010), the process of cross-cultural adaptation of instruments included the steps of translation, re-translation, and ensuring the conceptual equivalence of the scales. The process to implement this research was as follows: First, the scale was translated independently by three individuals, two of whom were Ph.D students in psychology and the other one was an English-language expert. Then, the translated versions were compared with the English text by one of the professors of psychology who is fluent in English culture and language and was revised. The final version was then retranslated into English by a translator fluent in both English and Persian and compared with the Persian version by the first author to verify the agreement between the two versions. Finally, it was reviewed by one of the professors for final approval. After preparing the final version of this scale along with the demographic information scale, the EFRQ, DERS, and ERQ were distributed by the researcher to the sample. Social media and social messengers were used to distribute the questionnaires. The link prepared by the researcher was distributed in several student groups on WhatsApp, and the members of the group were also requested to publish the relevant link in other groups, in this way, the necessary sample to conduct the research was collected in an accessible manner. At the beginning of the questionnaire, the purpose of the research was explained to the participants in a short text format and they were assured that their information would be kept completely confidential. Also, after reading the text, if they want to continue working and participate in the research, they should mark the option "I agree" so that the questions will be displayed for them. Otherwise, they will leave

Table 1. Goodness-of-fit indices of CFA of the new EFRQ

Fit Indices	χ^2	df	P	CMIN/df	RMSEA (CL 90%)	PNFI	CFI	PCFI	IFI	GFI
First model	569.19	199	<0.001	2.86	0.078 (0.071-0.086)	0.734	0.897	0.773	0.898	0.88
First modified model	475.078	196	<0.001	2.424	0.68 (0.061-0.076)	0.743	0.923	0.783	0.923	0.91
Second model	487.963	200	<0.001	2.44	0.069 (0.061-0.77)	0.756	0.92	0.797	0.921	0.907

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*Acceptable level of indicators (PNFI, PCFI (>0.05), GFI, CFI, IFI (>0.09), RMSEA (<0.08), CMIN/DF (3> good, 5> acceptable)

Abbreviations: RMSEA: Root mean square error of approximation; PNFI: Parsimonious normed fit index; CFI: Comparative fit index; PCFI: Parsimonious comparative fit index; IFI: Incremental fit index; GFI: Goodness of fit index; df: Degree of freedom; CMIN: Chi-square.

the page and no obligation exists to participate in the research. In this way, to continue the work, people tended to enter the next stage of the work, and they responded to EFRQ, DERS, and ERQ, respectively. The research report was also presented in such a way that it is not possible to identify the subjects.

Data analysis

After collecting and scoring the papers of each test and questionnaire, descriptive statistics (Mean±SD) and inferential statistics analyzed the data. To validate the factors, the first and second order of confirmatory factor analysis (CFA) was used with the maximum likelihood estimation method of AMOS software, version 24.

Results

Descriptive results

In this study, 300 adults from Gorgan City with a mean age of 32.52±9.51 years in the age range of 18-65 years were examined. The results showed that 192 participants (64%) were female and 108 participants (36%) were male. Also, in terms of education level, 47 people (15.7%) had a middle school diploma; 55 people (18.3 percent) had a diploma, 102 people (34 percent) had a bachelor's degree, and 96 people (32 percent) had a master's degree or higher.

Construct validity-CFA

Univariate and multivariate distributions were analyzed separately to evaluate normality and identify outliers. Mahalanobis' Dsquared was used to investigate multivariate outliers (P<0.001), and Mardia's coefficient was used to assess violations of multivariate kurtosis (>5). The results confirmed the univariate and multivariate normality of the new EFRQ data and the absence of outliers. Two models were proposed, and their fitting was performed to determine the best model for EFRQ22. The first model incorporates a first-order five-factor model, while the second model includes a second-order CFA, with distraction, CR, and acceptance being related to adaptive ERSs, and brooding and suppressive expression being maladaptive ERSs.

The first-order CFA model, known as the first model, was deemed to have a good fit based on the criteria of CMIN/df <3, RMSEA <0.08, and PNFI and PCFI >0.05. To improve the fit of the proposed model, three correlations were calculated between the measured errors (e10-e11, e14-e15, and e19-e20), which determined that all indices of the first modified model have an acceptable fit. The factor loadings of all questions related to the new EFRQ were >0.4 (Figure 1). Subsequently, a second-order CFA was employed to confirm that distraction, CR, and acceptance comprise the constructs of adaptive ERSs, while brooding and expressive expressions represent the constructs of maladaptive ERSs. The fit indices of the second model of the new EFRQ were at a favorable level, as displayed in Table 1, indicating an acceptable fit of the second-order CFA model of the new EFRQ in the Iranian population. Additionally, the factor loading of the higher constructs of the EFRQ was >0.4 (Figure 2).

Convergent and discriminant validity

Pearson correlation, Fornell-Larcker criterion, construct reliability (CR), and average variance extracted (AVE) were used to assess the convergent and discriminant validity of the new EFRQ. To ascertain convergent validity, all three aforementioned conditions must be met, AVE >0.5, CR >0.7, and consequently CR > AVE. The outcomes of the Pearson correlation test revealed that the EFRQ and its components exhibited a negative and statistically significant correlation with distraction, CR, acceptance, and adaptive emotion regulation. Fur-

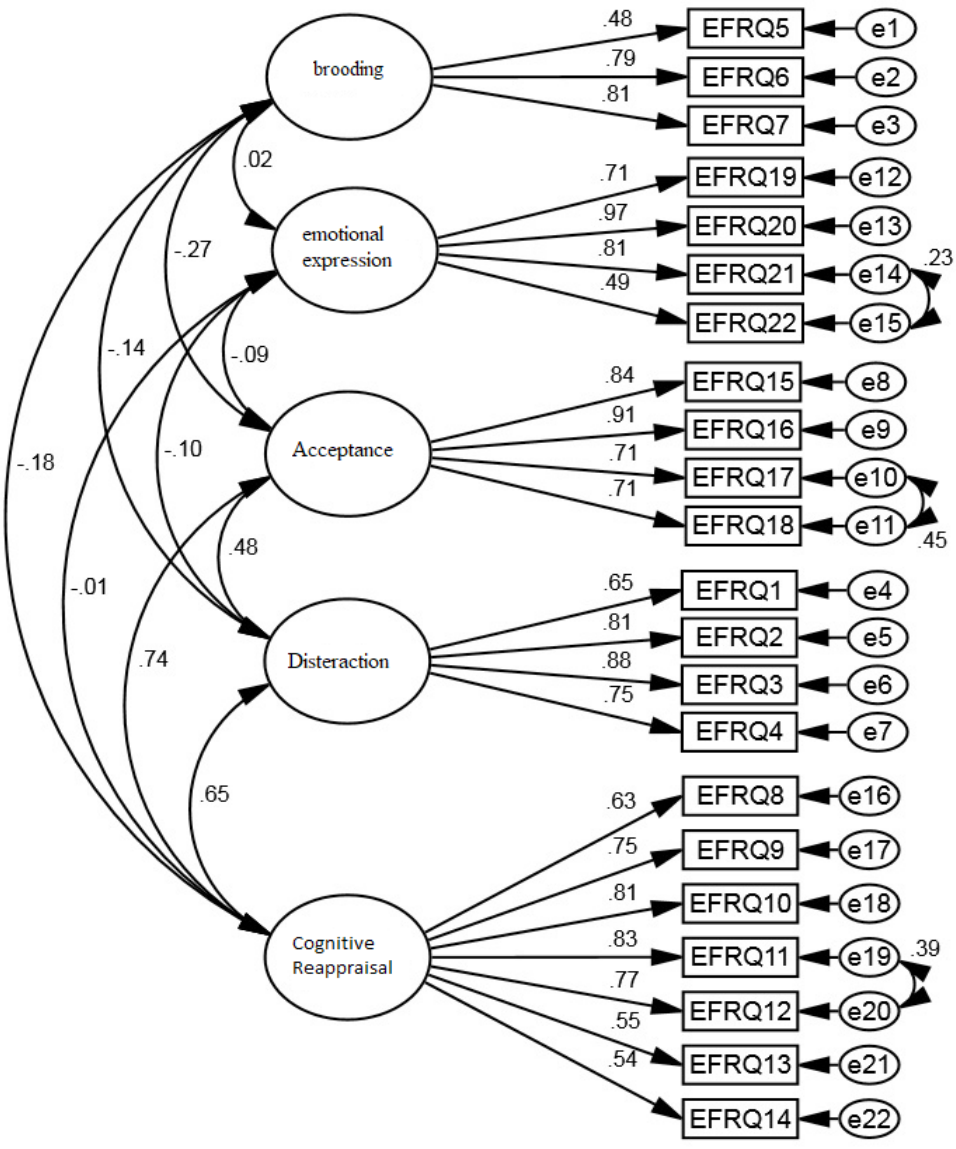

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Figure 1. First-order five-factor model of the new EFRQ (standard coefficients)

thermore, they displayed positive and statistically significant associations with brooding, ES, and maladaptive emotion regulation. Moreover, the Pearson correlation test indicated that suppression demonstrated a negative and statistically significant correlation with distraction, CR, acceptance, and adaptive emotion-regulation strategies. However, a positive and statistically significant correlation was observed between brooding, ES, and maladaptive emotion regulation. Additionally, reappraisal was positively correlated with distraction, CR, acceptance, and adaptive ERSs. Conversely, a negative and statistically significant correlation was observed between brooding, ES, and maladaptive emotion-regulation strategies (Table 3). Furthermore, the AVE and CR values of all factors of the new EFRQ were >0.5 and 0.7, respectively. Additionally, the AVE values of all EFRQ22 scale factors were higher than the CR (Table 2), indicating acceptable convergent and discriminant validity of the new EFRQ.

Validity

In this study, the ICR method was used to assess model reliability and validity using McDonald's and split-half (or preferably coefficient α) tests. As presented in Table 2, Cronbach's α and McDonald's values for all factors of the new EFRQ surpassed 0.7, indicating the scale's validity in the Iranian population.

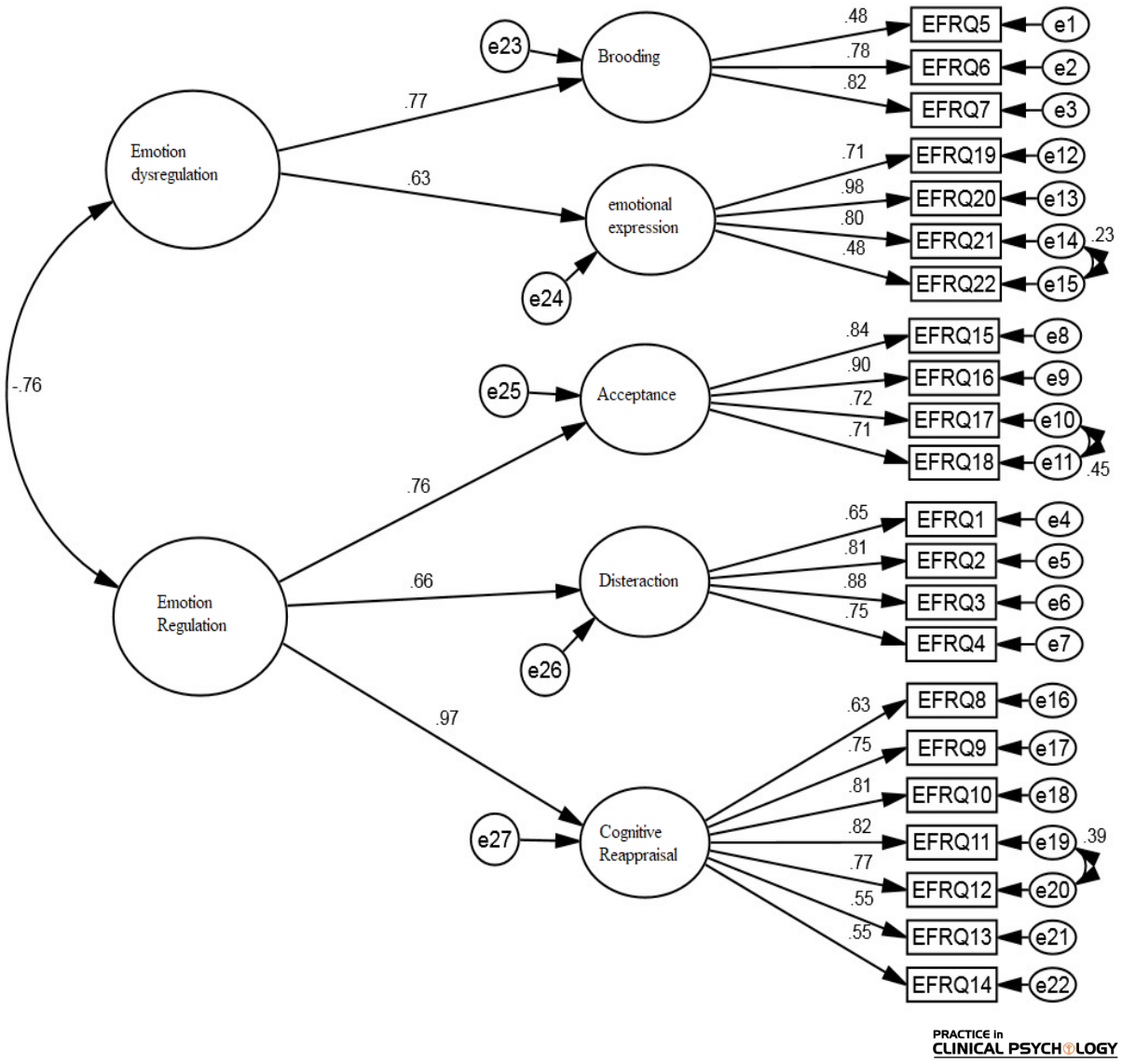

Figure 2. Second-order CFA model of the new EFRQ (standard coefficients)

Discussion

The current research was conducted to examine the psychometric analysis of the Persian EFRQ (Song et al., 2022), which assesses five items of Gross's process model-based EFS. The results of CFA showed that the data fit well with a five-factor model. The CFA model of the first stage has an acceptable fit. This result was consistent with previous results (Song et al., 2022). Also, our results showed that the EFRQ can be classified into two categories, adaptive and maladaptive ERSs. All the fit indices of the second model of the new EFRQ were at a favorable level, which indicates the acceptable fit of the two-factor second-order CFA model (adaptive and maladaptive ERSs) of the new EFRQ in Iranian society, which supports the idea that ERS is a multidimensional construct. Therefore, different ERSs are related to each other and the estimated scores of all subscales were reliable with Cronbach's α of 83% to 85%.

The study outcomes indicated a link between EFRQ scores and other assessment instruments. As anticipated, the DERS and its constituent parts exhibited negative and statistically significant correlations with distraction, CR, acceptance, and adaptive ERSs. Conversely, they displayed positive and statistically significant correlations with brooding, ES, and maladaptive ERSs. Furthermore, suppression demonstrated a negative and statistically significant correlation with distraction, CR, acceptance, and adaptive ERSs. However, it exhibited a positive and statistically significant relationship with brooding, ES, and maladaptive ERSs.

Table 2. Convergent validity, discriminant validity, ICR, and construct validity of the new ERQ

Factors	α	Ω	CR	AVE
Distraction	0.853	0.859	0.858	0.605
Brooding	0.731	0.758	0.741	0.502
CR	0.866	0.869	0.872	0.5
Acceptance	0.884	0.885	0.872	0.633
Suppressive emotion	0.836	0.85	0.842	0.584
Adaptive emotional regulation strategies	0.915	0.914	0.846	0.652
Maladaptive ERSs	0.766	0.782	0.751	0.5

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Abbreviations: ERSs: Emotion regulation strategies; CR: Cognitive reappraisal; α: Cronbach›s alpha; Ω: McDonald›s omega; AVE: Average variance extracted.

Furthermore, our results suggested that reappraisal positively correlated with distraction, CR, acceptance, and adaptive ERSs. Conversely, it demonstrated a negative and significant relationship with brooding, ES, and maladaptive ERSs. Theories of emotion have emphasized the role of cognitive appraisal in eliciting emotions. CR entails the utilization of cognitive and linguistic processes to reinterpret the significance of a stimulus. Additionally, our results are consistent with the models of affective disorders, underlining the role of ERSs in the emergence and persistence of psychological symptoms.

Table 3. Correlation matrix of dimensions

		New EFRQ						
Scale	**Dimensions**	**Distraction**	**Brooding**	**CR**	**Acceptance**	**ES**	**Adaptive Emotional Regulation**	**Maladaptive Emotional Regulation**
Difficulties in the emotion regulation scale	Difficulty regulating emotions	-0.31**	0.46**	-0.4**	-0.42**	0.09	-0.45**	0.2**
	Nonacceptance of emotional responses	-0.16*	0.41**	-0.17*	-0.22**	0.13*	-0.22**	0.13*
	Difficulty engaging in goal-directed behavior	-0.19*	0.36**	-0.24**	-0.28**	0.07	-0.28**	0.27**
	Impulse control difficulties	0.21**	0.42**	-0.29**	-0.37**	0.12*	-0.34**	0.34**
	Lack of emotional awareness	-0.19**	0.07	-0.29**	-0.22**	0.19**	-0.29**	0.12*
	Limited access to ERSs	-0.29**	0.43**	-0.4**	-0.39**	0.12*	-0.42**	0.16*
	Lack of emotional clarity	-0.33**	0.22**	-0.32	-0.28**	0.2**	-0.37**	0.04
Emotion regulation scale	Reappraisal	0.4**	-0.14*	0.37**	0.34**	-0.44**	0.43**	-0.44**
	ES	-0.15*	0.32**	-0.22**	-0.19**	0.72**	-0.25**	0.59**

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*Coefficients are significant, **P<0.001.

Abbreviations: ERSs: Emotion regulation strategies; ES: Expressive suppression; CR: Cognitive reappraisal.

Conclusion

The development of treatment protocols for emotional disorders often aims to enhance emotion regulation skills by increasing the implementation of adaptive ERSs (e.g. distraction, CR, and acceptance) while reducing the adoption of maladaptive ERSs (e.g. brooding and ES). Therefore, the results of this study indicate the validity and reliability of the Persian version of the EFRQ and are consistent with the original study (Song et al., 2022). Since this method evaluates five EFSs, it can be used to measure people's adaptive and maladaptive coping strategies and also as a valid scale in clinical or research projects.

Research limitations

This study faced several limitations. Accordingly, it has only focused on intrapersonal ERSs and has failed to assess interpersonal ERSs. It is essential to consider both types of strategies as people regulate their emotions through self-regulation and interactions with others. Additionally, the sample used in this study was non-clinical, which warrants caution when generalizing the results to other populations with different ages, education, and socio-economic status.

Future research

Future research should consider the cultural variability in the relationships between CR, ES, and other ERSs. Also, further studies should investigate the psychometric properties of this scale in a clinical population. Also, due to the self-report entity of the data obtained in this study that may be a source of possible bias, it is recommended to use objective assessments as scales. Eventually, future research can follow up on the current results with exploratory factor analysis. In future work, it is essential to replicate our results in different countries with different cultures because the relationships between CR, ES, and other strategies can sometimes vary by culture.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of the University of Science and Culture, Tehran, Iran (Code: IR.ACECR.USC.REC.1402.027).

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Authors' contributions

Conceptualization and supervision: Mohadese Norouzi, Mohsen Kachoei and Samaneh Behzadpoor; Methodology and analysis: Hojatollah Farahani; Data collection: Mohadese Norouzi; Investigation and writing: All authors.

Conflict of interest

The authors declared no conflict of interest.

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