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Journal of Cognitive-Behavioral Psychotherapy and Research

Dear Readers,

Volume 14, Issue 3 of the Journal of Cognitive-Behavioral Psychotherapy and Research presents a compelling collection of studies that reflect the dynamic and evolving nature of our field. The manuscripts in this issue, while diverse in their specific foci, converge on several critical themes: the relentless pursuit of psychometric excellence, the exploration of transdiagnostic cognitive processes, the innovative adaptation of delivery formats, and the imperative to combat stigma through education and empathy. Together, they paint a picture of a discipline that is both rigorously scientific and deeply humanistic.

This issue leads with a significant contribution to our methodological arsenal: the Turkish adaptation and validation of the Contrast Avoidance Questionnaires (CAQ-W and CAQ-GE) by Cömertoğlu Yalçın and colleagues. In a world where pathological worry remains a transdiagnostic challenge, this study provides clinicians and researchers with reliable tools to assess a key underlying mechanism—the fear of sharp emotional shifts. The findings underscore that while worry (CAQ-W) is more closely tied to anxiety, the broader tendency to sustain negative emotion to avoid contrast (CAQ-GE) is a powerful predictor of depression and general distress. This distinction is crucial for developing more precise and effective case formulations and interventions.

Further exploring the role of cognition in modern psychopathology, Durar's study investigates the impact of automatic thoughts on social media addiction (SMA) in university students. The findings—that automatic thoughts significantly predict SMA—highlight a critical cognitive-behavioral cycle. Individuals may engage with social media as a maladaptive coping strategy to escape from negative self-referential thinking, inadvertently reinforcing the addiction. This research elegantly links core cognitive theory with a contemporary behavioral issue, suggesting that therapeutic techniques aimed at challenging and restructuring automatic thoughts could be a vital component of treatment for behavioral addictions.

Complementing this, the pilot study by Safarova and Çakır Çelebi demonstrates the creative expansion of traditional CBT protocols. Their online group program, which integrates self-compassion exercises with standard CBT for social anxiety, represents a positive step toward more accessible and holistic care. The significant improvements in social anxiety, automatic thoughts, and self-compassion observed post-intervention advocate for the potency of blended models. It confirms that digital platforms can be powerful vehicles for change when delivering structured, evidence-based content, thereby expanding our reach to those in need.

Beyond individual therapy, this issue also turns its attention to the foundational attitudes of future healthcare providers. Tosun Altınöz et al. present a nuanced investigation into the effect of a psychiatry internship on attitudes toward schizophrenia. Their crucial finding—that knowledge acquisition alone is insufficient to change attitudes, and that the capacity for perspective-taking and low personal distress are key moderators—is a vital lesson for medical education. It forces us to consider that curricula must intentionally foster empathy and interpersonal skills alongside theoretical knowledge to truly reduce stigma.

Finally, Ekici and colleagues' analysis of YouTube videos on OCD serves as an important societal mirror. Their finding that over 60% of the most-viewed content is of poor-to-fair quality is a stark reminder of the challenging information environment our patients navigate. It reinforces the ethical responsibility of healthcare professionals to not only be consumers of research but also active contributors to public psychoeducation, creating and disseminating high-quality, reliable information to counter misinformation.

As we reflect on these contributions, we are reminded that the path to healing and understanding often requires resilience and perseverance—qualities we commemorate as a nation on the 30th of August, Victory Day. This day symbolizes the triumph of resilience and strategic action against overwhelming odds. In a parallel sense, the work of cognitive-behavioral therapy is a journey toward personal victory; it empowers individuals to challenge internalized negative beliefs, develop strategic coping behaviors, and ultimately achieve mastery over their own challenges. The studies in this issue each contribute, in their own way, to equipping both clinicians and patients for these vital battles.

We are proud to present this issue and remain committed to publishing science that enhances the theory, practice, and societal impact of cognitive-behavioral psychotherapies. We are pleased to present this issue as a platform for studies that showcase the empirical foundation of Cognitive-Behavioral Therapy as a scientifically based psychotherapy, and we are proud to contribute to this robust evidence base.

Mehmet Hakan Türkçapar, MD, PhD
Editor-in-Chief
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Adaptation, Validity, and Reliability of the Turkish Version of Contrast Avoidance Questionnaires

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ABSTRACT

This study aimed to adapt the Contrast Avoidance Model (CAM) and its measurement tools into Turkish while evaluating their psychometric properties. Llera and Newman (2017) developed the CAM to explore how avoiding sudden emotional changes can lead to pathological worry. The study utilized the Contrast Avoidance Questionnaires (CAQs), which comprises two scales: the Contrast Avoidance Questionnaire-Worry (CAQ-W) and Contrast Avoidance Questionnaire-General Emotions (CAQ-GE). A total of 549 participants, aged 18–66 (M=27.21), completed the CAQ-W, CAQ-GE, Depression Anxiety Stress Scale, Why Worry-II Scale, Penn State Worry Questionnaire, State-Trait Anxiety Inventory-II, Acceptance and Action Questionnaire-II, and Symptom Checklist-90. Confirmatory factor analysis confirmed the original three-factor structure of the CAQ-W and the two-factor structure of the CAQ-GE (CAQ-W: χ^2/df=2.97; Goodness of Fit Index [GFI]=0.87; Comparative Fit Index [CFI]=0.91; Root Mean Square Error of Approximation [RMSEA]=0.06; CAQ-GE: χ^2/df=2.73; GFI=0.90; CFI=0.95; RMSEA=0.05). The internal consistency was high (α=0.92 for CAQ-W; α=0.95 for CAQ-GE),with test–retest correlations of 0.77 and 0.82, respectively. Although women scored higher on contrast avoidance than men, this difference was not statistically significant. Overall, the findings suggest that the Turkish versions of the CAQs are valid and reliable tools for assessing contrast avoidance mechanisms in the Turkish population.

Keywords: Anxiety, depression, validation studies as topic.

ÖZ

Kontrasttan Kaçınma Anketlerinin Türkçe Formunun Uyarlanması, Geçerliliği ve Güvenilirliği

Bu çalışma, Kontrasttan Kaçınma Modeli ve bu modelin ölçme araçlarının Türkçeye uyarlanmasını ve psikometrik özelliklerinin değerlendirilmesini amaçlamaktadır. Llera ve Newman (2017) tarafından geliştirilen Kontrasttan Kaçınma Modeli, ani duygusal değişimlerden kaçınmanın patolojik endişeye yol açabileceğini öne sürmektedir. Bu modelin ölçme araçları olan Kontrasttan Kaçınma Ölçekleri (KKÖ), Kontrasttan Kaçınma Ölçeği-Endişe (KKÖ-E) ve Kontrasttan Kaçınma Ölçeği-Genel Duygular (KKÖ-GD) olmak üzere iki ölçekten oluşmaktadır. Araştırmaya, 18–66 yaş aralığında ve yaş ortalaması 27,21 yıl olan 549 katılımcı dahil edildi. Katılımcılar, KKÖ-E, KKÖ-GD, Depresyon Anksiyete Stres Ölçeği (DASÖ-21), Endişe ile İlgili Olumlu İnançlar Ölçeği (EOİÖ), Penn State Endişe Ölçeği (PSEÖ), Sürekli Kaygı Ölçeği (STAI-II), Kabul ve Eylem Formu-II (KEF-II) ve Belirti Tarama Testi (SCL-90) ölçeklerini doldurdu. Doğrulayıcı faktör analizi (DFA), KKÖ-E'nin üç faktörlü ve KKÖ-GD'nin iki faktörlü yapısını Türk örnekleminde doğruladı (KKÖ-E: χ^2/df=2,97, GFI=0,87, CFI=0,91, RMSEA=0,06; KKÖ-GD: χ^2/df=2,73, GFI=0,90, CFI=0,95, RMSEA=0,05). Ölçeklerin iç tutarlılık değerleri Cronbach alfa katsayısı ile 0,92 (KKÖ-E) ve 0,95 (KKÖ-GD) olarak bulundu. Test-tekrar test güvenilirliği KKÖ-E için 0,77, KKÖ-GD için 0,82 olarak hesaplandı. Kadınların kontrasttan kaçınma puanları erkeklerden daha yüksek olmasına rağmen, bu fark istatistiksel olarak anlamlı bulunmadı. Sonuç olarak, kontrasttan kaçınma ölçeklerinin Türkçe versiyonlarının geçerli ve güvenilir ölçüm araçları olduğu öne sürülebilir.

Anahtar Kelimeler: Anksiyete, depresyon, doğrulama çalışmaları.

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INTRODUCTION

Worry is recognized as a transdiagnostic risk factor that negatively impacts psychological and physical health (Marshall et al, 2018; Brosschot et al, 2006; Tully et al, 2013). Excessive worry has been associated with diminished quality of life, impaired job performance, and inappropriate behavior, as well as an increased risk of social harm (Javaherirenani et al, 2025). Worry is not only a core process of generalized anxiety disorder (GAD) but also a transdiagnostic process for a wide spectrum of clinical problems. Despite its negative effects on mental and physical health, worry has not yet received sufficient research attention (Dugas et al, 2010).

Previously, worry was often conflated with the cognitive aspects of anxiety. However, it has since been recognized as a distinct concept, separate from the cognitive elements of anxiety, allowing researchers to study it independently (Davey, 1993; Davey et al, 1992; Zebb & Beck, 1998). Borkovec, Robinson, Pruzinsky, and DePree (1983, p. 10) describe worry as a series of negatively charged thoughts and mental images characterized by a perceived lack of control. It involves attempts to mentally resolve problems related to uncertain situations that could result in negative outcomes and is closely associated with the fear process. More recent interpretations expand on this definition, conceptualizing worry as an anxious anticipation of potential future negative events (Barlow, 2004).

With the inclusion of worry as a core feature of GAD in the revised third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R; American Psychiatric Association, 1987), research on worry formation has increased, providing valuable insights into the frequency, nature, and function of worry and GAD. One of the first experimental studies on worry, conducted by Borkovec and Hu (1990), resulted in the emergence of the Cognitive Avoidance Theory of Worry, which is rooted in Mowrer's Fear Theory (1947) and Foa and Kozak's (1986) Emotional Processing Model (Behar et al, 2009). As per this theory, while worry may serve as an inadequate cognitive strategy to solve problems and eliminate perceived threats, it can also function as a means of avoiding the uncomfortable somatic and emotional experiences that naturally arise during fear (Borkovec et al, 2004). However, conflicting findings have emerged regarding the hypothesis that worry facilitates the avoidance of unpleasant somatic and emotional experiences. Several studies (Ottaviani et al, 2014; Skodzik et al, 2016; Pieper et al, 2010; Ottaviani et al, 2016) have indicated that worry produces various physiological effects, including reduced vagal tone, consistently elevated heart rate, heightened skin conductivity, increased endocrine system activity, higher blood pressure, and decreased heart rate variability. These findings suggest that worry can increase somatic activation.

Recent research challenges the notion that worry prevents negative emotional states. Instead, it has been argued that worry either triggers or prolongs negative emotions; several studies support this perspective (Pieper et al, 2010; Key et al, 2008; Verkuil et al, 2009; Llera & Newman, 2017; Burkhouse et al, 2015). Mennin, Heimberg, Turk, and Fresco (2005) found that individuals diagnosed with GAD are more likely to report that worry initiates and sustains negative emotions. Moreover, trait worry has been linked to a persistent, heightened sensitivity to threatening cues at the neural level.

Owing to these contradictory findings, Llera and Newman (2010) conducted an experimental study, expanding upon Borkovec's research while introducing key modifications. They examined the effects of anxiety, relaxation, and neutral inductions on reactivity to different emotional stimuli (fear, sadness, calmness, and happiness) in individuals with GAD and healthy participants. Participants who underwent anxiety induction exhibited lower physiological and subjective responses to the fear clip than those who underwent relaxation induction. Individuals with GAD did not show vagal withdrawal after neutral induction, whereas healthy individuals did. However, participants in the anxiety induction condition showed greater subjective reactivity to the fear clip than those in the neutral induction condition. These findings suggest that worry intensifies negative mood and that preemptive responses to fear exposure may help mitigate physiological arousal. However, no evidence was found to support fear-related emotion avoidance.

Regarding the sadness clip, participants who underwent anxiety induction reported fewer subjective responses than those in the neutral and relaxation induction conditions. Interestingly, the sadness clip resulted in a reduction in negative emotionality among those in the anxiety induction condition. Although anxiety did not directly affect physiological responses to negative emotions, it appeared to attenuate subjective reactivity. In contrast, no significant physiological or subjective differences were observed across the anxiety, relaxation, and neutral induction conditions in response to positive emotions. The happy clip elicited positive subjective responses regardless of the preceding induction type. Furthermore, anxiety did not inhibit the positive effects associated with positive emotions and increased vagal activity in response to the happy clip.

As a result, Newman and Llera (2011) developed the Contrast Avoidance Model (CAM) for GAD (Newman et al, 2013). The CAM is based on three core tenets: First, individuals with GAD are threatened by sharp shifts in negative emotion; they are highly sensitive to sharp negative emotional shifts and struggle to regulate them. They exhibit heightened

emotional reactivity, making it difficult to cope with emotional contrasts. Second, individuals with GAD use worry to create and sustain negative emotions to avoid negative emotional contrast; they engage in worry as a means of generating and maintaining a negative emotional state, thereby preventing sudden emotional shifts. Contrary to previous theories, the CAM does not propose that worry functions to suppress or avoid negative emotions; rather, it argues that worry itself triggers arousal and has detrimental psychological and physiological consequences (Newman & Llera, 2011). Third, individuals with GAD experience discomfort in resting positive states but do not avoid brief positive experiences (Positive Emotional Contrasts). The model suggests that while these individuals may seek short-term positive emotions, they simultaneously fear the possibility of a subsequent negative shift. Consequently, persistent worry serves as a mechanism to prepare for potential negative outcomes. However, after experiencing short-term positive emotions, these individuals often return to familiar negative emotional states, reinforcing the cycle of worry (Newman & Llera, 2017).

Newman and Llera (2017) developed two self-report measures to assess contrast avoidance tendencies: the Contrast Avoidance Questionnaire-Worry (CAQ-W), which evaluates the role of worry in contrast avoidance, and the Contrast Avoidance Questionnaire-General Emotion (CAQ-GE), which examines the role of other negative emotions. These two questionnaires, which assess contrast avoidance tendencies, complement each other and measure the model's different aspects. This study aimed to adapt these questionnaires into Turkish and evaluate their reliability and validity.

METHODS

Adaptation Process, Procedure, and Data Collection

First, permission for the study was obtained via email from Sandra J. Llera, the original scale developer. Ethical approval was obtained from the Istanbul Medipol University Social and Human Sciences Research Ethics Committee (Decision No: 41 Dated: April 29, 2019). This study was conducted in accordance with the Declaration of Helsinki to ensure the ethical standards and the rights of the participants. Three independent professionals—two psychiatrists and one psychologist—who specialize in repetitive thinking and have expertise in mental health conducted the Turkish translation of the scales. The most accurate translations for each item were selected from the three options following the translation process, resulting in the final version. Two individuals from the Department of English Language performed a back-translation of this final version, with no revisions suggested by the language experts.

The finalized Turkish version of the questionnaire was subsequently piloted with 80 participants to assess their comprehension of the items. Minor revisions were made based on the feedback received, leading to the establishment of the final version. Data were collected over approximately 4 months (May 2019–September 2019) through an online Google Form. The survey link was shared via social media platforms and WhatsApp groups, allowing voluntary participation. To evaluate the test–retest reliability of the scales, 20 participants from the research group were asked to complete the scales again after 1 month.

Participants

The sample consisted of 549 Turkish participants (394 women and 155 men) aged 18–66 years. The participants' mean age was 27.21 years (SD=9.89). The participants were nearly evenly split in terms of romantic relationships, with 49.4% reporting being in a relationship and 50.6% reporting not being in a relationship.

Instruments

CAQ-W

The CAQ-W, developed by Llera and Newman (2017), is a self-report scale that assesses the role of worry in negative contrast avoidance. The five-point Likert-type scale consists of 30 items and three subdimensions: 1) worry to avoid negative emotional shifts, 2) worry to create and sustain negative emotion, and 3) worry to create positive contrast. High scores on the scale indicate a tendency to use worry for contrast avoidance.

CAQ-GE

The CAQ-GE is a 25-item measure that assesses emotional contrast avoidance tendencies (Llera & Newman, 2017). It encompasses two subdimensions: "creating/sustaining negative emotion to avoid negative contrasts" and "discomfort with emotional shifts." Items were rated using a five-point Likert-type scale ranging from 1 (not at all true) to 5 (absolutely true). High scores indicated a tendency to maintain negative emotions as a strategy to avoid sudden emotional shifts.

Depression Anxiety Stress Scale (DASS-21)

The initial version of the scale was developed by Lovibond and Lovibond in 1995 and comprised 42 questions. Later, a 21-question version of the scale was developed (Antony et al, 1998). Participants were asked to state their answers on a four-point Likert scale. The Turkish adaptation was developed (Yıldırım et al, 2018) with three subscales: depression, anxiety, and stress; these subscales had internal consistency (coefficients alpha) of 0.89, 0.87, and 0.90, respectively.

Why Worry-II Scale (WW-II)

This scale was originally developed in French to assess positive beliefs regarding worry (Freeston et al, 1994). It was later adapted into English and revised (Holowka et al, 2000). The scale comprises 25 items that express positive beliefs about worry. Participants were asked to rate these items on a five-point Likert scale. The scale was adapted to Turkish by Sarı and Dağ (2009). While the original version had a five-factor structure, the Turkish adaptation exhibited a three-factor structure: 1) "worrying helps problem solving and is a source of motivation," 2) "worrying prevents dangerous and negative consequences," and 3) "worrying protects against negative emotions." The Turkish version of the scale has high internal consistency (a=0.95).

Penn State Worry Questionnaire (PSWQ)

The questionnaire developed by Meyer, Miller, Metzger, and Borkovec (1990) measures pathological worry characterized by excessive, persistent, and uncontrollable features. This self-report instrument consists of 16 items rated on a 5-point Likert scale. Boysan and Keskin (2008) conducted the validity and reliability study for the Turkish adaptation. For the Turkish version, the internal consistency coefficient was found to be 0.88, whereas the test–retest reliability coefficient ranged from 0.74 to 0.92 in the assessments conducted at intervals of 2–10 weeks.

State-Trait Anxiety Inventory-II (STAI)

The STAI was developed (Spielberger et al, 1970) to measure state and trait anxiety levels. The STAI consists of two distinct scales, each with 20 items: STAI-I, which is designed to assess state anxiety, and STAI-II, which is intended for trait anxiety measurement. The Turkish version underwent validity and reliability evaluations, which were conducted by Öner and Le Compte (1985). Only the STAI-II version was used in our study.

Acceptance and Action Questionnaire-II (AAQ-II)

The AAQ-II is an improved version of the initial Acceptance and Action Questionnaire, with stronger statistical data. This method was developed (Bond et al, 2011) to measure differences in psychological inflexibility and experiential avoidance in individuals. It is a unidimensional, seven-point Likert scale. An increase in the total scale score indicates heightened psychological inflexibility and experiential avoidance. The internal consistency coefficient of the scale for the total score was 0.84. The Turkish validity and reliability study of AAQ-II was conducted by Yavuz et al. (2016).

Symptom Checklist (SCL-90-R)

The scale, developed by Derogatis (1977), is a self-report instrument. It encompasses nine subdimensions that aim to capture psychiatric symptoms and complaints. These include somatization (S), anxiety (A), obsessive-compulsive symptoms, depression (D), interpersonal sensitivity, psychoticism (P), paranoid thought, anger-hostility, and phobic anxiety. Additionally, an extra subdimension covers symptoms related to guilt, eating disorders, sleep disturbances, and similar issues. The assessment consists of 10 subdimensions. The scale comprises 90 items, and the corresponding internal consistency coefficients for these subdimensions are as follows: 0.82, 0.84, 0.73, 0.78, 0.79, 0.73, 0.63, 0.79, 0.78, and 0.77. Scoring involves assigning points from 0 to 4 for each item. The validity and reliability analyses for the Turkish version were conducted by Dağ in 1991.

Data Analysis

The Turkish versions of CAQ-W and CAQ-GE were analyzed for validity and reliability using SPSS 20 and AMOS v24.

The skewness and kurtosis values of the distribution were examined to assess normality. The skewness values for all indicators fell within the range of ±2.0, and the kurtosis values were within ±7.0, indicating that the data followed a normal distribution (West et al, 1995).

Bartlett's test of sphericity and the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy were employed to determine whether the Turkish forms of CAQ-W and CAQ-GE were suitable for factor analysis. The KMO statistic ranges from 0 to 1, with values above 0.6 considered acceptable. Additionally, in Bartlett's test of sphericity, a p-value below 0.05 is considered satisfactory (Tabachnick & Fidell, 2001).

Subsequently, Confirmatory factor analysis (CFA) was conducted using AMOS v24 to evaluate the factor validity of the scales. This analysis assessed whether the data from the Turkish scales aligned with the factor structures proposed in their original versions.

The accuracy and fit of the models in structural equation modeling (SEM) were assessed using various fit indices. One commonly used index, the Chi-square to degrees of freedom ratio (χ^2/df), is preferred over the Chi-square statistic alone, as the latter is highly sensitive to sample size (Şimşek, 2007). Several fit indices, including χ^2/df, RMSEA, CFI, and SRMR, were employed in this study. Higher values indicate better model fit for certain indices (e.g., GFI, CFI, and Incremental Fit Index [IFI]), whereas lower values are preferable for others (e.g., RMSEA) (Munro, 2005; Şimşek, 2007).

Table 1. Descriptive Statistics

Scales	Mean	SD	Min	Max
CAQ-W	86.76	19.93	30.00	150.00
CAQ-GE	61.00	20.28	25.00	125.00
AAQ-II	24.48	10.22	7.00	49.00
DASS-21	23.07	14.85	0.00	60.00
WW-II	59.97	23.54	25.00	125.00
PSWQ	45.94	12.39	18.00	76.00
SCL-90-R	104.71	72.63	0.00	338.00
STAI-II	50.45	12.35	24.00	90.00

CAQ-W: Contrast Avoidance Questionnaire-Worry; CAQ-GE: Contrast Avoidance Questionnaire-General Emotion; AAQ-II: Acceptance and Action Questionnaire-II; DASS-21: Depression, Anxiety, and Stress Scale-21; WW-II: Why Worry-II; PSWQ: Penn State Worry Questionnaire; SCL-90-R: Symptom Checklist-90-Revised; STAI-II: State-Trait Anxiety Inventory-Trait Form; SD: Standard deviation; Min: Minimum; Max: Maximum.

Specific reference values are used in the structural equation modeling to assess the model fit. The IFI indicates an acceptable fit at ≥0.90 and an excellent fit at ≥0.95. Similarly, the CFI suggests an acceptable fit at ≥0.95 and an excellent fit at ≥0.97. The GFI denotes an acceptable fit at ≥0.85, while values ≥0.90 indicate an excellent fit. The RMSEA supports an acceptable fit at ≤0.080 and an excellent fit at ≤0.050. Lastly, χ^2/df is generally considered acceptable at ≤3.0 (Marcoulides & Schumacker, 2001). Collectively, these indices provide a comprehensive assessment of model fit, ensuring the suitability of the models for SEM analyses.

The DASS-21, STAI-II, PSWQ, SCL-90-R, WW-II, and AAQ-II were used for the validity analyses of the scales, and their relationships were examined using Pearson correlation analysis. To assess the reliability of the scales, the Cronbach's alpha coefficient and test–retest reliability were analyzed.

RESULTS

Descriptive Statistics

Table 1 presents the averages, standard deviations, and minimum and maximum values of the scales' scores used in the study.

Construct Validity Analyses

The analysis of the KMO and Bartlett's sphericity tests, evaluating the CAQ-W and CAQ-GE forms for factor analysis, indicates the data's suitability. For the CAQ-E scale, the KMO was 0.948, indicating high sampling adequacy. Bartlett's test (χ^2=9933.401, df=435, p<0.001) affirmed the non-identity correlation, supporting the factor analysis. Similarly, the KMO of CAQ-GE was 0.959, indicating strong sampling adequacy. Bartlett's test (χ^2=9645.298, df=300, p<0.001) reinforced data suitability.

Table 2. Fit indices for the models for the Turkish form of the CAQ-W tested in the confirmatory factor analysis

	χ^2/df	GFI	CFI	IFI	RMSEA	p
Model 1	3.88	0.83	0.88	0.88	0.07	0.001**
Model 2	2.97	0.87	0.91	0.91	0.06	0.001**

CAQ-W: Contrast Avoidance Questionnaire-Worry; χ^2/df: Chi-square to degrees of freedom ratio; GFI: Goodness of Fit Index; CFI: Comparative Fit Index; IFI: Incremental Fit Index; RMSEA: Root mean square error of approximation; *: P<0.05; **: P<0.001.

Table 3. Fit indices for the models for the Turkish form of the CAQ-GE tested in the confirmatory factor analysis

	χ^2/df	GFI	CFI	IFI	RMSEA	p
Model 1	4.48	0.84	0.90	0.90	0.08	0.001
Model 2	2.73	0.90	0.95	0.95	0.05	0.001

CAQ-GE: Contrast Avoidance Questionnaire-General Emotion; χ^2/df: Chi-square to degrees of freedom ratio; GFI: Goodness of Fit Index; CFI: Comparative Fit Index; IFI: Incremental Fit Index; RMSEA: Root mean square error of approximation; *: P<0.05; **: P<0.001.

CFA

CAQ-W

The CFA of the CAQ-W Turkish version was conducted using AMOS v24. Based on the values of various fit indices, the initial model did not meet the criteria for an acceptable fit. Upon further investigation of the modification indices, enhancements could be made to the model. Specifically, an analysis of the modification indices for items 1–2, 6–14, 19–20, 24–27, and 28–29 showed significant covariance-related measurement errors among these pairs of items. Consequently, these errors were rectified by making appropriate adjustments to the model.

The final fit indices for the revised 30-item model exhibited notable improvements over the original model after implementing these modifications. Table 2 shows the final model fit indices. These final indices indicate a markedly enhanced model fit compared with the initial version.

Figure 1 shows the factorial model of the scale and its standardized coefficients and t-values regarding the factor-item relationship. Looking at the figure, the factor loads of the items are 0.50 and above. In this case, the factor loads are at a good level (Büyüköztürk, 2002).

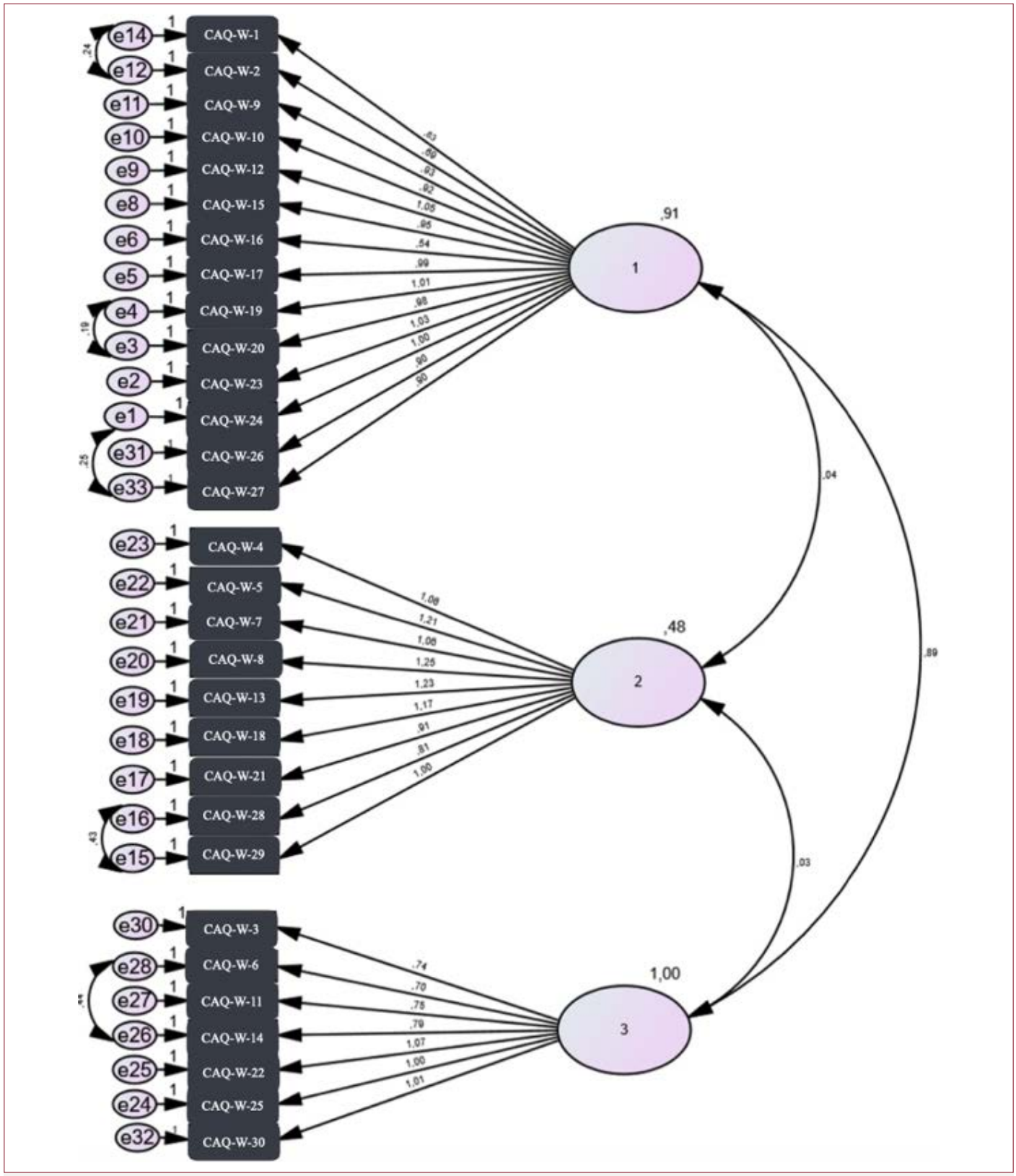

Figure 1. Standardized two-factor confirmatory factor analysis model for the Turkish version of the CAQ-W.

Table 4. Convergent validity of CAQ measures and subscales

	1	2	3	4	5	6	7	8	9	10	11
CAQ measures											
1. CAQ-W Total	1										
2. CAQ-W F1	0. 907**	1									
3. CAQ-W F2	0.407**	0.041	1								
4. CAQ-W F3	0.840**	0.803**	0.047	1							
5. CAQ-GE total	0.718**	0.728**	0.169**	0.608**	1						
6. CAQ-GE F1	0.698**	0.759**	0.041	0.635**	0.962**	1					
7. CAQ-GE F2	0.884**	0.898**	0.036	0.916**	0.631**	0.656**	1				
Convergent measures											
8. AAQ-II	502**	0.444**	0.306**	0.332**	0.663**	0.575**	0.378**	1			
9. PSWQ	0.557**	0.490**	0.356**	0.374**	0.567**	0.502**	0.400**	0.613**	1		
10. WW-II	0.685**	0.727**	0.006	0.676**	0.651**	0.668**	0.709**	0.471**	0.451**	1	
11. STAI-II	0.431**	0.371**	0.274**	0.295**	0.499**	0.434**	0.306**	0.650**	0.646**	0.680**	1

CAQ-W Total: Contrast Avoidance Questionnaire-Worry; CAQ-W F1: Worry to Avoid Negative Emotional Shifts; CAQ-W F2: Worry Creates and Sustains Negative Emotion; CAQ-W F3: Worry to Create Positive Contrast; CAQ-GE Total: Contrast Avoidance Questionnaire-General Emotion; CAQ-GE F1: Creating and Sustaining Negative Emotion to Avoid Negative Contrasts; CAQ-GE F2: Discomfort with Emotional Shifts; AAQ-II: Acceptance and Action Questionnaire-II; WW-II: Why Worry-II; PSWQ: Penn State Worry Questionnaire; STAI-II: State-Trait Anxiety Inventory-Trait Form. *: P<0.05; **: P<0.001.

CAQ-GE

CFA was also applied to test the construct validity of CAQ-GE, which originally had a two-factor structure. Considering the values because of the analysis, the model did not provide acceptable values; however, the model could be improved upon examining the modification indices. Suitability indices 1.-2., 4.-5., 21.-22., and 19.-23. revealed high covariance-related measurement errors among the items, which were corrected. According to the final fit indices, the revised and adjusted 25-item model outperformed the previous model. The values of the fit indices of the models are shown in Table 3.

Figure 2 presents the scale's factorial structure with standardized coefficients and t-values. The factor loadings, all at or above 0.50, indicate a satisfactory level (Büyüköztürk, 2002).

Convergent Validity Analyses

To determine the convergent validity of the CAQ-W, CAQ-GE, and their factors, we examined the correlation coefficients between STAI-II, PSWQ, WW-II, and AAQ-II. There was a significant correlation between CAQ-W, CAQ-GE, their factors, and all the other scales (Table 4).

Predictive Validity Analyses

The results of the hierarchical regression analysis indicated that CAQ-GE contributed more than CAQ-W in predicting PSWQ, STAI-II, DASS-Depression, DASS-Anxiety, DASS-Stress, SCL-Depression, and SCL-Anxiety scores.

The regression analysis indicated that CAQ-W significantly predicted all psychological outcomes; however, CAQ-GE was generally a stronger predictor, explaining a greater percentage of the variance in most cases. For PSWQ-A, CAQ-GE (β=0.211, t=7.057, p<0.001) was the strongest predictor, increasing the explained variance to 5.8% (R^2=0.058). In predicting STAI-II, CAQ-GE (β=0.239, t=7.414, p<0.001) accounted for 7.4% of the variance (R^2=0.074), showing a stronger effect than CAQ-W. For DASS-D, CAQ-GE (β=0.106, t=8.772, p<0.001) was the most influential predictor, explaining 9.5% of the variance (R^2=0.095). Similarly, for DASS-A, CAQ-GE (β=0.079, t=5.530, p<0.001) accounted for 4.3% of the variance (R^2=0.043). In DASS-S, CAQ-GE (β=0.099, t=6.749, p<0.001) explained 6.2% of the variance (R^2=0.062). For SCL-D, CAQ-GE (β=0.277, t=8.281, p<0.001) had the strongest effect, accounting for 9.0% of the variance (R^2=0.090). Lastly, for SCL-A, CAQ-GE (β=0.174, t=7.583, p<0.001) was the most significant predictor, explaining 7.8% of the variance (R^2=0.078). Overall, CAQ-GE consistently showed a stronger influence on psychological distress than CAQ-W (Table 5).

Internal Consistency

Corrected item–total correlations for the Turkish version of the CAQ-W items, the Cronbach's alpha coefficients (α) were found to be 0.93 for the first factor, 0.89 for the second factor, 0.85 for the third factor, and 0.92 for the total score. For the Turkish version of CAQ-GE, the Cronbach's alpha coefficients were found to be 0.96 for the first factor, 0.86 for the second factor,

Table 5. Results of the hierarchical regression analyses using CAQ-W and CAQ-GE as predictors

Variable	PSWQ-A		STAI-II		DASS-D		DASS-A		DASS-S		SCL-D		SCL-A	
	β	t	β	t	β	t	β	t	β	t	β	t	β	t
CAQ-W	0.192	6.324*	0.093	2.829*	0.039	3.196*	0.060	4.101*	0.053	3.526*	0.089	2.617*	0.063	2.678*
CAQ-GE	0.211	7.057*	0.239	7.414*	0.106	8.772*	0.079	5.530*	0.099	6.749*	0.277	8.281*	0.174	7.583*
R^2	0.058		0.074		0.095		0.043		0.062		0.090		0.078	
p	0.000		0.000		0.000		0.000		0.000		0.000		0.000	

CAQ-W: Contrast Avoidance Questionnaire-Worry; CAQ-GE: Contrast Avoidance Questionnaire-General Emotion; PSWQ: Penn State Worry Questionnaire; DASS-D: Depression, Anxiety, and Stress Scale-Depression; DASS-A: Depression, Anxiety, and Stress Scale- Anxiety; DASS-S: Depression, Anxiety, and Stress Scale-Stress; SCL-D: Symptom Checklist-90-Depression; SCL-A: Symptom Checklist-90-Anxiety. *p<0.05, **p<0.001.

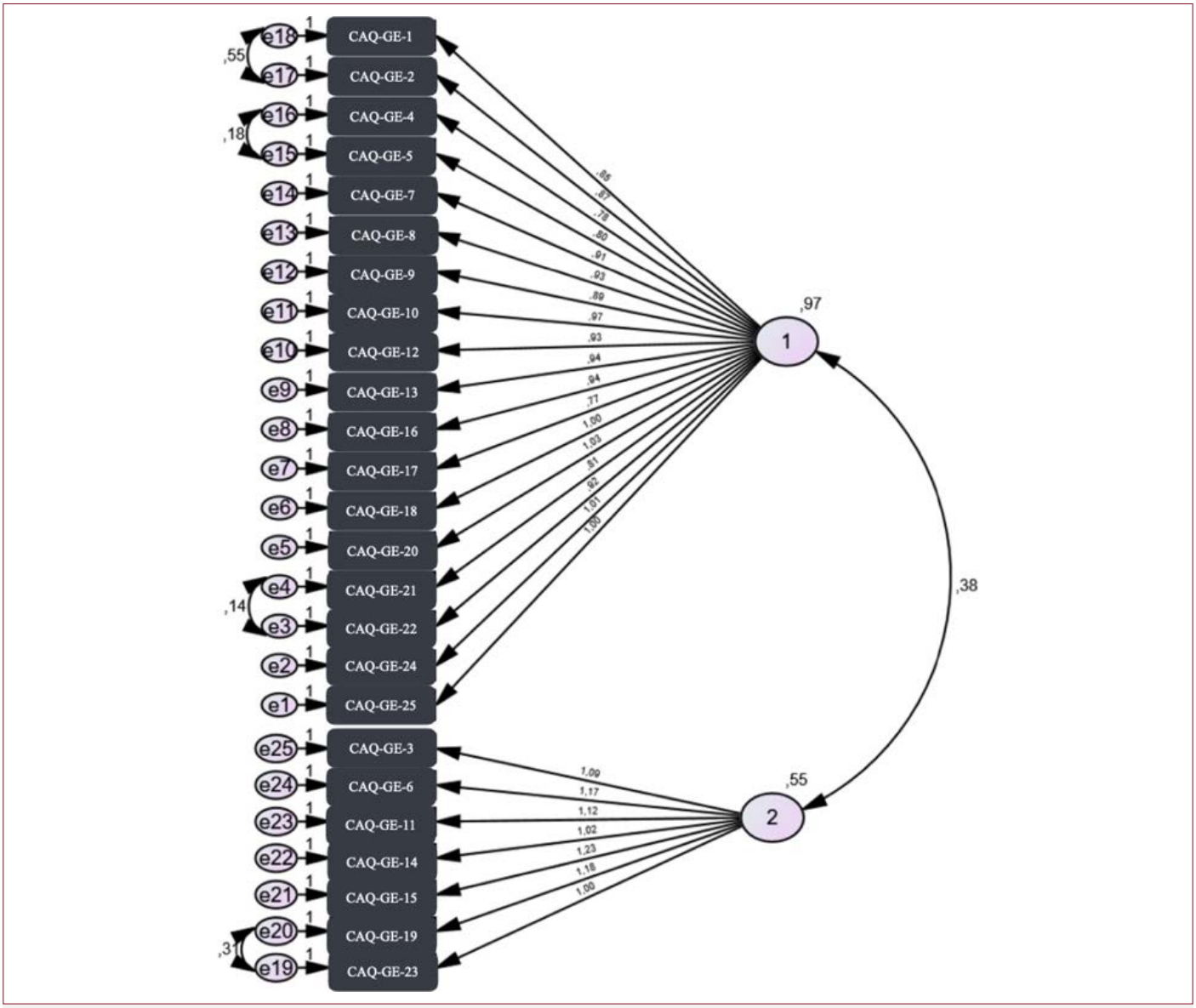

Figure 2. Standardized two-factor confirmatory factor analysis model for the Turkish version of the CAQ-GE .

Table 6. Corrected item–total statistics for the CAQ-W scale

	Mean if item is deleted	Variance if item is deleted	Corrected item–total correlation	Cronbach's alpha if item is deleted
1	84.79	376.245	0.493	0.921
2	84.66	375.244	0.459	0.922
3	84.48	370.860	0.507	0.921
4	82.89	378.334	0.397	0.923
5	82.86	385.737	0.252	0.924
6	83.45	370.105	0.539	0.921
7	82.63	384.900	0.323	0.923
8	82.92	386.881	0.221	0.925
9	84.17	365.209	0.660	0.919
10	84.50	365.878	0.674	0.919
11	84.62	370.853	0.561	0.920
12	84.11	362.290	0.675	0.919
13	82.90	382.949	0.331	0.923
14	83.62	368.046	0.579	0.920
15	84.46	366.588	0.661	0.919
16	83.92	373.156	0.459	0.922
17	84.44	363.010	0.724	0.918
18	82.94	385.495	0.265	0.924
19	84.13	363.704	0.686	0.919
20	84.24	364.709	0.661	0.919
21	83.43	384.472	0.254	0.925
22	84.10	360.822	0.697	0.918
23	84.22	362.834	0.725	0.918
24	84.53	362.312	0.714	0.918
25	84.22	363.247	0.659	0.919
26	84.43	368.691	0.621	0.920
27	84.35	363.364	0.656	0.919
28	83.25	393.313	0.058	0.927
29	82.94	389.870	0.148	0.926
30	84.02	364.244	0.628	0.919

CAQ-W: Contrast Avoidance Questionnaire-Worry.

Table 7. Corrected item–total statistics for the CAQ-GE scale

	Mean if item is deleted	Variance if item is deleted	Corrected item–total correlation	Cronbach's alpha if item is deleted
1	58.26	377.357	0.691	0.949
2	58.26	376.768	0.688	0.949
3	57.73	389.471	0.470	0.952
4	59.06	381.469	0.678	0.949
5	59.18	381.374	0.706	0.949
6	58.02	386.790	0.490	0.951
7	59.05	377.760	0.731	0.949
8	58.71	376.160	0.684	0.949
9	59.01	378.553	0.694	0.949
10	58.69	374.137	0.702	0.949
11	57.78	386.270	0.489	0.951
12	59.03	377.165	0.764	0.948
13	58.67	376.148	0.694	0.949
14	57.63	389.120	0.409	0.953
15	58.12	382.183	0.582	0.950
16	58.93	376.626	0.772	0.948
17	58.33	380.496	0.613	0.950
18	59.01	374.765	0.799	0.948
19	57.74	388.170	0.463	0.952
20	58.89	374.021	0.770	0.948
21	59.23	382.013	0.685	0.949
22	59.12	377.642	0.724	0.949
23	57.85	389.206	0.428	0.952
24	58.79	374.320	0.776	0.948
25	58.97	374.959	0.764	0.948

CAQ-GE: Contrast Avoidance Questionnaire-General Emotion.

and 0.95 for the total score. These values show that both scales have high internal consistency results.

Tables 6 and 7 present the descriptive analysis results for the CAQs, including corrected item–total correlations and Cronbach's alpha coefficients after item deletion. For the CAQ-W scale, the corrected item–total correlations ranged from 0.06 to 0.72. The removal of any individual item did not significantly affect internal consistency, with Cronbach's alpha values ranging from 0.918 to 0.927 after deletion, compared with an overall alpha of 0.921. Only items 8, 28, and 29 had corrected item–total correlations below the recommended threshold of 0.30.

For the CAQ-GE scale, the corrected item–total correlations ranged from 0.40 to 0.80, indicating that strong item discrimination is acceptable. The scale's internal consistency remained high regardless of item removal, with Cronbach's alpha values ranging from 0.948 to 0.953 following item deletion and an overall alpha of 0.950. None of the items fell below the 0.30 threshold, suggesting that all items contributed meaningfully to the overall scale reliability.

Table 8. Results of the test–retest analysis of the CAQ-W and CAQ-GE

	1	2	3	4
1. CAQ-W_1	1			
2. CAQ-W_2	0.777**	1		
3. CAQ-GE_1	0.515**	0.534**	1	
4. CAQ-GE_2	0.566**	0.649**	0.829**	1

CAQ-W_1: Contrast Avoidance Questionnaire - Worry (first measurement); CAQ-W_2: Contrast Avoidance Questionnaire - Worry (second measurement); CAQ-GE_1: Contrast Avoidance Questionnaire – General Emotions (first measurement); CAQ-GE_2: Contrast Avoidance Questionnaire – General Emotions (second measurement). P<0.05; **: P<0.01.

Test–Retest Reliability

This study aimed to perform a test–retest analysis to evaluate the temporal stability of the CAQ-W and CAQ-GE forms. Both scales were administered to 20 participants for the second time, 1 month after their initial completion. The correlation coefficients between the two applications of the CAQ-W and CAQ-GE forms were statistically significant and positive. The correlation coefficient between time 1 and 2 was r=0.78 (p<0.001) for "CAQ-W" and r=0.83 (p<0.001) for "CAQ-GE" (Table 8).

DISCUSSION

This study investigated the adaptation, validity, and reliability of the Turkish version of the Contrast Avoidance Questionnaires (CAQs); it was conducted with a sample of 549 healthy Turkish participants. In comparison, the original study included 410 participants for the CAQ-W scale and 126 participants for the CAQ-GE scale (Llera & Newman, 2017), indicating that the Turkish adaptation was tested with a substantially larger sample. To independently validate the factor structure of the CAQs and assess their utility in predicting relevant psychopathological symptoms, statistical analyses were conducted to evaluate internal consistency, temporal stability, construct validity, convergent validity, and predictive validity.

A CFA was conducted using AMOS to assess the construct validity of the Turkish versions of the CAQs. In particular, we examined whether the CAQ-W and CAQ-GE retained their original three-factor and two-factor structures, respectively. Although the Turkish versions exhibited similar factor structures, the fit indices did not meet acceptable thresholds (e.g., χ^2/df=3.77 for CAQ-W and 4.48 for CAQ-GE).

CFA is also useful for identifying measurement errors that arise from semantic and structural similarities between items or from participants' comprehension difficulties (Brown & Moore, 2012). In our analysis of the CAQs, the CFA revealed correlated measurement errors. We introduced covariance between highly correlated error terms as part of a model modification to improve the model fit.

Specific item pairings in the CAQ-W showed high covariance owing to conceptual overlap. Items 6 ("If I worry about the worst outcome…") and 14 ("I am more appreciative…") highlight a conditional, temporal link between worry and increased appreciation of positive outcomes. Items 1 ("Because bad things could happen…") and 2 ("When I'm worrying, …") emphasize the role of worry in providing comfort and emotional control, whereas Items 19 ("Worry to control my own emotions…") and 20 ("I feel like I have more control over the situation…") emphasize the function of worry in perceived control. Items 24 ("I prefer to worry rather than feel optimistic…") and 27 ("A part of me prefers to be worried…") reflect a preference for worry when anticipating negative events, whereas Items 28 ("Worrying is an unpleasant …") and 29 ("Worrying increases…") capture negative beliefs about worry.

After correcting these measurement errors, the χ^2/df value dropped to an acceptable level (χ^2/df=2.97); other fit indices also fell within acceptable ranges (GFI=0.87, CFI=0.91, IFI=0.91, and RMSEA=0.06). These results indicate that the three-factor structure of the Turkish version of the CAQ-W can be used similarly to the original scale.

A similar pattern of high covariance appeared in the CAQ-GE between Items 1–2, 4–5, 21–22, and 19–23. The shared variance in Items 1 ("I focus on the negative...") and 2 ("I tend to expect the worst…") may stem from overlapping semantics, whereas Items 4 ("I would rather feel bad now…") and 5 ("Because bad things could happen…") emphasize a negative emotional stance. Items 19 ("Fluctuations in my emotions bother me") and 23 ("Strongly fluctuating emotions are…") reflect discomfort with emotional fluctuations. In addition, the consecutive placement of Items 21 ("I would rather feel down…") and 22 ("Allowing myself to feel happy…") may have contributed to their high covariance.

After correcting these measurement errors and conducting subsequent analyses, the fit indices for the two-factor model of CAQ-GE were found to be within acceptable values (χ^2/df=2.73, GFI=0.90, CFI=0.95, IFI=0.95, and RMSEA=0.05).

The Turkish versions of the CAQ-W and CAQ-GE were assessed by comparing their results with various anxiety and depression measures. The findings indicated that both Turkish CAQs showed strong psychometric properties, exhibiting high internal consistency (reliability), and appropriate correlations with other measures (validity).

One of the most notable findings in the correlation analysis concerns the second factor of the CAQ-W. In particular, the second factor of the CAQ-W ("worry creates and sustains negative emotion") did not exhibit a significant correlation with

either the other two factors of the CAQ-W or the two factors of the CAQ-GE. Although this finding is noteworthy, it should be replicated in future studies, particularly with clinical samples.

However, recent research (Rashtbari et al, 2023; White et al, 2020) on the CAQs suggests that their factor structures may vary and that alternative configurations yield better model fit indices. One of the most significant modifications in this context is the transformation of the CAQ-W scale into a two-factor structure while retaining all items. Future studies should re-evaluate the validity and reliability of this newly proposed two-factor model in clinical and non-clinical samples within the Turkish population.

Furthermore, the correlation between the second factor of the CAQ-W and other variables was weaker than that between the other factors of the CAQ. This finding suggests that this factor may function independently of other factors, which warrants further investigation in future research. Conversely, the CAQ-W and CAQ-GE scores exhibited strong correlations with the anxiety and depression measures. However, the CAQ-GE demonstrated even stronger associations, showing significant correlations with nearly all anxiety and depression measures, surpassing those observed for the CAQ-W.

Significant positive correlations were found between the AAQ-II and WW-II scales and the subdimensions of the CAQ scales, except for the correlation between WW-II and the second factor of CAQ-W. This result aligns with expectations, as AAQ-II measures psychological inflexibility. Controlling, reducing, preventing, or eliminating negative internal experiences constitutes a core dimension of psychological inflexibility. In this regard, the CAQ scale can be considered a measure of strategies aimed at regulating emotions, particularly to avoid experiences such as disappointment. In addition, the tendency to use worry as a strategy to shield oneself from unwanted emotions or situations may reinforce positive beliefs about worry. Therefore, the observed positive correlation with WW-II, which assesses the degree of such beliefs, is theoretically anticipated.

In the original development study (Llera & Newman, 2017), the test–retest analysis was conducted with 124 ethnically diverse participants (e.g., Caucasian, African American, and Asian) 1 week apart, yielding reliability coefficients of r=0.90 for CAQ-W and r=0.93 for CAQ-GE. In the current study, the test–retest reliability coefficients were slightly lower (CAQ-W: r=0.78; CAQ-GE: r=0.83), with a more homogeneous and smaller sample that lacked racial diversity. The smaller sample size is considered acceptable given the homogeneous structure of the group. Furthermore, administering the retest 1 month apart, rather than 1 week apart, may have contributed to more reliable results compared with the original study.

The hierarchical regression analysis revealed that CAQ-GE was a stronger predictor of depression (DASS-D), general distress (SCL-D), general anxiety (SCL-A), state anxiety (STAI-II), and stress (DASS-S). In contrast, the CAQ-W was more closely associated with worry (PSWQ-A) and anxiety symptoms (DASS-A); however, the CAQ-GE remained the strongest predictor across all variables.

Moreover, these findings align with previous research, including the Iranian adaptation study of the CAQ (Rashtbari et al, 2023), where the CAQ-W was found to be a better predictor of anxiety-related measures such as the PSWQ-A and GAD-7, whereas the CAQ-GE was a stronger predictor of depressive symptoms and broader emotional distress (e.g., social phobia, depression, and the Obsessive-Compulsive Inventory). Similarly, other studies (Llera & Newman, 2017; White et al, 2021) have consistently shown that CAQ-W is more closely linked to anxiety, whereas CAQ-GE is a stronger predictor of depression and general emotional dysregulation.

Collectively, these findings strengthen the argument that CAQ-GE may play a more significant role in predicting depressive symptoms, whereas CAQ-W is more relevant for anxiety-related processes, reinforcing the distinction between these two regulatory mechanisms.

Limitations and Recommendations

This study has several limitations. One of the primary limitations of this study is the reliance on self-report measures. Although self-report tools provide valuable subjective data, they are prone to biases, such as social desirability and recall errors. For more reliable results, future studies could incorporate structured clinical interviews with individuals meeting the criteria for GAD to more objectively assess their worry behaviors. Additionally, alternative methodologies, such as Ecological Momentary Assessment (EMA), could be used to capture real-time worry patterns in daily life. Studies have supported the contrast avoidance hypothesis of the CAM (White et al, 2021). Another limitation concerns the scope of the sociodemographic data collected; more comprehensive reporting (e.g., education and employment status) would allow for a better contextualization of the findings. Studies have supported the contrast avoidance hypothesis of the CAM (White et al, 2021).

Another limitation is that the psychometric properties of the CAQ scales were only examined in a non-clinical sample. Notably, the CAQ-GE does not solely focus on worry but also comprehensively measures the tendency to avoid contrast. This suggests that certain psychological disorders or populations may rely on mechanisms other than generating negative emotions to prevent negative contrast (Llera & Newman, 2017). Previous research (Llera et al, 2016) found

that while the CAQ-GE significantly predicted GAD and depressive symptoms, the CAQ-W was specifically predictive of GAD. Future research should investigate contrast avoidance tendencies in clinical populations in Türkiye to further clarify the role of this mechanism across various disorders.

Recent studies have introduced modifications to the factor structure of the CAQ scales (Rashtbari et al, 2023; White et al, 2021). Future research should examine the validity of these newly proposed factor structures within the Turkish population to ensure their applicability and psychometric robustness.

Furthermore, this study not only contributes to the Turkish literature by introducing the CAM scales but also highlights the potential clinical significance of CAM. When addressed with traditional methods aimed at reducing worrisome behavior, GAD is often regarded as a treatment-resistant disorder. Viewing individuals with GAD through the CAM framework—understanding worry as an emotionally protective function—could offer valuable insights for treatment (Newman & Llera, 2017).

In summary, the findings of this study provide strong evidence that the Turkish versions of CAQ-W and CAQ-GE exhibit high psychometric integrity. Utilizing these scales with Turkish samples could lay the groundwork for future research in this field.

CONCLUSION

The Turkish CAQ-W (χ^2/df=2.97) and CAQ-GE (χ^2/df=2.73) retained their intended factor structures and showed solid psychometric properties—high internal consistency, acceptable 1-month test–retest reliability (r≈0.78–0.83), and theory-consistent links to anxiety (stronger for CAQ-W) and depression/general distress (stronger for CAQ-GE). These findings support the CAM in Turkish non-clinical samples and provide reliable tools for future research. However, replication with clinical groups and evaluation of the new two-factor CAQ-W solution remain important next steps.

Ethics Committee Approval: The Istanbul Medipol University Social and Human Sciences Research Ethics Committee granted approval for this study (date: 29.04.2019, number: 41).

Informed Consent: Written informed consents were obtained from patients who participated in this study.

Conflict of Interest: The authors have no conflict of interest to declare.

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Author Contributions: Concept – KFY, SCY; Design – KFY; Supervision – KFY, HK; Data Collection and/or Processing – KFY, SCY; Analysis and/or Interpretation – KFY, SCY; Literature Review – SCY; Writing – SCY; Critical Review – KFY, HK.

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Effect of Automatic Thoughts on Social Media Addiction in University Students

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ABSTRACT

This study aimed to determine the effect of automatic thoughts on social media addiction (SMA) in university students. The current research is descriptive. The study population consisted of all students studying at Iğdir University in the 2022–2023 academic year (N=14.000); the sample consisted of 631 people. Data were collected using a general information form, the SMA Scale (SMAS), and the Automatic Thoughts Scale (ATS). Descriptive statistical analyses (percentage, minimum, maximum, and mean), independent sample t-test, one-way analysis of variance Pearson correlation, and multivariate linear regression analysis were used to evaluate the data. The mean age of the students in the sample was 20.71±1.99, and 67.5% were female. The students were less dependent on social media (SM) and the level of negative automatic thoughts was above average. A significant difference was found between ATS and gender, family income status, psychiatric disorder status, and duration of SM use ($p<0.05$). The difference between SMAS and gender, psychiatric disorder status, years of SM use, and duration of use was statistically significant ($p<0.05$). A moderately significant relationship was statistically determined between ATS and SMAS ($r=0.423$; $p<0.05$). Finally, it was determined that automatic thoughts significantly predicted SMA ($F_{(2-436)}=136.929$; $p<0.05$). Consequently, it was determined that as automatic thoughts increase, SMA increases and automatic thoughts predict SMA. Furthermore, providing students with training programs that develop functional automatic thoughts instead of dysfunctional automatic thoughts and reduce their SM use may be important.

Keywords: Automatic thoughts, social media addiction, university students.

ÖZ

Üniversite Öğrencilerinde Otomatik Düşüncelerin Sosyal Medya Bağımlılığı Üzerine Etkisi

Bu çalışma, üniversite öğrencilerinde otomatik düşüncelerin Sosyal Medya Bağımlılığı (SMB) üzerindeki etkisini belirlemek amacıyla yapıldı. Bu tanımlayıcı nitelikte yapılan çalışmanın evrenini 2022-2023 eğitim öğretim yılında Iğdır Üniversitesi'nde öğrenim gören tüm öğrenciler (N=14.000), örneklemini ise 631 kişi oluşturdu. Veriler genel bilgi formu, Sosyal Medya Bağımlılığı Ölçeği (SMBÖ) ve Otomatik Düşünceler Ölçeği (ODÖ) kullanılarak toplandı. Verilerin değerlendirilmesinde betimsel istatistiksel analizler (yüzde, minimum, maksimum, ortalama), bağımsız örneklem t testi, tek yönlü ANOVA, Pearson korelasyon ve çok değişkenli doğrusal regresyon analizi kullanıldı. Örneklemdeki öğrencilerin yaş ortalamasının 20,71±1,99 ve %67,5'inin kadın olduğu tespit edildi. Öğrencilerin Sosyal Medyaya (SM) daha az bağımlı oldukları ve olumsuz otomatik düşünce düzeylerinin ortalamanın üzerinde olduğu görüldü. ODÖ ile cinsiyet, aile gelir durumu, psikiyatrik bozukluk durumu ve SM kullanım süresi arasında anlamlı bir fark olduğu bulundu ($p<0,05$). SMBÖ ile cinsiyet, psikiyatrik bozukluk durumu, SM kullanım yılı ve kullanım süresi arasındaki farkın istatistiksel olarak anlamlı olduğu tespit edildi ($p<0,05$). ODÖ ve SMBÖ arasında istatistiksel olarak pozitif yönde orta düzeyde anlamlı

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bir ilişki saptandı (r=0,423; p<0,05). Son olarak, otomatik düşüncelerin SMB'yi anlamlı şekilde yordadığı belirlendi ($F_{[2-436]}$=136,929; p<0,05). Sonuç olarak, otomatik düşünceler arttıkça SMB'nin arttığı ve otomatik düşüncelerin SMB'yi yordadığı belirlendi. Ayrıca öğrencilere işlevsiz otomatik düşünceler yerine işlevsel otomatik düşünceler geliştiren ve SM kullanımlarını azaltan eğitim programlarının uygulanması önemli olabilir.

Anahtar Kelimeler: Otomatik düşünceler, sosyal medya bağımlılığı, üniversite öğrencileri.

INTRODUCTION

Social media (SM) is an information technology-based platform that enables users to communicate and exchange information with each other (Aslan & Tolan, 2022; Huang et al, 2023). SM use is increasing daily, especially among young people (Aksu et al, 2019; Michikyan & Suárez-Orozco, 2016). According to data from We Are Social 2024, there are more than 5.04 billion active SM users, who spend an average of 2 h 23 min a day on SM. The report also states that SM users in Turkey spend an average of 2 h and 44 min a day on SM (We Are Social, 2024). As SM has become easily accessible and widespread worldwide, it negatively affects interpersonal relationships, psychological health, and private life (Doğan & Tosun, 2016; Acılar & Mersin, 2015; Aslan & Tolan, 2022). When the amount and duration of young people's use of SM networks are high, the phenomenon of addiction comes to the fore (Aslan & Tolan, 2022). Studies indicate that SM use can result in addiction risk and mental health problems (Kuss & Griffiths, 2017; Duan et al, 2020). SMA is defined as people's inability to control their use of SM to the extent that it interferes with other life tasks (Ryan et al, 2014; Andreasen 2015). Davis (2001) states that individuals with negative thoughts in daily life reveal these thoughts by hiding themselves on SM platforms and that these thoughts cause abnormal behaviors. Moreover, Davis states that the dysfunctional thinking in the mind leads the person to problematic Internet and SM use. People who have a negative attitude toward themselves use SM to get positive responses from others. They have automatic thoughts such as "I am good on SM," "I am worthless when I am not on SM," "I am a failure when I am not on SM," "SM is the only place I respect," "SM is my only friend," and "People treat me badly outside SM" (Şenormancı et al, 2010). Cognitive theory states that the basis of psychological disorders is the wrong, distorted interpretations of the individual; dysfunctional attitudes are accepted as the source of automatic thoughts (Yığman et al, 2021; Aslan and Tolan 2022). Automatic thoughts "are situation-specific cognitions that come to mind spontaneously, occur in certain situations, and take place in the flow of mind" (Türkçapar, 2018). Negative automatic thoughts have been reported as a crucial risk factor for maladaptive coping strategies and problematic behaviors (Lian et al, 2023; Hou et al, 2021; Nie et al, 2021). Individuals may turn to the virtual world (e.g., SM) to remove such negative emotions. Over time, these individuals become addicted to SM and spend more time on it, finding it difficult to free themselves from this situation (Liu et al, 2023). Studies have indicated that SM is widely used as a tool to spend time and eliminate negative emotions (Aslan & Tolan, 2022; Balıkçı et al, 2020; Pantic, 2014; Spada et al, 2015). In particular, "individuals with high automatic thoughts are more likely to form automatic and passive thoughts when faced with disappointment," which triggers unrealistic behavior and SMA. Previous studies have shown that automatic thoughts play a key role in avoiding reality and indulging in the Internet (Geng et al, 2009; Nie et al, 2021). Recent research has focused on assessing the link between positive metacognitive beliefs and SMA (Casale et al, 2018; Marino et al, 2016). Within the scope of the above concepts, it was considered that problematic SM use may be related to automatic thoughts. In this context, the beneficial use of SM is predicted to contribute to the literature as well as reduce its negative aspects. Although there is evidence that problematic SM use negatively affects mental health, very few studies have examined the mechanisms underlying this relationship. This study aimed to determine the effect of automatic thoughts on SM addiction. Therefore, the research questions developed based on this study's general purpose are listed below.

1. "Is there a significant difference between the demographic characteristics of the students and their automatic thoughts?"
2. "Is there a significant difference between the demographic characteristics of the students and the SMA?"
3. "Is there a significant relationship between the automatic thoughts and SMA?"
4. "Do automatic thoughts significantly predict SMA?"

METHOD

Design and Participants

This research was conducted using a cross-sectional design. The universe of research consisted of 14.000 students studying Iğdır University in undergraduate and associate degree programs between 2022 and 2023. For the study

sample, the minimum sample size was calculated as 372 students using the sample width formula, where the number of individuals in the universe is known. However, considering the possible losses, 700 students were included in the study, 69 studentswere excluded from the study because they left the scales incomplete, and the study was completed with 631 students. The inclusion criteria for the study were students using SM, agreeing to participate in the study, and signing informed consent. The exclusion criteria of the research were incomplete questionnaires and wanting to leave the study. Before starting the study, ethics committee approval was obtained from Iğdır University ethics committee (date: 25.05.2023 number: 2023/10). Before the study data were collected, written informed consent was obtained regarding the purpose, duration, and withdrawal from the study, and confidentiality was guaranteed. The research data were gathered by administering questionnaires in the classroom environment, and data collection took one hour. The researchers first informed the participants about the research and then distributed the questionnaires to those who volunteered. This study was conducted in accordance with the ethical standards of the Declaration of Helsinki (October 2013).

Data Collection Methods

Information Form: This form was created by the researcher in the form of a nine-question form that includes the demographic characteristics of students (such as gender, age, class, family income status, mother and father education status, and psychiatric disorder status) and SM usage (year and duration of SM use) in line with the literature review (Tutgun Ünal, 2015; Durar & Daştan, 2018).

Social Media Addiction Scale (SMAS): The SMAS, developed by Tutgun Ünal (2015), was used to measure students' SMA. The SMAS comprises 41 items and employs a five-point Likert-type response scale. The lowest possible SMAS score is 41, and the highest is 205. The scoring scale is as follows: 41–73 = "no addiction," 74–106 = "slightly dependent," 107–139 = "moderately dependent," 140–172 = "highly dependent," and 173–205 = "very highly dependent." The SMAS contains four subdimensions: "occupation," "mood regulation," "repetition," and "conflict." As per the Cronbach's alpha value (0.967), the scale is valid and reliable (Tutgun Ünal, 2015). In this study, the alpha values for the SMAS subdimensions were 0.86–0.94.

Automatic Thoughts Scale (ATS): Hollon and Kendall created the negative ATS to assess the severity of negative thoughts and negative self-evaluations. It is a Likert-type scale with 30 items and a score range of 30–150. The Cronbach alpha coefficient is 0.98. Şahin and Şahin (1992), (39) conducted the Turkish validity and reliability research. According to the results of the factor analysis, the scale has five elements (39).

Table 1. Frequency and percentage distribution of demographic characteristics of individuals participating in the study

	n	%
Gender		
Male	205	32.5
Female	426	67.5
Age		
17–20	329	52.1
21–35	302	47.9
Classroom		
First class	422	66.9
Second class	209	33.1
Family income status		
Good	137	21.7
Medium	169	26.8
Bad	325	51.5
Mother's educational status		
Illiterate	274	43.3
Primary	303	48.0
High school	42	6.7
Associate degree	5	0.8
Undergraduate	7	1.2
Father's educational status		
Illiterate	59	9.4
Primary	424	67.2
High school	111	17.6
Associate degree	17	2.7
Undergraduate	16	2.5
Illiterate	4	0.6
Psychiatric disorder status		
Yes	29	4.6
No	602	95.4
Year of SM use		
Less than 1 year	110	17.4
1–3 years	184	29.2
4–6 years	203	32.2
More than 7 years	134	21.2
Duration of SM usage		
Less than 1 h	134	21.2
1–3 h	302	47.9
4–6 h	149	23.6
More than 7 h	46	7.3
Total	**631**	**100.0**

SM: Social media.

The scale's subdimensions are personal maladjustment and desire for change (items 9, 26, and 29), loneliness/isolation (items 1, 4, 10, 2, and 8), and hopelessness (items 6, 11, 12, and 25). The Cronbach alpha coefficient is 0.93. In this study, the alpha values for the ATS ranged from 0.79 to 0.97; when the entire alpha value was analyzed, it was shown to be extremely reliable.

Data analysis

Data were analyzed using the Statistical Package for the Social Sciences v.23 program. Descriptive parameters, such as number, percentage, mean, and standard deviation, were employed to evaluate the data. In the paired groups, the independent group t-test was employed, as was one-way analysis of variance in groups of three or more, Pearson correlation to assess the link between variables, and multiple linear regression analysis for predictive analysis.

RESULTS

Table 1 shows the demographic features of the patients participating in the trial. The table shows that 32.5% of the students were male and 67.5 % were female. The students were minimum 17 and maximum 35 years old, 66.9% were in the first grade, and 95.4% did not have psychiatric disorders. The family income status of the students was poor (51.5%), and the majority of their mothers (48.0%) and fathers (67.2%) were primary school graduates. It was found that 32.2% of the students used SM between 4 and 6 years of age and 47.9% of them used it daily for between 1 and 3 h.

The analysis revealed that automatic thoughts did not differ according to age, class, education level, and years of SM use ($p>0.05$). The difference between the groups was statistically significant in the total ATS score and in the subdimensions of "Self-oriented," "Prone to Confusion and Escapism," "Prone to Personal Incompatibility," and "Prone to Loneliness" in the gender variable ($p<0.05$). According to the significant difference, women had a higher mean than men. The difference between the groups was statistically significant in the subdimensions of Prone to Personal Incompatibility and Prone to Loneliness in the variable of family income status ($p<0.05$). According to the significant differences, a difference was found between those with poor income and those with moderate income, and the average of those with moderate income was lower. The difference between the groups was statistically significant ($p<0.05$) in the total ATS score, in the subdimensions of Prone to Confusion–Escapism and Prone to Despair, and in the variable of having psychiatric disorder. According to the significant differences, there was a difference between those with and without psychiatric disorders, and the means of those with psychiatric disorders were higher. In the ATS total score and all subdimensions, the difference between the groups was found to be statistically significant in the variable of the duration of SM use ($p<0.05$). According to the significant differences that emerged, there was a difference between those who used SM for more than 7 h and those who used it for 1–3 h and less than 1 h, and the average of people who used SM for more than 7 h was higher. Another result is that there is a difference between those who use SM between 4–6 h and those who use it between 1–3 h and less than 1 h, and the average of those who use it between 4–6 hours is high (Table 2).

The analysis revealed that SMA did not differ according to age, class, family income, and education level ($p>0.05$). In the mood regulation subdimension of the SMAS, the difference between the groups in the variables of gender and psychiatric disorder was statistically significant ($p<0.05$). According to the significant differences, women had a higher mean than men. Another result is that the average number of people with psychiatric disorders is higher than those without psychiatric disorders. The difference between the groups was statistically significant in the SMAS total score and all subdimensions and in the variable of the year of SM use ($p<0.05$). According to the significant differences, it was determined that there was a difference between those who used SM for less than 1 year and those who used SM for 1–3 years, 4–6 years, and more than 7 years in the total score, preoccupation, and mood regulation subdimensions of the SMAS; and that the mean scores of those who used SM for less than 1 year were lower than those who used SM for 1–3 years, 4–6 years, and more than 7 years. Another result is that there is a difference between those who use SM for less than 1 year and those who use SM for 1–3 years and 4–6 years in the subdimensions of repetition and conflict; the mean scores of those who use SM for less than 1 year are lower than those who use SM for 1–3 years and 4–6 years. In the SMAS total score and all subdimensions, the difference between the groups in the variable of time spent on SM was statistically significant ($p<0.05$). According to the significant differences, it was determined that the averages of those who used SM for less than 1 h were lower than those who used SM for 1–3 h, 4–6 h, and more than 7 h; those who used SM for 1–3 h were lower than those who used SM for 4–6 hours and more than 7 h; and those who used SM for 4–6 h were lower than those who used SM for more than 7 h (Table 3).

The Pearson correlation analysis was performed to determine the relationship between ATS and SMAS (Table 4). A positive, moderately significant relationship was detected between ATS and SMAS ($r=0.423$; $p<0.05$). In terms of the ATS subdimensions, the highest relationship is between the "Prone to Confusion and Escapism" subdimension and the "Prone to Despair" subdimension ($r=0.869$), and the lowest correlation is between the "Prone to Personal Incompatibility" subdimension and the "Self-oriented" subdimension ($r=0.751$).

Table 2. Comparison of the mean scores of the Automatic Thoughts Scale and its subdimensions according to the descriptive characteristics of the participants

Variables	Self-oriented Mean±SD	Prone to confusion and escapism Mean±SD	Prone to personal incompatibility Mean±SD	Prone to loneliness Mean±SD	Prone to despair Mean±SD	ATS total Mean±SD
Gender						
(1) Male	18.45±9.103	13.28±6.244	7.39±3.341	9.10±3.856	8.30±4.074	62.54±27.052
(2) Female	20.06±9.297	14.46±6.769	8.13±3.368	9.85±4.129	8.95±4.370	67.88±28.550
Test	**T=2.046 p<0.05 1<2**	**T=2.100 p<0.05 1<2**	**T=2.587 p<0.05 1<2**	**T=2.184 p<0.05 1<2**	**T=1.791 p>0.05**	**T=2.227 p<0.05 1<2**
Age						
(1) 17–20	19.29±9.098	14.05±6.500	7.85±3.351	9.58±3.973	8.55±4.100	65.67±27.485
(2) 21–35	19.83±9.437	14.00±6.766	7.94±3.405	9.65±4.150	8.95±4.476	66.72±28.930
Test	T=–0.727 p>0.05	T=0.280 p>0.05	T=–0.344 p>0.05	T=–0.232 p>0.05	T=–1.183 p>0.05	T=–0.468 p>0.05
Clasroom						
(1) First class	19.91±9.368	14.33±6.635	7.97±3.364	9.75±4.016	8.81±4.251	67.16±28.200
(2) Second class	18.79±9.028	13.55±6.601	7.72±3.405	9.33±4.141	8.58±4.368	64.10±28.120
Test	T=1.423 p>0.05	T=1.389 p>0.05	T=0.857 p>0.05	T=1.211 p>0.05	T=0.634 p>0.05	T=1.277 p>0.05
Family income status						
(1) Good	19.81±10.359	14.25±6.923	8.05±3.666	9.62±4.208	8.89±4.496	66.85±30.372
(2) Medium	18.17±9.025	13.27±6.672	7.32±3.215	8.96±3.875	8.27±4.339	62.04±27.940
(3) Bad	20.16±8.822	14.44±6.449	8.12±3.300	9.95±4.052	8.92±4.157	68.04±27.150
Test	F=2.646 p>0.05	F=1.792 p>0.05	**F=3.335 p<0.05 2<3**	**F=3.323 p<0.05 2<3**	F=1.382 p>0.05	F=2.581 p>0.05
Mother's educational status						
(1) Illiterate	20.17±9.62	14.68±6.63	8.05±3.40	9.79±4.11	9.06±4.39	68.27±28.80
(2) Primary	18.97±8.94	13.54±6.45	7.72±3.30	9.41±3.92	8.44±4.11	64.22±27.16
(3) High school	19.86±9.45	13.97±7.37	8.06±3.78	9.79±4.55	8.90±4.73	66.76±31.21
(4) Associate degree	23.20±10.70	20.00±7.24	10.20±2.38	11.80±3.96	11.40±4.27	83.60±29.15
(5) Undergraduate	15.80±6.49	10.70±4.59	6.50±2.95	7.80±3.73	6.60±3.43	52.60±19.82
Test	F=1.182 p>0.05	F=2.677 p>0.05	F=1.355 p>0.05	F=1.202 p>0.05	F=1.858 p>0.05	F=1.768 p>0.05
Father's educational status						
(1) Illiterate	20.38±9.90	14.83±6.51	7.98±3.27	9.57±4.13	9.08±4.33	68.11±28.54
(2) Primary	19.63±9.06	14.14±6.64	7.98±3.38	9.65±3.99	8.79±4.28	66.59±27.99
(3) High school	19.60±9.97	13.75±6.66	7.63±3.47	9.52±4.33	8.59±4.45	65.19±29.66
(4) Associate degree	16.25±9.40	13.70±8.72	7.58±3.89	9.23±4.95	7.76±4.45	59.17±31.93
(5) Undergraduate	17.90±7.01	12.85±4.29	7.50±2.46	9.80±3.01	8.45±3.11	62.90±18.49
Test	F=0.833 p>0.05	F=0.449 p>0.05	F=0.340 p>0.05	F=0.072 p>0.05	F=0.384 p>0.05	F=0.456 p>0.05

Table 2 (cont). Comparison of the mean scores of the Automatic Thoughts Scale and its subdimensions according to the descriptive characteristics of the participants

Variables	Self-oriented Mean±SD	Prone to confusion and escapism Mean±SD	Prone to personal incompatibility Mean±SD	Prone to loneliness Mean±SD	Prone to despair Mean±SD	ATS total Mean±SD
Psychiatric disorder status						
(1) Yes	21.62±8.73	17.44±6055	9.06±3.31	10.89±4.20	10.86±4.67	76.89±27.71
(2) No	19.45±9.27	13092±6058	7.83±3.36	9.55±4.04	8.64±4.24	65.66±28.10
Test	T=1.233	**T=2.813**	T=1.950	T=1.743	**T=2.506**	**T=2.104**
	p>0.05	**p<0.05**	p>0.05	p>0.05	**p<0.05**	**p<0.05**
		1<2			**1<2**	**1<2**
Year of SM use						
(1) Less than 1 year	19.94±8.71	14.00±6.50	7.81±2.88	9.43±3.83	8.56±4.01	65.92±26.37
(2) 1–3 years	19.81±9.73	14.03±657	7.75±3.63	9.70±4.16	8.74±4.51	66.35±29.61
(3) 4–6 years	19.94±9.46	14.53±7.03	8.00±3.48	9.79±4.09	8.98±4.41	67.64±29.22
(4) More than 7 years	18.27±8.65	13.54±6.15	7.99±3.22	9.37±4.04	8.54±3.99	63.92±25.96
Test	F=1.083	F=0.610	F=0.221	F=0.385	F=0.366	F=0.469
	p>0.05	p>0.05	p>0.05	p>0.05	p>0.05	p>0.05
Duration of SM usage						
(1) Less than 1 h	18.19±8.68	13.10±6.51	7.41±3.34	9.08±3.94	8.16±4.19	61.79±27.26
(2) 1–3 h	18.69±8.22	13.48±6.15	7.46±3.12	9.32±3.73	8.28±3.85	63.32±25.25
(3) 4–6 h	21.53±10.55	15.33±6.93	8.79±3.48	10.25±4.34	9.36±4.61	72.36±30.70
(4) More than 7 h	23.02±11.31	17.11±7.71	9.36±3.82	11.36±4.93	10.75±5.24	78.77±34.41
Test	**F=6.285**	**F=6.812**	**F=9.199**	**F=4.640**	**F=7.571**	**F=7.674**
	p<0.05	**p<0.05**	**p<0.05**	**p<0.05**	**p<0.05**	**p<0.05**
	1<3	**1 < 3**	**1<3**	**1<3**	**1<3**	**1<3**
	1<4	**1 < 4**	**1<4**	**1<4**	**1<4**	**1<4**
	2<3	**2 < 3**	**2<3**	**2<3**	**2<3**	**2<3**
	2<4	**2 < 4**	**2<4**	**2<4**	**2<4**	**2<4**

SD: Standard deviation; ATS: Automatic Thoughts Scale.

In terms of the SMAS subdimensions, the highest relationship is between the "Conflict" subdimension and the "Repetition" subdimension (r=0.680), and the lowest relationship is between the "Repetition" subdimension and the "Emotion State Regulation" subdimension(r=0.505).

Table 5 presents the results of the multiple linear regression analysis on whether automatic thoughts predict SM addiction. The multiple linear regression model established to examine the effect of automatic thoughts on SMA was found to be significant (F(2–436)=136.929; p<0.05). Furthermore, there is no multicollinearity and autocorrelation problem in the established model (Durbin Watson=1.396; VIF<5). These variables together explain 17.9% of the change in the SMA level (R=0.423; R2(Adjusted)=0.179).

DISCUSSION

This study examined the effect of automatic thoughts on SMA in university students. In addition, the study also examined the differences in automatic thoughts and SMA levels among university students according to various demographic variables. The study observed that automatic thoughts and SMA variables were interrelated. Additionally, automatic thoughts were found to have the power to predict SM addiction. Very few comprehensive studies have examined the effect of automatic thoughts on SMA in university students. Therefore, it is thought that the study will contribute to the literature.

Significant differences were observed between the demographic characteristics of the students and their mean

Table 3. Comparison of the mean scores of the SMA Scale and its subdimensions according to the descriptive characteristics of the participants

Variables	Occupation Mean±SD	Mood regulation Mean±SD	Repetition Mean±SD	Conflict Mean±SD	SMAS total Mean±SD
Gender					
(1) Male	26.71±9.29	10.91±4.54	9.08±4.19	31.99±12.76	78.71±25.99
(2) Female	28.04±10.50	11.74±5.13	9.33±4.25	33.67±14.16	82.80±29.61
Test	T=1.536	**T=2.039**	T=0.689	T=1.439	T=1.681
	p>0.05	**p<0.05**	p>0.05	p>0.05	p>0.05
		1<2			
Age					
(1) 17–20	28.20±10.26	11.55±4.97	9.27±4.28	33.15±13.16	82.18±28.16
(2)21–35	26.99±9.99	11.39±4.96	9.23±4.18	33.11±14.36	80.73±28.98
Test	T=1.498	T=0.402	T=0.113	T=0.036	T=0.636
	p>0.05	p>0.05	p>0.05	p>0.05	p>0.05
Clasroom					
(1) First class	27.85±10.45	11.52±5.00	9.16±4.20	33.17±13.61	81.72±28.58
(2) Second class	27.10±9.50	11.37±4.91	9.42±4.29	32.94±13.98	80.85±28.50
Test	T=0.869	T=0.349	T=–0.729	T=0.202	T=0.359
	p>0.05	p>0.05	p>0.05	p>0.05	p>0.05
Family income status					
(1) Good	28.66±10.81	12.22±5.26	9.13±4.28	33.71±13.97	83.74±29.00
(2) Medium	26.76±9.38	11.00±4.64	9.40±4.37	32.00±12.86	79.17±27.07
(3) Bad	27.61±10.22	11.40±4.97	9.23±4.14	33.47±14.08	81.73±29.09
Test	F=1.338	F=2.393	F=0.159	F=0.803	F=1.004
	p>0.05	p>0.05	p>0.05	p>0.05	p>0.05
Mother's educational status					
(1) Illiterate	27.45±10.49	11.58±5.09	9.22±4.09	33.38±12.73	81.64±27.98
(2) Primary	27.45±9.47	11.31±4.83	9.31±4.40	32.93±14.67	81.02±28.79
(3) Highschool	29.60±12.50	12.11±5.26	9.02±3.86	33.06±13.89	83.81±31.81
(4) Associate degree	33.20±9.62	12.40±1.81	11.40±5.54	36.60±13.46	93.60±20.65
(5) Undergraduate	23.40±7.56	9.10±4.90	7.30±3.05	28.20±10.28	68.00±22.84
Test	F=0.849	F=0.430	F=0.471	F=0.197	F=0.417
	p>0.05	p>0.05	p>0.05	p>0.05	p>0.05
Father's educational status					
(1) Illiterate	26.59±11.43	10.77±5.07	8.25±3.34	34.06±14.27	79.69±30.45
(2) Primary	27.79±10.06	11.43±4.95	9.47±4.26	33.21±13.81	81.91±28.57
(3) High school	27.61±10.07	12.32±5.16	9.12±4.53	33.10±13.99	82.17±29.06
(4) Associate degree	26.00±9.63	9.52±3.59	8.47±4.17	28.52±8.53	72.52±19.40
(5) Undergraduate	28.50±9.33	11.45±4.24	9.10±3.99	32.75±13.20	81.80±26.74
Test	F=0.456	F=1.416	F=1.031	F=0.480	F=0.466
	p>0.05	p>0.05	p>0.05	p>0.05	p>0.05

Table 3 (cont). Comparison of the mean scores of the SMA Scale and its subdimensions according to the descriptive characteristics of the participants

Variables	Occupation Mean±SD	Mood regulation Mean±SD	Repetition Mean±SD	Conflict Mean±SD	SMAS total Mean±SD
Psychiatric disorder status					
(1) Yes	29.13±9.36	13.82±4.65	10.00±4.18	33.20±12.73	86.17±23.33
(2) No	27.54±10.18	11.36±4.95	9.22±4.23	33.13±13.80	81.26±28.77
Test	T=0.824	**T=2.622**	T=0.966	T=0.028	T=0.904
	p>0.05	**p<0.05**	p>0.05	p>0.05	p>0.05
		2<1			
Year of SM use					
(1) Less than 1 year	21.81±8.97	9.55±4.51	7.91±3.60	29.08±11.68	68.37±25.37
(2) 1–3 years	29.04±10.95	11.93±5.19	9.65±4.26	35.35±15.58	85.98±31.55
(3) 4–6 years	28.18±9.04	11.89±4.81	9.61±4.37	33.29±12.92	82.98±26.24
(4) More than 7 years	29.56±9.83	11.79±4.89	9.27±4.27	33.13±13.14	83.77±27.01
Test	**F=16.138**	**F=6.863**	**F=4.765**	**F=4.911**	**F=10.181**
	p<0.05	**p<0.05**	**p<0.05**	**p<0.05**	**p<0.05**
	1<2	**1<2**	**1<2**	**1<2**	**1<2**
	1<3	**1<3**	**1<3**	**1<3**	**1<3**
	1<4	**1<4**			**1<4**
Duration of SM usage					
(1) Less than 1 h	20.16±7.12	8.99±4.30	7.35±3.22	26.77±10.25	63.29±21.21
(2) 1–3 h	26.23±7.25	11.01±4.14	9.07±3.86	32.79±13.44	79.12±23.83
(3) 4–6 h	33.14±10.18	13.19±5.07	10.75±4.62	36.27±13.13	93.38±28.31
(4) More than 7 h	41.75±11.35	16.59±6.07	11.40±5.27	44.61±16.76	114.36±33.53
Test	**F=102.952**	**F=39.897**	**F=21.123**	**F=25.143**	**F=60.372**
	p<0.05	**p<0.05**	**p<0.05**	**p<0.05**	**p<0.05**
	1<2 2<3	**1<2 2<3**	**1<2 2<3**	**1<2 2<3**	**1<2 2<3**
	1<3 2<4	**1<3 2<4**	**1<3 2<4**	**1<3 2<4**	**1<3 2<4**
	1<4 3<4	**1<4 3<4**	**1<4 3<4**	**1<4 3<4**	**1<4 3<4**

SD: Standard deviation; SMAS: Social Media Addiction Scale.

ATS scores. According to the significant difference, women had a higher average than men. Gül et al. (2014) stated that automatic thought scores were significantly higher in female individuals. Karahan et al. (2016) reported that automatic thoughts in female students were higher than those in male students. Güloğlu Soysal (2021) reported that automatic thought subdimensions and total scores did not differ significantly according to gender. It can be seen that there are similar and different study results with our study findings. This may be owing to the sample group's personal characteristics, gender roles, the way they reacted to any situation, and the number of participants. Statistically significant differences were observed in the scores of the ATS subdimensions of Prone to Personal Incompatibility and Prone to Loneliness according to family income status. According to the significant differences, the average of students with a medium family income was low. In the related literature, no study has examined the significant difference between family income status and automatic thoughts. Statistically significant differences were observed in the ATS subdimensions of Prone to Confusion and Escapism and Prone to Despair and the total score according to the presence of psychiatric disorder. According to the significant differences, the mean of the participants with psychiatric disorders was higher. In the related literature, no study has examined the significant difference between psychiatric disorder and automatic thoughts. This may be owing to the sample

Table 4. Correlation test results for the relationship between the scales used in the study

	1	2	3	4	5	6	7	8	9	10	11
(1) Self-oriented	1										
(2) Prone to confusion and escapism	0.840*	1									
(3) Prone to personal incompatibility	0.751*	0.845*	1								
(4) Prone to loneliness	0.820*	0.841*	0.820*	1							
(5) Prone to despair	0.838*	0.869*	0.806*	0.818*	1						
(6) ATS total	0.946*	0.946*	0.880*	0.910*	0.928*	1					
(7) Occupation	0.323*	0.323*	0.333*	0.322*	0.294*	0.345*	1				
(8) Mood regulation	0.395*	0.408*	0.378*	0.406*	0.388*	0.428*	0.701*	1			
(9) Repetition	0.280*	0.255*	0.229*	0.221*	0.256*	0.281*	0.601*	0.505*	1		
(10) Conflict	0.375*	0.345*	0.313*	0.352*	0.344*	0.382*	0.639*	0.584*	0.680*	1	
(11) SMAS total	0.406*	0.390*	0.369*	0.387*	0.375*	0.423*	0.874*	0.779*	0.777*	0.911*	1

*: P<0.05; ATS: Automatic Thoughts Scale; SMAS: Social Media Addiction Scale.

Table 5. Results of multiple linear regression analyses on the prediction social media addiction of automatic thoughts

Variable	B	SE	β	t	p	VIF
Constant	53.137	2.633		20.179	0.000*	
ATS total	0.428	0.037	0.423	11.702	0.000*	1.000
R=0.423	$R^2_{(Adjusted)}$=0.179					
$F_{(2-436)}$=136.929	p=0.000	Durbin Watson=0.328				

SE: Standard error; ATS: Automatic Thoughts Scale; VIF: Variance inflation factor.

group's personal characteristics and the very small number of participants reporting psychiatric disorders. Statistically significant differences were observed in all subdimensions and the total ATS score according to the duration of SM use. According to the significant differences, it was determined that people who use SM for more than 7 h and between 4 and 6 h have more automatic thoughts. In the related literature, no study has examined the significant difference between the time used in SM and automatic thoughts. Students who encounter disappointment are more likely to form automatic and passive thoughts and therefore spend more time on SM.

In this study, statistically significant differences were observed in the mood regulation subdimension of the SMAS according to gender when the comparison of the demographic characteristics of the students and the mean scores of the SMAS was examined. According to the significant difference, women had a higher mean than men. In the literature, it has been observed that SMA differs according to gender and that women have higher SMA levels than men (Andreassen, 2015; Daşlı & Baloğlu, 2020; İnce & Koçak, 2017; Martinez-Ferrer et al, 2018; Yüksel-Şahin & Öztoprak, 2019). Some studies have found that male students' SMA levels were higher than those of female students (Aslan & Tolan, 2022; Bağatarhan et al, 2022; Cheng et al, 2021; Demircan et al, 2022; Yüksel et al, 2020; Göksel, 2018). The reason for this difference is that women are more mentally connected to SM than men and receive more emotional support from SM (Tutgun-Ünal & Deniz, 2016). Furthermore, gender distribution has often been unbalanced owing to the over-representation of women in studies evaluating different aspects of SM addiction. As a result, SM is thought to have a high impact on university students. A statistically significant difference was observed in the mood regulation subdimension of the SMAS according to the presence of a psychiatric disorder. According to the significant differences, the mean of people with psychiatric disorders was higher than those without psychiatric disorders. In the related literature, no study has examined the significant difference between the status of psychiatric disorder and SMAS. However, some studies have shown a significant negative relationship between SMA and psychological well-being (Kim & Lee, 2011; Brooks, 2015; Sabik et al, 2020). According to Yang et al. (2018), smartphone addiction is associated with mental health. Bian and Leung (2014) reported that factors such as social isolation, loneliness, communication problems, intense anxiety, and stress are effective sources of technological addictions. Because SMA is a technological addiction, these studies support our findings. When the SM usage characteristics of the students were examined, the SMA scores of the participants differed according to the duration of daily SM use and the year used. As the duration of SM use and the year of use increased, the SMA of the participants also increased. When the relevant literature is examined, the studies are similar to the findings obtained from the current study (Aktan, 2018; Radmard et al,

2020; Tutgun-Ünal & Deniz, 2016; Aslan & Tolan, 2022). People use SM for various purposes, such as sharing photos, having fun, using leisure time, accessing information, communicating, and being up-to-date (Solmaz et al, 2013). Such intensive use in daily life is thought to depend on the ease of access and use of SM, its ability to quickly deliver the messages desired to be conveyed to large masses, and the fact that it is completely free of charge. This study examined the relationship between automatic thoughts and SMA in university students. According to the results obtained, it was found that SMA increases as automatic thoughts increase. When the relevant literature is examined, the studies are compatible with the findings obtained from the current study (Aslan and Tolan 2022; Aksu et al, 2019). In addition, Chou and Edge (2012) stated that young people with high SMA levels have more intense thoughts of being wronged. In another study, Yığman et al. (2021) reported that SMA is positively related to dysfunctional attitudes and that automatic thoughts mediate the relationship between SMA and dysfunctional attitudes. Huang et al. (2023) reported that negative emotions are positively correlated with SM addiction. Some studies have stated that dysfunctional metacognitive beliefs are associated with SMA among young people (Casale et al, 2018; Marino et al, 2016; Huang et al, 2023; Lian et al, 2023). Some studies have found a significant positive relationship between Internet addiction and cognitive distortions (Demir, 2019; Özparlak, 2020; Yıldız, 2019). The fact that dysfunctional thoughts and attitudes have a significant relationship with SMA strengthens the findings of this study. Furthermore, the fact that cognitive distortions that form the basis of automatic thoughts are associated with Internet addiction, including SMA, supports the finding obtained in our study. Considering this finding, individuals with a high tendency toward automatic thoughts turn to SM to get rid of the anxiety caused by automatic thoughts.

According to the multiple linear regression analysis conducted in this study, automatic thoughts were found to be a significant predictor of SM addiction. When the related literature is examined, Aslan and Tolan (2022) stated that automatic thoughts significantly predicted SMA and explained 21% of the total variance in their study titled "social appearance anxiety, automatic thoughts, psychological well-being, and SMA in university students." Yığman ve ark. (2021) stated that dysfunctional attitudes and automatic thoughts positively predicted SMA. Ünal Aydın et al. (2021) reported that all factors related to metacognitions predicted problematic SM use. Keleş (2020) found that cognitive distortions were a significant predictor of secondary school students' problematic SM use. Similarly, cognitive distortions predict problematic Internet use in different studies (Çelik & Odacı, 2013; Şahan & Eraslan Çapan, 2017). Individuals with automatic thoughts tend to use the Internet, and problematic SM use increases as the Internet, which is necessary for SM access, is used. Accordingly, the person continues to use SM uncontrollably over time (Caplan, 2002). These findings support Young's (1999) view that negative core beliefs may be associated with pathological Internet use to overcome perceived inadequacies. According to Davis (2001), the fact that people with socialization problems and maladaptive cognitions prefer online social interactions are the basic elements of SMA. In the light of this information, the Internet and SMA should not only be seen as a behavioral problem but also as cognitive processes that play a major role in the background of behavior (Dinç, 2020). The stronger the beliefs about the positive effects of Internet, SM, and smartphone use on emotions and cognitions, the higher the tendency to engage in these behaviors (Casale et al, 2018). While negative automatic thoughts can result in the overuse of smartphones and SM platforms as a self-soothing behavior, positive automatic thoughts can also play an important role in the development of smartphone and SM addiction. People may engage in SM use as a means of cognitive-emotional self-regulation. The presence of negative automatic thoughts suggests that psychological distress rises to higher thresholds (e.g., deep thinking and anxiety may have become persistent), increasing the likelihood of engaging in problematic SM use as a way to escape from such persistent ways of thinking (Ünal Aydın et al, 2021).

Limitations

The study's limitation is that the sample group consists only of university students. Because the results obtained from the study can only be generalized to this group, conducting similar studies with individuals of different ages and educational levels would be useful."

CONCLUSION

When the results of the research are evaluated in general, it is observed that SM has an important place in the lives of young people. It was determined that as the automatic thoughts of the students increased, the SMA level increased, and automatic thoughts predicted SM addiction. To protect and prevent the harmful effects of the Internet and SM, seminars should be given to students in the risk group, academic and administrative staff working at the university, and parents about purposeful use and the positive and negative consequences of excessive use; posters should be hung in places determined by the university administration to raise awareness, and articles on this subject should be published on websites. Furthermore, it is recommended that psychoeducation studies be conducted for people with automatic thoughts and SM addiction. In this sense, cognitive and behavioral processes may be useful for treating SMA, and cognitive behavioral therapies may be a practical option.

Ethics Committee Approval: The Haliç University Social and Human Sciences Research Ethics Committee granted approval for this study (date: 10.07.2024, number: 06).

Informed Consent: Before the study data were collected, written informed consent was obtained regarding the purpose, duration and withdrawal from the study.

Conflict of Interest: The author have no conflict of interest to declare.

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Effect of an Online Group Programme based on Cognitive Behavioural Therapy Combined with Self-Compassion on Social Anxiety and Self-Compassion: A Pilot Study

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ABSTRACT

This pilot study examined the impact of an online psychoeducation group based on cognitive behavioural therapy (CBT) combined with self-compassion on social anxiety, automatic thoughts and self-compassion among university students. In line with the study's goal, a randomised control group pre-test, post-test and follow-up test design were used. The study group consisted of 18 university students from a public university in Türkiye (nine participants in each group). The experimental group underwent a six-session online programme combining CBT and self-compassion-based psychoeducation to reduce social anxiety, whereas the control group did not receive any treatment. The Liebowitz Social Anxiety Scale, Automatic Thoughts Scale and Self-Compassion Scale were used for data collection. The results showed that the levels of social anxiety and automatic thoughts of the students in the experimental group decreased, and their self-compassion levels increased. These findings suggest that the integrated approach used in this study is an effective online intervention for treating social anxiety.

Keywords: Automatic thoughts, cognitive behavioural therapy, self-compassion, social anxiety, psychoeducation.

ÖZ

Öz-Şefkat ile Birleştirilmiş Bilişsel Davranışçı Terapiye Dayalı Çevrim İçi Grup Programının Sosyal Anksiyete ve Öz-Şefkat Üzerindeki Etkisi: Bir Pilot Çalışma

Bu pilot çalışma, bilişsel davranışçı terapi ile öz-şefkati birleştiren çevrim içi psikoeğitim grup uygulamasının üniversite öğrencilerinin sosyal kaygı, otomatik düşünceler ve öz-şefkat düzeyleri üzerindeki etkisini inceledi. Çalışmanın amacı doğrultusunda, randomize kontrol gruplu ön-test, son-test ve izleme testi deseni kullanıldı. Çalışma grubu, Türkiye'deki bir devlet üniversitesine devam etmekte olan 18 üniversite öğrencisinden (her grupta dokuz katılımcı) oluşmaktadır. Deney grubuna sosyal kaygıyı azaltmak için bilişsel davranışçı terapi ve öz-şefkat temelli psikoeğitimi birleştiren altı seanslık çevrim içi bir program uygulanırken, kontrol grubu herhangi bir uygulamaya katılmadı. Veri toplama araçları olarak Liebowitz Sosyal Kaygı Ölçeği, Otomatik Düşünceler Ölçeği ve Öz-Şefkat Ölçeği kullanıldı. Sonuçlar, deney grubundaki öğrencilerin sosyal kaygı ve otomatik düşünce düzeylerinin azaldığını, öz-şefkat düzeylerinin ise arttığını gösterdi. Bu bulgular, bilişsel davranışçı terapi ile öz-şefkati birleştiren bir psikoeğitim grubunun sosyal kaygıyı azaltmaya yönelik etkili bir çevrim içi müdahale olabileceğini göstermektedir.

Anahtar Kelimeler: Otomatik düşünceler, bilişsel davranışçı terapi, öz-şefkat, sosyal kaygı, psikoeğitim.

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INTRODUCTION

Social anxiety is a common issue that significantly affects individuals' daily lives, characterised by a strong desire to make a positive impression, combined with insecurity about one's ability to do so (Rachman et al, 2000). It often arises in performance situations, where those with higher anxiety tend to limit self-disclosure to avoid negative evaluation (Cuming & Rapee, 2010). Social anxiety is prevalent among young people and disrupts social interactions, particularly in university settings, where it negatively correlates with communication with instructors and peers (Jefferies & Ungar, 2020; Morrison & Heimberg, 2013; Archbell & Coplan, 2022).

The prevalence of social anxiety disorder among university students varies depending on the population and assessment method (Schneier et al, 1992). Estimates range from 9.8% to 22% (Izgiç et al, 2000), whereas other studies have reported rates between 7.8% and 80% (Desalegn et al, 2019). Many students experience social anxiety without meeting the diagnostic criteria, making it essential to distinguish between normal nervousness and clinical social anxiety disorder (Schneier et al, 1992). Social anxiety is often under-recognised in higher education due to low self-reporting rates (Russell & Shaw, 2009). Affected individuals fear negative judgements before, during and after social interaction (Hope et al, 2010). Social anxiety has been linked to loneliness, problematic social media use and maladaptive cognitive patterns (O'Day & Heimberg, 2021), highlighting the need for university students to receive targeted treatment interventions.

Cognitive behavioural therapy (CBT) is an effective evidence-based treatment for social anxiety. This suggests that irrational beliefs triggered during stressful events contribute to anxiety and avoidance behaviours (Beck, 2010; Clark & Wells, 1995; Özdel, 2021). Reducing social anxiety requires identifying and challenging negative automatic thoughts (Iancu et al, 2015) as they shape self-perception and responses to social cues (Glashouwer et al, 2013). CBT techniques, such as exposure, behavioural experiments and cognitive restructuring, help counter irrational thoughts and reduce avoidance (Niles et al, 2021). Psychoeducational CBT interventions effectively provide coping skills and reduce social anxiety symptoms (Brown et al, 2018).

The coronavirus disease 2019 (COVID-19) pandemic has significantly increased the demand for online mental health services as many countries have turned to digital platforms to reduce infection risks. However, rising anxiety levels led individuals to prefer face-to-face interactions over online treatments. This shift highlights the need for e-mental health applications (Bentley et al, 2022; Wind et al, 2020). Online interventions can effectively reduce depression, anxiety and social phobia (Harrer et al, 2021; Titov et al, 2008). For social anxiety, online therapies can achieve effectiveness and satisfaction similar to face-to-face treatments (Jain et al, 2021).

Although research on Internet-based cognitive behavioural therapy (ICBT) for social anxiety is limited, studies suggest that it is effective (Niles et al, 2021; Nordmo et al, 2015; Riboldi et al, 2023). A meta-analysis found that online CBT is superior to other interventions (Harrer et al, 2019). ICBT allows individuals to engage in social assessment at their own pace and in a safe space, thereby reducing the anxiety associated with social assessment (Dryman et al, 2017). Based on the same principles as face-to-face CBT, ICBT offers greater flexibility in time and space, making it a valuable alternative for the treatment of social anxiety (Niles et al, 2021).

Research on social anxiety has increasingly highlighted the importance of self-compassion (Gill et al, 2018). Self-compassion alleviates social anxiety and addresses severe shyness in individuals with social anxiety disorder (Candea & Szentagotai-Tatar, 2018). Werner et al. (2012) found that individuals with SAD had significantly lower self-compassion scores, even after controlling for depression and anxiety. High self-compassion levels positively affect social anxiety symptoms (Gill et al, 2018). Self-compassion, a teachable skill for responding to personal pain with kindness, is invaluable (Neff & Toth-Kiraly, 2017, Neff & Toth-Kiraly, 2022). Studies, including those by Teale Sapach et al. (2023) and Stevenson et al. (2019), support the potential of self-compassion training in reducing social anxiety, particularly when added to CBT-based interventions.

This study contributes to the existing literature by developing an online psychoeducation programme that integrates CBT and self-compassion techniques to mitigate social anxiety. This study combined these approaches within a single programme and evaluates their combined efficacy. Additionally, it offers an accessible online format that is crucial for reaching a broader audience. The programme encompassed both informational content and practical exercises to assist participants in comprehending and managing their social anxiety symptoms more effectively. This pilot study aimed to explore the effects of an online CBT with a self-compassion programme on social anxiety. The first hypothesis predicted a significant decrease in anxiety and avoidance scores from the pre-test to the post-test, with continued improvement at the 3-month follow-up. The second hypothesis suggested a significant reduction in automatic thoughts, and the third predicted an increase in self-compassion scores in the experimental group. The fourth hypothesis anticipated significant differences between the post-test scores of the experimental and control groups, with the experimental group showing more favourable outcomes in anxiety, avoidance, automatic thoughts and self-compassion.

METHODS

This was an experimental study involving a RC group pre-test, post-test and follow-up design. Figure 1 shows the flow diagram of this study.

Participants

This study recruited 18 volunteer undergraduates (mean age=20.3 years, SD=1.5) from a public university in Türkiye, southern Anatolia. Figure 1 shows the flow of the study. Convenience sampling was used because of the limited number of eligible volunteers. Furthermore, the number of participants was deemed appropriate for the content and exercises of the online environment (Brown, 2018). To be eligible, participants had to score at or above the clinical cut-off (≥31) on the Social Interaction Anxiety Scale (SIAS) based on Turkish normative data; no formal DSM-5 diagnosis was required. Nine students (five females and four males) were randomly assigned to the experimental group and nine (seven females and two males) to the control group. The academic disciplines represented by the participants in the experimental group included gerontology, food engineering, nursing (n=2), English language teaching, cinema and television, sociology, city and regional planning and justice. Participants in the control group were from the fields of nutrition and dietetics, mechanical engineering, horticulture, psychology (n=3), medicine, tourism guidance and international relations.

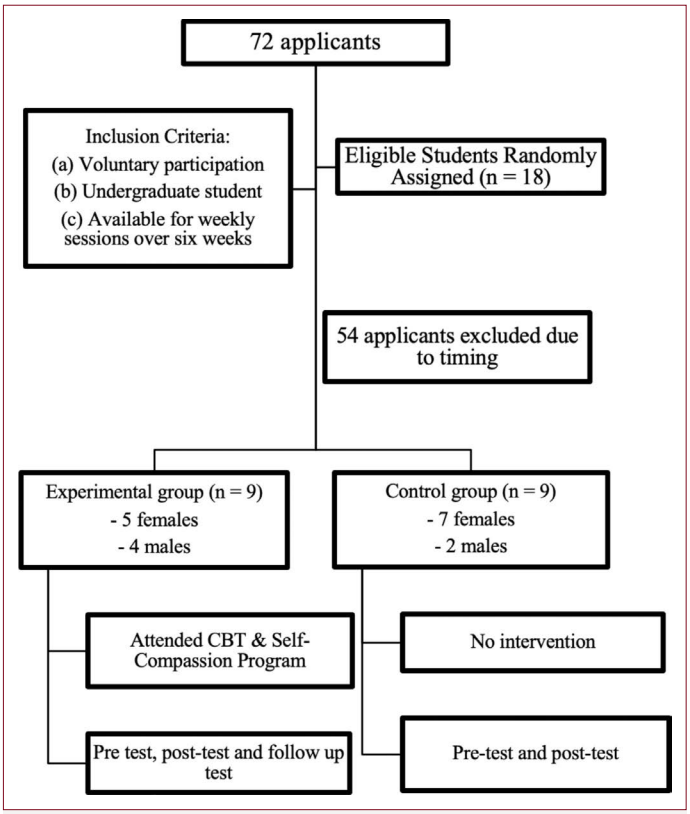

Figure 1. Study flow.

Data Collection Instruments

Primary Outcomes

The primary outcomes were the anxiety and avoidance sub-dimensions of social anxiety, which were measured using the Liebowitz Social Anxiety Scale (LSAS). Liebowitz (1987) developed this scale to assess the level of anxiety and avoidance experienced by individuals in their social interactions. The measure has 24 items and two subscales: anxiety and avoidance. The items were measured using a 4-point Likert scale, with higher scores indicating higher levels of social anxiety. Soykan et al. (2003) adapted the Turkish scale. Higher LSAS scores indicate higher levels of social anxiety. Cronbach's alpha coefficients for the Turkish version of the scale were 0.98 for the total scale, 0.96 for the anxiety subscale and 0.95 For the avoidance subscale. The Beck Anxiety Inventory was significantly correlated with the anxiety subscales, avoidance subscales and the whole scale (rsrr=0.26, 0.21 and 0.25, respectively, $p<0.05$).

Secondary Outcomes

The secondary outcomes included automatic thoughts and self-compassion. Automatic thoughts were measured using the ATS developed by Hollon and Kendall (1980) to assess negative self-directed thoughts. The scale comprises 30 items and five subscales. The items were measured on a 5-point Likert scale, with higher scores indicating a higher frequency of automatic thoughts. The Turkish adaptation of the ATS was carried out by Aydın and Aydın (1990), and the Cronbach's alpha coefficient for the Turkish version of the scale was reported as 0.93. Exploratory and confirmatory factor analyses of the Automatic Thoughts Questionnaire identified five factors that together accounted for 61% of the total variance, demonstrating construct validity.

Self-compassion was measured using the Self-Compassion Scale. The SCS developed by Raes et al. (2011) has 12 items and two subscales, with a 5-point Likert scale, with higher scores indicating higher levels of self-compassion. The Turkish adaptation study of the scale was carried out by Yıldırım and Sarı (2018), and the Cronbach's alpha coefficient was reported as 0.75. Confirmatory factor analyses of the 12-item Self-Compassion Scale–Short Form support its two-factor structure (RMSEA=0.06, GFI=0.96, NFI=0.91, CFI=0.95, NNFI=0.94).

Intervention and Procedure

This study followed the 1964 Declaration of Helsinki and was approved by the Scientific Research and Publication Ethics Committee for Social and Human Sciences of Akdeniz

University (approval date: 10.06.2022; approval number: 10-232). Participants provided electronic informed consent and completed the baseline questionnaires after receiving an email invitation. The first author delivered six weekly online sessions via a secure platform. Each 90-min session included a 5–15 min opening check-in and 30 min of psychoeducation, followed by practical activities and a brief 5-min closing meditation. Mid-week reminder emails and 5–10 min check-ins were sent to maintain engagement. Both groups completed the same pre-test (Week 0), post-test (Week 7) and follow-up (Week 19) assessments. The control group received no intervention during the study but was offered the programme afterwards. Recruiting students from several faculties and using an online format helped improve generalizability.

Online CBT with the Self-Compassion Programme

An online 6-week psychoeducational programme was designed to reduce social anxiety through a combination of CBT and self-compassion. The content was developed by reviewing various sources (Boersma et al, 2015; Gharraee et al, 2018; Gilbert, 2010; Heimberg, 2002; Niles et al, 2021; Sokol & Fox, 2019; Titov et al, 2008; Werner et al, 2012; Whitfield, 2010). The programme's structure, including the session content, goals, interventions and homework, was carefully planned. Each weekly session incorporated CBT-based exercises with self-compassion techniques. The brief content of the programme is provided in the Appendix.

The 6-week online programme began with a 90-min orientation in which the facilitator introduced herself, explained the CBT and self-compassion framework and worked with the participants to define social anxiety and self-compassion. The ground rules—confidentiality, punctuality, active sharing and homework completion—were co-created, and an icebreaker exercise ('What makes you different?') fostered group cohesion. The visual tools (the 4D model, Plutchik's Wheel) illustrated how thoughts, bodily sensations and behaviours interact in the context of social anxiety.

In Week 2, the participants learned to identify and challenge their negative automatic thoughts. The session covered cognitive distortions, evidence-based versus alternative thinking and self-compassion (self-kindness, common humanity and mindfulness). An externalisation exercise invited the participants to draw their 'anxiety character' and generate compassionate counter-thoughts; homework included daily thought records and guided diaphragmatic breathing practice. Week 3 focused on avoidance and safety behaviours. After reviewing the homework, the group mapped common escape tactics and discussed how self-compassionate confrontation could replace avoidance. In a creative 'compassionate strengths' activity, members sculpted and shared personal symbols of inner kindness. The session concludes with a brief self-compassion meditation. In the fourth session, the concepts of compassionate communication and self-awareness were introduced. Participants explored non-violent communication (observe–feel–need–request) and the Johari window model to broaden their 'open area'. Through subgroup brainstorming and role-play, members practiced observing without judgement, clearly expressing needs and giving and receiving feedback. A short breathing exercise reinforced a mindful presence. Week 5 addressed assertiveness ('secure assertion'), distinguishing refusal, praise and request rights. After reviewing Plutchik's Wheel to deepen emotional literacy, the participants contrasted 'I-language' with 'you-language' and applied their skills to real-life vignettes, generating aggressive, submissive and assertive responses. At the end of the session, meditation helped integrate assertive self-expression with self-compassion. In the final session, the facilitator guided a comprehensive review of all skills and led the participants to evaluate their progress against the initial goals ('Where I Was/Where I Am'). A metaphorical exercise invited participants to describe the programme as an object or living thing, underscoring personal growth. Following self-compassion meditation and post-test measures, certificates were awarded and farewells were exchanged.

Statistical Analysis

Preliminary analyses were conducted before the JASP main analyses. The normality assumption of the data was tested using histograms, Kolmogorov–Smirnov (p values ranged between 0.065 and 0.200) and Shapiro–Wilk tests (p values ranged between 0.082 and 0.952), which showed that the data followed a normal distribution. In addition, the kurtosis and skewness values of the data were examined, and it was determined that these values were between −2 and +2 (George & Mallery, 2010). Therefore, a t-test was used to compare the pre- and post-test scores of the experimental and control groups. ANOVA was used to compare the pre-test, post-test and follow-up test scores of the participants in the experimental group. The pre-test scores of the experimental and control groups did not differ significantly in total automatic thoughts ($t(16)=1.386$, $p=0.185$) or self-compassion ($t(16)=-0.030$, $p=0.976$). However, significant differences were found between the groups' pre-test scores in terms of anxiety ($t(16)=3.239$, $p=0.005$) and avoidance ($t(16)=2.351$, $p=0.032$). According to these results, the anxiety and avoidance scores of the participants in the experimental group were significantly higher than those in the control group. Therefore, an ANCOVA was used to compare the anxiety and avoidance post-test scores. In this study, post-hoc power analyses were conducted for tests at $\alpha=0.05$ (1-β error probe) using G*Power version 3.1.9.7 (Faul et al, 2007).

Table 1. Means and standard deviations for the study groups

Measurement		Experimental		Control	
	n	Mean	SD	Mean	SD
Pre-test					
Anxiety	9	40.11	11.90	24.00	9.00
Avoidance	9	36.56	11.14	24.56	10.51
Automatic thoughts	9	99.67	40.87	77.89	23.48
Self-compassion	9	27.00	10.07	27.11	4.34
Post-test					
Anxiety	9	20.89	11.45	27.22	10.16
Avoidance	9	19.67	9.01	26.22	9.38
Automatic thoughts	9	62.00	27.96	76.00	18.24
Self-compassion	9	35.11	6.11	27.00	5.57
Follow-up					
Anxiety	9	26.00	9.54		
Avoidance	9	23.56	10.68		
Automatic thoughts	9	60.78	27.06		
Self-compassion	9	34.22	6.418		

SD: Standard deviation.

Table 2. Differences among the experimental group scores

Measurements	n	df	F	p	η^2
Anxiety			15.452	0.001*	0.659
Pre-test	9	2			
Post-test	9	2			
Follow-up	9	2			
Avoidance			13.009	0.001*	0.619
Pre-test	9	2			
Post-test	9	2			
Follow-up	9	2			
Automatic thoughts			9.779	0.002*	0.550
Pre-test	9	2			
Post-test	9	2			
Follow-up	9	2			
Self-compassion			3.642	0.050	0.313
Pre-test	9	2			
Post-test	9	2			
Follow-up	9	2			

*: P<0.05; df: Degrees of freedom.

RESULTS

Differences Between the Experimental Group Scores

Table 1 provides descriptive statistics for the pre-test, post-test and follow-up scores of the experimental and control groups.

ANOVA was used to examine whether there was a significant difference between the experimental group's pre-test, post-test and follow-up test scores in terms of social anxiety, automatic thoughts and self-compassion. Table 2 presents the results.

The results for the experimental group presented in Table 2 indicate significant differences among the participants' pre-test, post-test and follow-up scores in anxiety (F=15.452, p=0.001) and avoidance (F=13.009, p=0.001) as primary outcomes and automatic thoughts (F=9.779, p=0.002) and self-compassion (F=3.642, p=0.050) as secondary outcomes. Post-hoc tests with Bonferroni correction were conducted for the social anxiety and automatic thoughts scores, and the results are shown in Table 3.

Table 3. Differences between the pre- and post-test scores of the experimental group

	n	MD	SE	t	p_{bonf}	η^2
Anxiety	9	19.222	3.582	5.366	0.001*	0.783
Avoidance	9	16.889	3.468	4.870	0.001*	0.748
Automatic thoughts	9	37.667	9.998	3.767	0.005*	0.639
Self-compassion	9	8.111	2.761	-2.938	0.019*	0.519

*: P<0.025; MD: Mean difference; SE: Standart error.

The results in Table 3 showed a significant difference between the pre- and post-test scores for anxiety (t=5.366, p=0.001) and avoidance (t=4.870, p=0.001) in favour of the post-test scores. Moreover, a significant difference was found between the pre- and post-test scores for automatic thoughts (t=3.767, p=0.005) and self-compassion (t=−2.938, p=0.019). No statistically significant differences were found between the post-test and follow-up test scores for anxiety (t=1.427, p=0.518), avoidance (t=1.121, p=0.836), automatic thoughts (t=−0.122, p=1.000) and self-compassion (t=0.270, p=0.791). These results suggest that the levels of anxiety and the avoidance sub-dimensions of social anxiety, as well as the levels of automatic thoughts and self-compassion, underwent significant changes from the pre-test to the post-test with large effect sizes and that these changes continued after three months.

Differences Between the Post-Test Scores of the Two Groups

The pre-test social anxiety scores were significantly different between the experimental and control groups. ANCOVA was performed to test for a significant difference in the post-test scores of social anxiety, while controlling for pre-test scores (Table 4).

Table 4. ANCOVA results for anxiety and avoidance scores

Post-test	MS	F	df	p	η^2
Anxiety	585.998	6.297	1	0.024*	0.296
Avoidance	502.003	8.089	1	0.012*	0.350

*: P<0.001; ANCOVA: Analysis of Covariance; MS: Mean square; df: Degrees of freedom.

Table 5. Differences between self-compassion and automatic thoughts post-test scores of the groups

	n	t	df	p	Cohen's d
Self-compassion	9	2.943	16	0.010*	1.387
Automatic thoughts	9	-1.258	16	0.226	-0.593

*: P<0.05; df: Degrees of freedom.

The ANCOVA results in Table 4 revealed that the mean anxiety post-test scores of the participants in the experimental group (X=20.88) were significantly lower than the mean anxiety post-test scores of the participants in the control group (X=27.22) with a large effect size (F(1,17)=6.297, p=0.024, η^2=0.353). Furthermore, the mean avoidance post-test scores in the experimental group (X=19.66) were significantly lower than those in the control group (X=26.22), with a large effect size (F(1,17)=8.089, p=0.012, η^2=0.350).

The independent samples t-test was used to test the difference between the mean self-compassion and automatic thoughts post-test scores of the experimental and control groups. Table 5 presents the results.

The post-test scores showed a significant improvement in self-compassion in the experimental group compared to the control group, with a large effect size (Cohen's d=1.387, p=0.010). Conversely, no significant difference was found between the groups in terms of automatic thoughts (p=0.226). This suggests that the intervention effectively enhanced self-compassion but did not significantly impact automatic thoughts.

DISCUSSION

This study examined the effectiveness of an online CBT programme integrated with self-compassion techniques to reduce social anxiety and automatic thoughts and enhance self-compassion among university students. These findings support the first hypothesis, which predicted a reduction in the anxiety and avoidance subscales of social anxiety. After completing the CBT programme with self-compassion, the experimental group showed significant decreases in both anxiety and avoidance levels, with large effect sizes. This reduction in social anxiety was maintained at the 3-month follow-up, suggesting the intervention's long-term effectiveness. In contrast, no significant changes in social anxiety were observed in the control group. These findings contribute to prior research showing that CBT-based psychoeducation can reduce social anxiety (Dryman et al, 2017; Nowakowski et al, 2016) and that self-compassion-focused interventions are effective in treating social anxiety (Gill et al, 2018). Face-to-face and online CBT interventions have similar efficacy in reducing social anxiety symptoms (Dryman et al, 2017).

The programme design, which adapted CBT techniques to incorporate self-compassion, may have influenced the reduction in social anxiety scores among participants in the experimental group. This integration may have allowed participants to engage with their thoughts and emotions in a more forgiving, non-judgemental manner, thereby reducing the negative automatic thoughts that perpetuate social anxiety. Self-compassion can be a valuable tool for reducing social anxiety and promoting emotional regulation (Pauley & McPherson, 2010).

The second hypothesis was also supported as the experimental group showed a significant reduction in the number of automatic thoughts. Follow-up analyses confirmed that this reduction was maintained. In contrast, no significant changes in automatic thoughts were observed in the control group. These results suggest that CBT with the self-compassion programme helped participants become more aware of their automatic thoughts and provided them with tools to challenge these thoughts. The inclusion of self-compassionate alternatives to negative automatic thoughts likely plays a key role in these positive outcomes. Self-compassion can effectively and automatically reduce negative thoughts (Arimitsu & Hofmann, 2015).

The third outcome of this study was the increase in self-compassion levels in the experimental group. Post-test comparisons between the experimental and control groups revealed significant differences from the experimental group, demonstrating increased self-compassion. Considering the content of the programme, the inclusion of self-compassion exercises in CBT may have contributed to the increase in self-compassion. Previous research has shown that self-compassion-based interventions reduce the symptoms of social anxiety and depression (Wilson et al, 2019), and CBT-based group therapy increases self-compassion (Hamedani et al, 2023). Thus, a higher level of self-compassion can be a channel for decreasing social anxiety (Candea & Szentagotai-Tatar, 2018) and can serve a regulatory function to reduce social anxiety. The findings of this study provide evidence that developing self-compassion and reducing negative thoughts can reduce the severity of anxiety symptoms (Arimitsu & Hofmann, 2015).

CONCLUSION

The findings of this study indicate that a six-session online CBT with a self-compassion programme can effectively reduce social anxiety and automatic thoughts and increase self-compassion. This study has several limitations. First, the small sample size (18 participants) may not fully represent the diversity of responses in a larger population. Post-hoc power analyses indicated adequate statistical power to detect significant effects. However, a larger sample size would enhance the generalizability of the results. Second, the follow-up period was relatively short (3 months). A long-term follow-up would provide more insights into the intervention's sustained effects. Notwithstanding these limitations, the findings of this study suggest that online group interventions incorporating CBT techniques together with self-compassion exercises may be recommended to mitigate social anxiety and automatic thoughts while enhancing self-compassion among university students.

Ethics Committee Approval: Social and Human Sciences of Akdeniz University Ethics Committee granted approval for this study (date: 10.06.2022, number: 10-232).

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Appendix

Session 1: Introduction, Goals and Rules

Information on the group process was provided.

Group rules were established.

Expectations and personal goals regarding the group process were stated.

The concepts of CBT, social anxiety and self-compassion were explained to the participants through the 4D cycle.

Activities: 'Meeting and warm-up activity' and 'Features I want to improve'.

Session 2: Automatic Thoughts and Self-Compassion

Automatic thoughts and concepts of self-compassion were explained to the participants.

The leader explained the formulation of social anxiety.

Generating a compassionate alternative to negative thoughts was explained.

Activities: 'Externalisation of thought and compassion alternative generation' and 'Breathing exercise'.

Homework: 'Thought recording exercise'

Session 3: Avoidance and Safety Behaviours

Information on escaping, avoiding and safety behaviours was provided.

The members' experiences of these behaviours were asked, and their common experiences were recorded.

The experience of compassionate confrontation versus avoidance was described.

Activities: 'My compassionate powers' and 'Self-compassion meditation'.

Session 4: Compassionate Communication

The importance of compassionate communication in improving interpersonal interactions was emphasised.

The participants learned empathy and understanding, which can effectively reduce social anxiety and improve relationships with others.

The concept of compassionate communication was explained.

Information on the Johari window was provided.

In-session and out-of-session experiments were designed.

Activities: 'Typical and compassionate communication', 'Self-awareness in compassionate communication' and 'Compassionate breathing exercise'.

Homework: 'Compassionate communication practice'.

Section 5: Assertiveness

This session was a continuation of compassionate communication.

The concept of assertiveness in interpersonal communication was introduced.

The assertiveness rights in interpersonal relationships were explained.

The ABC model is explained as an assertiveness framework.

The role of emotions in communication was introduced.

Activities: 'My aggressive and compassionate responses' and 'A brief meditation'

Session 6: Compassionate Conclusion

The entire group process was evaluated.

The participants' personal goals and expectations regarding the group process were revisited, and they were asked to evaluate their progress: 'What did I learn in the programme?'

Feelings and thoughts about the group process were reflected: 'What object or creature does this psychoeducation process resemble for you?'

Activities: 'What have I been, what have I become?' and 'Self-compassion meditation'.

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Effect of Psychiatry Internship on Schizophrenia Attitudes and Knowledge and its Relationship With Interpersonal Reactivity

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ABSTRACT

The attitudes and knowledge of medical students about psychotic disorders may change throughout their psychiatry training, but the literature presents inconsistent findings. This study aimed to evaluate the attitudes and knowledge of 6th-year medical students toward psychotic disorders before and after a psychiatry internship and examine the associations between these changes and the students' interpersonal reactivity and sociodemographic characteristics. The Attitudes toward Schizophrenia Questionnaire (ASQ) and the Interpersonal Reactivity Index (IRI) were administered to participants before the internship. The ASQ was re-administered after the internship. A total of 498 medical students from 6th year participated in this study. There was no significant difference in the overall ASQ scores applied to the participants before and after the psychiatry internship. A significant relationship was observed between the change in the ASQ remedy-seeking subscale and the IRI personal distress subscale, the ASQ treatment subscale and the IRI personal distress subscale, and the ASQ community-life subscale and the IRI perspective-taking subscale. The findings suggest that although the psychiatry internship alone may not lead to a significant overall change in students' attitudes, its impact may be observed in relation to specific aspects of interpersonal reactivity. This underlines that internships may have a limited impact on the attitudes of students unless they are supported by adequate empathy and interpersonal skills. The results highlight the importance of empathizing with and addressing personal distress in medical education programs.

Keywords: Attitude, psychotic disorders, interpersonal reactivity, psychiatry internship.

ÖZ

Psikiyatri Stajının Şizofreniye Yönelik Tutum ve Bilgiye Etkisi ve Kişiler Arası Reaktivite ile İlişkisi

Tıp fakültesi öğrencilerinin psikotik bozukluklara ilişkin tutum ve bilgi düzeyleri psikiyatri stajı süresince değişiklik gösterebilir; ancak literatürde bu konuda tutarsız bulgular bulunmaktadır. Bu çalışmada, altıncı sınıf tıp öğrencilerinin psikotik bozukluklara yönelik tutum ve bilgi düzeylerinin psikiyatri stajı öncesi ve sonrası değerlendirilmesi ve bu değişimlerin öğrencilerin kişiler arası tepki verebilirlik düzeyleri ile sosyodemografik özellikleriyle ilişkilerinin incelenmesi amaçlandı. Katılımcılara, araştırmacılar tarafından geliştirilen bir sosyodemografik bilgi formu, Şizofreniye Yönelik Tutumlar Ölçeği (ŞYTÖ) ve Kişiler Arası Tepkisellik İndeksi (KTİ) psikiyatri stajı öncesinde uygulandı. ŞYTÖ, staj sonrasında tekrar uygulandı. Toplam 498 altıncı

sınıf tıp öğrencisi çalışmaya katıldı. Psikiyatri stajı öncesi ve sonrası uygulanan ŞYTÖ toplam puanları arasında anlamlı bir fark bulunmadı. Ancak, ŞYTÖ'nün "yardım arama" alt ölçeği ile KTİ'nin "kişisel sıkıntı" alt ölçeği, ŞYTÖ'nün "tedaviye yönelik tutum" alt ölçeği ile KTİ'nin "kişisel sıkıntı" alt ölçeği ve ŞYTÖ'nün "toplumsal yaşama katılım" alt ölçeği ile KTİ'nin "bakış açısı alma" alt ölçeği arasında anlamlı ilişkiler bulundu. Bulgular, psikiyatri stajının tek başına öğrencilerin genel tutumlarında anlamlı bir değişim yaratmasa da kişiler arası tepkiselliğin belirli boyutlarıyla ilişkili olarak etkisinin gözlemlenebileceğini göstermektedir. Bu durum, psikiyatri stajının öğrencilerin tutumlarında anlamlı bir değişim yaratabilmesi için uygun empati ve kişiler arası becerilerle desteklenmesi gerektiğini vurgulamaktadır. Sonuçlar, tıp eğitimi programlarında empatinin güçlendirilmesinin ve kişisel sıkıntının ele alınmasının önemini ortaya koymaktadır.

Anahtar Kelimeler: Tutum, psikotik bozukluklar, kişiler arası tepkisellik, psikiyatri stajı.

INTRODUCTION

The stigmatization of mental illnesses constitutes one of the main problems in the field of mental health. Despite the increase in general knowledge about the nature and etiology of mental illnesses, negative attitudes, prejudices, and stigma surrounding severe mental illnesses, such as schizophrenia, tend to continue in academic circles and the public (Corrigan & Watson, 2002). Stigmatization causes people with mental illnesses to be excluded from society and social life by restricting their opportunities such as getting married, renting a house, finding a job and working, socializing, and having close relationships with other people (World Health Organization, 2002). This situation increases the gap between people with mental illnesses and society, prevents them from receiving social support, which is very important for them, and causes them to detach even more from social relations, resulting in a decrease in their ability to cope with their illnesses and the development of resistance to treatment.

Therefore, the study of stigmatization and attitudes toward mental illness has recently become an important area of study in the field of mental health. In the study by Dickerson et al. (2002), the rates of negative attitudes of different groups toward individuals with schizophrenia were examined, and it was found that 61% of the society, 36% of their employers, 20% of mental health workers, 19% of family members, 14% of their friends, and 11% of their partners have negative attitudes toward people with schizophrenia. The exclusionary and stigmatizing approach of healthcare professionals, who provide healthcare services and act as consultants and models in the field of health, stands out as one of the most important factors affecting the negative attitude of the society toward people with mental illness (Yüksel & Taşkın, 2005). Patients with mental health problems are sensitive to the attitudes of healthcare professionals. The negative attitudes of healthcare professionals may make patients with mental illnesses less inclined to seek necessary help. For all these reasons, recent attitudes studies have mostly focused on determining the attitudes of healthcare workers (Eşsizoğlu & Arısoy, 2008).

Negative attitudes toward schizophrenia were found to be common in studies evaluating the judgments and beliefs of medical faculty and nursing school students, general practitioners, psychiatry nurses, psychiatrists, and other specialists. Furthermore, the majority of medical professionals seem to perceive patients with schizophrenia as aggressive and dangerous (Arkan et al, 2011; Dickerson et al, 2002; Ergün, 2005; Özyiğit et al, 2004; Taşkın et al, 2003). A recent study conducted on the attitudes of medical faculty students toward psychotic disorders found that negative attitudes are common among students (Kong et al, 2020). In most studies investigating the attitudes of medical faculty students toward mental illnesses, evaluations were made before and after the psychiatry internship, and the effect of the psychiatry internship on attitudes and knowledge toward mental illnesses was investigated. The results of these studies were contradictory. Studies have reported that psychiatry internship has led to significant changes in attitudes toward mental illnesses (Keane, 1990; Mino et al, 2001; Singh et al, 1998), and studies have reported that it has not (Arkar & Eker, 1997; Özmen et al, 2003). In their study investigating the attitudes of medical students toward schizophrenia, Yanik et al. (2003) found that a history of psychiatry education did not change the negative attitudes about patients with schizophrenia regarding social life; accordingly, special education programs are needed to change attitudes toward schizophrenia.

This study aimed to evaluate the knowledge and attitudes of 6th-year medical faculty students toward psychotic disorders before and after the psychiatry internship and examine the relationship between the changes in students' knowledge and attitudes with their interpersonal reactivity, as measured by the Interpersonal Reactivity Index (IRI), and various demographic features. Unlike previous studies that have often focused solely on the impact of education, this research uniquely investigates how IRI-assessed individual differences in empathy and personal discomfort mediate the effect of the psychiatry internship on attitudes toward psychotic disorders.

Understanding this relationship can inform more targeted educational interventions to effectively reduce stigmatization among future healthcare professionals. This study hypothesizes that students with higher levels of empathic abilities (specifically in the empathic concern subscale), lower perception of personal distress in interpersonal relationships, and students who report spending more time with patients in the clinic will exhibit more prominent positive changes in their attitudes compared to others.

METHOD

Sample

The study included 498 medical students from 6th year attending Eskişehir Osmangazi University Medical School between July 2018 and July 2022. Before starting the 1-month psychiatry internship, the researchers created a sociodemographic information form, IRI, and Attitudes toward Schizophrenia Questionnaire (ASQ) were administered to all students. After the internship, the ASQ was again administered to the students, and a questionnaire regarding a general evaluation of the psychiatry internship was also administered. All questionnaires were administered by impartial observers.

The psychiatry internship of 6th-year medical students at Eskişehir Osmangazi University Medical School lasted 30 days, 15 of which were spent in the inpatient clinic and 15 in the outpatient clinic. Our inpatient psychiatric ward is a locked unit with a capacity of 23 beds accommodating both male and female patients. The patient population mostly consisted of patients with psychotic disorders and those with bipolar disorder. During their time in the inpatient unit, students interact with patients, observe diagnostic interviews, and participate in group processes such as morning meetings and various activities. In addition, students have two-night shifts during the internship and participate in 8 hours of internship lessons and 8 hours of literature review lessons.

Forms and Questionnaires Used in This Study

The sociodemographic information form: This form is created by the researchers. It contains items questioning the age and gender of participants and any history of psychiatric diagnosis or treatment in participants and their relatives.

Interpersonal Reactivity Index (IRI): Mark H developed IRI. Davis for a multi-dimensional evaluation of empathy (Davis, 1980). The validity and reliability study of the Turkish version was conducted by Engeler and Yargıç (2007). This self-report scale is a five-point Likert-type scale comprising 28 items. The IRI is divided into four subscales, each consisting of seven items, and each subscale evaluates a different aspect of empathy. These subscales consist of prospective taking (PT), empathic thinking (ET), PD, and fantasy scale (FS).

The PT subscale measures a person's tendency to put themselves in the shoes of others, to look at events and situations from other people's perspectives, and to accept others' perspectives. PT corresponds to empathy's cognitive dimension.

The ET subscale measures emotional responses, such as closeness and warmth, to other people's experiences and evaluates the emotional dimension of empathy. The PD subscale refers to the severity of feelings, such as distress and discomfort, felt by the person when faced with negative experiences of other people, during tense interpersonal relationships, and in situations that may cause negative emotions in the majority of people. The FS subscale measures a person's ability to put themselves in the shoes of characters in movies, games, or novels and to perceive their feelings and behaviors. This subscale is also highly correlated with emotional empathy.

Attitudes Toward Schizophrenia Questionnaire (ASQ): The Psychiatric Research and Education Association prepared the ASQ to evaluate attitudes toward psychiatric disorders. It is commonly used in attitude and stigmatization studies in Turkey (Aker et al, 2002; Yuksel et al, 2019). It is a five-point Likert-type self-report survey. In our study, questions of this scale were applied, except for the first part of the schizophrenia section (28 items). The ASQ consists of four subscales, each consisting of seven items. The overview subscale evaluates a person's degree of general knowledge about schizophrenia ("schizophrenia is a state of extreme sadness" and "schizophrenia is a disease"). The community-life subscale questions stigmatizing and marginalizing behaviors toward patients with schizophrenia seen in social life ("I can work with a person who has schizophrenia" and "If I had a house I wouldn't rent it to a person with schizophrenia"). The treatment subscale measures a person's general knowledge about schizophrenia treatment ("schizophrenia is a disease that can be treated with psychotherapy" and "drugs used in the treatment of schizophrenia cause serious side effects"). The remedy-seeking subscale questions opinions about the extent of recovery for a person with schizophrenia and what he or she should do to recover ("she has to go to a doctor first" and "she can overcome this situation if she wishes").

Statistical Analysis

Continuous data are presented as mean±standard deviation. Categorical data are expressed as frequency and percentage. The normal dispersion fitness was tested using the Shapiro-Wilk test. The paired samples t-test was used for normally distributed data, and the Wilcoxon signed-rank test was used for unevenly distributed data when comparing the

Table 1. Distribution of participants' demographic characteristics and their relationship to changes in ASQ scores

Demographic variable	Percentage (%) (female/male, yes/no)	Relationship with the change in ASQ scores
Gender	49.4/50.6	p=0.027*
History of psychiatric application	19.9/80.1	
History of psychiatric diagnosis	12.8/87.2	
History of psychiatric treatment	12.6/87.4	
Current psychiatric treatment options	4.8/95.2	p=0.044**
Psychiatric application in the family	34/66	
Family psychiatric diagnosis	22.9/77.1	
Schizophrenia in the family	2.7/97.3	
Schizophrenia in acquaintances	8/92	
Are you satisfied with your psychiatric internship?	48.5/50.4	p=0.032***
Do you think that you have spent enough time with your patients?	57.2/42.8	

*: P-value regarding the change in ASQ community-life subscale scores in female students. **: P-value regarding the change in ASQ treatment subscale scores in the group of students receiving current psychiatric treatment. ***: P-value regarding the change in total ASQ scores in the group of students who stated they were satisfied with the psychiatry internship. ASQ: Attitudes toward schizophrenia.

changes in ASQ scores before and after the internship. A two-way repeated measures analysis of variance (ANOVA) was conducted to examine the relationship between the changes in the scores of the ASQ and IRI subscales. This approach allowed us to simultaneously assess the main effects of time (pre- vs. post-internship) and specific IRI subscales, as well as their interaction effect on ASQ subscale scores. Analyses were conducted using IBM SPSS Statistics 21.0 program. For the statistical significance level, a $p<0.05$ criterion value was set.

Ethics

The Clinical Research Ethics Committee of Eskişehir Osmangazi University approved this study. This study was conducted in accordance with the principles of the Declaration of Helsinki.

RESULTS

A total of 498 medical students from 6th year participated in this study. Of the participants, 49.4% were women and 50.6% were men. Among the participants, the rate of participants with a previous history of psychiatric admission was 19.9%, the rate of participants with a history of previous psychiatric treatment was 12.6%, the rate of participants with a current history of psychiatric treatment was 4.8%, the rate of participants with a family history of psychiatric admission was 34%, the rate of participants with a family history of psychiatric disease was 22.9%, and the rate of participants with a family history of schizophrenia was 2.7%. The percentage of participants who had an acquaintance with the diagnosis of schizophrenia was 8%. Moreover, 48.5% of the participants stated that they were satisfied with the psychiatry internship, and 57.2% stated that they spent enough time with their patients during their psychiatry internship.

There was no significant difference between the ASQ scores applied to the participants before and after the psychiatry internship ($p>0.05$). The change in the ASQ scores of the participants who stated that they were satisfied with the psychiatry internship was statistically significantly higher ($p=0.032$). The change in the ASQ community-life subscale scores of female students was statistically significantly higher ($p=0.027$). The change in the ASQ treatment subscale scores of students who are currently receiving psychiatric treatment was statistically significantly higher ($p=0.044$). Previous psychiatric treatment had no significant effect on the change in the ASQ score ($p>0.05$) (Table 1).

A two-way ANOVA was conducted to examine the relationship between the change in the ASQ scores before and after the internship and the IRI scores. The results revealed a significant relationship between the change in the ASQ remedy-seeking subscale score and the IRI personal discomfort subscale score ($p=0.006$). A significant correlation was found between the change in the ASQ treatment subscale score and the IRI personal discomfort subscale score ($p=0.012$). There was a significant relationship between the change in the ASQ community-life subscale score and the IRI perspective-taking subscale score ($p=0.006$). The association of change in the ASQ treatment subscale score and the IRI fantasy subscale score was borderline statistically significant ($p=0.052$) (Table 2).

Table 2. Relationship between changes in the ASQ and IRI subscale scores

ASQ subscale	IRI subscale	p	Time	Mean	SD	F	η_p^2
Remedy-seeking	Personal discomfort	**0.006**	t1	28.45	0.324	1558	0.07
			t2	29.29	0.238	7.9	
Treatment	Personal discomfort	**0.012**	t1	15.51	0.313	370.9	0.05
			t2	15.38	0.263	6.4	
Community-life	Perspective-taking	**0.006**	t1	22.72	0.376	192.3	0.06
			t2	23.21	0.357	7.7	

SD: Standard deviation; ASQ: Attitudes Toward Schizophrenia Questionnaire; IRI: Interpersonal Reactivity Index.

DISCUSSION

The findings of the studies conducted to date on whether attitudes toward mental illnesses can be improved with education are contradictory. In addition to studies that found that psychiatric education improves attitudes toward mental illnesses, some studies found no change. Yanık et al. (2003) examined the attitudes of 4th-year students who had no psychiatric education, 5th-year students who received only theoretical education, and 6th-year students who received both theoretical and applied education. No difference was found between the groups in most cases, and more negative attitudes were observed in the educated subjects in some items. In Ikiışık's (2008) study, stigmatization toward mental illness was qualitatively examined with 62 medical faculty students from the 1st and 6th years, and it was determined that the psychiatry internship during the education process did not provide more positive attitudes toward schizophrenia. The conflicting data on the effects of education on attitudes may be due to methodological differences between studies. The results of this study are consistent with those of other studies that found that education alone has no effect on attitudes toward mental illnesses. In addition, although the amount of knowledge about the etiology and treatment of mental illnesses has increased significantly in the last 50 years, attitudes toward mental illness have remained unchanged, which may support the opinion that the stigma on mental illnesses is too complex to be explained solely by lack of education or knowledge (Dickerson et al, 2002). A recent study examined various approaches for reducing stigmatization of mental illnesses, and the results were found to be inconsistent (Heim et al, 2020). This may be due to the fact that while education has been emphasized in attitude studies conducted so far, personal factors such as interpersonal reactivity that may cause stigmatization have not been adequately examined.

Considering the sociodemographic characteristics that may affect attitudes toward schizophrenia, the significantly higher change in the ASQ community-life subscale scores of female participants may be a result of the fact that women are living in a patriarchal society and therefore can easily identify with the problems that patients with schizophrenia may experience in their social lives. In a study comparing the IRI scores of female and male medical school students, the scores of female students in empathy were higher than those of male students (Worly et al, 2019). Therefore, the difference observed in our study between genders in terms of attitude change may be due to women having better emphatic skills in general. While there was a significant change in the treatment subscale scores in the group currently receiving psychiatric treatment, the absence of a significant change in the group that received diagnosis or treatment in the past can be interpreted as the effect of receiving treatment on attitudes is only temporary. The positive relationship between students' satisfaction levels with the psychiatry internship and total attitude score change may be explained by the possibility that students who generally had positive feelings about the internship had more opportunities to interact with patients and thus improved their attitudes. The subjective perception of spending enough time with patients does not seem to be related to the change in attitude.

One of the important reasons for stigmatizing attitudes toward patients with schizophrenia is that these patients are perceived as dangerous and unpredictable individuals (Arkan et al, 2011; Link & Phelan, 2001). Stigmatization results in social distancing, which increases the group's marginalization by decreasing the interaction between the person and the stigmatized group, leading to a vicious cycle that perpetuates the stigma (Angermeyer & Dietrich, 2006). In situations that require establishing personal closeness, the need to maintain social distance and the tendency to decrease interaction with the stigmatized person increase (Arkan et al, 2011; Sari et al, 2005). Contact and social interaction with individuals with severe mental illness improve attitudes toward these patients (Altındag et al, 2006; İkiışık, 2008). In contrast, the findings of this study indicate that contact with individuals with mental diseases is not sufficient by itself for decreasing stigmatizing attitudes, but it is a necessary prerequisite.

In general, no change was found in the attitudes of students before and after the psychiatry internship. However, when the relationship between the difference in attitude scores and the IRI subscale scores was examined, students who scored higher in the IRI emphatical thinking subscale and those who scored lower in the IRI discomfort subscale had higher changes in their ASQ scores after the psychiatry internship. The negative correlation between the changes in the ASQ treatment and remedy-seeking subscales and the IRI personal discomfort scores may be interpreted as students with low interpersonal discomfort levels being more comfortable spending time and interacting with psychotic patients during the internship, thus having more positive experiences that improve their beliefs about the treatability of psychotic illnesses. This finding may also mean that students with higher levels of discomfort in interpersonal relations tend to avoid actively interacting with patients with psychosis during their internships and are therefore unable to have experiences that will change their attitudes.

The correlation between the change in the ASQ community-life subscale and the IRI perspective-taking subscale scores may indicate that students who have higher cognitive empathy skills can more easily identify with the social problems that psychotic patients may experience during their internships. In various attitude studies examining stigmatization against patients with AIDS, patients with alcohol and substance use disorders, homeless people, and ethnic minorities, empathizing with the stigmatized group is emphasized as one of the basic conditions necessary to decrease stigmatization (Batson, 2014; Eisenberg & Miller, 1987; Batson et al, 2002). In this respect, the findings of our study align with those of other studies that examine the relationship between empathic listening and the improvement of attitudes toward stigmatized groups, as well as the increase in helping behavior. Batson et al. (2002) conducted a study on the stigmatization of patients with alcohol and substance use disorder and found that those who listen to patients empathically can better put themselves in the patient's shoes, understand the difficulties they experience or may experience, and their attitudes toward the patient change positively. The change in their attitudes was not only for the individual they interacted with but also for the whole group of patients with the same diagnosis (Batson et al, 2002).

These findings underline the importance of not only the lack of knowledge but also personal factors, especially the lack of empathic listening skills, in the development and persistence of negative attitudes. In a recent study, narratives in the form of stories were incorporated in undergraduate teaching, and it was found that they increase the knowledge of medical students about psychotic disorders, but do not cause a permanent change in their attitudes (Tsoi et al, 2021). Although use of narratives facilitates learning, a model beyond education aiming to enhance knowledge is necessary to affect a change in attitudes. To combat the stigmatizing attitudes of healthcare professionals toward individuals with mental illnesses, enabling students to interact more with patients during internships and adding empathic skills training to education programs may be beneficial. A study examining the relationship between IRI and burnout syndrome among medical students found that students with low empathy scores and high personal discomfort scores were more likely to experience burnout (Von Harscher et al, 2018). These findings are important in showing the effects of interpersonal reactivity in different areas, especially the importance of empathy skills and personal discomfort interventions in medical education programs.

Despite its contributions, this study has several limitations. First, the data were collected from students at a single medical school, which may limit the generalizability of the findings to other institutions or cultural contexts. Second, while the study broadly assessed attitudes toward psychotic disorders, the ASQ primarily focuses on schizophrenia, which might limit the representativeness of the attitudinal assessment for the broader category of psychotic disorders. Additionally, the reliance on self-report questionnaires (ASQ and IRI) introduces the potential for response bias, where participants might provide socially desirable answers rather than their true attitudes or feelings. Future research could benefit from incorporating objective measures or qualitative methods to complement self-reported data. Furthermore, although significant correlations were found, the study's design does not permit drawing causal conclusions between interpersonal reactivity and attitude change. Longitudinal studies with larger and more diverse samples are needed to further explore these relationships and the long-term impact of PT.

CONCLUSION

To the best of our knowledge, this is the first study to examine the relationship between stigmatization and IRI. The findings of this study are significant in explaining the conflicting results found in previous studies regarding the effect of psychiatry internship on attitudes. The effect of the psychiatry internship on students' attitudes appears to occur only when there is a capacity to empathize and interact with patients easily. Additional studies are needed to better examine the relationship between stigmatization and empathy.

Ethics Committee Approval: The Eskişehir Osmangazi University Ethics Committee granted approval for this study (date: 18.04.2017, number: 13).

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Quality and Reliability Analysis of Youtube Videos on Obsessive Compulsive Disorder and its Treatment

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ABSTRACT

The Internet is a crucial and popular health knowledge resource for individuals. YouTube ranks among the most frequently used social media platforms globally. Multiple studies have reported that the quality of health information in YouTube videos is low, and many YouTube users are exposed to such low-quality information. This study aims to establish the quality and reliability of the most-viewed videos about obsessive-compulsive disorder (OCD) and its treatment. On September 15, 2024, the terms "obsessive-compulsive disorder," "OCD," "obsessive-compulsive disorder treatment," and "OCD treatment" were searched on YouTube. Video features (duration of the video, number of likes, comments, and views) and upload sources were noted. Quality and reliability were evaluated based on the Quality Criteria for Consumer Health Information (DISCERN) and the Global Quality Scale (GQS) scores. A total of 126 most-viewed YouTube videos were assessed, and exclusion criteria were subsequently applied. The analysis showed that 31.8% of the YouTube videos on OCD and OCD treatment were very poor or poor, 31.8% were fair, and 36.4% were good or excellent. Our findings revealed that DISCERN (p=0.004) and GQS (p=0.000) scores were significantly higher for YouTube videos uploaded by healthcare providers than for those uploaded by independent users. There were no relationships between DISCERN scores and video duration and popularity indices (likes, comments, view ratio, Video Like Ratio, and Video Power Index [VPI]). However, the view ratio, number of likes, and VPI were significantly higher for videos rated as fair compared to those in the other groups (p<0.05). Platforms such as YouTube have become significant public resources for mental health education. To increase the impact of medical videos, efforts should be focused on maintaining high-quality content while keeping the video length concise. Optimizing both content quality and video length can significantly improve the effectiveness of health-related videos as primary sources of information from health professionals.

Keywords: DISCERN, global quality scale, OCD, OCD treatment, YouTube

ÖZ

Obsesif Kompulsif Bozukluk ve Obsesif Kompulsif Bozukluk Tedavisi ile İlgili YouTube Videolarının Kalite ve Güvenilirlik Analizi

İnternet, bireyler arasında önemli ve popüler bir sağlık bilgisi kaynağıdır. YouTube, dünya çapında en sık kullanılan sosyal medya platformları arasında yer almaktadır. Birçok çalışma, YouTube videolarındaki sağlık bilgilerinin kalitesinin düşük olduğunu ve birçok YouTube kullanıcısının bu tür bilgileri izlediğini bildirmiştir. Bu çalışma, obsesif kompulsif bozukluk (OKB) ve tedavisi hakkında en çok izlenen videoların kalitesini ve güvenilirliğini belirlemeyi amaçlamaktadır. 15 Eylül 2024'te YouTube'da "obsesif kompulsif bozukluk, OKB, obsesif kompulsif bozukluk tedavisi ve OKB tedavisi" terimleri arandı. Video özellikleri (vi-

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deonun süresi, beğeni sayısı, yorumlar, görüntülemeler) ve yükleme kaynakları not edildi. Kalite ve güvenilirlik, Tüketici Sağlığı Bilgileri için Kalite Kriterleri (Quality Criteria for Consumer Health Information-DISCERN) aracı ve Global Kalite Ölçeği (Global Quality Scale-GQS) ile değerlendirildi. Toplamda 126 adet en çok izlenen YouTube videosu değerlendirildi ve sonrasında dışlama kriterleri uygulandı. Mevcut çalışmada OKB ve OKB tedavisi ile ilgili YouTube videolarının %31,8'inin çok kötü veya kötü, %31,8'inin orta ve %36,4'ünün iyi veya mükemmel olduğu belirlendi. Bulgularımız, sağlık hizmeti sağlayıcıları tarafından yüklenen YouTube videolarında DISCERN (p=0,004) ve GQS (p=0,000) puanlarının, bağımsız kullanıcılar tarafından yüklenen videolara göre önemli ölçüde daha yüksek olduğunu ortaya koydu. DISCERN puanları ile video süresi ve popülerlik endeksleri (beğeniler, yorumlar, görüntülenme oranı, Video Beğenme Oranı [VLR] ve Video Güç Endeksi [VPI]) arasında bir ilişki yoktu. Ancak görüntülenme oranı, beğeni sayısı ve VPI, orta videolarda diğer gruplara göre önemli ölçüde daha yüksekti (p<0,05). YouTube gibi platformlar, ruh sağlığı eğitimi için önemli kamu kaynakları haline gelmiştir. Tıbbi videoların etkisini artırmak için, çabalar daha kısa video uzunlukları ve yeterli yüksek kaliteli içeriği korumaya odaklanmalıdır. İçerik kalitesini ve video uzunluğunu optimize etmek, sağlık profesyonelleri aracılığıyla birincil sağlık bilgi kaynakları olarak sağlık ile ilgili videoların etkinliğini önemli ölçüde artırabilir.

Anahtar Kelimeler: DISCERN, global kalite ölçeği, obsesif kompulsif bozukluk, obsesif kompulsif bozukluk tedavisi, YouTube.

INTRODUCTION

The Internet and social media have become deeply integrated into modern life, significantly influencing various domains, including healthcare. Individuals increasingly turn to the Internet as a primary resource for seeking information on health-related issues (Madathil et al, 2015). YouTube is a widely used video-sharing platform that hosts substantial medical content, as anyone can freely upload and access videos (Sanchez Bocanegra et al, 2017). Platforms such as YouTube have been recognized for their potential psychoeducational value, suggesting the need for structured approaches to health information dissemination on these platforms (Godwin et al, 2017). However, concerns persist about the quality of information, as inaccurate or misleading health-related content can pose risks to viewers (Madathil et al, 2015). Recent studies have investigated the quality of mental health content on disorders such as psychotic, attention-deficit and hyperactivity, mood, and generalized anxiety disorders (Alsabhan et al, 2024; Kumar & Jha, 2018; MacLean et al, 2017; Ward et al, 2020). Videos on obsessive-compulsive disorder (OCD) are also widely available on YouTube, with some garnering millions of views. Research has shown that it can take between 8 and 17 years from the onset of symptoms in a patient with OCD to the initial reciept of treatment (Hirschtritt et al, 2017). When clinicians recommend treatment, patients and their families may search for additional information related to the proposed therapies online, including on YouTube. The quality and reliability of YouTube videos about OCD have been found to be poor in the literature (Kaya et al, 2021). Accurate and reliable information can enhance awareness, encouraging individuals to seek professional help, whereas misleading information could hinder help-seeking behaviors in those affected by OCD. Specifically, it may be crucial to evaluate whether there is a quality difference between the videos of independent users and healthcare providers. Therefore, this study aimed to assess the quality and reliability of YouTube videos related to OCD and its treatment, a topic of significant public interest.

METHOD

On September 15, 2024, a YouTube search was conducted using the terms "obsessive compulsive disorder," "obsessive compulsive disorder treatment," "OCD," and "OCD treatment." The filters were set to "worldwide" and "all categories," and the results were organized according to popularity (most-viewed). Based on the exclusion criteria, the following types of videos were excluded from the analysis: restricted videos that were less than 30 s long; irrelevant, non-English, and purely commercial videos; and videos that lacked audio and visual content (Fig. 1). In multipart series uploaded by the same source, each video was treated as a separate video. The "most-viewed" filter was specifically used to identify videos with broad public engagement. Consequently, the top 100 videos that met the inclusion criteria were selected, resulting in a final sample size of 126 videos, which was deemed sufficient for robust statistical analysis based on previous studies (Barlas et al, 2023; Li et al, 2019).

Each eligible video was securely archived for backup purposes. Two researchers independently conducted the initial searches to ensure reliability. Subsequently, an experienced psychiatrist and a medical student with a minimum of 5 years of medical training independently evaluated and rated each video.

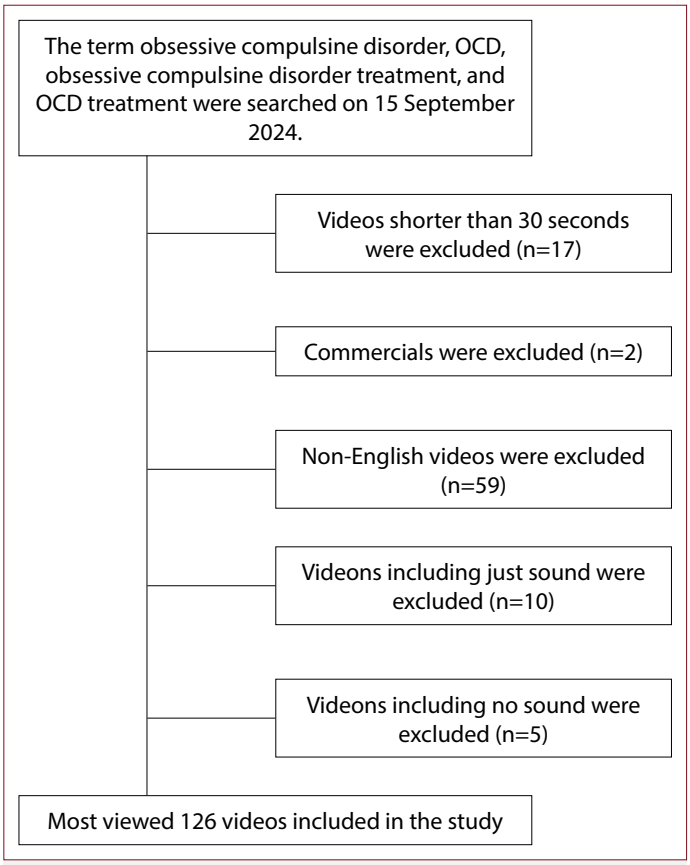

Figure 1. Video extraction based on the exclusion criteria.

Inter-rater reliability was assessed, and the average of the evaluators' scores was used for statistical analyses. Videos were categorized by their source, either healthcare providers or independent users, and further classified by content type, such as symptoms (Diagnostic and statistical manual of mental disorders: DSM-5™, 5th ed, 2013) or pharmacological treatments for OCD. Standardized tools, including the Quality Criteria for Consumer Health Information (DISCERN) and the Global Quality Scale (GQS) scores, were employed to assess all videos, regardless of their source. For each video, detailed data were recorded, including the URL, duration in minutes, number of days since upload, upload source, number of views, "likes," and "comments." Additional popularity metrics, such as the view ratio (number of views per day), video-like ratio (VLR=100×likes/[likes+dislikes]), and video power index (VPI=VLR×view ratio/100), were calculated. The VPI was particularly useful in adjusting for upload date variability, offering a more precise measure of video popularity than raw view counts alone. These metrics, validated in prior research (Moon & Lee, 2020), enabled a standardized quality and reliability assessment. The evaluation criteria focused on parameters such as informational relevance, clarity of purpose, source transparency, and instructional value for viewers. To establish the quality and reliability of the videos, we applied DISCERN and GQS. These instruments have been widely used in previous studies and are considered reliable tools for assessing the quality and credibility of medical topics on video-sharing platforms.

Measures

Quality Criteria for Consumer Health Information: The DISCERN questionnaire was developed to assist consumers in assessing the quality of written health information, particularly regarding treatment options. The DISCERN tool includes 16 questions rated on a 1–5 scale ("very poor" to "excellent"), with higher scores reflecting better quality. The questionnaire is divided into three parts: the first part includes eight questions assessing the reliability of the source, the second part includes seven questions evaluating the specifics of the treatment options presented, and the final question provides an overall quality rating of the sources. In this study, the DISCERN instrument was applied to classify videos into five quality classes: excellent, 63–75 points; good, 51–62 points; fair, 39–50 points; poor, 27–38 points; and very poor, 16–26 points (Charnock et al, 1999).

The Global Quality Scale: The GQS was used to assess the quality of the videos. This tool evaluates the clarity, streaming quality, and usability of the presented information. The GQS uses a 5-point Likert scale to measure patient content quality, informational coverage, and usefulness. A score of 1 indicates poor quality with little or no helpful information and poor usability. In contrast, a score of 2 reflects generally poor quality with limited utility for patients and significant gaps in content. A score of 3 denotes moderate quality; such videos adequately discuss critical information but skip certain key topics, making them somewhat helpful to patients. A score of 4 signifies good quality, with the primary topic well covered and the video deemed beneficial for patient education. Finally, a score of 5 represents excellent quality, where the video demonstrates outstanding flow, comprehensive coverage of critical topics, and high patient utility. The GQS uses a 5-point Likert questionnaire, with scores ranging from "poor" to "excellent" (Bernard et al, 2007).

Statistical Analysis

Data analysis was conducted using the Statistical Package for the Social Sciences, version 25.0 (IBM SPSS Statistics for Windows; Armonk). Intraclass correlation analysis revealed an intraclass correlation coefficient above 90% for both scoring methods, indicating substantial agreement among the raters and supporting the inter-rater reliability of the DISCERN and GQS scores. Descriptive statistics and normality tests

Table 1. Characteristics of YouTube videos about OCD and treatment for OCD

	Total (n=126)
Duration in minutes	6.81 (3.58–12.21)
Time since video upload (days)	2,075.50 (1,165.75–3,450.50)
Like	3,050 (1,300–10,427.25)
Comments	358 (93–1,338.25)
Views	168,802 (73,276.75–626,817.25)
View ratio (daily views)	93.75 (42.50–345.97)
Video-like ratio	97.20 (94.32–98.40)
VPI	63.19 (26.98–168.82)
Video sources (%)	
Independent users	46.8
Healthcare providers	53.2
Video content symptoms (%)	
No	7.1
Yes	92.9
Video content treatment (%)	
No	62.7
Yes	37.3

VLR: Video like ratio; VPI: Video Power Index. IQR: Interquartile range. Data are expressed as median (IQR).

were performed. A non-normal distribution was determined ($p<0.05$). Consequently, nonparametric methods were applied for comparative analyses. The Mann–Whitney U test, the Kruskal–Wallis test, and Spearman's correlation were used to assess nonparametric variables. Statistical significance was determined using a two-tailed p-value threshold of <0.05. Since the study used publicly accessible videos without any human or animal subjects, ethical approval or consent was not deemed necessary.

RESULTS

Clinical Characteristics

In this study, 126 videos related to OCD and its treatment were analyzed. Of these, 53.2% were uploaded by healthcare providers, whereas 46.8% were uploaded by independent users. The general characteristics of the OCD-related videos on YouTube are detailed in Table 1. The median duration of the videos was 6.81 min, with a median time since upload of 2,075.50 days. The videos demonstrated significant popularity, with a median view count of 168,802, a median daily view count of 93.75, and a maximum view count of 16,754,280. The median number of likes for these videos was 3,050. The study primarily focused on OCD symptoms and pharmacotherapy options (Table 1).

Table 2 summarizes the characteristics of YouTube videos categorized by source. Videos uploaded by independent users garnered significantly more comments and views than did those uploaded by healthcare providers ($p<0.05$). However, no statistically significant differences in video duration, number of days since upload, daily views, VLR, or VPI were observed between the two groups ($p>0.05$). Interestingly, videos created by healthcare providers had a significantly greater number of likes than did those from independent users ($p=0.031$). Furthermore, the videos uploaded by healthcare providers achieved higher DISCERN and GQS scores, reflecting superior quality and reliability compared with videos uploaded by independent users ($p<0.05$).

Owing to the small number of videos in the "excellent" and "very poor" categories, all videos were consolidated into three broader groups according to the DISCERN classification: "very poor–poor," "fair," and "good–excellent." Quality analysis revealed no statistically significant differences in video duration or popularity metrics among the groups. Table 3 provides a detailed summary of video characteristics based on these quality categories. Compared with the other groups, the "fair" category had significantly greater view ratios, numbers of likes, and VPI scores ($p<0.05$). However, no significant differences in VLR ($p=0.623$) or video duration ($p=0.567$) were observed among the three groups.

Significant relationships were observed between the DISCERN scores of the YouTube videos and their respective popularity indices (Table 4). Results in the table show that the relationships between DISCERN scores and video popularity indices are not statistically significant; moreover, there are only substantial correlations between DISCERN and GQS.

DISCUSSION

Because of their free and unrestricted accessibility, online platforms serve as significant sources of medical information for millions of users. YouTube stands out as one of the most frequently visited video-sharing websites, with over 100 million daily views. A substantial proportion of these videos address health-related topics, thereby providing a wide array of medical content. However, any registered user can upload videos to YouTube without the need for validation or standardization regarding the reliability or accuracy of the information provided. This lack of oversight raises issues regarding the quality and trustworthiness of health-related videos available on the platform (Kumar et al, 2014; Madden et al, 2013).

YouTube videos on disorders such as psychotic disorders (Kumar & Jha, 2018), bipolar affective disorder (Alsabhan et al, 2024), generalized anxiety disorders (MacLean et al, 2017), OCD (Abhishek et al, 2018, 2021; Kaya et al, 2021),

Table 2. Characteristics of YouTube videos according to video source

	Healthcare providers (n=67)	Independent users (n=59)	p
Duration in minutes	7.04 (4.40–11.31)	6.40 (3.32–13.05)	0.813
Time since video upload (days)	1,908 (894–3,623)	2,226 (1,597–3,440)	0.232
Like	2,000 (1,200–7,100)	36 (29–44)	0.031
Comments	203 (83–768)	517 (131–2,003)	0.004
Views	132,075 (72,226–306,901)	278,366 (97,567–1,524,490)	0.041
View ratio (daily views)	80.48 (41.90–305.40)	110.6 (44.6–848.7)	0.252
Video-like ratio	97.43 (94.60–98.60)	96.9 (88.3–98.3)	0.192
VPI	62.37 (26.81–137.80)	64.00 (27.40–201.20)	0.603
Video content symptoms (%)			
No	(1.5) 1	(13.6) 8	0.012
Yes	(98.5) 66	(86.4) 51	0.012
Video content treatment (%)			
No	(43.3) 29	(84.7) 50	0.000
Yes	(56.7) 38	(15.3) 9	0.000
GQS	3 (3–4)	2 (1–3)	0.000
DISCERN	53 (43–64)	36 (29–44)	0.004

DISCERN: Quality Criteria for Consumer Health Information; VLR: Video like ratio; VPI: Video Power Index; GQS: Global Quality Scale; IQR: Interquartile range. Data are expressed as median (IQR).

Table 3. Comparison of video features based on the quality and reliability of the videos

	Verypoor, poor (n=40)	Fair (n=40)	Good, excellent (n=46)	p
Video duration/min	7.20 (3.30–13.26)	6.49 (4.34–11.15)	6.83 (4.01–12.42)	0.567
View ratio	72.75 (27.66–1,456.84)	143.85 (55.62–404.91)	77.45 (49.83–207.04)	0.004
Like	3,318 (1,425–32,500)	3,900 (1,225–10,000)	1,900 (1,200–6,650)	0.015
VLR	96.75 (68.28–98.23)	97.62 (95–98.56)	97.32 (94.50–98.45)	0.623
Comments	550 (112.25–2,911.75)	381 (89.25–1,187.25)	239.50 (91.25–827.25)	0.051
VPI	43.60 (22.16–273.45)	70.77 (27.93–221.82)	61.57 (38.70–141.33)	0.017

Min: Minute; VLR: Video like ratio; VPI: Video Power Index; GQS: Global Quality Scale; IQR: Interquartile range. Data are expressed as median (IQR).

Table 4. Correlations between DISCERN scores and popularity indices

	Correlation coefficient	p
Video duration/min	0.113	0.207
View ratio	0.020	0.822
Like	-0.101	0.260
VLR	0.039	0.667
Comments	-0.123	0.172
VPI	0.001	0.988
GQS	0.908	0.000

DISCERN: Quality Criteria for Consumer Health Information; VLR: Video like ratio; VPI: Video Power Index. IQR: Interquartile range.

and ADHD (Ward et al, 2020)—and their treatment—have been assessed in earlier studies. Our results revealed that DISCERN and GQS scores were higher for videos uploaded by healthcare providers than for those of independent users. In some earlier studies, healthcare providers' videos had higher quality and reliability compared with independent users' videos (Ozsoy-Unubol & Alanbay-Yagci, 2021; Ward et al, 2020). However, some researchers have reported the opposite outcome when the topic is insulin resistance (Barlas et al, 2023). This may be because OCD is more distinct and often focused on by healthcare providers. According to multiple guidelines and studies, pharmacotherapy and psychotherapies (such as cognitive-behavioral therapies)

are crucial for the treatment of OCD (Bandelow et al, 2012; Lovell & Bee, 2008). These obsessions tend to be more concealed and closely tied to OCD symptoms. For example, an individual experiencing disturbing intrusive thoughts about harming others may engage in self-concealment as a coping mechanism to reduce self-directed disgust. Except for contamination-related symptoms, individuals typically exhibit a lower tendency to seek professional help across most OCD dimensions. Self-concealment may contribute to the development or persistence of OCD by preventing individuals from sharing or addressing their intrusive thoughts, thus hindering the normalization process associated with low-consensus schemas. These thoughts are often imbued with excessive importance or meaning; without normalization, this can amplify the intensity of obsessions (Wheaton et al, 2016). Weak or insufficient information about OCD treatment may increase patients' ambivalence toward treatment or lead to deterioration in existing care.

Our results revealed that the relationships between DISCERN scores and video popularity indices are not statistically significant, which is consistent with the findings of previous studies. However, some studies examining popularity indices in relation to DISCERN scores reported inconsistent results. Internet users may view multiple YouTube videos—with varying quality and reliability—on the same topic. Even if some videos provide low-quality or misleading information, viewers may still engage with them, leading to potential confusion. The abundance of videos with questionable credibility can significantly impact Internet users by distorting their understanding and hindering their ability to access accurate and reliable information.

A total of 31.8% of YouTube videos on OCD and OCD treatment were classified as very poor or poor, 31.8% as fair, and only 36.4% as good or excellent, according to the DISCERN classification. The view ratio, number of likes, and VPI were significantly higher in the fair group compared with the other two groups ($p<0.05$). However, no statistically significant difference was found in VLR or video duration among the three groups. When the results were examined, no statistically significant differences in video duration were observed across the three quality categories ("very poor/poor,""fair," and "good/excellent"). However, videos rated as fair, which had relatively short durations, were more frequently viewed and appeared more popular, consistent with the findings of previous studies (Kaya et al, 2021). This finding suggests that shorter, higher-quality videos are key to increasing viewership and popularity. Therefore, individuals may prefer high-quality videos as trustworthy sources of information. However, video duration was found to have a positive association with DISCERN scores, with "good" and "excellent" videos tending to be longer. In longer videos, topics may be explained more thoroughly and in greater detail. Previous studies have reported similar findings, indicating that higher-quality videos are often longer than lower-quality ones (Barlas et al, 2023; Ozsoy-Unubol & Alanbay-Yagci, 2021). Therefore, efforts should focus on maintaining high-quality content while keeping the video length concise to increase the impact of health-related videos. Optimizing both content quality and video length can significantly improve the effectiveness of such videos.

Our study had certain limitations. First, its cross-sectional design provides only a snapshot of the current state of YouTube content, which may evolve over time as videos are added or removed. Second, video evaluations were conducted by members of our study team, introducing the potential for subjective bias in scoring. However, to mitigate this, we used widely accepted scoring tools, with scores demonstrating strong correlations with each other. Additionally, intraclass correlation between raters was high, indicating strong inter-rater reliability. Another limitation is the possibility of duplicate views, as some viewers may watch specific videos multiple times to gather relevant information. Nevertheless, the high view ratios of OCD-related videos compared with other medical topics did not significantly impact our findings. Additionally, our study was limited to English-language videos, which may limit the generalizability of the results. However, English remains the predominant language among internet users worldwide, making these findings broadly relevant. Finally, the study focused exclusively on YouTube, and the findings may not apply to other social media platforms. Despite these limitations, the comprehensive methodology employed herein is a major strength. Unlike many prior studies, this research encompasses a wide range of videos related to OCD and its treatment uploaded by different sources, offering a unique and thorough analysis of this content (Abhishek et al, 2021; Kaya et al, 2021).

CONCLUSION

The YouTube videos reviewed in this study were categorized under "obsessive-compulsive disorder," "OCD," "obsessive-compulsive disorder treatment," and "OCD treatment"; they were often of low, fair, and high quality and differed in terms of uploaders. Given the increasing reliance on online platforms as primary health information sources, health professionals should create content to present treatment choices and psychiatric follow-up information objectively and comprehensively. Platforms such as YouTube have become significant public resources for mental health education. Our findings indicate that when healthcare providers produce high-quality and reliable video content addressing symptoms and treatments on video-sharing platforms, such

content can reach significantly large audiences. Therefore, integrating evidence-based video materials into digital health communication strategies may enhance patient education, reduce misinformation, and support early recognition and management of medical conditions at the population level. This could be critical in accurately informing the public and promoting a better understanding of medical conditions.

Ethics Committee Approval: Ethical approval or consent was not deemed necessary because the study used publicly accessible videos without any human or animal subjects.

Conflict of Interest: The authors declare that there is no conflict of interest.

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Role of Parenting Perceptions, Alexithymia, and Attachment in Chronic Pain: A Case–Control Study

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ABSTRACT

This study examined the relationship among alexithymia, attachment styles, and perceived parenting in individuals with chronic pain (CP). This case–control study included 63 patients with CP and 62 healthy individuals. Participants completed questionnaires on sociodemographic and clinical data, the Young Parenting Scale (YPS), Experiences in Close Relationships Inventory (ECRI), Toronto Alexithymia Scale (TAS), Beck Depression Inventory (BDI), and Beck Anxiety Inventory (BAI). Compared with controls, patients with CP reported statistically significantly higher TAS scores (median [IQR] = 50 [44–55] vs. 43 [36–48], p<0.001), indicating greater difficulty in identifying and expressing emotions. They also showed significantly higher attachment anxiety levels (69 [55–86] vs. 60 [47–71], p=0.035). Regarding parenting perceptions, CP patients scored higher on several negative subscales: for mothers—Belittling/Criticizing, Permissive/Boundless, Pessimistic/Worried, and Restricted/Emotionally Inhibited; for fathers—Exploitative/Abusive, Permissive/Boundless, and Emotionally Depriving. These findings suggest that individuals with CP experience greater emotional dysregulation, higher attachment anxiety, and more negative early caregiving experiences, especially maternal criticism and paternal abuse or emotional deprivation. Early negative relational environments and difficulties in emotional regulation may contribute to the development or persistence of CP. Addressing these factors could enhance the effectiveness of psychological interventions. Further research is needed to investigate the underlying mechanisms in larger cohort studies.

Keywords: Chronic pain, alexithymia, object attachment, parenting.

ÖZ

Kronik Ağrıda Ebeveynlik Algısı, Aleksitimi ve Bağlanmanın Rolü: Bir Olgu-Kontrol Çalışması

Bu çalışma, kronik ağrı tanısı alan bireylerde aleksitimi, bağlanma stilleri ve algılanan ebeveynlik arasındaki ilişkiyi incelemeyi amaçlamıştır. Bu olgu-kontrol çalışmasına 63 kronik ağrı tanılı hasta ve 62 sağlıklı birey katıldı. Katılımcılar; Sosyodemografik ve Klinik Bilgi Anketi, Young Ebeveynlik Ölçeği (YEO), Yakın İlişkilerde Yaşantılar Envanteri (YİYE), Toronto Aleksitimi Ölçeği (TAÖ), Beck Depresyon Envanteri (BDE) ve Beck Anksiyete Envanterini (BAE) yanıtladı. Kronik ağrı hastaları, kontrol grubuna kıyasla istatistiksel olarak anlamlı düzeyde daha yüksek TAÖ puanları bildirdi (ortanca [çeyrekler arası aralık]=50 [44-55] vs. 43 [36-48], p<0,001); bu da duyguları tanıma ve ifade etmede daha fazla güçlük yaşadıklarını göstermektedir. Ayrıca kronik ağrı grubunun bağlanma anksiyetesi (69 [55-86] vs. 60 [47-71], p=0,035), puanları da

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istatistiksel olarak anlamlı yüksek bulundu. Olumsuz ebeveynlik algısına ilişkin olarak kronik ağrı hastaları; annelikte Küçümseyici/Kusur Bulucu, Aşırı İzin Verici/Sınırsız, Kötümser/Endişeli ve Kapalı/Duygularını Bastıran alt ölçeklerinde; babalıkta ise Sömürücü/İstismar Edici, Aşırı İzin Verici/Sınırsız ve Duygusal Yoksun Bırakıcı alt ölçeklerinde anlamlı olarak daha yüksek puanlar aldı. Bulgular, kronik ağrı hastalarının daha fazla duygusal düzenleme güçlüğü, yüksek bağlanma anksiyetesi ve daha olumsuz erken dönem ebeveynlik algısı deneyimlediklerini göstermektedir. Özellikle anneden algılanan eleştirel tutum ile babadan algılanan istismar ve duygusal yoksunluk dikkat çekicidir. Erken dönemde bakım verenle kurulan olumsuz ilişkiler ve duygusal işlevsizlik, kronik ağrının gelişiminde veya sürdürülmesinde rol oynayabilir. Bu faktörlere yönelik müdahaleler, psikolojik tedavilerin etkinliğini artırabilir. Gelecek araştırmalarda daha geniş örneklemlerle yürütülecek kohort çalışmaların nedensel ilişkileri incelemesi önerilmektedir.

Anahtar Kelimeler: Kronik ağrı, aleksitimi, bağlanma davranışı, ebeveynlik.

INTRODUCTION

Chronic pain (CP) that persists for at least three months is defined as chronic (Merskey & Bogduk, 1994). CP can result from various biological processes, such as joint degeneration, inflammation, tumor growth (cancer pain), and nerve damage affecting different body parts. It may also occur in multisymptom conditions (Treede et al, 2015). A population-based study covering both developing and developed countries found that the prevalence of CP ranged from 37% to 40%, and it was more common in women. The comorbidity of depression and anxiety disorders was found to be 1.6 to 2.4 times higher among individuals with CP than among those without pain (Tsang et al, 2008). It is one of the leading causes of disability, increased medical costs, and lost productivity (Gaskin & Richard, 2012; James et al, 2018). It is also associated with poor general health and reduced quality of life (Soriano-Maldonado et al, 2015). Fibromyalgia syndrome (FMS) and rheumatoid arthritis (RA) are chronic conditions frequently associated with persistent pain. FMS is characterized by widespread musculoskeletal pain, fatigue, sleep disturbances, and cognitive difficulties, with an estimated prevalence of 1%–5% (Smith et al, 2011). RA is an autoimmune inflammatory disorder primarily affecting joints and surrounding tissues, with a lifetime prevalence of 0.5%–1% (Suzuki & Yamamoto, 2015; Prados et al, 2013). Both disorders are more common in women (Prados et al, 2013; Suzuki & Yamamoto, 2015) and share not only somatic symptoms but also psychological features. Notably, depression and anxiety are frequently observed in individuals with FMS and RA, suggesting that psychogenic factors may contribute to the onset and course of these conditions (Fiest et al, 2017; McWilliams et al, 2008).

Various factors—including neurobiological, psychological, and social influences—can contribute to the prolonged pain experience (Gatchel et al, 2007). CP encompasses sensory, cognitive, and affective components (Melzack & Katz, 2013). Therefore, understanding its psychogenic aspects and their relationship with etiology remains an important area of interest. Adverse experiences and unfavorable parenting styles during infancy, childhood, and adolescence—periods of heightened vulnerability to environmental stressors—are increasingly recognized as significant contributors to CP development and persistence (Anno et al, 2015; Sachs-Ericsson et al, 2009). Clinical research suggests that such early-life stressors can disrupt brain and bodily development, thereby increasing the risk of CP later in life (Jones et al, 2009; Noll-Hussong et al, 2010). The association between CP and early-life adversity, including child–parent interactions and attachment styles, has recently attracted substantial research attention. Studies have reported a link between CP and insecure attachment styles, which have been implicated in the development of CP conditions and reduced adherence to treatment (Peñacoba et al, 2018; Romeo et al, 2020). Attachment theory explores how early interactions with caregivers shape later interpersonal behaviors and psychological functioning. The unique bond formed between an infant and their caregiver significantly influences long-term psychological and physical well-being (Fraley & Shaver, 2000).

The association between CP and alexithymia—defined as difficulty in identifying and describing subjective emotional experiences, limited imagination, and an externally oriented cognitive style (Porcelli & Taylor et al, 2018)—has been recognized for many years (Di Tella et al, 2017; Romeo et al, 2020). Inadequate parenting, insecure attachment, and adverse early-life experiences are also associated with alexithymic traits in adulthood, similar to those observed in individuals with CP (Gil et al, 2008; Kooiman et al, 2004; Montebarocci et al, 2004). However, within the context of CP, the available data and the number of studies remain limited, making it difficult to draw definitive conclusions about the relationship between different dimensions of perceived parenting styles, attachment styles, and alexithymia.

This case–control study aimed to examine the relationship between alexithymia, attachment styles, and various perceived parenting styles in patients with CP. We hypothesize that patients with CP will differ from healthy controls in terms of alexithymia levels, that scores on attachment subdimensions reflecting secure attachment will differ between the two groups, and that negative parenting subdimensions assessed by the Young Parenting Inventory will also show significant differences. Additionally, we hypothesize a positive relationship between alexithymia and the subdimensions of perceived negative parenting.

METHOD

Sample

This case–control study included patients with CP and a control group. The CP group consisted of individuals diagnosed with fibromyalgia syndrome (FMS) or RA in remission according to the American College of Rheumatology 2010 criteria (Wolfe et al, 2010), who visited the Rheumatology and Physical Medicine and Rehabilitation departments of Başkent University Hospital during the first six months of the study period. Patients were consecutively recruited. Over a six-month period, 41 patients were diagnosed with FMS, of whom 33 volunteered and were included in the study. Additionally, 30 patients with RA in remission were recruited. The control group consisted of 62 individuals without CP or somatization symptoms, similar to the CP patients in terms of age, gender, and education level. They were selected from the community using the snowball sampling method. FMS and RA diagnoses were confirmed by a physical medicine specialist and a rheumatologist. Participants in the control group were screened for CP and somatization symptoms to ensure they did not meet the criteria for FMS, RA, or other CP conditions.

The exclusion criteria for both the patient and control groups included being younger than 18 or older than 65 years of age, illiteracy, significant visual or hearing impairments that could interfere with communication, severe psychiatric disorder, or a history of traumatic brain injury. Participants with severe psychiatric disorders were excluded based on clinical evaluations conducted by a psychiatrist. A semi-structured clinical interview guided by the diagnostic criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM–IV–TR) was used to assess major psychiatric conditions such as psychotic disorders, bipolar disorder, and substance use disorders.

Measurements

Sociodemographic and Clinical Variables

The researchers developed a questionnaire to collect sociodemographic and clinical data in accordance with the study objectives. The questionnaire included questions on age, gender, marital status (married, single, divorced, widowed), education level (high school or less [≤11 years], university or master's degree [>11 years]), employment status, current psychiatric disorders, and history of psychiatric illness.

Parenting Perceptions

Perceptions of parenting were assessed using the Turkish version of the Young Parenting Scale (YPS). This 72-item scale evaluates various parental behaviors that are believed to contribute to the formation of early maladaptive schemas. It is a six-point Likert-type scale. The Turkish version of the YPS includes the following subdimensions for both mothers and fathers: Normative, Belittling/Criticizing, Exploitative/Abusive, Overprotective/Anxious, Conditional/Achievement-Focused, Permissive/Boundless, Pessimistic/Worried, Emotionally Depriving, Punitive, and Restricted/Emotionally Inhibited. The Cronbach's alpha reliability coefficients for the Turkish version ranged from α=0.53 to 0.86 for the YPS–Mother form and from α=0.61 to 0.88 for the YPS–Father form (Soygüt et al, 2008).

Attachment Dimensions

Attachment dimensions were measured using the Turkish version of the Experiences in Close Relationships Scale. This 36-item scale assesses two fundamental attachment dimensions: attachment anxiety and attachment avoidance. Each item is rated on a 7-point Likert scale (1=strongly disagree, 7=strongly agree). Cronbach's alpha coefficients for the Turkish version were α=0.90 for attachment avoidance and α=0.86 for attachment anxiety (Sümer, 2006).

Alexithymia

Alexithymia was assessed using the Turkish version of the Toronto Alexithymia Scale (TAS-20), a 20-item self-report questionnaire rated on a 5-point Likert scale. The scale includes three subdimensions: TAS-1: Difficulty identifying feelings, TAS-2: Difficulty describing feelings, and TAS-3: Externally oriented thinking (Güleç et al, 2009).

Depression Level

The Turkish version of the Beck Depression Inventory (BDI), which assesses the physical, emotional, cognitive, and motivational symptoms of depression, was used to measure depressive symptoms (Hisli, 1989).

Anxiety Level

The Turkish version of the Beck Anxiety Inventory (BAI), which measures the frequency and severity of anxiety symptoms experienced by individuals, was used to assess anxiety symptoms (Ulusoy et al, 1998).

Statistical Analysis

All analyses were performed using IBM SPSS Statistics. Descriptive statistics for the data are presented as frequency and percentage for categorical variables and as median and interquartile range (IQR) for continuous variables, with appropriate tables organized. The normality of the continuous variables was tested using the Kolmogorov–Smirnov test and visual methods. Since continuous variables did not conform to a normal distribution, the Mann–Whitney U test was used to compare continuous variables. Pearson's chi-square and Fisher's exact tests were used to compare categorical variables. The correlations among attachment, alexithymia, parenting perceptions, depression, and anxiety were examined using Spearman's correlation coefficient. The correlation was considered weak if rho ranged from ±0.1 to ±0.29, moderate if between ±0.30 and ±0.49, and strong if between ±0.50 and ±1.0 (Cohen, 2013). Statistical significance was determined at a p-value of <0.05.

A post hoc power analysis was performed based on the study's main findings. Using G*Power (version 3.1), with a total sample size of 125 participants (n=63 in the CP group and n=62 in the control group), the study had a power of 0.81 to detect a medium effect size (Cohen's d=0.5) at an alpha level of 0.05. This indicates that the sample size was sufficient to detect significant group differences with adequate statistical power. Pairwise comparisons of the TAS, BAI, and BDI revealed medium effect sizes (r≈0.31), indicating robust differences between the CP and control groups, with an estimated statistical power exceeding 80%. The ECR-R Anxiety subscale yielded a small effect size (r≈0.19), with a corresponding power estimate of approximately 60%–70%, reflecting a statistically significant but comparatively modest group difference. Furthermore, several subdimensions of perceived parenting demonstrated small to medium effect sizes (r≈0.18–0.27), reinforcing the sample size's adequacy in detecting clinically meaningful variations in parental representations between groups.

Procedure

This study was approved by the Başkent University Medical and Health Sciences Research Board and the Non-Interventional Clinical Research Ethics Committee (Project No: KA13/21). All participants provided informed consent, and the study was conducted in accordance with the principles of the Declaration of Helsinki.

RESULTS

The study included 125 participants, with a mean age of 40±10 years. Most participants were female (87%) and married (79%). More than half were employed (58%) and held at least a university degree (54%).

Table 1. Comparison of the sociodemographic and clinical characteristics

Characteristic	Chronic pain (n=63) n (%)	Control (n=62) n (%)	p
Age, years, median (IQR)	40 (31–50)	38 (33–46)	0.28[a]
Sex			0.97[b]
Female	55 (87.3)	54 (87.1)	
Male	8 (12.1)	8 (12.9)	
Education level			0.32[b]
High school or less	32 (50.8)	26 (41.9)	
University/master's degree	31 (49.2)	36 (58.1)	
Employment status			**<0.001[b]**
Non-employed	37 (58.7)	16 (25.8)	
Employed	26 (41.3)	46 (74.2)	
Marital status			0.96
Married	50 (79.4)	49 (79)	
Single/divorced/widowed	13 (20.6)	13 (21)	
Psychiatric history			**<0.001[c]**
Yes	25 (39.7)	0 (0)	
No	38 (60.3)	62 (100)	
Current psychiatric diseases			
Yes	12 (19)	0 (0)	**<0.001[c]**
No	51 (81)	62 (100)	

a: Mann-Whitney U Test; b: Pearson Chi-Square Test; c: Fisher's Exact Test; IQR: Interquartile range.

A Mann–Whitney U test revealed no significant difference in the median (interquartile range, IQR) age between the CP and control groups (40 [31–50] vs. 38 [33–46], Z=-1.08, p=0.28). The Pearson chi-square test revealed no significant differences in sex, education level, or marital status between the two groups. However, the percentage of employed individuals was higher in the control group (72% vs. 41.3%, χ^2=13.86, p<0.001). Fisher's exact test results indicated that participants with CP had a higher prevalence of both current psychiatric disorders (19% vs. 0, χ^2=13.06, p<0.001) and a history of psychiatric disorders (39.7% vs. 0, χ^2=30.75, p<0.001). The results are presented in Table 1.

As shown in Table 2, the Mann–Whitney U test revealed statistically significant differences between the CP group and the control group in median (IQR) scores of alexithymia (50 [44–55] vs. 42 [36–48], Z=-4.65, p<0.001), depression (12 [8–19] vs. 6 [3–11], Z=-5.53, p<0.001), and anxiety (13 [7–21] vs. 5 [3–10],

Table 2. Comparison of the alexithymia, attachment, depression, and anxiety scores

Scale	Chronic pain (n=63) Median (IQR)	Control (n=62) Median (IQR)	p
TAS	50 (44–55)	42 (36–48)	**<0.001**
ECRI_ avoidance	60 (40–73)	50 (34–76)	0.23
ECRI_ anxiety	69 (55–86)	60 (47–71)	**0.03**
BAI	13 (7–21)	5 (3–10)	**<0.001**
BDI	12 (8–19)	6 (3–11)	**<0.001**

Mann–Whitney U Test. IQR: Interquartile range; TAS: Toronto Alexithymia Scale; ECRI: Experiences in Close Relationships Inventory; BAI: Beck Anxiety Inventory; BDI: Beck Depression Inventory.

Z=-4.32, p<0.001). A statistically significant difference in median (IQR) attachment anxiety scores was observed between the groups (69 [55–86] vs. 60 [47–71], Z=-2.10, p=0.035), whereas no significant difference was observed in attachment avoidance scores (60 [40–73] vs. 50 [34–76], Z=-1.19, p=0.235).

When the parenting perceptions of the CP and control groups were compared, no significant differences were found in the median scores of the Normative, Overprotective/Anxious, Conditional/Achievement-Focused, and Punitive subdimensions of the YPS. In contrast, the Mann–Whitney U test revealed statistically significant differences between the CP group and the control group in median (IQR) scores of maternal Belittling/Criticizing (12 [9–17.5] vs. 10 [9–13], Z=-2.01, p=0.044), maternal Permissive/Boundless (9 [6–13] vs. 7 [6–10], Z=-2.46, p=0.014), maternal Pessimistic/Worried (7 [5–11] vs. 6 [5–9], Z=-2.05, p=0.040), maternal Restricted/Emotionally Inhibited (9.5 [7–11] vs. 8 [7–9], Z=-2.23, p=0.026), paternal Exploitative/Abusive (7 [7–10] vs. 7 [7–7], Z=-2.99, p=0.003), paternal Permissive/Boundless (9 [6–14] vs. 8 [6–11], Z=-2.84, p=0.004), and paternal Emotionally Depriving (21 [14–26] vs. 17 [12–21], Z=-2.42, p=0.016) dimensions. The results are presented in Table 3.

The relationship between alexithymia, attachment subdimensions, and parenting subdimensions was assessed using a Spearman correlation test. Alexithymia showed a significant moderate positive correlation with both attachment anxiety (ρ=0.429, p<0.01) and attachment avoidance (ρ=0.303, p<0.01). The results also revealed a low positive correlation between alexithymia and the Belittling/Criticizing (ρ=0.281, p<0.01), Permissive/Boundless (ρ=0.226, p<0.05), and Emotionally Depriving (ρ=0.280, p<0.01) subdimensions for mothers, as well as the Exploitative/Abusive (ρ=0.202, p<0.05) and Restricted/Emotionally Inhibited (ρ=0.274, p<0.01) subdimensions for fathers, and the Overprotective/Anxious parenting style (mother: ρ=0.232, p<0.01; father: ρ=0.228, p<0.01).

A moderate positive correlation was found between alexithymia and the maternal Restricted/Emotionally Inhibited subdimension (ρ=0.402, p<0.01), as well as the paternal Emotionally Depriving (ρ=0.319, p<0.01) and Pessimistic/Worried (ρ=0.371, p<0.01) subdimensions. Additionally, a strong positive correlation was observed between alexithymia and the maternal Pessimistic/Worried subdimension (ρ=0.583, p<0.01).

Attachment anxiety showed a low positive correlation with the maternal Normative (ρ=0.213, p<0.05) and Restricted/Emotionally Inhibited (ρ=0.296, p<0.01) subdimensions, as well as the paternal Belittling/Criticizing (ρ=0.204, p<0.05), Exploitative/Abusive (ρ=0.226, p<0.05), Permissive/Boundless (ρ=0.225, p<0.05), Emotionally Depriving (ρ=0.233, p<0.05), and Punitive (ρ=0.294, p<0.01) subdimensions.

A moderate positive correlation was found between attachment anxiety and the paternal Normative (ρ=0.346, p<0.05) and maternal Pessimistic/Worried (ρ=0.354, p<0.01) subdimensions.

Additionally, attachment anxiety was strongly positively correlated with the paternal Pessimistic/Worried subdimension (ρ=0.554, p<0.01).

Attachment avoidance showed a low positive correlation with both Pessimistic/Worried parenting (mother: ρ=0.229, p<0.05; father: ρ=0.250, p<0.05) and the maternal Restricted/Emotionally Inhibited subdimension (ρ=0.234, p<0.05). However, it showed a low negative correlation with the maternal Normative (ρ=-0.220, p<0.05) and Conditional/Achievement-Focused (ρ=-0.185, p<0.05) subdimensions. The results are presented in Table 4.

DISCUSSION

This study aimed to examine the relationship among alexithymia, attachment styles, and perceived parenting in patients with CP. Our findings showed that alexithymia and attachment anxiety are significantly associated with CP. Specific parenting styles—such as Belittling/Criticizing, Pessimistic/Worried, Restricted/Emotionally Inhibited, and Permissive/Boundless mothering, and Exploitative/Abusive, Emotionally Depriving, and Permissive/Boundless fathering—were also more commonly reported by patients with CP.

Attachment

Patients with CP reported higher attachment anxiety, emotional sensitivity, fear of abandonment, and difficulty managing relational stress. These interpersonal difficulties

Table 3. Comparison of parental perception scores between the study groups

YPS subdimension	Chronic pain (n=63) Median (IQR)	Control (n=62) Median (IQR)	p
Normative			
Mother	34 (21–47)	28 (24–39)	0.39
Father	34 (24–48)	37 (44–28)	0.72
Belittling/criticizing			
Mother	12 (9–17.5)	10 (9–13)	**0.04**
Father	12 (9–18)	10 (9–13)	0.21
Exploitative/abusive			
Mother	7 (7–7)	7 (7–7)	0.99
Father	7 (7–10)	7 (7–7)	**0.003**
Overprotective/anxious			
Mother	21 (16–26)	19 (15–24)	0.21
Father	17 (14–26)	17 (15–21)	0.15
Conditional/achievement-focused			
Mother	17 (13–20)	14 (12–19)	0.12
Father	17 (12–22)	16 (12–22.5)	0.82
Permissive/boundless			
Mother	9 (6–13)	7 (6–10)	**0.01**
Father	9 (6–14)	8 (6–11)	**0.004**
Pessimistic/worried			
Mother	7 (5–11)	6 (5–9)	**0.040**
Father	8 (5–12)	6 (5.5–8)	0.090
Emotionally depriving			
Mother	16 (12–22)	14 (12–20)	0.230
Father	21 (14–26)	17 (12–21)	**0.016**
Punitive			
Mother	8 (7–10)	8 (7–9)	0.223
Father	9 (6–11)	9 (7–10.5)	0.609
Restricted/emotionally inhibited			
Mother	9.5 (7–11)	8 (7–9)	**0.026**
Father	10 (7–13)	9 (7–13)	0.788

Mann–Whitney U Test. YPS: Young Parenting Scale; IQR: Interquartile range.

may intensify physiological arousal and maladaptive coping, contributing to persistent pain. Previous studies have similarly linked attachment anxiety with emotional dysregulation, heightened threat sensitivity, and increased pain perception (Borthwick et al, 2024; McWilliams & Asmundson, 2007). Although attachment avoidance was not significantly associated with CP in our sample, previous studies have found that both anxiety and avoidance are related to pain (Peñacoba et al, 2018; Romeo et al, 2020). One possible explanation for this discrepancy may lie in the differences in how attachment was measured across studies. In the present study, attachment was assessed dimensionally (i.e., as anxiety and avoidance dimensions), whereas some previous research has classified attachment into four

Table 4. Correlations among alexithymia, attachment, and parenting variables

Scale	TAS (ρ)	ECRI-anxiety (ρ)	ECRI-avoidance (ρ)
TAS	–		–
ECRI-Anxiety	**0.429****	–	–
ECRI-Avoidance	**0.303****	–	–
BDI	-0.074	**0.459****	**0.403****
BAI	0.006	**0.283****	**0.315****
Normative-M	0.036	**0.213***	**-0.220***
Normative-F	0.172	**0.346***	-0.36
Belittling/criticizing-M	**0.281****	0.091	-0.032
Belittling/criticizing-F	0.174	**0.204***	0.089
Exploitative/abusive-M	0.029	-0.052	0.069
Exploitative/abusive-F	**0.202***	**0.226***	0.091
Overprotective/anxious-M	**0.232****	0.056	0.097
Overprotective/anxious-F	**0.228****	0.043	0.149
Conditional/achievement-focused-M	0.064	0.029	**-0.185***
Conditional/achievement-focused-F	0.149	0.118	-0.146
Permissive/boundless-M	**0.226***	0.168	-0.076
Permissive/boundless-F	0.114	**0.225***	-0.025
Pessimistic/worried-M	**0.583****	**0.354****	**0.229***
Pessimistic/worried-F	**0.371****	**0.554****	**0.250***
Emotionally depriving-M	**0.280****	-0.069	0.026
Emotionally depriving-F	**0.319***	**0.233***	0.011
Punitive-M	0.060	0.165	-0.066
Punitive-F	0.059	**0.294****	0.034
Restricted/emotionally inhibited-M	**0.402****	**0.296****	**0.234***
Restricted/emotionally inhibited-F	**0.274****	0.175	0.023

*: P<0.05; **: P<0.01; ρ: Spearman's rank correlation coefficient; TAS: Toronto Alexythmia Scale; ECRI: Experiences in Close Relationships Inventory; BAI: Beck Anxiety Inventory; BDI: Beck Depression Inventory.

categories (secure, anxious, avoidant, and disorganized) using categorical measures. Such methodological differences in the measurement tools may account for the inconsistent findings. Future longitudinal research using standardized and comparable attachment measures could help clarify these associations. Insecure attachment can also hinder treatment adherence, reinforcing the need for therapeutic interventions that address attachment-related vulnerabilities (Bennett et al, 2011; Ciechanowski et al, 2001). Insecure attachment, therefore, may serve as a meaningful focus for psychological intervention. Cognitive-behavioral therapy, which has strong empirical support in CP treatment, has been shown to be effective in helping individuals with attachment anxiety reframe maladaptive thoughts and develop healthier coping mechanisms for emotional distress. Pain management can help patients develop more adaptive coping strategies, enhance emotional awareness, and reduce pain catastrophizing tendencies (Ciechanowski et al, 2003; Foster et al, 2018).

Alexithymia

Consistent with the existing literature (Gil et al, 2008; Romeo et al, 2020), our results showed higher alexithymia scores among patients with CP. This supports the theory that emotional awareness difficulties may lead to the somatization and bodily expression of affect. Alexithymic traits—such as difficulty identifying or articulating emotions—may contribute to CP via dysregulated stress responses and poor emotional processing.

Parenting Perceptions

Perceptions of parenting were notably different in the CP group. Negative maternal characteristics, such as pessimism, belittling, and emotional inhibition, and negative paternal traits, such as abuse and emotional deprivation, were more prevalent. These parental styles may fail to buffer children's anxiety and instead become sources of emotional distress. Inconsistent or emotionally unavailable early interactions may hinder the development of trust, emotion regulation, and stress resilience. Although no study has used the YPS for direct comparison, findings from other parenting instruments, such as the Parental Bonding Instrument, reveal similar trends. For instance, Romeo et al. (2020) and Gil et al. (2008) both reported decreased parental care and increased overprotection in patients with fibromyalgia, suggesting early relational environments marked by coldness, dismissiveness, and intrusiveness. Similarly, research evaluating early maladaptive schemas in patients with CP found increased levels of Dependence/Incompetence, Vulnerability to Harm or Illness, and Negativity/Pessimism schemas, as well as elevations in the Impaired Autonomy and Performance schema domain. These findings support our results, suggesting that early-life experiences may play a significant role in the psychological profiles of individuals with CP and carry significant relevance for clinical practice (Saariaho et al., 2015). Schema therapy, which targets early maladaptive schemas rooted in dysfunctional attachment and parenting experiences, offers a tailored approach to patients with CP by addressing persistent cognitive and emotional patterns associated with vulnerability and distress (Yousefzade et al, 2020).

Additionally, significant associations were found between alexithymia and parenting perceptions. The strongest correlations emerged with perceptions of a Pessimistic/Worried and Restricted/Emotionally Inhibited mother. These patterns may indicate learned emotional suppression or avoidance in the familial context, as postulated by Stoudemire (1991), who suggested that alexithymia may develop through social learning within the family system. Our findings are also consistent with those of Thorberg et al. (2011), who found moderate associations between alexithymia and parental overprotection.

The co-occurrence of negative parenting perceptions and alexithymia in the CP group suggests a possible mediating role for alexithymia between early-life adversity and CP. However, given the sample size, no formal mediation analysis could be conducted in this study.

A moderate-to-strong association was found between alexithymia and attachment anxiety and a moderate association with attachment avoidance. These findings support previous work that identified insecure attachment as a predictor of alexithymia (Ciechanowski et al, 2002; Peñacoba et al, 2018; Zhang et al, 2024). Individuals with insecure attachment often lack adequate emotional modeling and may adopt avoidant strategies, focusing on external facts while neglecting internal states (Feeney, 1999; Winterheld, 2016). Emotional neglect in childhood may set the stage for alexithymic patterns in adulthood.

Limitations

The study's limitations include a relatively small sample size, which limited advanced statistical modeling. The female predominance, while representative of CP populations, may limit generalizability. The single-center design also restricts the findings' broader applicability. The snowball sampling method for the control group may have introduced bias due to the lack of diversity. All data were self-reported, which raises recall bias concerns, especially for retrospective childhood experiences.

Strengths

This study uniquely integrates alexithymia, attachment styles, and detailed parenting perceptions in the context of CP. The use of a multidimensional assessment of early relational experiences contributes to a deeper understanding of the psychological vulnerabilities of this population.

CONCLUSION

Our findings highlight the significant associations between CP, attachment anxiety, alexithymia, and perceived parenting styles. Individuals with CP exhibited heightened attachment anxiety and greater difficulty in recognizing and expressing emotions, as reflected in elevated levels of alexithymia. Negative perceptions of maternal and paternal behaviors—particularly emotionally inhibiting, pessimistic, belittling, and overprotective parenting—appear to play a crucial role in shaping emotional regulation difficulties in adulthood. These results align with existing theories that early relational experiences and parental influences contribute to the development of alexithymic traits, which may mediate the relationship between childhood emotional environments and CP.

The strong associations between insecure attachment, alexithymia, and CP underscore the importance of psychological interventions aimed at improving emotional regulation, cognitive flexibility, and interpersonal functioning. Person-centered assessments are essential for identifying appropriate treatment goals. Cognitive-behavioral therapy, mindfulness-based interventions, schema therapy, and trauma-focused techniques may help patients modify maladaptive patterns rooted in early-life experiences, enhance emotional expression, and develop more adaptive coping strategies for managing CP. Future research should employ cohort designs and larger, more diverse samples to further explore causal relationships between early-life experiences, emotional regulation, and CP, using structural models to test the mediating roles of attachment and parenting.

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Application of Metacognitive Therapy Techniques in Generalized Anxiety Disorder: A Technical Report

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ABSTRACT

Generalized anxiety disorder (GAD) is one of the most common anxiety disorders, characterized by excessive and uncontrollable worry that significantly impairs an individual's functioning. Although cognitive behavioral therapy is an evidence-based treatment for GAD, it is associated with high relapse rates and only moderate levels of improvement. Metacognitive therapy (MCT) has emerged as an effective psychotherapeutic approach for anxiety disorders, including GAD. According to MCT, the most fundamental factor in the maintenance of GAD is the presence of negative metacognitive beliefs about worry—such as the belief that worry is uncontrollable and dangerous. Conversely, the presence of positive metacognitive beliefs about worry leads individuals to respond to negative thoughts with intense worry, resulting in a prolonged cycle of thinking. Therefore, treatment should first focus on modifying negative metacognitive beliefs, followed by identifying the dysfunctional cognitive and behavioral strategies used by the individual. In the final stage, the focus should shift to addressing positive metacognitive beliefs. In this context, the primary aim of this paper is to present the theoretical foundations of MCT and its conceptualization of psychopathology in detail. Additionally, the paper aims to illustrate the stages and techniques of MCT through a sample GAD case interview based on Wells' (2013) metacognitive model for GAD.

Keywords: Cognitive behavioral therapy, generalized anxiety disorder, metacognitive therapy.

ÖZ

Yaygın Anksiyete Bozukluğunda Metakognitif Terapi Tekniklerinin Kullanımı: Bir Teknik Yazı

Yaygın anksiyete bozukluğu, bireyin işlevselliğini önemli ölçüde etkileyen, aşırı ve kontrol edilmesi zor bir endişe düzeyi ile karakterize en yaygın anksiyete bozukluklarından biridir. Bilişsel davranışçı terapi, yaygın anksiyete bozukluğu için kanıta dayalı bir tedavi yöntemi olsa da araştırmalar bilişsel davranışçı terapinin yüksek yineleme oranlarına ve orta düzeyde iyileşme oranlarına sahip olduğunu göstermektedir. Son yıllarda metakognitif terapi, yaygın anksiyete bozukluğu da dahil olmak üzere anksiyete bozuklukları için etkili bir psikoterapi yaklaşımı olarak öne çıkmıştır. Metakognitif terapiye göre; yaygın anksiyete bozukluğuna sahip bireylerin endişe ile ilgili negatif metakognitif inançlara sahip olmasının (endişenin kontrol edilemez ve tehlikeli olduğuna dair inançlar) hastalığın sürmesindeki en temel etken olduğu kabul edilmektedir. Öte yandan endişeyle ilgili pozitif metakognitif inançların varlığı, bireylerin negatif düşüncelerine yoğun bir endişe ile yanıt vermelerine ve uzun uzadıya bir düşünme döngüsüne girmelerine yol açmaktadır. Bu sebeple tedavide öncelikle negatif metakognitif inançların değiştirilmesi, ardından bireyin kullandığı işlevsiz zihinsel ve davranışsal stratejilerin tespit edilmesi ve son aşamada pozitif metakognitif inançlar üzerinde çalışılması gerekmektedir. Bu bağlamda, yazının temel amacı, Wells'in (2013) yaygın anksiyete bozukluğu için geliştirdiği metakognitif modeli temel alınarak, metakognitif terapinin basamaklarını ve kullanılan teknikleri örnek bir yaygın anksiyete bozukluğu vakası görüşmesi üzerinden göstermektir.

Anahtar Kelimeler: Bilişsel davranışçı terapi, yaygın anksiyete bozukluğu, metakognitif terapi.

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INTRODUCTION

Generalized anxiety disorder (GAD) is a highly prevalent psychiatric disorder characterized by an excessive and uncontrollable level of worry accompanied by various physical and anxiety symptoms—including restlessness or feelings of apprehension, easy fatigability, irritability, difficulties in concentration, muscle tension, and sleep disturbances—that result in significant functional impairments (American Psychiatric Association, 1980). Clinical practice guidelines advocate for pharmacological and psychotherapeutic interventions for GAD treatment (Antony & Stein, 2008; Cape et al, 2010). While selective serotonin reuptake inhibitors are recommended as the primary pharmacological treatment, cognitive behavioral therapy (CBT)—an evidence-based approach with substantial experimental support—has emerged as the leading psychotherapeutic option (Cape et al, 2010). However, considering the fact that approximately 50% of patients undergoing GAD treatment do not exhibit an adequate response to first-line therapies such as antidepressant medication (Ansara, 2020) and also the high relapse rates and moderate clinical improvement achieved with CBT (Fisher, 2006; Hunot et al, 2007), alternative and effective psychotherapeutic approaches are increasingly needed. In this context, metacognitive therapy (MCT) is another important psychotherapeutic method emphasized as a promising perspective in treating GAD (Wells, 2013; Wells, 2011). MCT is based on a theoretical foundation called the Self-Regulatory Executive Function Model (S-REF model; Wells & Matthews, 1994, 1996), which suggests that a repetitive thinking style called cognitive attentional syndrome (CAS) in response to triggering thoughts and feelings plays a crucial role in perpetuating the psychological problems rather than biased cognitions, which is seen as the primary cause of psychopathology by other psychological approaches such as CBT. According to this model, people who develop psychological problems engage in CAS, which consists of perseverative thinking style, specifically worry and rumination, threat monitoring, attentional biases such as self-focused attention, and other dysfunctional coping behaviors in the form of thought suppression, avoidance, alcohol, and self-harm (Wells, 2011). MCT argues that CAS is developed as a result of dysfunctional metacognitive beliefs, which are divided into positive and negative beliefs. The first one refers to beliefs related to the benefits of engaging in worry and rumination, such as "I must worry about things so that I can feel prepared" or "I need to analyze things to get answers." The latter concerns uncontrollability and danger beliefs such as "I cannot control my worry" or "If I continue worrying, it will harm me mentally and physically" or "Some thoughts can harm me." Due to these dysfunctional metacognitive beliefs, people engage in CAS and unhelpful coping strategies that hinder the regulation of the mind, making them stuck in the negative thinking loop. Besides, engaging in CAS perpetuates psychological problems because it makes people over-focus on triggering thoughts, feelings, and perceived threats, prevents them from building a flexible relationship with their triggering thoughts, and reduces the likelihood of collecting new information that could help them modify maladaptive metacognitive beliefs. A growing body of empirical evidence supports the notion that CAS plays a central role in the maintenance of emotional disorders, such as OCD, depression, and GAD (Fergus et al, 2013; Wells, 2011). Changes in metacognitive beliefs have been found to be strong predictors of symptom change and improvement in individuals suffering from OCD (Sunde et al, 2021), social anxiety disorder (Nordahl et al, 2017), and comorbid anxiety disorders (Hoffart et al, 2018), highlighting the importance of targeting the maladaptive metacognitive beliefs underlying psychopathology. In this manner, the aim of MCT is to target and change dysfunctional metacognitive beliefs and interrupt CAS strategies and unhelpful mental and behavioral strategies so that the vicious cycle can be broken.

Metacognitive Model of GAD

According to Wells' (1995, 2011, 2013) metacognitive model of GAD, worry is the most fundamental cognitive characteristic of GAD. Worry is defined as a predominantly cognitive response triggered by any negative thought that arises (e.g., "What if I lose my child?"). MCT posits that worrying does not always lead to adverse outcomes, although many people view it as a means of foreseeing problems and better coping with them. Instead, GAD onset is thought to begin with the activation of negative metacognitive beliefs about worry. Two primary negative beliefs are emphasized: the belief that worry is uncontrollable and that worry will cause physical or mental harm. Negative beliefs, such as "I'm losing control" or "I'm going to go crazy," are commonly observed in patients with GAD. According to MCT, these patients begin to worry about the worry itself—a phenomenon termed Type 2 worry (meta-worry). When individuals start worrying about their worry, their anxiety intensifies, leading them to engage in ineffective cognitive or behavioral strategies that ultimately undermine their daily functioning. Wells (1995, 2011, 2013) notes that individuals may resort to behavioral strategies such as seeking reassurance, approval, avoidance, distraction, or even alcohol use, as well as various thought-control methods, in an effort to control their minds. Cognitive strategies frequently employed by patients with GAD include thought suppression, positive thinking, rumination, fixation of attention, overthinking, and attempts to rid themselves of their thoughts. The use of these dysfunctional response patterns further reinforces negative metacognitive beliefs related to worry, diminishes awareness of their inefficacy, and ultimately contributes to the persistence of the problem (Wells, 2011).

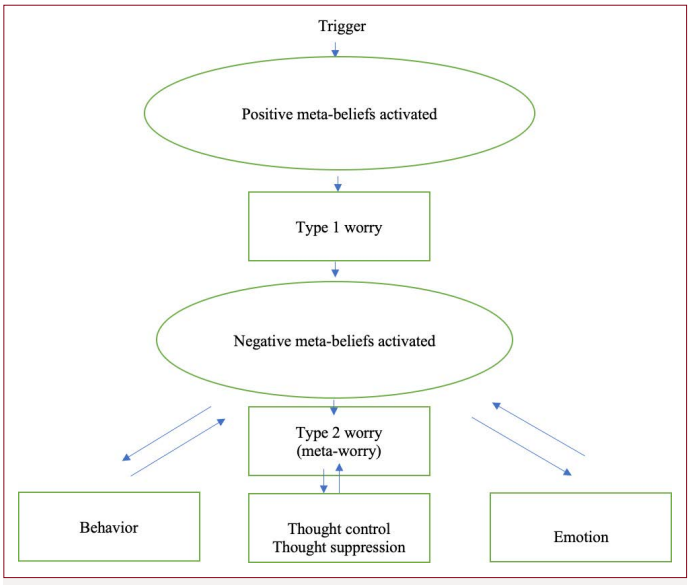

Figure 1. Metacognitive model of GAD (Wells, 2013).

This text aims to provide detailed information on the specific techniques used in GAD treatment, with a clinical application based on the Wells' (2011) model, as shown in Figure 1. First, the aim of the first session in MCT is to generate a case formulation by focusing on a recent instance in which worry was triggered so that the positive and negative metacognitive beliefs that perpetuate the psychological problem and the maladaptive coping strategies to worry can be identified. The steps for generating a case formulation are illustrated in the following sample dialogs.

1. Sample Dialog: Generating a Case Formulation

Therapist: *Welcome. How are you?*

Client: *As usual, I am worried and anxious.*

Therapist: *Do you feel anxious and worried because of the concerns you mentioned?*

Client: *Yes. I always feel this way.*

Therapist: *Was yesterday also a day when you felt worried?*

Client: *Yes. It never goes away.*

Therapist: *Let's look at your worries from yesterday. Where were you?*

Client: *I was at home. I had topics to study for my exam. The feelings of not being able to pass my exam came back again, and I couldn't do anything. I just started crying.*

Therapist: *When the exam materials were in front of you, what was the first thought that came to your mind? Was it something like, "What if … happens?"*

Client: *The thought was, "What if I fail the exam?"*

Therapist: *I understand that this was your initial triggering thought. Is that correct?*

Client: *Yes, but it doesn't stop there. What if I fail? Then I won't find a job, and I won't be able to stay here.*

Therapist: *So you started worrying—"What if I fail the exam? What if I can't find a job? What if I can't stay here?" Is that correct?*

Client: *Yes. I don't want to go back to my family or live with them. But at this rate, that's what will happen.*

Therapist: *I see that you were quite worried yesterday. How did you start feeling after those worries set in?*

Client: *I felt extremely worried and started crying right away. I felt very unsettled.*

Therapist: *If you continue to feel and think this way, what do you think is the worst thing that could happen?*

Client: *It feels like I'm losing my mind. I really feel like I'm going crazy.*

Therapist: *How much do you believe that your worry will make you lose your mind? If I asked you to rate it on a scale from 0 to 100, what number would you give? A score of 0 means that you don't believe it at all, and 100 means that you believe it very strongly.*

Client: *70.*

Therapist: *Do you believe that continuing to worry could lead to other negative consequences?*

Client: *I think if this continues for a bit longer, I might have a heart attack. My body won't be able to handle this level of strain.*

Therapist: *How much do you believe that your worry will cause you to have a heart attack? If I asked you to rate it again on a scale from 0 to 100, what number would you give?*

Client: *90.*

Therapist: *I understand that you believe that you might have a heart attack and that you might lose your mind because of your worry. If worry is this harmful for you, why don't you just stop worrying?*

Client: *I can't stop. It's not something I have control over.*

Therapist: *So, you believe that worry is uncontrollable. Is that correct?*

Client: *Yes, absolutely.*

Therapist: *If I asked you to rate this belief on a scale from 0 to 100, what would you say?*

Client: *I'd say 90.*

Therapist: *So, you believe that worry will drive you crazy, cause a heart attack, and that it is uncontrollable. These are your negative*

beliefs about worry. Do you have any positive beliefs about it? When you started worrying about the exam yesterday, did you ever think it might be useful or helpful to you in some way?

Client: *Well, if I don't pass the exam, everything will be terrible. I need to prepare for the possibility of not being able to stay here and having to go back to my family. Otherwise, how will I cope?*

Therapist: *Do you think that worrying might actually help you cope?*

Client: *Yes. I will be more prepared and able to handle things better if they happen.*

Therapist: *How much do you believe that worrying will make you more prepared and help you cope better with situations?*

Client: *About 70.*

Therapist: *Alright. I'm curious about something. While you were worrying, did you do anything to pull yourself out of it?*

Client: *I keep talking to my roommate. I discuss different scenarios with my roommate about whether I will pass or fail the exam and ask for my roommate's opinion. My roommate tells me that I will pass and that it won't be so bad. Sometimes, it reassures me.*

Therapist: *It sounds like you're seeking reassurance. Am I correctly understanding that?*

Client: *Yes.*

Therapist: *Is there anything else you do to soothe yourself or avoid worrying?*

Client: *I try to do different things. I put on a show, and to be honest, I also drink alcohol.*

Therapist: *So, I understand that you try to shift your focus, drink alcohol, and seek reassurance from your roommate. Do you do anything else to eliminate these thoughts?*

Client: *I just want to shut the exam topic out of my mind. I don't want to think about it. Sometimes, it seems so irrational—I tell myself, "You'll pass. You already know these topics. Don't be ridiculous. Of course you will pass the exam."*

Therapist: *It sounds like you're trying to reassure yourself by thinking positively. Have you ever tried responding to the thought, "What if I fail the exam?" without worrying?*

Client: *No, I haven't. The exam is extremely important to me. It determines things like whether I can stay here and whether I will be able to find a job.*

Therapist: *So, because of this, you want to think about it extensively and don't let that thought go unanswered. Let's call this "continuous thinking" and include it in our model.*

Socialization of the Model

The second step of MCT is to initiate the socialization process to explore the case formulation components in greater detail. The primary goal of the socialization process is to show the client that the problem does not stem from the triggering thought itself but rather from the presence of negative and positive beliefs about worry. Furthermore, during the socialization process, it is vital to work with the client on how mental and behavioral strategies to cope with worry actually maintain psychological distress (Hjemdal et al, 2013). After effectively working with the case conceptualization and the socialization process, the client should be provided a detailed explanation of the structure of the MCT and the metacognitive processes that will be worked on.

2. Sample Dialog: Modifying Metacognitive Beliefs Regarding Uncontrollability

Several studies have examined the strong relationship between pathological worry and negative metacognition. For instance, Wells and Carter (2001) reported that when GAD clients were compared with clients with social phobia, panic disorder, and healthy controls, the GAD group had significantly higher negative metacognitive beliefs regarding the uncontrollability and danger of worry. Moreover, when the frequency of Type 1 worry was statistically controlled, the differences in beliefs about uncontrollability and danger remained the same. Similarly, Ruscio and Borkovec (2004) found that although all groups reported the same level of experiencing worry, only individuals with GAD strongly endorsed negative metacognitive beliefs about worry. This suggests that the primary difference between people without GAD and those diagnosed with GAD is not about the amount of worry experienced but rather about the beliefs about worry. Therefore, during the MCT, the aim is not to alter the content of the worry itself but to alter the negative metacognitive beliefs that clients have regarding the worry. The steps for modifying the uncontrollability beliefs of worry are illustrated in the following sample dialog.

Therapist: *How much do you believe that worry is uncontrollable?*

Client: *I believe it's 90%. It's out of my control.*

Therapist: *Are you feeling worried right now while talking to me?*

Client: *Yes, I feel very anxious.*

Therapist: *Do you think worry and anxiety are the same thing?*

Client: *I think they are.*

Therapist: *Let's elaborate on these concepts. Anxiety is an emotion that you experience automatically. However, worry is a verbal process that occurs when you respond to a triggering thought. For example, "What if I fail the exam?" is a triggering thought. Is that correct?*

Client: *Yes, it's a thought that keeps coming to my mind.*

Therapist: *You initiate the thinking process by responding to this*

thought with worry—such as "What if I can't find a job on time? What if I have to move back with my family?" Who is the one giving this response?

Client: *Yes, it's me.*

Therapist: *So, if you didn't respond with worry, could the worry process still begin?*

Client: *I assume it couldn't.*

Therapist: *For example, right now, are you worrying or just feeling anxious?*

Client: *Right now, I'm just feeling anxious. I'm listening to you at the same time.*

Therapist: *If worry were something completely uncontrollable, how did it stop right now?*

Client: *I think it's because I'm focused on you and what you're saying.*

Therapist: *So, while being in session with me, you are able to choose not to respond to the triggering thought with worry?*

Client: *Yes, that's right. The worry has stopped for now.*

Therapist: *Then, if you are the one who starts the process by responding to the triggering thought, then who do you think is the one choosing not to respond and stopping it right now?*

Client: *It's me.*

Therapist: *So, what does this tell us about the belief that worry is uncontrollable?*

Client: *Yes, sometimes it can be controlled.*

Therapist: *For example, you mentioned that you took your girlfriend's boyfriend to the hospital last week. What happened to your worry process at that moment?*

Client: *Well, it stopped at that moment because I was dealing with that emergency.*

Therapist: *If it was able to stop, could it really be uncontrollable?*

Client: *Yes, when such situations happen, I can control it.*

Therapist: *If worry were uncontrollable, do you think whether we can control it would change depending on the situation?*

Client: *I hadn't thought about it this way. No, it wouldn't.*

Therapist: *So, what happens to your worry when you sleep?*

Client: *I always feel tired and anxious. I can't sleep well, as I always tell you.*

Therapist: *Are anxiety and tiredness the same as worry?*

Client: *No, they are not.*

Therapist: *If worry were truly uncontrollable, would you be able to sleep?*

Client: *No, I wouldn't be able to sleep. That means my worry stops, but sometimes it doesn't, and I can't control it at night. That's why I can't sleep well.*

Therapist: *Do you think this proves that worry is uncontrollable, or does it show that you are not using the right strategies and continue responding to your thoughts?*

Client: *Yes, it seems like the second one.*

Therapist: *Even if you don't have control over your initial triggering thought, you can still choose not to respond to it with worry and avoid engaging in a prolonged worry process. In the next stage, we will explore these alternative approaches. At the moment, how strongly do you believe that worry is uncontrollable?*

Client: *Right now, I think I have some control over it. So, I would say 50.*

Detached Mindfulness Practice

Detached mindfulness is one of the core techniques of MCT to demonstrate that the strategies the client has used to cope with triggering thoughts have been ineffective. As clients with GAD have difficulty differentiating between the initial trigger thoughts and worrying, it is crucial that the client develops this skill with detached mindfulness in the early stages of the treatment. The aim of detached mindfulness is to teach clients that there is a new way of responding to triggering thoughts without worrying and letting them come and go without engaging them (Wells & Matthews, 1994). Detached mindfulness can be developed through techniques called tiger or free association tasks. For instance, in the tiger task, the client can be asked to think about a tiger for 1 minute by allowing the thought of a tiger to take shape in his/her mind without trying to change or control it. The aim is to help clients to take a step back and simply watch what their mind presents to them without changing or analyzing any thoughts or images. In the free association task, the client is asked to listen to the neutral words that the therapist says aloud, such as sea, tree, green, birthday, and holiday. The client's task is to observe the thoughts or images that pop into their mind after each word without analyzing or responding to any of them. Clients are asked to apply the same "do nothing" strategy to their triggering thoughts so that they can discover the difference between having triggering thoughts and engaging with them.

In detached mindfulness practices, clients may continue to control, analyze, or respond to their thoughts. Therefore, it is important to remind them that the goal is to "do nothing" in response to the thoughts that arise in their mind. As the clients with GAD have been trying to cope by constantly battling and responding to their thoughts for a long time, it is important to acknowledge that they may initially find this practice challenging. For several clients with GAD, "doing nothing" in

response to their thoughts—that is, not fighting them—can feel even more difficult than actively struggling against them. Emphasizing this possible difficulty during therapy is crucial for the client's motivation and the therapeutic relationship. The same exercise should be practiced again during the session, followed by its application to the client's worry-triggering thoughts. Clients can be asked to bring the initial triggering thought such as "what if I lose my loved ones" into their mind without responding to it in any way. As a homework assignment, to continue developing detached mindfulness, the client should practice it so that they can increase their ability to allow triggering thoughts in the mind without worrying about them.

3. Sample Dialog: Worry Postponement Technique

Another key technique of MCT to reduce worry activity and help the client discover that worry is controllable is called "Worry Postponement Technique." The aim of this technique is to teach the client that whenever any triggering thoughts pop into their mind, they can remind themselves not to engage the thought at that moment and postpone it to a later time during the day when they can respond to triggering thoughts and initiate the worrying process for approximately 10 minutes. As they continue to apply the Worry Postponement Technique and observe that they have not responded to the thought for a certain period, they have a chance to discover that the worry process is controllable (Wells, 2011; Wells, 2010). The following sample dialog illustrates how this technique is effective in reducing uncontrollability beliefs about worry.

Therapist: *How was your week?*

Client: *Honestly, it felt a bit easier; but at times, I still felt worried and anxious.*

Therapist: *Did triggering thoughts come to your mind? And did you try, as we discussed, not to respond to them, to take a step back, and to let them be on their own?*

Client: *Yes, they came—they always do. Especially when I decided to study. Sometimes, I couldn't postpone them and ended up responding; but for the most part, the part where I told myself "I'm not going to engage with you right now, I will focus on studying" was helpful.*

Therapist: *So, a "What if..." thought came to your mind, and you chose not to respond to it, instead trying to focus on what you were doing. Is that correct? Did you think about it in the evening?*

Client: *Yes, in the evening, I did think about it for 10–15 minutes. But honestly, in the last few days, I didn't really think much about it, even when that time came.*

Therapist: *So, when a thought came, you could postpone responding to it. What does this tell you about the belief that worry is uncontrollable?*

Client: *I mean, I could actually postpone it when I wanted to, and it felt like the thoughts just lingered in my mind. This time, I felt like I had more control.*

Therapist: *So, if I am the one choosing not to respond and to postpone, and in the evening, I am also the one who starts or stops the worry when I want to, then who is in control of the worry?*

Client: *Yes, it is under my control. But those thoughts still made me feel uncomfortable.*

Therapist: *You're right. Even though those thoughts that come to your mind create an emotion in you, they are still just thoughts, aren't they? If you looked at them independently of your emotions, what would you actually say?*

Client: *Yes, they are still just thoughts.*

Therapist: *So, when the thought "What if I fail the exam?" comes to your mind and you respond to it with worry, what happens to that emotion? Furthermore, what happens to the intensity of your emotion when you don't respond and postpone it?*

Client: *It definitely decreases, and I can focus more on my day.*

Therapist: *So, can we say that responding to thoughts and initiating the worry process actually increases the intensity of our emotion?*

Client: *Yes, I feel extremely worried and anxious at that point. I can't do anything.*

Therapist: *You mentioned that you are responding less to your thoughts, creating some distance, and are generally able to postpone them. I would like you to continue applying the Worry Postponement Technique. Considering all of this, I would like you to once again rate your belief in the uncontrollability of worry.*

Client: *Right now, I would say around 10–15%.*

4. Sample Dialog: Modifying Metacognitive Beliefs About the Danger of Worry

Verbal Methods: Questioning the Mechanism, Seeking Evidence, and Counter-Evidence

Another important negative metacognitive belief that maintains GAD is the belief regarding the physical and mental danger of worry. For example, clients with GAD believe that extreme worrying will harm their physical health and cause a heart attack by increasing their anxiety and distress levels. Many of them also believe that if they continue worrying, it will make them lose control or go crazy. To intervene and test the belief that worry may be harmful, it is important to explore with the client how worry could be harmful and by what mechanism it might cause harm. The following sample dialog illustrates this purpose.

Therapist: *How do you know that worry is harmful?*

Client: *When I worry, my blood pressure rises, and my heart rate increases incredibly. This is not good for my heart.*

Therapist: *So, when you worry, your heart beats faster. How do you think a faster heartbeat could harm your heart?*

Client: *I think I'm going to have a heart attack because my heart starts beating so fast. It doesn't feel like it normally does.*

Therapist: *What happens to your heart rate and blood pressure when you are not worrying?*

Client: *It goes back to normal. Right now, it's not that bad. However, if I keep worrying for a while longer, my heart will start beating really fast, and I feel like I might have a heart attack.*

Therapist: *So, you're saying that temporarily increased blood pressure and a faster heartbeat are dangerous.*

Client: *Yes.*

Therapist: *Can you think of anything else that increases your heart rate?*

Client: *My heart beats faster when I walk briskly.*

Therapist: *That's right. Do you believe that brisk walking is harmful to your heart and increases the risk of heart attack?*

Client: *No, quite the opposite. It has significant benefits for heart health.*

Therapist: *What happens to your heart rate during sexual activity?*

Client: *Yes, it increases a lot; but I've never experienced any harm from it.*

Therapist: *Are you aware of the similarity between the symptoms you experience when you worry, exercise, or engage in sexual activity? Do you think that exercising or having sex is bad for heart endurance, or could it be beneficial?*

Client: *Yes, they are very similar, and they are beneficial.*

Therapist: *That's correct. So, an increased heart rate and temporarily elevated blood pressure may not be a good example of worry being harmful to your heart or causing a heart attack. Have you ever wondered why your heart rate changes when you feel anxious and worried?*

Client: *Because I feel extremely afraid.*

Therapist: *When we are afraid, what substance does our body produce that causes our heart to beat faster?*

Client: *I can't remember.*

Therapist: *Our body produces adrenaline. Have you ever seen what people do in movies when someone has a heart attack and needs to be revived?*

Client: *Yes, I know from Gray's Anatomy. They use a defibrillator.*

Therapist: *Exactly. Why do defibrillators help? What substance plays a role in this?*

Client: *Adrenaline.*

Therapist: *That's right. If adrenaline were harmful, do you think doctors would inject it into patients with heart attack to bring them back to life?*

Client: *No. Actually, it saves lives. So, adrenaline is not as harmful as I thought.*

Therapist: *Yes. What are you thinking now about the belief that worry could harm your body and cause a heart attack?*

Client: *I mean, I'm experiencing the same symptoms as I do during exercise, and if adrenaline is recommended for protecting the heart rather than harming it, then maybe it's not dangerous for me either.*

Therapist: *In the first session, you mentioned that you have been someone who worries for a long time. Have you ever experienced any actual harm in this sense?*

Client: *There have been times when I was extremely worried, but nothing ever happened to my heart. At least not so far.*

Therapist: *Right now, how would you rate your belief that worry can harm your body?*

Client: *I would say 30.*

With a client who believes that worry, distress, and anxiety are psychologically harmful, the idea that worry is not harmful to mental health can be explored through the evolutionary perspective using the following example dialog.

Therapist: *Do you think conditions were difficult for our ancestors who lived in earlier times?*

Client: *Yes, of course, it must have been very difficult.*

Therapist: *So, do you think they had many things to worry about? Considering survival, shelter, and food?*

Client: *Yes, probably even more than we do today.*

Therapist: *You're right. If worry and distress caused mental illnesses, do you think humanity would have evolved and still exist today?*

Client: *No, it wouldn't have.*

Therapist: *Do you think they experienced anxiety?*

Client: *Yes, they must have been very anxious.*

Therapist: *If anxiety were a harmful emotion, would it serve as a survival response for humans, or would humanity have been able to evolve?*

Client: *I've never looked at it this way before. Anxiety and distress have always been emotions I was afraid of.*

Therapist: *Can you think of any profession or group of people who are exposed to extreme distress?*

Client: *Soldiers in combat come to mind. Even in movies, I sometimes find it difficult to watch.*

Therapist: *Yes, they experience intense distress. If worry and distress were truly psychologically harmful, then soldiers should experience severe psychological crises, right?*

Client: *Yes, they probably do.*

Therapist: *No, quite the opposite. Studies have shown that cases of psychological disorders actually decrease during times of war. Similarly, think about race car drivers—another profession that operates under extreme distress. However, they do not suffer from more psychological or physical harm. In contrast, their performance improves.*

Given this evidence, how strongly do you now believe that worry and distress are harmful?

5. Sample Dialog: Behavioral Experiments for Modifying Metacognitive Beliefs About the Danger of Worry

Although verbal techniques are powerful in challenging metacognitive beliefs about the perceived danger of worry, some clients with GAD still hold the belief that worry could drive them insane or lead them to lose their mind. Therefore, after effectively working on this belief using verbal techniques, a behavioral experiment called the "try to go crazy with worry" experiment can be designed with clients to test this belief through the following structured dialog to achieve a more stable and lasting change.

Therapist: *What is the worst thing that could happen if you continue to worry?*

Client: *If I keep worrying for a little longer, I think I will lose my mind.*

Therapist: *Can you explain to me what you mean by losing your mind? What would happen exactly? What would I see if I were observing you at that moment?*

Client: *It feels like I would forget everything I know and start acting impulsively. I might suddenly throw myself out of the window, my mind would go completely blank, and I could even forget who I am—like reaching a "crazy" level.*

Therapist: *I see. Let's conduct an experiment together. Can you start worrying about your exam in the same way that you normally would? In fact, let's try to increase your worry to the maximum level possible.*

Client: *That sounds a bit scary, but I will try.*

Therapist: *That's okay. We can stop whenever you want, but let's see what happens when you push your worry to the maximum.*

The client can be asked to begin intensely worrying (for example, about her exam) during the session, and the therapist can start questioning whether the worry is actually leading to losing her mind, as she fears.

Therapist: *How are you feeling right now?*

Client: *I feel tense and anxious.*

Therapist: *Have you lost your mind? You told me that you might act impulsively. Did you?*

Client: *No, I thought I might, but I didn't.*

Therapist: *You said you would know nothing and you wouldn't be able to remember anything. If I asked you your name and surname, where we are right now, and what we are doing, could you tell me?*

Client: *Yes, I can say all of them, but I still feel anxious.*

Therapist: *Is feeling anxious the same as losing your mind?*

Client: *No, it's not.*

Therapist: *So, could it be that you haven't lost your mind but are just feeling anxious?*

Client: *Yes, that's right.*

Therapist: *Right now, how strongly do you believe that your worry will cause you to lose your mind?*

Client: *Approximately 15%.*

Therapist*: As a homework assignment, I want you to deliberately continue worrying when you feel anxious instead of trying to stop it Let's see if your intense worry leads to the outcomes you fear.*

6. Sample Dialog: Behavioral Experiment to Assess the Effects of Worry on the Body

It is common for GAD clients to believe that worrying is harmful for their body because it changes their heart rate, which could lead to a heart attack. To show the actual effects of worry on their body, a behavioral experiment can be designed to explore the actual effects of worry on bodily responses, as shown in the following example dialog:

Therapist: *You mentioned that worry significantly increases your heart rate and that, as a result, you might have a heart attack. Let's conduct an experiment together to see how worry affects your body. How much do you think your heart rate changes when you are worrying and when you are not?*

Client: *I think there is a significant difference. I would say at least 40 beats.*

Therapist: *Alright. Would it be meaningful for you if we measured your heart rate while doing light exercise, sitting with neutral thoughts, and worrying, and then compared the differences?*

Client: *Yes, but as I said, I feel like it's beating way too fast.*

With the help of this behavioral experiment, the therapist and the client can discover that while worry increased the client's heart rate, the difference between the heart rate when thinking neutrally or positively and when worrying is not as high as the client thinks. This MCT technique significantly reduces the belief that worry could increase heart rate, harm the body, and cause a heart attack. In this way, clients' belief in the danger of worry can drop to zero.

7. Sample Dialog: Modifying Positive Metacognitive Beliefs About Worry

Although the MCT approach does not consider having positive metacognitive beliefs about worry a pathological condition, GAD clients continue to respond to their triggering thoughts and emotions with excessive conceptual activity and use dysfunctional strategies while coping with their internal experiences as a result of these beliefs. For this reason, after working on negative metacognitive beliefs about worry, it is also necessary to flexibly challenge and effectively modify positive metacognitive beliefs through the following example interventions. Through verbal restructuring, the advantages of worry can be examined together with the client by questioning supporting and opposing evidence using the following example dialog.

Therapist: *What evidence do you have that worrying is helpful?*

Client: *I think that if I worry, I will be better able to cope with problems.*

Therapist: *How much do you believe this? A score of 0 means you don't believe it at all, 100 means you completely believe it.*

Client: *I'd say 80.*

Therapist: *Alright. How does worry help you cope with problems?*

Client: *Let's say I fail an exam. It feels like I am calculating what I can do about it and what will happen if I fail.*

Therapist: *So, you believe that worrying about "What if I fail the exam?" will help you cope better if you fail. What conclusions have you reached through worry? Let's say you do fail, what will you do to cope better?*

Client: *Well, if I fail, I will know in advance, so I will immediately find a solution. I can retake the exam, start looking for a job, or talk to my professors.*

Therapist: *Do you think it's possible to know these alternative solutions without worrying? Did you worry right now, or did you simply think about what you could do if you failed, and then it ended there?*

Client: *Yeah, this isn't really a worry.*

Therapist: *Would you still be able to apply these alternatives if you failed the exam, even without worrying?*

Client: *I assume I could, but I feel like I will come up with even more solutions if I worry more.*

Therapist: *Because you've worried a lot about this before, let me ask you—if I gave you 3 more hours to worry, where do you think you would end up? Furthermore, in all the times you've worried about this before, have you reached any conclusions beyond what you just listed?*

Client: *Honestly, nowhere.*

Therapist: *So, how do you feel when you worry? What happens to your concentration? What happens to your emotions?*

Client: *I feel anxious and tense. My concentration is disrupted. For example, I can't study.*

Therapist: *Do you think that someone who is more anxious, more tense, has disrupted concentration, and has spent half of their day worrying about the exam will cope better if they fail? Or will someone who has kept their focus on studying as much as possible and reduced their worry activity cope better?*

Client: *Actually, when you put it that way, it's definitely the second one.*

Therapist: *So, if you fail the exam, wouldn't you still be able to consider the alternatives that you mentioned today? Do you think you could cope and take these actions without worrying?*

Client: *Yes, I assume I could. However, it feels like I would be less upset.*

Therapist: *So, you're saying that if we worry enough about things, we will be less upset when they actually happen. I should try that too.*

Client: *(Smiles) Yeah, when you put it that way, it sounds silly.*

Therapist: *If this were true for the exam, have you felt less upset in the past when things you worried about actually happened? Or did you still experience whatever emotion came at that moment?*

Client: *No, I wasn't less upset.*

Therapist: *So, would you rather increase your anxiety and tension by worrying, losing concentration, failing the exam, and feeling upset? Or would you prefer to focus on the exam without worrying, study, and if you fail, feel upset at that moment? Which of these would you choose?*

Client: *Definitely not worrying and feeling upset if it happens.*

Therapist: *So, does something that makes you feel anxious and tense help you cope better or worse? Which version of you would be more resilient?*

Client: *I would prefer the second version of me, who studies for the exam, worries less, and feels less anxious.*

Therapist: *So, how much do you believe right now that worry helps you cope? A score of 0 means you don't believe it at all, 100 means you completely believe it.*

Client: *I would say 20.*

8. Sample Dialog: Worry Abandonment and Enhancement Experiments

Another effective way to challenge and modify beliefs about the advantages of worry is to compare the impact of increased and decreased worry on the client's life. If worry were truly a useful strategy, there should be observable positive effects in the client's daily life. The therapist and the client designed an experiment together to evaluate the effects of worry, as demonstrated in the following example dialog.

Therapist: *"Worrying means that I care." How strongly do you believe this?*

Client: *60–70.*

Therapist: *Does worrying about the exam, for example, show that you care about it?*

Client: *Yes, if I don't worry, it feels like I will stop caring and won't study.*

Therapist: *So, you believe that worrying improves your performance and makes you study more for the exam.*

Client: *Yes, exactly.*

Therapist: *Then, can we say that people who don't worry about the exam don't care about it?*

Client: *Well, they probably do.*

Therapist: *How would you know that they care?*

Client: *By looking at how much time they spend studying for the exam.*

Therapist: *So, you wouldn't determine whether someone cares based on how much they worry about the exam.*

Client: *Yes, when you put it that way, it sounds strange; but it still feels like I will give up if I don't worry.*

Therapist: *If worrying truly improves your performance and helps you study more, then when you don't worry about the exam, your performance should worsen, and you should be unable to study. Is that correct?*

Client: *Yes.*

Therapist: *Then, how about we conduct an experiment? To examine the effect of worry on your performance, I would like you to spend tomorrow worrying about the exam, and then the next day prevent yourself from worrying. Let's observe the changes in your performance together.*

Client: *This seems like it will be interesting. Alright, I will spend a day worrying and the next day not worrying, and I will observe how it affects my exam studies.*

In the following session, the client was asked whether she noticed any difference between her performance on the 2 days. The client reported that she did not observe any difference in her performance between the day she worried and the day she did not. She realized that she studied for the exam in both cases and that worry had no additional benefit. However, on the day she worried, she felt more anxious and uneasy, and her concentration was disrupted. Through this experiment, the client's beliefs about the usefulness of worry were effectively changed.

9. Sample Dialog: Worry Mismatch Strategy

To demonstrate to the client that worry does not fully align with reality, the following example dialog is used to discuss the discrepancy between a past event the client worried about and what actually happened. The goal of this strategy is not to change the content of the worry but to modify beliefs about the usefulness and advantages of worry (Wells, 2011).

Therapist: *Can you share another situation about which you have recently been worried?*

Client: *I remember worrying for weeks about the presentation I had to give during my internship. It was awful.*

Therapist: *What did you think would happen during the presentation? What were you worried about?*

Client: *I was going to present it online. I kept thinking "What if something happens to my Internet? What if I can't open my presentation? What if I completely freeze and can't say anything? What if I can't answer people's questions? What if I get expelled from the internship?"*

Therapist: *Let's write these down individually as part of your worry scenario. Now, let's look at the real scenario—what actually happened. Did anything happen to your Internet?*

Client: *No, my Internet worked fine.*

Therapist: *Alright, let's continue. Were you able to open your presentation?*

Client: *I tried twice, but it opened.*

Therapist: *Did you completely freeze and fail to say anything?*

Client: *I got stuck in some parts, but I was able to talk through the whole presentation.*

Therapist: *Were you able to answer the questions?*

Client: *I received 3–4 questions. I didn't understand one of them, but I answered the rest.*

Therapist: *Let's continue. Were you expelled from the internship?*

Client: *(Laughs) No, I wasn't expelled. I completed my internship.*

Therapist: *What do you think about this picture?*

Client: *I'm wondering how none of it actually happened.*

Therapist: *If your worries don't match reality, how useful can they be to you?*

Client: *I assume they are not useful at all.*

Therapist: *So, what does this tell you about the nature of worry?*

Client: *It always predicts the worst and is unrealistic. Looking at it this way, it's quite surprising.*

Therapist: *That's right. If worry always predicts the worst and has a distorted nature, can it really be helpful to us?*

Client: *No, it can't.*

CONCLUSION

MCT postulates that people who develop psychopathology response to their inner experiences (thoughts, feelings, and images) with a repetitive thinking style known as the CAS, as a result of dysfunctional metacognitive beliefs. According to the model, individuals without GAD have also been found to hold positive metacognitive beliefs about worry and worry about similar topics (e.g., family, finances, and relationships) as those with GAD. Therefore, the primary difference between those with and without GAD is not about the quantity or content of Type 1 worry but rather the belief in the uncontrollability of worry. Therefore, during MCT, the therapy process should begin by challenging negative metacognitive beliefs using verbal and behavioral techniques, such as worry postponement. After the clients' belief in uncontrollability is successfully challenged and they discover that the worry process is controllable, danger beliefs should be targeted and addressed with verbal and behavioral techniques. As some clients with GAD tend to engage in extended thinking and respond to their trigger thoughts with worry because of positive metacognitive beliefs, therapy should also focus on modifying beliefs regarding the usefulness of engaging in worry. During MCT therapy, it is essential to maintain meta-mode during dialogs when working with clients with GAD, which means that the therapist should be careful not to challenge the content of the worry and instead target metacognitive beliefs about worry. The aim is to help the clients to do nothing in response to triggering thoughts, which differs from other treatment approaches, such as CBT, in which techniques, such as breathing exercises, relaxation strategies, or cognitive restructuring, are commonly used when working with GAD.

Ethics Committee Approval: This technical report presents fictional therapist-client dialogues created solely to illustrate metacognitive therapy techniques for generalized anxiety disorder. No real patient data were used in this article. Therefore, ethical approval was not required. A separate case report based on a real client, which cites this technical report, will be submitted independently and will include appropriate ethical considerations.

Informed Consent: The dialogues included in this technical report are based on clinical examples used solely to illustrate therapeutic techniques. They do not contain any personally identifiable information. No real case details are disclosed, and thus, formal informed consent was not required.

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