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# Who Predicts Mainly Anxiety and Depression Severity in The Community Sample: Metacognitions or Intolerance of Uncertainty?

## Toplum Örnekleminde Anksiyete ve Depresyonu Kim Yordar: Üstbilişler mi? Belirsizliğe Tahammülsüzlük mü?

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## ABSTRACT

**Objective:** Our study aims to find the predictors of anxiety and depression in a community sample.

**Methods:** Beck depression inventory (BDI), Beck anxiety inventory (BAI), Intolerance of Uncertainty Scale (IUS), and Metacognition Questionnaire-30 (MCQ-30) were rated by 172 individuals who were without ongoing psychiatric disorders and treatment.

**Results:** There were significant relationships between BAI and cognitive confidence and the total score of MCQ (r=0.175 and r=0.157, respectively; p<0.05). BDI had significant relationships with all subscales and total scores of MCQ-30 and IUS (r=0.234-0.520, p<0.05). There was a significant relationship between the total score of MCQ-30 and IUS (r=0.707, p<0.05). MCQ-30 and IUS did not predict anxiety symptoms. However, "need to control thoughts" (β=0.49, p<0.05) and "cognitive self-consciousness" (β=-0.27, p<0.05) predicted levels of depression and explained 34% of the variance in depression.

**Conclusion:** In conclusion, our study showed depression had a more close relationship with metacognitions than anxiety did. Despite the limitations, our findings highlight the possible relationship between two important cognitive models and anxiety and depression.

**Keywords:** Anxiety, depression, intolerance of uncertainty, metacognition

## ÖZ

**Amaç:** Çalışmamız bir toplum örnekleminde anksiyete ve depresyon yordayıcılarını bulmayı amaçlamaktadır.

**Yöntemler:** Halihazırda psikiyatrik bir tanısı ve devam eden bir tedavisi olmayan 172 bireyde Beck depresyon envanteri (BDE), Beck anksiyete envanteri (BAE), Belirsizliğe Tahammülsüzlük Ölçeği (BTÖ) ve Üstbiliş Ölçeği-30 (ÜÖ-30) puanlanmıştır.

**Bulgular:** BAE ile ÜÖ-30 toplam puanı ve bilişsel güven alt boyutu arasında anlamlı ilişkiler saptanmıştır (sırasıyla r=0,175 ve r=0,157, p<0,05). BDE ile ÜÖ-30 ve BTÖ ölçeğinin tüm alt boyutları ve toplam puanları arasında anlamlı ilişkiler saptanmıştır (r=0,234-0,520, p<0,05). Ayrıca ÜÖ-30 ve BTÖ ölçeklerinin toplam puanları arasında anlamlı bir ilişki saptanmıştır (r=0,707, p<0,05). ÜÖ-30 ve BTÖ anksiyete skorunu predikte etmezken düşünceleri ÜÖ-30'un kontrol ihtiyacı (β=0,49, p<0,05) ve bilişsel farkındalık (β=-0,27, p<0,05) alt boyutları depresyon skorunu predikte etmiş ve %34'ünü açıklamıştır.

**Sonuç:** Sonuç olarak, çalışmamız depresyon skorunun anskiyete skoruna göre üstbilişler ile daha yakın bir ilişkide olduğunu göstermiştir. Kısıtlılıklarına rağmen bulgularımız anksiyete, depresyon ve iki önemli bilişsel model arasındaki ilişkiye ışık tutmaktadır.

**Anahtar Sözcükler:** Anksiyete, depresyon, belirsizliğe tahammülsüzlük, üstbiliş

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## Introduction

Depression is a common and severe psychiatric disorder related to morbidity, mortality, and decreased quality of life and functioning (1). Specifically, in Western countries, around 16-20% of people face depression in their lifetimes (2). Anxiety is also a very common psychiatric problem. Literature shows that the current prevalence of all anxiety disorders ranges between 0.9% and 28.3% (3). Depression and anxiety disorders are common comorbid psychiatric disorders (4). The Netherlands Study of Depression and Anxiety (NESDA) study showed that the lifetime comorbidity rate of anxiety disorder was 75% in individuals with depression (5). Although comorbidity rates of anxiety and depressive symptoms in community samples were relatively lower, studies proved that comorbidity rates aligned with NESDA rates (6). Identifying the key factors that may affect depression and anxiety symptoms is important; if clinicians could find these factors, they could find the factors playing role in the onset, maintenance, and potential treatment target of depression (7).

The metacognitive model explains psychological disorders such as depression and anxiety disorders with the self-regulatory executive function model (8). According to the metacognitive model of emotional disorders, "rumination, worry, fixated attention, and unhelpful self-regulatory strategies or coping behaviors" called cognitive attentional syndrome (CAS) is the core of the model (8). Mostly, this type of thinking style is temporary. However, CAS could impact people by forcing them into perseverative, toxic, and persistent thinking styles. CAS results from incorrect metacognitive beliefs (MBs) and is controlled by these positive and negative MBs. Positive MBs about rumination and unhelpful coping and negative MBs such as uncontrollability and harmfulness of this process lead to depression and anxiety (9). Empirical studies have demonstrated that MBs play an important role in depression (9). Several studies examined the relationship between MBs and depression in healthy participants and found further evidence for the metacognitive model of depression (10,11). The metacognitive model is also one of the most esteemed cognitive models of anxiety disorders, and literature has proved that significantly negative MBs play an important role in worry, generalized anxiety disorder, panic disorder (PD), and social anxiety disorder (12,13).

The other most prominent cognitive factor underlying depression and anxiety disorders is intolerance of uncertainty (IoU). IoU could be defined as a vast and possibly transdiagnostic construct characterized by emotional, cognitive, and behavioral reactions to uncertainty in life (14). First, IoU was initially developed from worry, a distinctive feature of generalized anxiety disorder (14). However, studies suggest that IoU could also be related to depression (15,16). There are contrary results in the literature about the relationship between IoU, depression, and anxiety. Some studies put forward that IoU is associated with anxiety more than depression (15,17), and others put forward a unique relationship between IoU and depression (16).

Some researchers recognized maladaptive beliefs as a modulator of IoU (18). IoU might be related to metacognitions (19). Studies in clinical and non-clinical samples showed that IoU and MBs had a significant positive relationship (20,21). Furthermore, Einstein's IoU model underlines the "need for predictability" beliefs at the center of IoU (18). "Need for predictability" beliefs could cause undesired feelings and coping behaviors such as rumination, worry, and avoidant behaviors (22). Although Einstein's model and previous data reported a more critical relationship between anxiety and MBs than IoU, there is still a need to investigate these important cognitive factors (MBs, IoU) and their relationship between anxiety and depression in different samples.

The current study aims to investigate the effects of metacognitions and IoU on depressive symptoms and anxiety symptoms in individuals without ongoing psychiatric disorders and treatment processes. Based on the literature, our hypotheses are: (i) There is a significant positive correlation between MBs and depression and anxiety severity. (ii) There is a significant positive correlation between IoU and depression and anxiety severity. (iii) MBs could predict depression and anxiety severity better than IoU.

## Methods

### Sample

We conducted an a priori power analysis using G*Power version 3.1.9.7 for sample estimation. The minimum sample size was n=68 with a significance criterion of alpha=0.05 and beta=0.20 for detecting a medium effect. According to the study's aim, we collected data from 177 individuals. Five individuals were excluded from the study due to missing values.

One hundred seventy-two nonclinical participants aged between 18-65 and literate were included in the study. The participants were informed about the study, and written informed consent was obtained. Participants who were not diagnosed as having any psychiatric disease during the psychiatric interview were included in the study. Individuals with previous psychiatric treatment history were included in the study if their treatment had been concluded. Exclusion criteria included ongoing psychiatric disorder, organic mental diseases, such as delirium, mental disability, medical illnesses with significant cognitive sequelae, epilepsy, dementia, and active alcohol or substance use disorders. The participants were not paid for their contribution to the study. The Ethics Committee of Ankara Training and Research Hospital approved the procedures and the purposes of the study (decision number: E-23-1197, date: 08.03.2023).

Sociodemographic Data Form, Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), Intolerance of Uncertainty Scale (IUS), and Metacognition Questionnaire-30 (MCQ-30) were filled out by individuals.

### Measurements

**The Sociodemographic Data Form,** was used to collect personal information such as age, sex, level of education, and information about the history of applying to a psychiatric unit.

**Beck Anxiety Inventory,** was used to measure anxiety scores. This 21-item and 4-point Likert-type scale was developed by Beck et al. (23). The Cronbach α of BAI was 0.88 in the current study.

**Beck Depression Inventory,** was developed to measure depression levels (24). This test includes 21 items in six subscales answered using a 4-point Likert-type scale. The Cronbach α of BDI was 0.89 in the current study.

**Intolerance of Uncertainty Scale,** is a 12-item scale that measures IoU (25). IUS has two subscales (inhibitory and prospective). IUS is a 5-point Likert scale ranging from 1 (not at all characteristic of me) to 5 (entirely characteristic of me). Higher scores indicate higher IoU. IUS's Cronbach α was 0.95 in the current study.

**Metacognition Questionnaire-30 (MCQ-30),** was developed by Cartwright-Hatton and Wells (26). It is a 30-item 4-point Likert-type scale ranging from 1 (do not agree) to 4 (agree very much). Higher scores obtained from the scale indicate more dysfunctional MBs. MCQ-30 provides information on five subscales. These subscales are cognitive confidence, positive beliefs about worry, cognitive self-consciousness, negative beliefs about uncontrollability and danger of worry, and the need to control thoughts. The Cronbach α of MCQ-30 was 0.94 in the current study.

### Statistical Analysis

The IBM SPSS Statistics for Windows v.25.0 was used to analyze the data (IBM Corp., Armonk, NY). Initially, we performed descriptive statistics to describe the study group. The Pearson correlation coefficient was used to examine the relationship between measurement tools. Finally, multiple linear regression analysis was performed to examine the predictors for depression and anxiety. In the models, BAI and BDI were entered as the dependent variables, and subscales of MCQ-30 and IUS were entered as the regressors. The significance level was considered as 0.05.

Before performing multiple linear regression analysis, the assumptions that should be met were tested. First, the ZPRED-ZRESID graph was examined to determine the normal distribution of the differences between the estimated values and the observed values, and it was determined that this graph was in the form of an ellipse, that is, the residual values showed a normal distribution. When the graphs were drawn to determine whether the relationship between the predictor and the predicted variable was linear, which is the second assumption, it was found that this assumption was met. For the third assumption, the multicollinearity problem, variance inflation factor (VIF), and tolerance values were examined, and it was observed that VIF values ranged from 4.26 to 1.60, and tolerance values ranged from 0.24 to 0.63, and it was determined that there was no multicollinearity problem among the predictive variables. Skewness and kurtosis values were examined to determine whether the predicted variable, which is the last assumption, had a normal distribution. It was seen that the predicted variables had a normal distribution. After testing all assumptions, multiple regression analysis was performed.

## Results

The sociodemographic data of the sample are shown in Table 1. The mean age of the participants was 36.45±9.36 years, and 56.4% of the sample (n=97) was female. The mean education level was 14.80±6.21 years, and 69.8% of the participants (n=120) was employee/officer.

Descriptive statistics of the scales and the subscales are given in

**Table 1.** The sociodemographic data of the sample

| Variables | | f | % |
|---|---|---|---|
| Sex | Female | 97 | 56.4 |
| | Male | 75 | 43.6 |
| Marital status | Single | 65 | 37.8 |
| | Married | 100 | 58.1 |
| | Divorced | 7 | 4.1 |
| Occupational status | Unemployed | 13 | 7.6 |
| | Self-employment | 21 | 12.2 |
| | Employee/officer | 120 | 69.8 |
| | Student | 10 | 5.8 |
| | Retired | 8 | 4.6 |
| History of psychiatric treatment | Yes | 28 | 16.3 |
| | No | 144 | 83.7 |
| **Total** | | 58 | 100 |
| | **Minimum-maximum** | $\bar{X}$ | S |
| Age (years) | 19-59 | 36.45 | 9.36 |
| Level of education (years) | 2-27 | 14.80 | 6.21 |

**Table 2.** Descriptive statistics of the scales and the subscales

| | Min-Max | $\bar{X}$ | SD |
|---|---|---|---|
| BAI | 0.00-33.00 | 9.05 | 7.76 |
| BDI | 0.00-36.00 | 10.58 | 8.52 |
| PBW | 6.00-24.00 | 11.10 | 4.48 |
| NBC and DW | 6.00-24.00 | 11.26 | 4.70 |
| CC | 6.00-22.00 | 11.60 | 4.22 |
| NCT | 6.00-22.00 | 11.63 | 4.24 |
| CSC | 6.00-23.00 | 13.14 | 4.16 |
| MCQ-30 (Total) | 30.00-108.00 | 58.73 | 18.05 |
| Prospective anxiety | 7.00-35.00 | 19.41 | 7.05 |
| Inhibitory anxiety | 5.00-25.00 | 12.35 | 5.76 |
| IUS (Total) | 12.00-60.00 | 31.76 | 12.03 |

BAI: Beck Anxiety Inventory, BDI: Beck Depression Inventory, PBW: Positive beliefs about worry, NBC and DW: Negative beliefs about uncontrollability and danger of worry, CC: Cognitive confidence, NCT: Need to control thoughts, CSC: Cognitive self-consciousness, MCQ-30: Metacognition Questionnaire-30, IUS: Intolerance of Uncertainty Scale, SD: Standard deviation, Min:Minimum, Max: Maximum

Table 2.

Correlational analyses of the variables were summarized in Table 3. There was no significant relationship between the BAI and the subscales of MCQ-30 except cognitive confidence and the total score of MCQ (r=0.175 and r=0.157, respectively). Also, there was no relationship between the BAI and the total score and subscales of IUS. The BDI had significant and positive relationships with all subscales and total scores of MCQ-30 and IUS (r=0.234-0.520, p<0.05). There was a significant positive relationship between the total score of MCQ-30 and IUS (r=0.707, p<0.05).

After the correlational analyses between the variables were examined, multiple linear regression analyses were conducted to predict anxiety and depression in the study sample. The results were given in Table 4 for anxiety and Table 5 for depression. In the first model, BAI was entered as the dependent variable, and subscales of MCQ-30 and IUS were entered as regressors. The first model showed that neither MCQ-30 nor IUS significantly predicted anxiety symptoms (p>0.05). Also, this model did not show good fitness, F(7-164)=0.97, p=0.455, and adjusted $R^2$=0.04 for the anxiety model.

In the second model, BDI was entered as the dependent variable, and subscales of MCQ-30 and IUS were entered as regressors. This model showed a good fitness with F(7-164)=11.85, p=0.00, and adjusted $R^2$=0.34. According to the model, a higher "need to control thoughts" (β=0.49, p<0.05) and lower "cognitive self-consciousness" (β=-0.27, p<0.05) predicted higher levels of depression. The need to control thoughts and cognitive self-consciousness together explained 34% of the variance in

**Table 3.** Correlations between variables

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. BAI | -- | | | | | | | | | |
| 2. BDI | 0.233* | -- | | | | | | | | |
| 3. PBW | 0.147 | 0.234* | -- | | | | | | | |
| 4. NBC and DW | 0.095 | 0.445* | 0.646* | -- | | | | | | |
| 5. CC | 0.175* | 0.258* | 0.406* | 0.397* | -- | | | | | |
| 6. NCT | 0.110 | 0.520* | 0.588* | 0.838* | 0.497* | -- | | | | |
| 7. CSC | 0.126 | 0.256* | 0.702* | 0.712* | 0.578* | 0.702* | -- | | | |
| 8. MCQ-30 (Total) | 0.157* | 0.415* | 0.811* | 0.874* | 0.687* | 0.877* | 0.890* | -- | | |
| 9. Prospective anxiety | 0.105 | 0.373* | 0.615* | 0.614* | 0.337* | 0.576* | 0.564* | 0.656* | -- | |
| 10. Inhibitory anxiety | 0.118 | 0.434* | 0.586* | 0.647* | 0.363* | 0.629* | 0.544* | 0.672* | 0.760* | -- |
| 11. IUS (Total) | 0.118 | 0.426* | 0.641* | 0.670* | 0.372* | 0.639* | 0.591* | 0.707* | 0.950* | 0.924* |

*p<0.05; BAI: Beck Anxiety Inventory, BDI: Beck Depression Inventory, PBW: Positive beliefs about worry, NBC and DW: Negative beliefs about uncontrollability and danger of worry, CC: Cognitive confidence, NCT: Need to control thoughts, CSC: Cognitive self-consciousness, MCQ-30: Metacognition Questionnaire-30, IUS: Intolerance of Uncertainty Scale

**Table 4.** Multiple linear regression with anxiety as the dependent, and subscales of MCQ-30 and subscales of IUS as predictors

| Variables | b | Standard deviation b | β | t-test |
|---|---|---|---|---|
| Constant | 4.60 | 2.23 | -- | 2.07 |
| PBW | 0.20 | 0.21 | 0.11 | 0.95 |
| NBC and DW | -0.07 | 0.26 | -0.04 | -0.27 |
| CC | 0.27 | 0.18 | 0.15 | 1.54 |
| NCT | 0.01 | 0.28 | 0.00 | 0.02 |
| CSC | -0.06 | 0.25 | -0.03 | -0.24 |
| Prospective anxiety | -0.01 | 0.14 | -0.01 | -0.06 |
| Inhibitory anxiety | 0.06 | 0.17 | 0.05 | 0.36 |
| R=0.20 | $R^2$=0.04 | | | |
| $F_{7\text{-}164}$=0.97 | p=0.455 | | | |

p<0.05; BAI: Beck Anxiety Inventory, BDI: Beck Depression Inventory, PBW: Positive beliefs about worry, NBC and DW: Negative beliefs about uncontrollability and danger of worry, CC: Cognitive confidence, NCT: Need to control thoughts, CSC: Cognitive self-consciousness, MCQ-30: Metacognition Questionnaire-30, IUS: Intolerance of Uncertainty Scale

**Table 5.** Multiple linear regression with depression as the dependent, and subscales of MCQ-30 and subscales of IUS as predictors

| Variables | b | Standard deviation b | β | t-test |
|---|---|---|---|---|
| Constant | -0.45 | 2.03 | -- | -0.22 |
| PBW | -0.24 | 0.19 | -0.13 | -1.28 |
| NBC and DW | 0.18 | 0.24 | 0.10 | 0.75 |
| CC | 0.17 | 0.16 | 0.08 | 1.05 |
| NCT | 0.99 | 0.25 | 0.49 | 3.89* |
| CSC | -0.55 | 0.23 | -0.27 | -2.39* |
| Prospective anxiety | 0.11 | 0.13 | 0.09 | 0.89 |
| Inhibitory anxiety | 0.26 | 0.16 | 0.18 | 1.68 |
| R=0.58 | $R^2$=0.34 | | | |
| $F_{7\text{-}164}$=11.85 | p=0.000 | | | |

*p<0.05; BAI: Beck Anxiety Inventory, BDI: Beck Depression Inventory, PBW: Positive beliefs about worry, NBC and DW: Negative beliefs about uncontrollability and danger of worry, CC: Cognitive confidence, NCT: Need to control thoughts, CSC: Cognitive self-consciousness, MCQ-30: Metacognition Questionnaire-30, IUS: Intolerance of Uncertainty Scale

depression.

## Discussion

The primary aim of the current study was to investigate the MBs and IoU as potential predictors of anxiety and depression in a sample of community individuals. Also, we aimed to examine the relationship between MBs, IoU, and depression and anxiety. We found that while depression correlated with IoU and all MBs, anxiety only correlated with the "cognitive confidence" subscale of MCQ and total score of MCQ. Multiple linear regression analyses revealed that "cognitive self-consciousness" and "need to control thoughts" predicted depression severity. However, unexpectedly, there were no variables predicting anxiety severity.

In the present study, we observed significant correlations between variables. While depression correlated with all MB and IoU subscales, anxiety just correlated with cognitive confidence and total score of MCQ-30. The cognitive confidence subscale of MCQ-30 can be defined as "concerns with efficacy of ones' cognitive skills, distrust in memory." Nordahl et al. (27) found that trait anxiety had significant correlations with all subscales of MCQ. Although they obtained similar results between trait anxiety and MBs in their evaluations with an interval of 8 weeks, they could not find a relationship between cognitive confidence and anxiety in their first evaluation, but they did in their second evaluation (27). Some studies showed that "cognitive confidence" and negative beliefs about the "uncontrollability and danger of worry" were significantly associated with anxiety (28). Aydın et al. (13) studied individuals with PD and generalized anxiety disorder (GAD). They found a significant relationship between the "need to control thoughts" and GAD severity, while they did not find any relationships between MBs and PD severity (13).

On the other hand, another study showed a relationship between "self-consciousness" and PD severity (13). These findings suggest that the relationship between different anxiety disorders and MBs can vary, and evaluations made at different times can affect these results. Lastly, anxiety had a weak correlation with the MCQ-30 total score in our study. We found that our study's MCQ total and subscales' mean scores were lower than previous studies conducted in healthy controls (13). We could suggest that these results could explain the absence of correlations between anxiety and the subscales of MCQ-30, except for cognitive confidence and the weak relationship between anxiety and the total score of MCQ-30. Also, the total score of MCQ-30 was considered a more durable construct than its subscales, so our findings could be interpreted in line with the previous data (13). Consequently, we could suggest that the participants in our study had success avoiding negative MBs and anxiety.

Surprisingly, we found that the anxiety severity in healthy individuals did not correlate with IoU. Previous literature indicated a relationship between IoU and different anxiety disorders such as social anxiety disorder, generalized anxiety disorder, and PD, and the level of IoU is usually higher in clinical samples compared to control groups (19,29,30). Worry, a construct highly associated with anxiety, is related to IoU in the literature (29). In this study, we did not examine the relation of worry with IoU or focus on the difference between worry and anxiety. We conducted our study with a non-clinical sample. The absence of a correlation between anxiety and IoU in our sample could be related to the study design and sample above characteristics.

In the present study, all subscales of MCQ-30 and total score of MCQ significantly correlated with depression severity. Our findings are consistent with the previous literature suggesting that depression levels have significant correlations with positive and negative MBs in clinical and non-clinical samples (10,22,27). According to the metacognitive theory of depression, positive MBs such as the "need to control thoughts" about rumination could be considered as a solution to analyze the depressive thoughts to get over depression. However, this method's negative consequences could lead to negative MBs such as "uncontrollability and danger of worry" (8). Our findings agree with the theoretical background of the metacognitive model for the relations between positive and negative MBs and depression.

We found positive correlations between depression severity and inhibitory anxiety, prospective anxiety, and total score of IUS. Previous data suggest mixed results regarding the relationship between depression and IoU (17). Some studies suggest that depression is related to IoU (16,29), and some studies suggest that depression is less associated with IoU than anxiety (15,17); even some studies indicate that depression is not related to IoU (20). On the other hand, in studies that found a relationship between depression and IoU, when factors such as rumination and worry were searched for a mediator effect between these two concepts, it was determined that rumination had a mediator role between the two (29). In our study, depression was correlated with IoU moderately, consistent with the previous data (7). However, we needed to examine further analyses to understand the diverse nature of this relationship. Multiple regression analyses were performed to find predictors of depression severity in our study.

Unexpectedly, multiple linear regression analyses revealed that the anxiety model did not show good fitness. We found that neither IoU nor MBs predicted the anxiety severity in our sample. In many studies, previous data confirmed the association between anxiety and cognitive factors such as IoU and MBs (27,31). As mentioned in the introduction, IoU had some dimensions, and we examined "the desire for predictability" and the "tendency to become paralyzed in the face of uncertainty" as predictors in our study. Researchers have suggested that "the desire for predictability" could directly affect worry and that the "tendency to become paralyzed in the face of uncertainty" could be associated with avoidance behavior (32). Even though previous studies found a relationship between IoU and anxiety, our results could be related to different variables not investigated in the study, such as cultural differences.

Researchers showed that MBs were specific predictors of anxiety in nonclinical samples (27). MBs are accepted as a central factor in trait and state emotions and could be the main construct of anxiety (8). However, we used BAI to assess anxiety in our

sample, and BAI measures mostly the somatic component of anxiety. Essential components of anxiety as rumination and worry were not assessed in this study. This could be the reason for the results of the anxiety model.

Our regression model of depression showed that the "need to control thoughts" positively and "cognitive self-consciousness" negatively predicted depression severity. IoU subscales did not predict depression severity, and our third hypothesis was confirmed by multiple linear regression. Some studies found that negative beliefs about the uncontrollability and danger of worry and lack of cognitive confidence predicted depression but cognitive self-consciousness was not a predictor of depression (27). Yilmaz et al. (33) showed that negative MBs explained the additional variance in depression followed by positive MBs. Also, Huntley and Fisher (10) found that negative MBs about uncontrollability and harm contributed more to depression severity than positive MBs in a healthy sample. Contrary to our study, Solem et al. (34) showed that while cognitive confidence, positive beliefs about worry, and negative beliefs about worry were predicting depression, the need to control and cognitive self-consciousness were not predicting depression.

In the depression model, IoU total score and subscales did not predict depression. Prior studies argued that there was an uncertain relationship between IoU and depression (17). Many studies suggested that depression had a relationship with IoU via rumination or MBs (7,22). Some studies suggested that depression and IoU had a specific relationship after controlling other measures (16). Our results aligned with the previous literature suggesting that depression did not have a direct relationship with IoU. Further studies should focus on the mediational role of anxiety and conduct further analyses in different samples.

### Study Limitations

Several limitations of the study should be mentioned. The first limitation was the cross-sectional design of our study. We examined our hypothesis in a nonclinical sample, and we could not generalize the findings to a clinical sample. We also excluded the individuals who had a psychiatric diagnosis with psychiatric interview; however, we did not use a structured clinical measurement. Another limitation of the study was that the participants fulfilled the measurement tools that could cause a bias. In addition, we did not examine the role of anxiety between depression and IoU with further analyses. Finally, although we examined the anxiety and depression severity, we did not control the contribution of rumination and worry in our study.

## Conclusion

In conclusion, our study showed essential relations between the IoU, MBs, depression, and anxiety in a non-clinical sample. There was a significant positive relationship between MBs, IoU, and depression; however, anxiety correlated with cognitive confidence and total score of MCQ-30. Also, we found that cognitive self-consciousness and the need to control thoughts predicted the depression level, and IoU and MBs did not predict the anxiety level, while previous data addressed contradictory findings. Our findings showed that in our sample, depression had a more close relationship with MBs than anxiety did. Despite the limitations, our study expands the literature and enlightens the possible relationship between two critical cognitive models and anxiety and depression. Future research should focus on the role of rumination and worry in this relationship to extend our results and repeat our study in clinical samples for the generalizability of the findings.

### Ethics

**Ethics Committee Approval:** The Ethics Committee of Ankara Training and Research Hospital approved the procedures and the purposes of the study (decision number: E-23-1197, date: 08.03.2023).

**Informed Consent:** The participants were informed about the study, and written informed consent was obtained

### Authorship Contributions

Concept: K.S.K., A.G.G., Design: K.S.K., A.G.G., Data Collection or Processing: K.S.K., Analysis or Interpretation: K.S.K., A.G.G., Literature Search: K.S.K., A.G.G., Writing: K.S.K., A.G.G.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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