Intolerance of Uncertainty and Eating Disorder Pathology in Anorexia Nervosa: Examining the Mediation Effect of Worry

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Abstract

Due to the limited effectiveness of treatment for anorexia nervosa (AN), much research has been dedicated to finding transdiagnostic maintaining processes that may serve as targets for intervention. In light of this, the current study aims to investigate whether worry explains the effect of intolerance of uncertainty (IU) on eating disorder (ED) pathology in AN patients. Due to its unique relation with worry, the current study examined prospective IU (i.e., a subtype of IU) specifically. The current cross-sectional study is part of a larger study conducted by a highly specialized ED treatment facility in the Netherlands, and included participants who were 18 years and older, female, and had an AN diagnosis (N = 178). Participants completed self-report measures for prospective IU, worry and ED pathology at the facility. Results of the regression analyses showed that IU is positively associated with ED pathology, and that worry fully explains this relationship. However, the explanatory value of IU and worry for ED pathology scores was relatively low. Thus, their clinical relevance seems dubious. Nevertheless, the current study is the first to demonstrate an indirect association of IU and ED pathology in AN through worry, suggesting that (some) AN patients may benefit from intervention targeting such underlying transdiagnostic vulnerabilities.

Keywords: intolerance of uncertainty, worry, anorexia nervosa, eating disorder, mediation

Intolerance of Uncertainty and Eating Disorder Pathology in Anorexia Nervosa: Examining the Mediation Effect of Worry

Anorexia nervosa (AN) is a serious psychiatric illness that is marked by a restriction of food intake leading to a significant low weight, an intense fear of gaining weight or persistent behavior that interferes with weight gain (e.g. restricting, purging), and a disturbance in the way in which one's body is experienced (American Psychiatric Association, 2013). Although it mostly affects adolescent girls, the disorder is also found in adults (0.5-0.6% lifetime prevalence among adult women; Garfinkel et al., 1996; Walters & Kendler, 1995). AN is a devastating disease, characterized by high rates of disability and mortality (Arcelus, Mitchell, Wales, & Nielsen, 2011). While patients' suffering posits a clear need for effective treatment, outcomes are generally poor, with only 46% of patients achieving full recovery, while many experience only partial recovery (33%) or remain chronically ill (20%; Steinhausen, 2009). Furthermore, 30-50% of patients relapse after treatment (Pike, 1998).

The ineffectiveness of current treatments may be partially explained by the high comorbidity rates found in AN, and a failure to address these in treatment (Bloss et al., 2011; Herpertz-Dahlmann et al., 2001; Pallister & Waller, 2008). For example, 71% of AN patients will also suffer from an anxiety disorder during their lifetime (Godart et al., 2003), which often precedes the eating disorder (ED; Kaye, Bulik, Thornton, Barbarich, & Masters, 2004; Pallister & Waller, 2008). Moreover, several anxiety processes appear to be causal and maintaining factors in AN (Pallister & Waller, 2008; Roblek & Frank, 2012). In particular, recent research has highlighted the importance of intolerance of uncertainty (IU). IU is defined as "a dispositional characteristic that results from a set of negative beliefs about uncertainty and its implications and involves the tendency to react negatively on an emotional, cognitive, and behavioral level to uncertain situations and events" (Buhr & Dugas, 2009, p. 216). Based on factor-analytic studies, IU is generally divided up into two subtypes,

namely prospective IU (i.e., a cognitive component, expressed as a desire for predictability), and inhibitory IU (i.e., a behavioral component, expressed as uncertainty paralysis; Kesby, Maguire, Brownlow, & Grisham, 2017). Originally proposed as an underlying construct in generalized anxiety disorder (GAD; Dugas, Freeston, & Ladouceur, 1997), IU is now acknowledged as a transdiagnostic factor associated with a wide range of disorders, including other anxiety disorders (Boelen & Reijntjes, 2009), obsessive-compulsive disorder (OCD; Steketee, Frost, & Cohen, 1998), major depressive disorder (MDD; Carleton et al., 2012) and EDs, such as AN (Brown et al., 2017; Frank et al. 2012; Kesby, Maguire, Vartanian, & Grisham, 2019; Konstantellou, Campbell, Eisler, Simic, & Treasure, 2011; Renjan, McEvoy, Handley, & Fursland, 2016; Sternheim, Startup, & Schmidt, 2011, 2015). In AN, elevated IU has been linked to a wide range of symptoms and psychological difficulties, including alexithymia (i.e. the inability to identify and describe emotions experienced by one's self or others), depression, drive for thinness, body dissatisfaction, harm avoidance, impaired decision making and impaired social problem solving (Brown et al., 2017; Sternheim, Danner, Van Elburg, & Harrison, in press).

To improve treatment for AN, several authors have proposed a shift in focus from treating the main presenting features and cognitive content of AN, to a transdiagnostic approach where underlying maintaining cognitive processes are targeted (Pallister & Waller, 2008; Startup et al., 2013). Given its strong relation with AN pathology, IU is considered a promising target for intervention.

In order to optimize this treatment approach, an accurate understanding of the mechanism through which IU maintains AN pathology is crucial. One factor that may explain this IU-AN link, is worry. Worry is a type of repetitive negative thinking that is predominantly verbal in nature, future focused, and involves themes of potential catastrophe (Borkovec, Robinson, Pruzinsky and Depree, 1983), and is considered to be the hallmark

symptom of GAD (American Psychiatric Association, 2013). Worry has been identified as one of many maladaptive coping strategies that individuals high in IU may employ to gain a sense of certainty and control over future events, and thus to decrease IU-related anxiety (Boswell, Thompson-Hollands, Farchione, & Barlow, 2013). Indeed, IU and worry are strongly related in clinical and non-clinical samples, and experimental inductions of IU have been found to increase worry (e.g. Dar, Iqbal, & Mushtaq, 2017; Dugas, Gosselin, & Ladouceur, 2001; Kesby et al., 2019; Ladouceur, Gosselin, & Dugas, 2000). Specifically, it is generally prospective IU that is found to be uniquely and strongly related to worry (Helsen, Van den Bussche, Vlaeyen, & Goubert, L, 2013; Hong & Lee, 2015; McEvoy & Mahoney, 2011). This makes sense, given that individuals who have a strong desire for predictability may use worrying as a way to gain this sense of predictability.

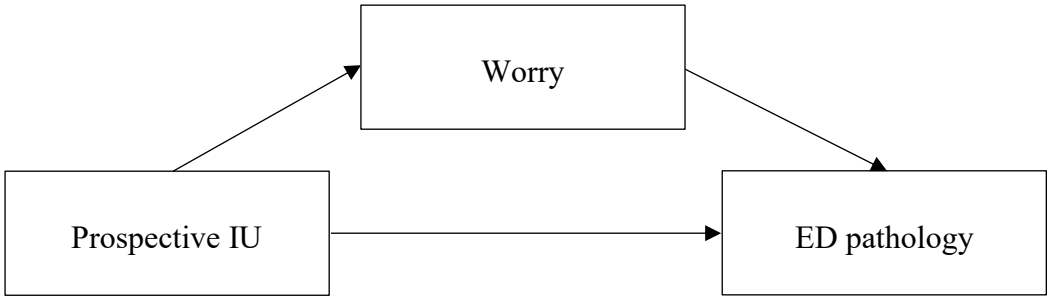
In turn, worry has been proposed as an important causal and maintaining cognitive factor for AN pathology. Indeed, several studies demonstrate elevated worry levels in AN patients compared to healthy controls, and show a positive association between worry levels and ED pathology in patients (Oldershaw, Lavender, Sallis, Stahl, & Schmidt, 2015; Sassaroli et al., 2005; Startup et al., 2013; Sternheim et al., 2012; Sternheim et al., 2015). Supporting the causal nature of this link, one prospective study found that worry predicted a drive for thinness across six months in a college sample, while drive for thinness did not predict worry (Sala & Levinson, 2016). This worry-AN association can be explained in several steps. First, it is hypothesized that the development of AN often involves an attempt to avoid or control difficult emotions. Specifically, people developing AN may focus their worrying on specific and seemingly controllable issues such as weight, shape and eating as a tactic to avoid more general, distressing worries (e.g. interpersonal issues, self-esteem issues, stress, failure; Frank et al., 2012; Sassaroli et al., 2005; Wildes, Ringham, & Marcus, 2010). Subsequently, worrying about shape, weight and eating may maintain and aggravate the AN symptoms in

several ways. For example, the process of worrying about these topics may simply keep them active in the mind, and this negative focus may increase dissatisfaction with weight and shape. Additionally, worrying is known to promote hypervigilance towards signals that indicate future threat, and this may cause natural fluctuations in weight and shape to be more easily (and falsely) perceived as signaling future danger in AN patients (i.e. predicting future weight gain; Hildebrandt, Bacow, Markella, & Loeb, 2012). Consequently, this may result in more weight and shape concern and an increase in restrictive or compensative behaviors.

To promote a greater understanding of the transdiagnostic maintaining factors in AN and thus identify potential targets for treatment, the current study represents the first attempt to investigate whether worry explains the maintaining effect of IU on ED pathology in AN patients. Here, it is hypothesized that IU is positively associated with ED pathology, and that (part of) this association is explained (i.e. mediated) by worry (see Figure 1). Contrary to previous research on IU in AN, the current study will focus on prospective IU specifically, given the unique impact of prospective (vs. inhibitory) IU on worry (e.g. Helsen et al., 2013). In addition to focusing on overall ED pathology, the proposed mediation model will also be tested for each specific ED symptom category (shape concern, weight concern, eating concern, restraint) for exploratory purposes.

Figure 1

Theoretical Model of the Mediation Effect of Worry on the Relationship Between IU and ED Pathology in AN Patients



Methods

Participants

This cross-sectional study is part of a larger study into the genetic background and relations with phenotypes in people with AN, conducted by Altrecht Eating Disorders Rintveld in Zeist, a Dutch highly specialized treatment facility for ED patients. The current study was performed using the phenotype battery from this larger study. From this dataset, participants were selected who met all the following criteria: age of 18 years or older, female gender, a DSM-V diagnosis of AN restricting (ANR) subtype or binge eating/purging (ANBP) subtype[1], and no missing data in the analysis variables. This resulted in a total sample size of 178 participants. Participants had an average age of 26.54 years (SD = 9.79) and an average amount of educational years of 13.67 (SD = 2.45). The average Body Mass Index (BMI) was 16.87 (SD = 2.41), which is below the cut-off of 18.5 and thus indicative of being underweight. The average age of onset of AN was 17.90 (SD = 6.57), and the average illness duration was 8.63 years (SD = 9.50).

Procedure

Recruitment and participation took place during the time of intake at the treatment facility. Before participating, participants were informed about the procedure, were given the opportunity to ask questions about the study, and signed the informed consent form. Participants completed all measures on a computer at the treatment facility, which were programmed using Inquisit 4 software (2015). Completing the entire test battery took approximately 45-60 minutes. The researcher was nearby, in case there were any questions.

[1] Ascertained by experienced clinicians (all medical doctors) and confirmed using the Eating Disorder Examination (EDE), a semi-structured interview widely used to assess psychopathology associated with eating disorders.

Afterwards, participants were debriefed and provided with the opportunity to indicate whether they wanted to be informed about the results of the study.

The research protocol is authorized by the Committee Scientific Research of Altrecht Mental Health Institute and the Medical Ethical Committee of the University Medical Center Utrecht.

Measures

Intolerance of Uncertainty

The Intolerance of Uncertainty Scale (IUS; Freeston, Rhéaume, Letarte, Dugas, & Ladouceur, 1994) measures one's IU as expressed in several domains, including emotion, cognition and behavior. For this study, the shorter IUS-12 version of the original 27-item scale was used (Carleton, Norton, & Asmundson, 2007). It has two subscales, including prospective IU, which measures cognitive distress, and inhibitory IU, which measures behavioral inhibition. Respondents rate the degree to which each of 12 items apply to them on 5-point Likert scale ranging from 1 (not at all characteristic of me) to 5 (entirely characteristic of me). An example of an item of the prospective IU subscale is "It frustrates me not having all the information I need." Subscale scores were calculated by summing up the respective items, with higher scores indicating higher levels of IU. The prospective IU subscale contains 7 items, and scores may thus range from 7 to 35. The Dutch version of the IUS-12 used in this study has good psychometric properties (Helsen et al., 2013). In the current study, only the prospective IU subscale was included in analyses, which had good internal consistency (α = .87).

Worry

The Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger and Borkovec, 1990) contains 16 items that assess pathological worry on a 5-point Likert scale ranging from 1 (not at all typical) to 5 (very typical). An example item is "My worries overwhelm me."

Total scores were calculated by summing all the item scores, resulting in a possible range of 16 to 80. Higher scores indicate higher levels of pathological worry. Both the English and Dutch PSWQ have very good psychometric properties (Kerkhof, Hermans, Figee, Laeremans, Pieters, & Aardema, 2000; Startup & Erickson, 2006). The PSWQ had excellent internal consistency in the current study (α = .91).

Eating Disorder Pathology

Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994) measures the key behavioral aspects of ED pathology. Respondents rate the frequency at which each of the 36 behaviors or experiences occurred over the last 28 days on a 7-point scale ranging 0 (no days) to 6 (every day). The questionnaire includes four subscales, namely shape concern, weight concern, eating concern, and restraint. Total and subscale scores are calculated by taking the average over their respective items, and thus have a potential range of 0 to 6. High scores indicate high levels of ED pathology. The EDE-Q has good psychometric properties (Mond, Hay, Rodgers, Owen, & Beumont, 2004). The internal consistency for this sample could not be determined because the dataset made available for this study contained no item scores.

Statistical Analysis

The statistical analyses were performed using IBM SPSS Statistics Version 22 and an online resource for performing the Sobel test (Preacher & Leonardelli, 2001). First, bivariate associations between the study variables were analysed using Pearson correlation coefficients. Second, a mediation analysis with prospective IU as independent variable, worry as mediator, and global ED pathology (based on total EDE-Q scores) as dependent variable was performed. The mediation analysis contained the following steps. In a first step, a simple regression analysis was conducted in order to estimate the effect of prospective IU on worry. In a second step, a hierarchical regression analysis in which prospective IU was entered in block 1 and

worry was entered in block 2 was calculated in order to estimate the total (block 1) and direct (block 2) effects of prospective IU as well as the effect of worry (block 2) on global ED pathology. In a third step, the indirect effect of prospective IU on global ED pathology via worry was tested for significance with a Sobel test (Sobel, 1982). Mediation is said to occur when a significant indirect effect is found (Zhao, Lynch & Chen, 2010). When a significant indirect effect but no direct effect is found, this is considered to be a full mediation. Otherwise, the effect is referred to as partial mediation.

For explorative purposes, the effects of prospective IU and worry were also analysed for each of the ED pathology categories based on the EDE-Q subscales (i.e., shape concern, weight concern, eating concern, restraint) separately. This meant the mediation analysis was repeated for each category, using the specific symptom category (e.g. shape concern) as the dependent variable in the model. All coefficients are reported in standardized as well as unstandardized form.

Results

Descriptive Statistics

Table 1 shows the minimum scores, maximum scores, means and standard deviations of the IUS prospective subscale, the PSWQ, and the EDE and its subscales.

Table 1

Minimum Scores (Min.), Maximum Scores (Max.), Means (M) and Standard Deviations (SD) of IUS Prospective, Worry and ED pathology (N = 178)

Measure	Min.	Max.	M	SD
IUS Prospective	8.00	35.00	24.35	5.59
PSWQ	28.00	76.00	62.80	11.07
EDE Total	0.30	5.80	3.68	1.10

EDE Shape Concern	0.10	6.00	4.15	1.37
EDE Weight Concern	0.00	6.00	3.77	1.51
EDE Eating Concern	0.00	6.00	3.03	1.21
EDE Restraint	0.00	6.00	3.73	1.26

Bivariate Associations between Prospective IU, Worry, and ED pathology.

Table 2 displays the bivariate correlations between the analysis measures.

Table 2

Bivariate Correlations of Analysis Measures

	1	2	3	4	5	6
1. IUS Prospective	-	-	-	-	-	-
2. PSWQ	.48**	-	-	-	-	-
3. EDE Total	.19*	.28**	-	-	-	-
4. EDE Shape Concern	.15	.24**	.89**	-	-	-
5. EDE Weight Concern	.18*	.22**	.88**	.79**	-	-
6. EDE Eating Concern	.14	.23**	.73**	.52**	.53**	-
7. EDE Restraint	.16*	.18*	.76**	.57**	.55**	.43**

Note. $^{*}p < .05$, $^{**}p < .01$.

Total, Direct, and Indirect Effects of Prospective IU on ED pathology

Global ED Pathology

The results of the regression analyses are presented in Figure 2. The simple regression analysis revealed a significant positive relation of prospective IU and worry, indicating that

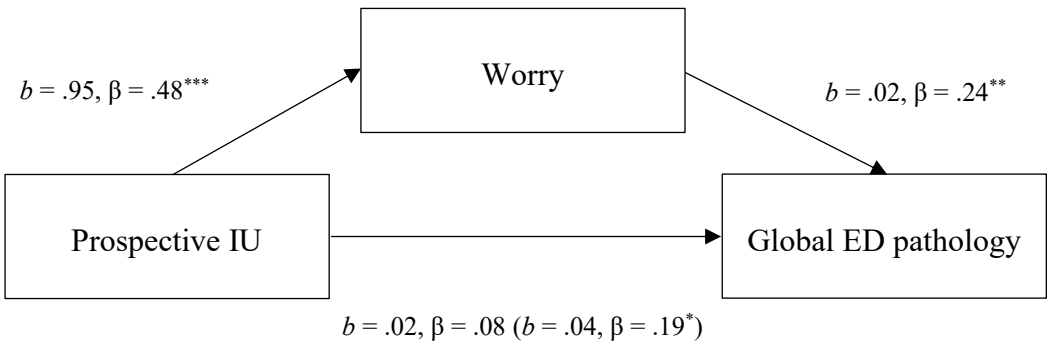
more prospective IU is associated with more worry. Here, prospective IU explained 23% of the variance in worry, $F(1,176) = 51.90$, $p < .001$.

The hierarchical regression analysis revealed a significant positive total effect prospective IU on global ED pathology in step 1. This indicates that more prospective IU is associated with more global ED pathology. Adding worry as a predictor in step 2 revealed a significant positive relation between worry and global ED pathology. This indicates that more worry is associated with more global ED pathology. Notably, after controlling for worry in step 2, no significant relation between prospective IU and global ED pathology was found, $p = .350$.

In step 1, 4% of the variance in global ED pathology could be explained by prospective IU, $F(1,176) = 6.71$, $p = .010$. Adding worry in step 2 resulted in an increase of the explained variance in global ED pathology by 4%, $\Delta F(1,175) = 8.46$, $p = .004$. Together, prospective IU and worry explained a total of 8% of the variance in global ED pathology, $F(2,175) = 7.73$, $p = .001$.

Figure 2

Results of the Regression Analyses Predicting Global ED Pathology. The Total Effect Derived from Step 1 of the Hierarchical Regression Analysis is Displayed in Parentheses



Note. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

The Sobel test revealed a significant positive indirect effect of prospective IU on global ED pathology via worry, $b = .02$, $p = .006$. This indicates that more prospective IU is associated with more global ED pathology through more worry. Because no significant direct effect of prospective IU was found, these results indicate full mediation.

ED Pathology Categories

For the exploratory purposes, the mediation analysis was performed for each of the separate ED symptom categories, as measured with the EDE subscales. The results of these analyses are presented in Table 3.

Table 3

Results of the Regression Analyses and Sobel Tests for Predicting the separate ED Pathology Categories

	b	β	Δ*F*	df1, df2	ΔR^2
Shape concern					
Step 1			3.89	1, 176	.02
Prospective IU	.04	.15			
Step 2			7.11	1, 175	.04**
Prospective IU	.01	.04			
Worry	.03**	.22**			
Final model			5.57	2, 175	.06**
Indirect effect	.03**				
Weight concern					
Step 1			5.60	1, 176	.03*

Prospective IU	.05*	.18*			
Step 2			4.57	1, 175	.03*
Prospective IU	.02	.09			
Worry	.02*	.18*			
Final model			5.14	2, 175	.06**
Indirect effect	.02*				
Eating concern					
Step 1			3.48	1, 176	.02
Prospective IU	.03	.14			
Step 2			6.41	1, 175	.04*
Prospective IU	.01	.04			
Worry	.02*	.21*			
Final model			5.00	2, 175	.05**
Indirect effect	.02*				
Restraint					
Step 1			4.48	1, 176	.03*
Prospective IU	.04*	.16*			
Step 2			2.60	1, 175	.01
Prospective IU	.02	.09			
Worry	.02	.14			
Final model			3.56	2, 175	.04*
Indirect effect	.02				

Note. $^{*}p < .05$, $^{**}p < .01$.

Here, results largely reflect the findings for overall ED pathology. The hierarchical regression analysis revealed a positive total effect of prospective IU for all individual symptom categories, although for shape concern and eating concern, this effect reflected a trend rather than a statistically significant effect ($p_{shape} = .050$, $p_{eating} = .064$). This result indicates that more prospective IU is associated with more weight concern and restraint, and that a similar but nonsignificant trend is found for shape concern and eating concern.

Adding worry as a predictor in step 2 revealed a significant positive effect for each symptom category except for restraint ($p = .109$), indicating that more worry is associated with more shape concern, weight concern, eating concern. When controlling for worry in this step, no significant effect of prospective IU was found for any of the symptom categories ($p_{shape} = .625$; $p_{weight} = .282$; $p_{eating} = .648$; $p_{restraint} = .274$).

The Sobel tests for shape concern, weight concern and eating concern revealed a significant positive indirect effect of prospective IU via worry. This indicates that more prospective IU is associated with more shape concern, weight concern and eating concern through more worry. Because no significant direct effect of prospective IU was found for these outcomes, these results indicate full mediation. Restraint was the only outcome for which no significant indirect effect was found, $p = .118$. Thus, worry does not mediate the relationship between prospective IU and restraint.

Discussion

The current study aimed to investigate whether worry explains the maintaining effect of prospective IU on ED pathology in AN patients. As expected, a positive relation was found between prospective IU and ED symptoms, which was fully explained by worry. In other words, more prospective IU is associated with more global ED pathology through more

worry. While this study is the first to demonstrate such a mediation effect directly, this result is in line with previous studies demonstrating a positive relation between IU and worry (e.g. Dar et al., 2017; Dugas et al., 2001; Kesby et al., 2019; Ladouceur et al., 2000), and in turn, a positive relation between worry and ED pathology (Oldershaw et al., 2015; Sassaroli et al., 2005; Startup et al., 2013; Sternheim et al., 2012, 2015).

Results from the exploratory analyses focussing on the separate ED symptoms categories revealed a similar pattern. That is, prospective IU was positively associated with shape concern, weight concern and eating concern through its positive effect on worry. However, this pattern was not found for restraint, as worry was found to be unrelated to restraint and did not explain the positive relation between prospective IU and restraint.

It should be mentioned that while the hypothesis regarding mediation is confirmed, the explanatory level of prospective IU and worry for ED pathology was relatively low. This would suggest the current findings have little clinical relevance. This is somewhat unexpected, as previous studies have demonstrated substantially higher correlations among IU, worry and ED pathology (Frank et al., 2012; Sternheim et al., 2015). There are several potential explanations for these differential findings. Firstly, the analyses focussed on prospective IU, as opposed to total IU. While that appears to be a logical decision when it comes to predicting worry levels (Helsen et al., 2013; Hong & Lee, 2015; McEvoy & Mahoney, 2011), ED symptoms may be best explained by the full scope of IU expressions, including the more behaviourally expressed inhibitory IU. This makes sense given that one of the hallmark symptoms of AN is dietary restraint, which is behavioural in nature. Notably, restraint was the only symptom category for which the indirect effect of prospective IU through worry was not found. Second, the current study included a patient group with high levels of IU, worry and ED pathology and did not include a healthy control group, which possibly limited the variance in the data. However, this explanation seems unlikely, given that

previous studies have found high correlations between IU and symptom severity within similar ED patient groups (Frank et al., 2012; Sternheim et al., 2015). Third, the low explanatory value could indicate that the overall AN patient population is a diverse group in terms of disorder aetiology and maintaining factors. This theory and its implications for treatment are discussed in the next section.

Implications for Treatment

As discussed, the low explanatory value of IU and worry in this study could be a result of the diversity of the AN patient population. Indeed, a wide variety of comorbidities are commonly observed within the AN patient population, including mood disorders, anxiety disorders, OCD, substance abuse disorders, and autism spectrum disorders (Huke, Turk, Saeidi, Kent, & Morgan; 2013; Salbach-Andrae et al., 2008). Given this variety, anxiety processes such as IU and worry may play a clinically significant role in maintaining ED pathology for some AN patients and not for others, implying that targeting such processes in treatment may be a worthwhile pursuit for only some patients. To effectively address these differing needs in treatment, an individualized approach may be used. Here, a treatment plan is not based on the categorical DSM diagnosis, but on a patient's unique dimensional variation and interaction of transdiagnostic symptoms (such as IU and worry). Notably, an increasing number of clinical experts advocate for idiographic alternatives for diagnosis and treatment of mental disorders (Van Os, 2014). Importantly, one recently developed group intervention targeting IU in AN patients showed promising results, supporting the idea that IU is modifiable through treatment (Sternheim & Harrison, 2018)

Strengths and Limitations

The current study has several strengths. It is the first to attempt to examine the processes maintaining ED pathology in AN patients through a mediation model including prospective IU and worry, and did so using a large clinical sample. Its results thus form a

unique and meaningful contribution to understanding how symptoms are maintained in AN patients.

However, some study limitations should be noted. First, the patient sample presented with a considerably high average worry level, comparable to that found in patients with GAD, a disorder that is characterized by persistent worry (Brown, Antony, & Barlow, 1992). However, similarly high worry levels have been found in several studies using clinical AN samples, suggesting that such high worry levels are representative for the AN patient population (Startup et al., 2013; Sternheim et al., 2011; Sternheim et al., 2015).

Second, the correlational nature of the current study design prevents any strong conclusions with regard to causality and direction of the studied effects. Specifically, it remains uncertain whether the results reflect the hypothesized effects of IU increasing worry and worry subsequently increasing ED pathology. While there is some empirical support for this (Ladouceur et al., 2000; Sala & Levinson, 2016), the evidence is still in its infancy. Admittedly, it makes little theoretical sense that the current results could be explained by ED symptoms or worry increasing IU, because the latter is considered a trait (Kesby et al., 2017). However, such a reverse effect is indeed conceivable for worry, where an increase in ED severity and its effects on a patient's life may be experienced as a source of worry.

Third, the use of a Sobel test to determine the significance of the indirect effect of IU and worry on ED pathology may be considered a limitation, as this test is widely criticized for its limited power (Zhao et al., 2010). However, the current sample is considered large enough to mitigate these problems, as is evidenced by finding statistically significant indirect effects in both the main and exploratory analyses.

Fourth, it is uncertain whether the EDE-Q had sufficient internal consistency in the current sample, as the dataset made available for this study did not allow for the calculation of

a Cronbach's alpha. However, an unacceptable internal consistency is considered unlikely given that previous studies demonstrated excellent internal consistency (Mond et al., 2004).

Recommendations for Future Research

While the current study produced unique insights into the relation between IU, worry and ED pathology in AN patients, several questions remain unanswered. For example, it is unclear to what extend the current results are clinically relevant, and whether including total IU as opposed to prospective IU may improve this. Second, the causal nature of the effects have yet to be established. Here, prospective studies tracking IU, worry and ED symptoms over time may produce valuable insights. Third, it may be valuable to identify the way in which IU-related worry increases ED pathology. As mentioned previously, one potential explanation is that worrying about one's weight and shape promotes hypervigilance towards fluctuations in weight and shape, so much so that natural fluctuations are easily misperceived as signaling future weight gain, resulting in more weight and shape concern and an increase in restraint. This theory remains to be empirically tested and may provide valuable insights to be used in treatment.

Conclusion

The current study forms an important contribution to the IU and AN literature by demonstrating that worry is a key factor explaining the IU-AN link. The representativeness of these findings is supported by the use of a large clinical sample. However, prospective studies are needed to test whether these associations are indeed causal. In addition, the question remains whether the low explanatory value of the model is a valid finding, or whether this is an artefact of excluding inhibitory IU from the analyses. Nevertheless, the current study demonstrated that anxiety processes such as IU and worry are indeed related to ED pathology, suggesting that AN treatment may improve by focussing on these underlying transdiagnostic vulnerabilities.

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