

Anxiety Mediates the Relationship Between Multidimensional Perfectionism and Insomnia Disorder.

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Abstract:

Individuals with insomnia often report aspects of perfectionism alongside symptoms of anxiety and depression. However, there has been limited examination of these factors together. The current study investigated whether individuals with insomnia report increased perfectionism compared to normal-sleepers. Further, the mediating role of anxiety and depression was examined. Participants were 39 individuals with DSM-5 defined Insomnia Disorder, and 39 normal-sleepers, who completed two measures of multidimensional perfectionism and the Hospital Anxiety and Depression Scale. Results demonstrated that, compared to normal-sleepers, individuals with insomnia display increased perfectionistic traits of: concern over mistakes, doubts about action, and parental criticism. In addition, these differences were partially mediated by symptoms of anxiety, but not depression. Our findings highlight the significance of treating symptoms of anxiety with the prospect of alleviating negative thoughts concerning one's mistakes, doubts about action, and perception of parental criticism, which may contribute to insomnia.

Keywords: anxiety; depression; insomnia; perfectionism; personality; sleep.

1. Introduction

Insomnia is influenced by a number of predisposing, precipitating and perpetuating factors, which are behavioural, biological, environmental, or psychological in nature (Spielman, Caruso, & Glovinsky, 1987). One such predisposing, and potentially perpetuating, factor is perfectionism, defined as the tendency to set excessively high standards for oneself and to engage in overly critical self-evaluations (Frost, Marteen, Lahart, & Rosenblate, 1990). It has previously been hypothesized that individuals with perfectionistic traits exhibit a tendency to be overly concerned with the negative effects of a poor night's sleep (Lundh, Broman, Hetta, & Saboonchi, 1994). These concerns could inadvertently perpetuate the development of a vicious thought cycle consisting of worry, frustration, and negative expectations concerning sleep (Frost et al., 1990).

Various aspects of perfectionism have been associated with insomnia. Evidence points towards relationships between insomnia and the multidimensional perfectionism subscales/dimensions: doubts about action, parental criticism, concern over mistakes, personal standards, and socially prescribed perfectionism (Akram, Ellis, & Barclay, 2015; Azevedo et al., 2010, Jansson-Fröjmark & Linton, 2007; Lundh et al., 1994; Vincent & Walker, 2000). However, whether these relationships are direct or mediated by other psychological factors is yet to be confirmed.

Perfectionistic tendencies including concern over mistakes, doubts about action and socially prescribed perfectionism have been independently associated with symptoms of anxiety and depression (Kawamura, Hunt, Frost, & DiBartolo, 2001); and symptoms of anxiety and depression commonly co-occur with insomnia (Ford & Kamerow, 1989). It is thus conceivable that the psychological factors mediating the link between perfectionism and insomnia may include anxiety and depression. Lundh and Broman (2000) postulate that when perfectionistic standards co-occur with a tendency to worry, these standards amplify the negative valence of such worry, increasing the likelihood of an elevated focus on sleep. One suggested pathway may be that anxious and depressive symptoms serve to further increase such worry, and therefore a state of preoccupation with sleep, particularly during the pre-sleep period. This pattern of thinking could contribute to the development of negatively toned cognitive activity, arousal and distress consequently leading to difficulties initiating and maintaining sleep (Lundh & Broman, 2000).

Taking this into account, it is plausible that relationships between perfectionism and insomnia may be mediated by anxiety and/or depression. To the best of our knowledge, only two studies have examined this possibility (Akram, Ellis, & Barclay, 2015; Jansson-Fröjmark & Linton, 2007). Jansson-Fröjmark and Linton (2007) demonstrated that concern over mistakes appears to be significantly related to pre-existing and future insomnia, characterized by sleep initiation or maintenance difficulties. However, when anxiety and depression were controlled for, these relationships diminished. Similarly, Akram and colleagues (2015) demonstrated that concurrently, doubts about action and parental criticism were significantly related to insomnia symptoms amongst members of the general population. However, when anxiety and depression were accounted for, these relationships disappeared. Interestingly, pre-existing insomnia symptoms were related to an increased reporting of future doubts about action and parental criticism; and this relationship was mediated only by anxiety, but not depressive symptoms. These studies suggest the relationship between insomnia and perfectionism is mediated by anxiety and, possibly, depression. However, one of these studies assessed only two perfectionism facets (Jansson-Fröjmark & Linton, 2007); whilst the other was limited in its assessment of insomnia symptoms (Akram et al., 2015). This study aimed to further investigate the mediating role of anxiety and/or depression in the insomnia-perfectionism relationship amongst a sample meeting diagnostic criteria for insomnia disorder by

assessing all facets of perfectionism from two multidimensional perfectionism scales (Frost et al., 1990; Hewitt & Flett, 1991). Specifically, we aimed to determine whether: i) individuals with insomnia report increased aspects of perfectionism compared to normal-sleepers and ii) any confirmed group (insomnia vs. normal-sleepers) differences in perfectionism are mediated by symptoms of anxiety and/or depression.

2. Method

2.1 Participants

Participants were recruited from the general population using posters around Northumbria University, emails to students, and social media. Participants completed a diagnostic screening questionnaire to determine eligibility to take part and group allocation – insomnia disorder or normal-sleeper (see ‘Measures’ section). Eighty-five individuals completed the screening questionnaire, and the final sample consisted of 78 participants: 39 with insomnia (mean age =22.18 years, SD=5.37 years; 87% female), and 39 normal-sleepers (mean age =24.03 years, SD=6.25 years; 70% female). The average duration of insomnia within the insomnia group was 1.32 years (SD=1.75), ranging from 0.3 to 10 years.

2.2 Measures

2.2.1 Screening questionnaire for eligibility and group allocation

A screening questionnaire determined eligibility and normal-sleeper/insomnia status. Individuals who reported symptoms of a sleep/wake disorder (other than insomnia for the insomnia group), an existing psychiatric illness, a central nervous system disorder, use of medication that may affect sleep, prior head injury or shift-work were ineligible to participate (n=7). Participants with insomnia met DSM-5 criteria for insomnia disorder (American Psychiatric Association, 2013). Specifically, individuals with insomnia reported dissatisfaction with sleep characterized by either a difficulty initiating or maintaining sleep or early morning awakenings. The insomnia had to be present for three or more nights per week, for at least three months, and cause significant daytime impairment. Finally, these conditions had to be met despite adequate opportunity to sleep. It was a requirement that normal-sleepers reported no problems with sleep and no history of any sleep-disorder.

2.2.2 Multidimensional Perfectionism Scales

Original versions of the Frost (F-MPS: Frost et al., 1990) and Hewitt-Flett (HF-MPS: Hewitt & Flett, 1991) Multidimensional Perfectionism Scales assessed different aspects of perfectionism. The 35-item F-MPS assesses six components on 5-point likert scales. Scores for each component range as follows: concern over mistakes (CM) 9-45; doubts about action (D) 4-20; parental expectations (PE) 5-25; parental criticism (PC) 4-20; organisation (ORG) 30; and personal standards (PS) 7-35. Higher scores represent a greater tendency towards perfectionism. Internal consistency assessment yielded a Cronbach’s α of .86 for the subscale CM; .81 for D; .84 for PE; .87 for PC; .89 for ORG; and .82 for PS.

The 45-item HF-MPS assess three dimensions on 7-point likert scales. For each dimension, self-oriented perfectionism (SOP); other oriented perfectionism (OOP); and socially prescribed perfectionism (SPP), scores range between 15-105. Higher scores represent a greater tendency towards perfectionism. Internal consistency assessment yielded a Cronbach’s α of .89 for the subscale of SOP; .78 for OOP; and .91 for SPP.

2.2.3 Hospital Anxiety & Depression Scale

Symptoms of anxiety and depression were assessed using the original version of The Hospital Anxiety and Depression Scale (HADS: Zigmond & Snaith, 1983), consisting of 14 items (seven for both anxiety and

depression) scored between 0-3, with a maximum score of 21 on both subscales. Higher scores on each subscale represent greater anxiety and depression. Both subscales demonstrated good internal consistency (Cronbach's α of .84 for anxiety, and .76 for depression).

2.3 Procedure

All participants provided written informed consent prior to participation. Ethical approval was granted by the Faculty of Health and Life Sciences Ethics committee at Northumbria University. Participants were seated at a desk in a laboratory room and completed a questionnaire booklet consisting of the F-MPS, HF-MPS, and HADS. Once complete, participants were thanked and debriefed.

2.4 Statistical Analyses

Pearson's bivariate correlations examined associations between perfectionism facets, anxiety and depression for all participants, and each group independently. Moreover, Independent samples *t*-tests were conducted to determine differences between individuals with insomnia and normal-sleepers concerning the degree of each perfectionism dimension/subscale, and anxiety and depression symptoms reported. This was followed by a series of sequential logistic regression analyses, to determine whether group (insomnia vs. normal-sleepers) differences in perfectionism were mediated by symptoms of anxiety and depression after controlling for age and sex. For example, age and sex (step 1), concern over mistakes (step 2), anxiety (step 3), and depression (step 4) were entered as predictor variables, with insomnia status as the dependant variable. Significance was considered at the $p < .05$ level.

3. Results

Mean scores for F-MPS dimensions, HF-MPS subscales and HADS for both groups are presented in Table 1. Correlations between F-MPS dimensions, HF-MPS subscales and HADS for all participants are presented in Table 2, and by group (individual with insomnia / normal sleeper) in Table 3.

Table 1
Means and standard deviations (SD) for normal-sleepers and insomnia groups on measures of perfectionism, anxiety and depression

	Normal-Sleepers		Insomnia		<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	Mean	SD	Mean	SD			
F-MPS Subscale:							
Organisation	22.21	4.16	22.43	4.26	-0.24	.809	-.05
Concern Over Mistakes	21.64	5.55	24.95	6.13	-2.50	.015*	-.60
Personal Standards	23.67	4.04	22.95	4.95	0.74	.461	.16
Doubts About Action	11.28	3.63	13.28	3.01	-2.65	.010**	-.60
Parental Expectation	13.33	4.14	14.38	4.61	-1.06	.293	-.24
Parental Criticism	7.64	2.92	9.85	4.10	-2.74	.008**	-.62
HF-MPS Dimension:							
Self Oriented Perfectionism	68.62	12.74	67.87	15.51	0.73	.465	-.05
Socially Prescribed Perfectionism	53.12	10.24	53.78	12.37	-0.55	.585	-.06
Other Oriented Perfectionism	58.21	9.71	55.00	10.04	1.31	.195	.33
Anxiety	6.07	3.59	9.46	3.62	-4.49	.001**	-.94
Depression	2.78	2.34	4.12	2.75	-2.80	.007**	-.52

Note: Anxiety, Depression: Hospital Anxiety and Depression Scale.

* Sig at $< .05$, ** $< .01$

Table 2.*Correlations between measures of anxiety, depression and perfectionism for all participants*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Anxiety										
2. Depression	.53**									
3. ORG	.05	-.14								
4. CM	.37**	.32**	.20							
5. PS	.17	.11	.40**	.51**						
6. D	.41**	.33**	.09	.54**	.28*					
7. PE	.14	.24*	.01	.48**	.26*	.20				
8. PC	.22	.20	.08	.54**	.28*	.32**	.76**			
9. SOP	.20	.19	.34**	.52**	.67**	.35**	.38**	.35**		
10. SPP	.13	.21	.11	.59**	.33**	.34**	.49**	.41*	.47**	
11. OOP	.03	.23*	-.06	.40**	.40**	.02	.37**	.28*	.54**	.43**

Note: Anxiety, Depression: Hospital Anxiety and Depression Scale; ORG, Organisation; CM, Concern Over Mistakes; PS, Personal Standards; D, Doubts About Action; PE, Parental Expectation; PC, Parental Criticism; SOP, Self Oriented Perfectionism; SPP, Socially Prescribed Perfectionism; OOP, Other Oriented Perfectionism.

* Sig at < .05, ** < .01

Table 3.*Correlations between measures of anxiety, depression and perfectionism for normal-sleepers and insomnia groups*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Anxiety		.55**	-.11	.23	.27	.35*	.01	-.05	.38*	.26	.25
2. Depression	.41**		-.31	.24	.19	.30	.21	.16	.27	.32*	.48**
3. ORG	.16	-.01		.15	.27	.24	-.16	.04	.24	-.00	-.39*
4. CM	.32*	.28	.23		.46**	.47**	.38*	.24	.57**	.68**	.39*
5. PS	.20	.11	.52**	.63**		.45**	.32*	.26	.63**	.29	.35*
6. D	.31	.25	-.10	.55**	.19		-.03	.10	.48**	.38*	.13
7. PE	.17	.22	.15	.54**	.23	.39*		.67**	.38*	.27	.42**
8. PC	.19	.11	.10	.66**	.38*	.40*	.82**		.24*	.23	.23
9. SOP	.14	.17	.41	.53**	.70**	.29	.40*	.45**		.57**	.49**
10. SPP	.04	.13	.19	.56**	.37*	.32	.66**	.53**	.42**		.43**
11. OOP	.01	.14	.26	.56**	.43**	.02	.38*	.46**	.58**	.46**	

Note: Insomnia group below diagonal; Normal-sleepers above diagonal

Anxiety, Depression: Hospital Anxiety and Depression Scale; ORG, Organisation; CM, Concern Over Mistakes; PS, Personal Standards; D, Doubts About Action; PE, Parental Expectation; PC, Parental Criticism; SOP, Self Oriented Perfectionism; SPP, Socially Prescribed Perfectionism; OOP, Other Oriented Perfectionism.

* Sig at < .05, ** < .01

Compared to normal-sleepers, individuals with insomnia reported significantly higher scores on the perfectionism dimensions of concern over mistakes ($t(76)=-2.50, p=.02$), doubts about action ($t(76)=-2.65, p=.01$), and parental criticism ($t(76)=-2.74, p=.008$). No other group differences concerning the remaining facets of perfectionism were established (all $p's > .05$). Individuals with insomnia also reported greater symptoms of anxiety ($t(76)=-4.30, p=.001$) and depression ($t(76)=-2.57, p=.01$).

Sequential logistic regression analyses demonstrated that concern over mistakes (step 2: 13% total variance explained) significantly predicted insomnia status after controlling for age and sex (step 1: .06% variance). However, after accounting for anxiety and depression, anxiety remained the only significant predictor of insomnia status in the subsequent steps (step 3: 24% variance; step 4: 25% variance; see Table 4-A). Likewise, doubts about action (step 2: 13% variance) significantly predicted insomnia status after controlling for age and sex (step 1: .06% variance). However, after accounting for anxiety and depression, anxiety again remained the only significant predictor of insomnia status in the following steps (step 3: 24% variance; step 4: 25% variance; see Table 4-B). Therefore, whilst individuals with insomnia exhibit increased concern over mistakes and doubts about action relative to normal-sleepers, these differences appear to be mediated by symptoms of anxiety, but not depression.

Parental criticism (step 2: 15% variance) significantly predicted insomnia status after controlling for age and sex (step 1: .06% variance). However, after accounting for anxiety and depression, both parental

criticism and anxiety remained significant predictors in subsequent steps (step 3: 28% variance; step 28% variance; see Table 4-C). Therefore, whilst individuals with insomnia display increased parental criticism relative to normal-sleepers, this difference appears to be only partially mediated by anxiety symptoms.

Table 4
Sequential logistic regression analyses with insomnia status as the dependant variable; age, sex, perfectionism, anxiety and depression as predictors

Predictors	R ²	β	Wald	Sig.
[A]				
Step 1	.06			
Age		-.04	1.02	.31
Sex		.98	2.67	.10
Step 2	.13			
Age		-.48	1.21	.27
Sex		.95	2.22	.14
Concern over mistakes		.10	5.27	.02*
Step 3	.24			
Age		-.03	.38	.54
Sex		1.01	2.25	.13
Concern over mistakes		.06	1.40	.24
Anxiety		.26	9.06	.01**
Step 4	.25			
Age		-.03	.35	.55
Sex		1.02	2.28	.13
Concern over mistakes		.05	1.27	.26
Anxiety		.24	6.93	.01**
Depression		.06	.20	.65
[B]				
Step 1	.06			
Age		-.04	1.02	.31
Sex		.98	2.67	.10
Step 2	.13			
Age		-.02	.28	.60
Sex		1.09	2.97	.09
Doubts about action		.18	5.53	.02*
Step 3	.24			
Age		-.02	.12	.73
Sex		1.08	2.63	.11
Doubts about action		.09	1.21	.27
Anxiety		.26	8.78	.01**
Step 4	.25			
Age		-.02	.12	.73
Sex		1.08	2.64	.10
Doubts about action		.09	1.09	.29
Anxiety		.24	6.71	.01**
Depression		.06	.22	.64
[C]				
Step 1	.06			
Age		-.04	1.02	.31
Sex		.98	2.67	.10
Step 2	.15			
Age		-.07	2.06	.15
Sex		.83	1.66	.20
Parental criticism		.19	6.35	.01**
Step 3	.28			
Age		-.05	1.05	.331
Sex		.84	1.42	.23
Parental criticism		.17	4.18	.04*
Anxiety		.27	10.02	.01**
Step 4	.28			
Age		-.05	.98	.32
Sex		.85	1.46	.23
Parental criticism		.17	3.97	.05*
Anxiety		.26	7.69	.01**
Depression		.04	.10	.75

Note: Anxiety, Depression: Hospital Anxiety and Depression Scale; R²: Cox & Snell R Square.

* Sig at < .05, ** < .01

4. Discussion

The present study examined whether: i) individuals with insomnia, compared to normal-sleepers report increased aspects of perfectionism; and ii) differences in these aspects of perfectionism are mediated by symptoms of anxiety and/or depression. Our results provide further evidence that individuals with insomnia exhibit a greater degree of concern over mistakes (e.g. "People will think less of me if I make a mistake"), doubts about action (e.g. "I have doubts about the everyday things I do") and parental criticism (e.g. "My parents never tried to understand my mistakes") compared to normal-sleepers. Furthermore, these differences were partially mediated by symptoms of anxiety, but not depression.

The notion that individuals with insomnia report increased concern over mistakes and doubts about action is consistent with literature (Jansson-Fröjmark & Linton, 2007; Lundh et al., 1994; Vincent & Walker, 2000). Vincent and Walker (2000) note those who excessively doubt their own actions and worry about making mistakes may consequently experience an increased state of arousal during the pre-sleep period, which contributes to delayed sleep onset. Alternatively, when faced with difficulty sleeping, individuals who are high on these facets of perfectionism may spend a disproportionate amount of time critically evaluating their sleep, leading to elevated pre-sleep arousal (Akram et al., 2015).

Whilst our results indicate that individuals with insomnia are more likely to doubt their own actions and be excessively concerned with making mistakes, relative to normal-sleepers, this relationship appears to be mediated by symptoms of anxiety. It is possible that the preoccupation with negative consequences and daytime impairment associated with a poor night's sleep may perpetuate an overly critical self-evaluation with regards to one's sleep (Lundh & Broman, 2000). Certainly, the perception that poor sleep hinders daytime functioning could contribute to excessive doubts about actions and concerns over mistakes during the day. Further, symptoms of anxiety could increase the likelihood that individuals exhibit negative doubts and concerns regarding past and future behaviour(s). In this context, anxiety may exacerbate pre-existing worry and ruminative thinking in the form of perfectionism amongst individuals with insomnia, leading to a negative thought cycle whereby doubts and concerns during the day transition into the night contributing to increased pre-sleep arousal and delayed sleep-onset. These results suggest that treatments for insomnia should address symptoms of anxiety with the prospect of reducing perfectionistic thinking, specifically doubts about action and concerns over mistakes.

Present findings also indicate that individuals with insomnia display an increased perception of parental criticism relative to normal-sleepers, and that this relationship is partially mediated by symptoms of anxiety. These results are consistent with existing evidence that parental criticism is related to insomnia (e.g. Vincent & Walker, 2000). Further, whilst previous research notes that the relationship between parental criticism and insomnia symptoms is partially mediated by anxiety (Akram et al., 2015), our results confirm that this pattern extends to individuals meeting full diagnostic criteria for insomnia disorder.

Whilst the current data demonstrates that relationships between insomnia and specific aspects of perfectionism are mediated by symptoms of anxiety, depressive symptoms were not a mediating factor. These different mechanisms may have emerged because symptoms of anxiety are often considered to be a greater risk factor for the onset of insomnia, whereas depression may be a consequence of insomnia (e.g. Ford & Kamerow, 1989). Current results show that participants with insomnia reported higher mean scores for anxiety relative to depressive symptoms, and it is possible that anxiety symptoms, which often precede the onset of insomnia, are also maintained over the course of the insomnia. Moreover, daytime impairments associated with insomnia potentially impair one's ability to cope with social and

interpersonal difficulties and stressors of daily life, which consequently precipitate depressive symptoms (Staner, 2010). Perhaps a relatively short mean duration of insomnia may account for the relatively lower reports of depressive symptoms (i.e. in this sample, depressive symptoms are yet to emerge). Thus, future research should focus on longitudinal exploration of the current research questions.

Considering anxiety and depression appear to be the most commonly associated psychological disorders with insomnia (e.g. Ford & Kamerow, 1989), this study focused on the mediational role of anxious and depressive symptoms. However, it may be worthwhile for research to explore the role of symptoms from other disorders (e.g. schizophrenia, anorexia nervosa) on the perfectionism-insomnia relationship. Further, whilst we screened for the report of an existing psychiatric illness, it would have been worth assessing the symptomology of other psychopathologies related to perfectionism including disorders of eating and obsessive compulsive-disorders (Hewitt & Flett, 1991). Finally, it is relevant to note the current sample was rather limited in size and consisted primarily of female participants.

Overall, this study expands upon previous research by encompassing all dimensions and subscales from two conceptualizations of perfectionism to investigate the mediating role of anxiety and depression on the relationship between insomnia disorder and perfectionism. Future research should examine the present research questions amongst a larger, more balanced sample, which may add further support to these preliminary results. Indeed, such research would further highlight the importance of treating symptoms of anxiety to relieve negative thoughts concerning one's mistakes, doubts about action, and perception of parental criticism with the prospect of reducing symptom severity amongst individuals with insomnia.

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