Employees with common mental disorders: from diagnosis to return to work
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Chapter 3

Irrational beliefs in employees with common mental disorders, a prospective cohort study
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Abstract

Objectives To investigate differences in level, type, and stability of irrational beliefs among groups with different common mental disorders. To examine whether a change in irrational beliefs is related to symptom recovery.

Design Prospective cohort study with one-year follow-up.

Setting A primary care setting in 9 occupational health services in the Netherlands.

Participants 190 employees who recently reported themselves ill because of common mental disorders (adjustment disorder, depression, anxiety disorder, or double diagnosis of depression and anxiety disorder).

Main outcome measures Level (IBI-total score), type (IBI subscales), and stability (IBI-total scores during follow-up) of irrational beliefs. Relation between change in irrational beliefs over time and type of psychological symptom recovery.

Results Diagnostic groups differed in their level of irrational beliefs. Highest levels of irrationality were observed in the double diagnosis group, followed by the anxiety disorder group, and the depression group. Participants with adjustment disorders showed the lowest levels of irrationality, comparable to a community sample. We did not find differences in the type of irrational beliefs between diagnostic groups. The level of irrationality declined over time for all diagnostic groups. No differences in decrease were observed between diagnostic groups. The magnitude and direction of change in irrational beliefs was related to the magnitude of recovery of depressive, anxiety, and stress symptoms over time.

Conclusion A relation between irrational beliefs and diagnosis, as well as symptom recovery, was found. Diagnostic groups differed in level, but not in type of irrational beliefs. These results support the application of general cognitive interventions for patients with common mental disorders, especially for patients with a depression or an anxiety disorder.

Nieuwenhuijsen K, Verbeek JHAM, De Boer AGEM, Blonk RWB, van Dijk FJH. (submitted) (Chapter3).
Introduction

In recent years, cognitive behaviour therapy (CBT) has been applied to a broad variety of patient groups and settings. It is advocated as the therapy of choice for common mental disorders by the Department of Health of the UK. The cognitive component of CBT is based upon the notion that irrational cognitions play a key role in the development and maintenance of emotional disturbances. According to this theory, emotions are not determined by environmental events but rather, negative emotions are enhanced by irrational cognitions, which magnify the intensity of the situation at hand. For example, the prominent model of Rational Emotive Behaviour Therapy (REBT) in cognitive therapy postulates that excessive negative emotions are the result of irrational beliefs such as "I must absolutely not fail, I cannot tolerate failing". Within the framework of cognitive therapy, symptom recovery is achieved by disputing these irrational beliefs and replacing them with more adaptive rational cognitions.

In non-clinical populations, several studies have found that irrational beliefs are associated with depressive symptoms and anxiety symptoms. Moreover, the efficacy of CBT in treating both depressive and anxiety disorders has been confirmed in meta-analyses. However, it remains unclear if patients with different types of common mental disorders, such as adjustment disorders, anxiety, and depression, have the same irrational ideas. Even though the relation between either anxiety symptoms or depressive symptoms and the type of irrational beliefs has been the subject of study in student populations as well as a community sample, we do not know of any study comparing irrational beliefs between diagnostic groups.

Knowledge of the specific characteristics of irrationality in different diagnoses could provide clinicians with clues as to which patients could potentially benefit most from cognitive interventions. Furthermore, it would generate indications of which irrational ideas should be addressed during CBT.

Irrationality may differ in many aspects. Patients with one disorder may endorse more irrational cognitions than patients with other disorders. Furthermore, they may endorse different types of irrational cognitions. Finally, irrational beliefs may be more persistent in certain disorders. Therefore, the aim of this study is to investigate differences in level, type, and stability of irrational beliefs among a primary care population with different common mental disorders. The second aim of this study is to examine whether a change in irrational beliefs in these diagnostic groups is related to symptom recovery.
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Methods

Participants and procedure
As part of a longitudinal cohort study of employees with mental health problems, 30 occupational physicians from nine occupational health services provided data on consecutive patients. Eligible employees had to have been on full sick leave for less than six weeks due to mental health problems. Mental health problems were defined as psychological symptoms which were not caused by a somatic disorder. Any previous consultation with the occupational physician had to be more than three months previously.

From March 2001 until February 2002, data on 277 employees eligible for participation in this study were reported to us by the occupational physicians. Of these 277 patients, 66 (24%) refused to participate. Of the remaining 211 employees who signed an informed consent form, 198 filled out the baseline questionnaire. For the purpose of this study, only data from participants with common mental disorders (adjustment disorder, depression, anxiety disorder, or double diagnosis of depression and anxiety disorder) were used (n=188).

Each participant was interviewed by the researchers by telephone. Subsequently, four questionnaires were sent to the participants by mail at baseline (t0), three (t1), six (t2), and twelve months (t3). One reminder was sent to each participant who did not return the questionnaire within two weeks.

Measures

Diagnostic Interview
Participants were diagnosed by means of a telephone version of the structured Composite International Diagnostic Interview (CIDI\textsuperscript{52}). An interview by telephone was used because of its convenience and its demonstrated comparability with face-to-face interviews\textsuperscript{53-55}. The telephone interview included the following diagnostic groups: major depressive disorder, panic disorder, social phobia, somatoform disorder, bipolar disorder, obsessive-compulsive disorder, post-traumatic stress disorder, and psychotic disorder. For the first three diagnoses we administered the full CIDI scales, while we used only the stem (or screen) questions for the other categories. It was allowed for a participant to meet the criteria for more than one diagnosis. Anxiety disorder was operationalised as meeting the criteria for one or more of the following disorders: panic disorder, social phobia, somatoform disorder, obsessive-compulsive disorder, or post-traumatic stress disorder. Depression was operationalised as meeting the criteria for major depressive disorder. All
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interviews were conducted or supervised by a mental health professional. All interviews were tightly scripted and lasted 15 to 20 minutes.

Questionnaire
The baseline questionnaire provided information on age, gender, occupation, and self-reported cause of mental health problems, while irrational beliefs and symptoms were measured in all four questionnaires. The Irrational Beliefs Inventory (IBI) is a 50-item measure of irrational beliefs, comprising five subscales (Worrying, Rigidity, Need for Approval, Problem Avoidance, and Emotional Irresponsibility) and a total score. Each item is scored on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A high score reflects higher irrationality. Support for satisfactory internal consistency, construct validity, and sensitivity for change was found. The total score was used to assess level of irrationality, while the five subscales provided information on the type of irrational beliefs that the participants endorsed.

Psychological symptoms were measured using the DASS-42, which consists of 42 items divided into three subscales: Depression scale, Anxiety scale, and Stress scale. Participants rated the extent to which they had experienced each symptom over the previous week on a 4-point Likert scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). Internal consistency, construct validity, convergent and divergent validity, and criterion validity of the DASS were satisfactory. Missing values within the subscales of the DASS were imputed by the mean of the subscales if more than half of the items of that scale had been filled in.

Statistical analyses
Three separate analyses were conducted to investigate differences in level, type, and stability of irrational beliefs among employees with different diagnoses. To examine the overall difference in level of IBI total scores, one-way analysis of variance (ANOVA) was conducted on IBI scores at t0 between the four main diagnostic groups: adjustment disorder, depression, anxiety disorder, and double diagnosis (both depression and anxiety disorder). Tukey post hoc analyses were carried out in order to test differences in IBI total score for each group separately.

To subsequently test the overall difference in type of irrational beliefs at t0 between the diagnostic groups, Multivariate Analysis of Variance (MANOVA) with diagnosis as between-subjects factor and IBI-subscale scores as within-subject factor was conducted.
Stability over time of the irrational beliefs was tested using MANOVA, with repeated measurements of IBI-total scores with diagnosis as between-subjects factor and time as the within-subject factor. Whenever significant results were found, the MANOVAs were followed by univariate ANOVAs to determine the nature of the effect.

In order to describe the relation between change in irrationality and symptom recovery, employees were classified into three groups based upon their change in IBI total score between t0 and t3. Cases were divided into three IBI change groups based upon their tertile score. Subsequently, overall differences of these groups on the three DASS-sub scales at t0, t1, t2, and t3 were examined with three separate repeated measurements MANOVAs. IBI change group was used as between-subjects factor and time as within-subject factor.

Analyses were performed using the SPSS 10.0.7 software package (SPSS Inc., Illinois, USA).

Results

Employee characteristics
Table 1 presents the characteristics of the employees who participated in the study. Two of the original participants did not return any of the follow-up questionnaires (lost to follow-up). Overall, 53 (7%) of the four questionnaires sent to each of the remaining 186 participants were missing. A non-response analysis revealed no statistically significant differences in gender, IBI-total score, DASS-Depression, DASS-Anxiety, and DASS-Stress scores at baseline between participants with and without missing questionnaires. Compared to participants without missing questionnaires, participants with one or more questionnaires missing were significantly younger (mean age 40 years vs. 45 years; t=3.2, p<0.05).
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Table 1 Mean, standard deviation (SD) or percentage of gender, age, diagnosis, occupation, and self-reported cause of common mental disorder. Due to missing values, n ranges from 183 to 186

<table>
<thead>
<tr>
<th>Participant characteristic</th>
<th>% (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender, male</td>
<td>40 (74)</td>
</tr>
<tr>
<td>Age, mean (SD)</td>
<td>44.5 (8.5)</td>
</tr>
<tr>
<td>Diagnosis</td>
<td></td>
</tr>
<tr>
<td>adjustment disorder</td>
<td>64 (120)</td>
</tr>
<tr>
<td>depression</td>
<td>16 (30)</td>
</tr>
<tr>
<td>anxiety disorder</td>
<td>12 (22)</td>
</tr>
<tr>
<td>both anxiety disorder and depression (double diagnosis)</td>
<td>8 (14)</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
</tr>
<tr>
<td>mentally demanding (light and heavy)</td>
<td>44 (80)</td>
</tr>
<tr>
<td>mixed mentally and physically demanding</td>
<td>53 (98)</td>
</tr>
<tr>
<td>physically demanding (light and heavy)</td>
<td>3 (6)</td>
</tr>
<tr>
<td>Cause of common mental disorder (self-reported), work-related</td>
<td>68 (125)</td>
</tr>
</tbody>
</table>

Irrational Beliefs

Differences in level of irrationality between diagnostic groups

The diagnostic groups had statistically different IBI-total scores at baseline (Table 2). Employees with a double diagnosis had the highest IBI total scores, followed by employees with an anxiety disorder, and employees with a depression. Employees with adjustment disorders had the lowest IBI-total scores. Post-hoc analysis indicated that the adjustment disorder group had statistically significant lower scores than either the anxiety disorder or the double diagnosis group. Furthermore, the depression group scored significantly lower than the double diagnosis group.

Differences in type of irrational beliefs between diagnostic groups

Employees from the diagnostic groups differed in their scores on the IBI-subscales at baseline (Table 2). The double diagnosis group had the highest scores on all 5 subscales. The adjustment disorder group scored the lowest on IBI-Worrying, Need for Approval, and Emotional Irresponsibility. Subscale scores were not related to one specific diagnosis.
<table>
<thead>
<tr>
<th>Table 2</th>
<th>Mean and standard deviation (SD) of IBI-subcales and IBI-total at baseline for the diagnostic subgroups and the total group. (n = 184)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Adjustment disorder (n = 118)</strong></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td>IBI-Total</td>
<td>140.4</td>
</tr>
<tr>
<td>IBI-Worrying</td>
<td>37.1</td>
</tr>
<tr>
<td>IBI-Rigidity</td>
<td>36.6</td>
</tr>
<tr>
<td>IBI-Need for Approval</td>
<td>21.8</td>
</tr>
<tr>
<td>IBI-Problem Avoidance</td>
<td>22.6</td>
</tr>
<tr>
<td>IBI-Emotional Irresponsibility</td>
<td>22.2</td>
</tr>
</tbody>
</table>

One-way analysis of variance (ANOVA) revealed a main effect of diagnostic group for IBI-total scores: $F(3,180)=10.3$ $p<0.001$. Tukey post-hoc analysis indicated a significant difference between adjustment disorder group on the one hand, and the anxiety disorder ($p=0.04$) and double diagnosis group on the other ($p<0.001$). The depression group differed significantly from the double diagnosis group ($p=0.001$). Multivariate Analysis of Variance (MANOVA) with diagnosis as between-subjects factor, and IBI-subscale scores as within-subject factor showed an overall main effect of diagnosis ($F(15,534)=2.6$, $p=0.001$). Furthermore, this analysis yielded significant univariate main effects of diagnosis for IBI-Worrying ($F(3)=7.3$, $p<0.001$), IBI-Rigidity ($F(3)=4.0$, $p=0.009$), IBI-Need for Approval ($F(3)=3.8$, $p=0.01$), and IBI-Problem Avoidance ($F(3)=3.8$, $p=0.01$).
Differences in stability of irrational beliefs between diagnostic groups
A decrease was found in IBI-total score during the follow-up period for all diagnostic groups (see Figure 1). Yet, no statistically significant interaction effect of diagnosis and time was found. This suggests that the decrease over time is the same for the four diagnostic groups.

The Multivariate Analysis of Variance (MANOVA) with repeated measurements of IBI-total scores with diagnosis as between-subjects factor and time as the within-subject factor revealed a statistically significant main effect for time: F(3,145)=10.5, p<0.001. The interaction effect for time x diagnosis was not significant: F(9,441 )=0.69, p=0.73.

Relation between change in irrational beliefs and symptom recovery
The three IBI-change groups, based on the tertile scores, differed substantially in their mean change in IBI-total score, while no statistically significant differences were observed between IBI-total scores at baseline (F(2)=2.7, p=0.07). The first group had a mean increase of 6.0 (IBI-increase group), the second group showed a mean decrease of 7.7 (IBI-small decrease group), and the third group was found to have a mean decrease of
22.2 (IBI-substantial decrease group). The IBI-increase group showed the smallest reduction in depression, anxiety, and stress symptom levels followed by the IBI-small decrease group (Figure 2). The IBI-substantial decrease group had the largest reduction in symptom levels over time. This means that a change in irrational beliefs is related to the magnitude of symptom recovery.
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Figure 2  Mean scores of DASS subscales at T0, T1, T2, and T3 for three IBI-change groups. A time by IBI-change group interaction effect was statistically significant for depressive (F(6,294)=3.4, p=0.003), anxiety (F(6, 294)=2.4, P=0.03), and stress symptoms (F(6,314)=3.7, p=0.001). (n =151 due to missing values)

Discussion

This study showed that employees with both a depression and an anxiety disorder have the highest level of irrational beliefs, followed by employees with only anxiety disorders. Employees with a depression had lower levels of irrationality than employees with anxiety disorders, but higher levels than the group with adjustment disorders. Groups with different diagnoses differed more in level of irrationality than in type of irrational beliefs. Furthermore, the whole group showed a decrease in irrational beliefs over time, while no differential effects for diagnosis were found. In accordance with expectations, the magnitude and direction of change in irrationality was associated with the magnitude of symptom recovery.

Our study encompassed four groups of employees with different common mental disorders, which enabled us to compare irrationality to diagnosis. We did not find any type of irrational belief as being most pronounced in certain disorders. This corroborated
results from an earlier study that could not establish differential relationships between IBI-subscscales and either anxiety or depressive symptoms.\textsuperscript{72} However, future studies should reveal whether the questionnaire is inappropriate for measuring disorder-specific beliefs, or whether the diagnostic groups differ only in level of irrationality.

The longitudinal design of this study provided the means for an examination of the course of irrationality. As in earlier studies on depression alone, change in irrational cognitions was associated with change in symptoms.\textsuperscript{76} However, the question of whether a decrease in irrationality precedes symptom recovery remains unanswered. It has been argued that irrational cognitions and symptoms are both influenced by an unknown common cause.\textsuperscript{77} The time between our measurements is too long to examine what came first: a decrease in irrationality or a decrease in symptoms.

Our group of patients with adjustment disorders had a level of irrational beliefs (mean IBI-total score 140.6) comparable to those found in a community sample (mean score 140.9) in a previous study.\textsuperscript{72} The level of irrationality in the other diagnostic groups was higher. This is in agreement with the notion that anxiety disorders and depression are considered more severe disorders than adjustment disorders.\textsuperscript{11} At follow-up (T3), patients from the adjustment disorder group had even lower levels of irrationality (mean score 132.4) than normal controls. Participants with an anxiety disorder or a double diagnosis had irrationality scores higher than normal controls at follow-up (144.2 and 154.1 respectively). This could mean that they had not yet recovered sufficiently. Another explanation is that these patients had a stable tendency to have irrational beliefs, which made them prone to relapse.

Overall, diagnostic groups appeared to differ mostly in level of irrational beliefs, with depression and anxiety disorders showing higher levels than adjustment disorders. These findings suggest that CBT may encompass similar cognitive interventions for all common mental disorders. Furthermore, cognitive interventions seem to be most appropriate for patients with depression and anxiety disorders. To a certain extent, the association between changes in irrational beliefs and symptoms supports the use of cognitive interventions in CBT. A challenging task for future research will be to answer the question of whether a decrease in irrational beliefs is a prerequisite for symptom recovery.