



## Psychological distress across twelve months in patients with rheumatoid arthritis: The role of disease activity, disability, and mindfulness



Ivan Nyklíček<sup>a,\*</sup>, Frans Hoogwegt<sup>b</sup>, Toon Westgeest<sup>c</sup>

<sup>a</sup> Center of Research on Psychology in Somatic disease (CoRPS), Department of Medical and Clinical Psychology, Tilburg University, The Netherlands

<sup>b</sup> Department of Medical Psychology, Máxima Medical Center, Eindhoven, The Netherlands

<sup>c</sup> Regional Rheumatic Center, Eindhoven, The Netherlands

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### ABSTRACT

**Objective:** Mindfulness may diminish effects of adversities on psychological well-being in medical patients, but studies are scarce, especially in patients with rheumatoid arthritis (RA). The purpose was to examine the prospective moderating effect of mindfulness regarding psychological distress associated with disease activity and disability in patients with RA.

**Methods:** Two-hundred-and-one patients with RA (mean age  $57.4 \pm 11.7$ , 55% women) completed questionnaires at baseline and at six and twelve month follow-up. Disease activity score was assessed by the rheumatologist.

**Results:** Controlled for potential confounders, mixed linear model analyses showed a strong prospective association of higher baseline mindfulness with lower psychological distress up to the twelve month follow-up ( $p < .001$ ). In addition, a mindfulness by disability by time interaction showed that higher baseline mindfulness was associated with lower disability related psychological distress at follow-up ( $p = .022$ ).

**Conclusion:** Findings are in line with the hypothesis that mindfulness may protect against psychological distress associated with disability in RA. Potential benefits of mindfulness-based interventions for prevention should be examined in this population.

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### Introduction

Rheumatoid arthritis (RA) is a common chronic arthritis, involving inflammation and often pain, which may lead to functional disability [1,2]. Patients with RA have to adapt to the disease [3], especially as a result of the incurable nature and often unpredictable course. This often promotes psychological distress, which is usually higher compared with people in the general population [4].

Psychological distress as part of quality of life is recognized as an important treatment outcome [5,6]. RA patients have shown considerable individual differences regarding their trajectories of psychological distress over time [7]. Not only disease activity influences psychological distress and quality of life, but these are at least as strongly influenced by psychological characteristics, such as coping styles and attitudes towards the disease and towards life in general [6,8]. For instance, an optimistic attitude has been found to be related to lower psychological distress in RA patients [9], and with fewer disease symptoms [10].

A specific attitude may facilitate coping with the uncontrollable nature of the disease, including pain: acceptance of sensory phenomena

as they take place [11,12] by means of an open and nonjudgmental attention to whatever happens in the present moment, called mindfulness [13,14]. Mindfulness facilitates acceptance and is claimed to prevent rumination about the ‘why’ of having the disease and worries about the future [15]. In various populations mindfulness has been found to be associated with decreased levels of psychological distress and higher psychological flexibility [11,16], including coping with pain [14,17]. Two mechanisms of mindfulness that have been claimed to be important are (a) identification and letting go of ruminative/perseverative thoughts about the past or future, and (b) mental and bodily relaxation [18]. Thus, mindfulness may also protect subjective well-being when confronted with adverse situations, such as a chronic unpredictable condition with concomitant pain and disability like RA.

Indeed, mindfulness has been found to buffer against the effects of experienced stress on negative mood [19]. This has been recently found to be especially the case when experienced stress was due to unavoidable events [20], including a chronic disease, such as multiple sclerosis [21]. In addition, also in experimental studies mindfulness was found to buffer the effects of exposure to stressful laboratory tasks, including affective and cortisol responses [22]. Furthermore, mindfulness-based psychological interventions have been reported to enhance quality of life [23–25], and decrease pain and enhance coping with pain [26,27] in various patient and non-patient samples, including two studies in patients with rheumatoid arthritis [28,29].

\* Corresponding author at: Department of Medical and Clinical Psychology, Tilburg University, PO Box 90153, 5000 LE Tilburg, The Netherlands. Tel.: +31 13 4662391; fax: +31 13 4662167.

E-mail address: i.nykliecek@tilburguniversity.edu (I. Nyklíček).

Therefore, the aim of the present study was to examine in what way mindfulness may be associated with psychological distress over a period of one year in RA patients. Based on theory and previous studies in other patient groups discussed above, it was hypothesized that mindfulness would be related with a more favorable course of psychological distress both (i) in a direct association and (ii) in a moderating association reflecting diminished psychological distress when disease activity or disability is high. Because socially desirable response tendencies have been found to correlate both negatively with measures of psychological distress and positively with mindfulness [16], this construct was included to control for possible confounding by this factor.

## Methods

### Study sample and procedure

Participants were recruited in the Regional Rheumatic Center ZO-Brabant, Eindhoven, the Netherlands. For the computation of the required sample size, we used the conservative MANOVA F-test for Interactions procedure with a medium effect size ( $f^2 = .15$ ), 11 predictors, alpha of .05 and power of .95, which resulted in a total sample size of 111. Because we anticipated loss to follow-up of about 30–40%, 225 consecutive regular check-up patients were approached from March 2008 to June 2010 and informed by their rheumatologist. Inclusion criteria were a diagnosis of RA; starting treatment with one of the two most frequently prescribed medication in the Netherlands for RA (methotrexate or a TNF- $\alpha$  antagonist; for a substudy not reported on here) and sufficient understanding of written and spoken Dutch language. The exclusion criteria were age >80 years; chronic severe psychiatric conditions (e.g. psychosis or a personality disorder) and any infections during the last week, all self-reported by the patient when asked by the rheumatologist or nurse. In case of an infection, which however was very temporary (such as common cold), the inclusion was postponed by a week or two.

The study complied with the Helsinki Declaration on human subjects and the protocol was approved by the Medical Ethics Committee of Máxima Medical Center, Eindhoven, the Netherlands.

After explanation of the study and written informed consent, patients were asked to complete the baseline questionnaire at home and to send it back within one week. In case of refusal, a short questionnaire with general variables including sex, age, marital status, level of education and the time since diagnosis was attached to be able to compare participants with nonparticipants.

The disease activity score (DAS-28, see [Assessments](#)) was measured by the rheumatologist and had to be determined within a month before and a month after the questionnaire was completed. Average time between patients' completion of questionnaires and determination of disease activity score was  $5.6 \pm 9.6$  days.

The procedure was repeated at 6 (T1) and 12 (T2) month follow-up. In case no follow-up visit took place, follow-up questionnaires were sent to the participants by regular mail.

### Assessments

At baseline, a brief questionnaire was administered for assessing various sociodemographic variables, including age, sex, education level, and partner status. Time since diagnosis and treatment (methotrexate or a TNF- $\alpha$  antagonist) was obtained from medical records. The other assessments were performed at all three measurement times.

Several questionnaires were used to measure various aspects of psychological distress and its reverse, subjective well-being, to examine a broader range of related constructs, ranging from (a) specific symptoms (anxiety and depression) to general distress and (b) negative to positive states (positive mood and general life satisfaction).

First, the Perceived Stress Scale (PSS) [30] was used to assess general feelings of psychological distress. This 14-item scale assesses the degree

to which one's current life is appraised as stressful. The items are scored using five-point Likert scales ranging from 0 (never) to 4 (very often). The scale has been reported to have an internal consistency (Cronbach's  $\alpha$ ) coefficient of 0.85 and well-established validity [30, 31], also of the Dutch version [24].

The Dutch brief Symptoms of Anxiety and Depression scale (SAD-4) [32] was applied to assess these widely studied specific symptoms of psychological distress. The scale consists of 4 items which are scored on a five-point Likert scale ranging from 0 (not at all) to 4 (very much). The questionnaire is a reliable index of mixed anxiety-depression symptoms, which has shown good internal consistency (Cronbach's  $\alpha$  of 0.86) and validity [32].

To assess general mood, both negative and positive, the Dutch version of the Global Mood Scale (GMS) [33] was applied, which consists of 10 negative mood items and 10 positive mood items. The patients have to answer on a five-point Likert scale ranging from 0 (not at all) to 4 (extremely) the extent to which they have experienced each mood state lately. This questionnaire has shown adequate construct validity and a good internal consistency (Cronbach's  $\alpha$  of 0.90 for both positive and negative moods) [33].

Finally, the Dutch version of the Satisfaction with Life Scale (SWLS) [34] was used to assess general life satisfaction. It is a brief questionnaire consisting of 5 items using a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). It measures how satisfied patients are with their present life. Adequate construct validity and internal consistency have been reported (Cronbach's  $\alpha$  of 0.87) [34].

Mindfulness was assessed by means of the Freiburg Mindfulness Inventory-short-form (FMI-s) [35]. It consists of 14 items and is regarded as an index of overall mindfulness, including the aspects of attention to external and internal (proprioceptive and psychological) phenomena in the present moment, accepting self-reflection, and a nonreacting stance. These items are scored on a four-point Likert scale ranging from 1 (rarely) to 4 (almost always). The original short form has shown a good construct validity and internal consistency (Cronbach's  $\alpha$  of 0.86) [35]. The Dutch version has shown a satisfactory Cronbach's  $\alpha$  of 0.79 [36].

Disability was assessed using the Health Assessment Questionnaire (HAQ) [37]. It has been validated in groups of patients with a wide variety of rheumatic diseases. We used the standard Dutch version [38], which consists of 20 items in 8 categories which represent a comprehensive set of functional activities (dressing and grooming; arising; eating; walking; hygiene; reach; grip and common daily activities). These questions are part of the Disability Index score, excluding questions regarding aids and devices. The questions ask about the past week using the format "Are you able to..." perform a particular task. The responses are scored on a four-point Likert scale ranging from 0 (without any difficulty) to 3 (unable to do) [37]. In addition, a VAS scale (1–100) is included, which assesses pain in the past week (1 = no pain, 100 = worst pain imaginable). The Dutch version has been found to have adequate reliability: Cronbach's  $\alpha$  was between 0.85 and 0.95 [38].

The Disease Activity Score (DAS-28) [2] is an instrument that indicates how active the rheumatoid arthritis is at a certain moment. The DAS-28 consists of four parts: (a) the number of swollen joints and (b) the number of tender joints as determined by the rheumatologist, (c) a general health assessment on a visual analogue scale (VAS) (from 1 to 100) obtained from the patient on self-evaluated disease severity, and (d) erythrocyte sedimentation in the blood. The DAS-28 score can be calculated using the following formula:  $DAS-28 = 0.56 (\sqrt{\text{number of tender joints}}) + 0.28 (\text{number of swollen joints}) + 0.70 (\text{In erythrocyte sedimentation}) + 0.014 (\text{VAS score})$ . This total score is a number between 0 and 10, indicating the amount of disease severity. This composite measure has shown adequate validity [2,39].

Social desirability was measured by means of the Marlowe-Crowne Social Desirability Scale [40]. The Dutch short form was used, consisting of 15 items, which are answered with false (0) or true (1). The original

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