The Clinical Journal of Pain Publish Ahead of Print
DOI:10.1097/AJP.0000000000000929

Wellbeing and perceived stigma in individuals with rheumatoid arthritis and fibromyalgia: a daily diary study

Maité Van Alboom[1], MSc, Lies De Ruddere[1], PhD, Sara Kindt[2], PhD, Tom Loeys[3], PhD, Dimitri Van Ryckeghem[1,4,5], PhD, Piet Bracke[6], PhD, Manasi M. Mittinty[7], MD, PhD, & Liesbet Goubert[1], PhD

[1] Department of Experimental-Clinical and Health Psychology, Ghent University, Ghent, Belgium

[2] Department of Applied Health and Lifestyle Sciences, University of Applied Sciences, Bruges, Belgium

[3] Department of Data Analysis, Ghent University, Ghent, Belgium

[4] Department of Clinical Psychological Science, Maastricht University, Maastricht, the Netherlands

[5] Department of Behavioural and Cognitive Sciences, University of Luxembourg, Esch-sur-Alzette, Luxembourg

[6] Department of Sociology, Ghent University, Ghent, Belgium

[7] Pain Management Research Institute, University of Sydney, NSW, Australia

Corresponding author: Maité van Alboom, Department of Experimental-Clinical and Health Psychology, Ghent University, Henri Dunantlaan 2, B-9000 Gent, Belgium. Tel: +32 (0)9 264 86 90, Fax: +32 (0)9 264 63 92. Electronic mail may be sent to Maite.VanAlboom@UGent.be.

Acknowledgements

This study was supported by a grant from the Fund for Scientific Research (FWO) – Flanders (G020118N). MM Mittinty is funded by the Endeavour Post-doctoral research fellowship, Department of Education and Training, Australian Government, Australia. There are no conflicts of interest that may arise as a result of the research presented in this manuscript.

Abstract

The presence or absence of clearly defined symptoms and underlying pathophysiology may be a crucial variable related to variability in wellbeing and stigmatization in individuals with chronic pain (ICPs). In the context of pain, absence of clearly defined symptoms and pathophysiology deviates from the widely endorsed biomedical model and as such, may lead to stigmatization, which in turn could be related to ICPs' wellbeing.

Objectives

The present study compared physical, psychological, and social wellbeing and perceived stigmatization in individuals with clearly defined symptoms and underlying pathophysiology (rheumatoid arthritis, RA) and individuals with less well understood symptoms and pathophysiology (fibromyalgia, FM) using daily diaries. Furthermore, the association between daily perceived stigmatization and daily wellbeing was examined.

Methods

Seventy-nine participants with FM, 86 participants with RA, and 33 participants with both diagnoses completed a diary for 14 consecutive days.

Results

Compared to individuals with RA, individuals with FM and individuals with both diagnoses reported worse daily wellbeing. After controlling for age, pain duration, and daily pain, differences between FM and RA remained significant for social wellbeing and completion of plans. Differences between RA and the dual diagnosis group remained significant for completion of plans, negative affect, and isolation. Furthermore, results suggested more stigmatization in individuals with FM than in individuals with RA. Individuals with both diagnoses reported equal stigmatization as individuals with FM, but more stigmatization than individuals with RA. Finally, increased levels of perceived stigma were associated with lower wellbeing.

Discussion

Findings highlight that the absence of clearly defined symptoms and pathophysiology could be contributing to greater feelings of stigmatization, which may be detrimental for ICPs' wellbeing.

Key words: chronic pain, fibromyalgia, rheumatoid arthritis, wellbeing, stigma

1. Introduction

Chronic pain often results in decreased wellbeing. Yet, not all individuals with chronic pain (ICPs) experience a similar impact on their wellbeing. The presence or absence of clearly defined symptoms and underlying pathophysiology has been put forward to be pivotal [24]. Particularly, it has been suggested that individuals experiencing pain with less clearly understood symptoms and pathophysiology may experience a lack of understanding of the illness and may worry about possible explanations, which may be detrimental for wellbeing [49]. In this context, research has shown that individuals with rheumatoid arthritis (RA) report better mental wellbeing in comparison with individuals suffering from a condition with less clearly defined symptoms and pathophysiology (e.g. fibromyalgia (FM)) [3,64,73,77]. RA and FM are both musculoskeletal disorders, which are amongst the most common causes of long-term pain and disability, often resulting in lower quality of life [3]. RA is an autoimmune and inflammatory condition that often affects multiple joints. The tissue damage associated with RA can cause severe chronic pain, deformity and loss of function [43]. FM is a condition associated with widespread pain along with a complex set of symptoms including poor sleep, fatigue, depression, and cognitive difficulties [30,46,81]. Diagnosis of RA relies on a combination of patient's medical history, physical examination, laboratory tests, and imaging [43], while FM is a diagnosis of exclusion and relies on the widespread pain index (counting number of painful body regions) and the symptom severity score [30,46]. Up till now, no clear pathophysiology has been identified for FM [81]. Several studies have demonstrated that individuals with FM had worse physical and social wellbeing compared to individuals with RA [38,69], yet, other studies found no difference between both [3,5,56]. As yet, findings are inconclusive and available research is largely limited to cross-sectional research designs using questionnaires in which people reflect over a longer period of time, allowing retrospective bias and prohibiting to take the dynamic nature of pain and wellbeing into account.

One potential factor related to variability in wellbeing between ICPs may be the social environment and the prevailing medical norm. Particularly, an absence of tissue damage (cfr. FM) deviates from the widely endorsed biomedical model and as such, may lead to suspicion about the genuineness of the ICPs' pain complaints [12,13,18,19] and stigmatization [16,18-20]. Stigma has been defined as devaluing and discrediting responses of observers toward individuals who possess a characteristic that deviates from societal norms [14,16]. Studies have shown that individuals in the general population [8,18,20,64], medical students [9,29] and healthcare practitioners [19,67,68] ascribe lower pain to ICPs and suspect deception when the symptoms and pathophysiology are less well understood [18,19]. Additionally, ICPs in general report feelings of disbelief from romantic partners [33], relatives [50], friends [72], colleagues [21,33,50] and healthcare practitioners [53]. Uncertainty about the pathophysiology of chronic pain and lack of visible signs for the pain may elicit stigmatizing responses in others because people expect a visible injury explaining the pathophysiology of the pain [36]. Additionally, the sick role may only be possessed for a limited period in time, which is violated in the context of chronic pain [57].

Further, individuals with FM reported more perceived invalidation as compared to individuals with RA [40]. Invalidation has been defined as perceptions of non-acceptance by others, including perceptions of disbelief, suspicion of exaggerated or falsified symptoms, misunderstanding, stigmatization, and outright rejection [42]. According to this definition, overlap exists between stigma and invalidation, but they are not the same. Invalidation is highly similar to enacted stigma (which is the focus of the current study) as defined by Chaudoir and colleagues [6]: both focus on perceptions of strained interactions in the past between stigmatized individuals and other people. Preliminary research showed that invalidation was associated with lower psychological and physical wellbeing in individuals with RA or FM [41,42].

Based upon the Stigma Mechanisms in Health Disparities Model [6], public stigma (i.e., community's stigmatizing responses) ultimately leads to worse mental and physical health in stigmatized individuals. Perceived stigma, i.e., the perception of being stigmatized, is proposed as one of the influential processes by which public stigma might impact upon ICP's wellbeing. One study found that internalized stigma (i.e. self-stigma) was associated with lower self-esteem and pain self-efficacy, more catastrophizing thoughts and reduced sense of personal control in ICPs [78]. Another study showed that chronic pain stigma was related to more depression and disability [65]. Yet, systematic inquiry is largely lacking to what extent perceived stigmatization is related to different aspects of wellbeing in conditions that are better understood in terms of symptoms and underlying pathophysiology versus conditions that are less well understood in terms of symptoms and pathophysiology.

The present study aimed at examining the difference in daily wellbeing and daily perceived stigmatization between individuals with chronic pain associated with clearly defined symptoms and pathophysiology (RA) and individuals with chronic pain that is less well understood in terms of symptoms and pathophysiology (FM) using daily diaries. A diary methodology diminishes retrospective bias [35] and allows to study thoughts, feelings, and behaviors in their natural context with possible fluctuations in social interactions [56], which is highly informative in the context of stigmatizing responses. Also, diaries allow the investigation of factors contributing to daily variations in wellbeing [35]. Furthermore, the study aimed at investigating the impact of daily perceived stigmatization upon daily wellbeing. We hypothesized that individuals with FM would report lower physical (disability, physical activity), psychological (positive and negative affect, self-esteem, completion of plans), and social (isolation, searched social contact) wellbeing than individuals with RA. Second, we hypothesized that individuals with FM would perceive more daily stigmatization in comparison with individuals with RA. Third, we hypothesized that daily perceived stigmatization would be related to ICPs' wellbeing.

2. Methods

2.1. Participants

Participants were recruited through the Flemish Pain League (FPL), an organization for patients with chronic pain, and through the League for Rheumatoid Arthritis (LRA), an organization for patients with rheumatoid arthritis. All members (N= 1983) of the FPL and the LRA (N= 319) were sent an invitation letter to participate in studies on chronic pain and wellbeing at the Ghent Health Psychology Lab. Four hundred and seven members (= 20.5%) of the FPL, and 118 (= 37%) members of the LRA agreed to participate and were contacted by phone to provide further information about the study and to check the following inclusion criteria: (1) having chronic pain (i.e., persistent or recurrent pain for at least three months), (2) being diagnosed with fibromyalgia and/or rheumatoid arthritis, (3) speaking Dutch fluently, and (4) being older than 18 years. About 40% of the members who were called met these inclusion criteria, resulting in a sample of 211 participants with FM, RA, or both diagnoses. We decided to include this dual diagnosis group because it represented a significant proportion of the sample (15,6% of all participants), and this way we could elucidate the impact of having both diagnoses. In particular, we aimed to explore whether they are more similar to the FM group or to RA group regarding daily wellbeing and daily perceived stigmatization. One hundred and eighteen participants (= 78%) of the FPL completed both the questionnaires and diaries; two participants filled out only the questionnaires. Further, five participants filled out only the diaries. The data from the latter group were excluded from the analyses as we were unable to secure their informed consent, which was included in the questionnaire set. Thirty nine participants (79%) from the LRA filled out both the questionnaire and diaries; two participants filled out only the questionnaire.

After data collection, 9 participants reported to have neither RA nor FM; 2 participants did not reconfirm being diagnosed with FM; and 2 participants reported to have pain for less than 3 months. Data of these participants were excluded. In sum, data of 79 participants with FM, 86 participants with RA, and 33 participants with both diagnoses were used for further analyses. All participants reported that the (FM or/and RA) diagnosis was provided by a physician.

The study was approved by the ethical committee of the Faculty of Psychology and Educational Sciences of Ghent University.

2.2. Procedure

Participants were sent two weblinks, one to fill out the online sociodemographic and pain questionnaire, and one for the online end-of-day diary for 14 consecutive days. All questionnaires and diaries were preferable administered online through LimeSurvey, a protected web-based survey tool to obtain research data. Yet, sixty-three participants asked for a paper booklet containing the (daily) measures (= 32%). Participants received detailed information and explanation about the diary items by telephone, and were given the opportunity to receive text reminders every evening. Participants could fill out the diary questions as of 4 p.m. until 10 a.m. the following day. The completion of the diary items took 10 minutes each day and the questionnaires took, on average, 30 minutes.

2.3. Sociodemographic information and pain characteristics

A questionnaire including sociodemographic information (i.e., sex, age, nationality, marital status, work status, education, pain diagnosis, and pain duration) was administered. Furthermore, pain grades were calculated by means of the Graded Chronic Pain Scale (GCPS;[76]). Three items of the GCPS assess current, worst, and average experienced pain intensity during the past six months, and were rated on an 11-point scale ranging from 0 (no pain) to 10 (worst imaginable pain). Pain disability was assessed by four items of the GCPS, i.e., the reported days in which the person was prevented from carrying out his/her usual activities (work, school or household duties) during the past six months and three items measuring whether the participant was prevented from carrying out daily activities, recreational/social/familial activities, and work during the past six months, answered on an 11-point scale from 0 (no difficulties at all) to 10 (impossible to execute activities). Mean pain intensity was calculated by averaging the items measuring worst and average pain experienced during the past six months. The disability score was a combined score related to the number of disability days (<7 days = 0 points, ≥ 7 and <15 = 1 point, ≥15 and <31 = 2 points, ≥31 = 3 points) and points related to three items that measure pain interference (score <30 = 0 points, score ≥30 and <50 = 1 point, score ≥50 and <70 = 2 points, score >70 = 3 points). Cronbach's alpha was .83 for mean pain intensity, and .90 for the disability score.

In line with Von Korff and colleagues [76], participants were classified into 5 grades based on the scores for mean pain intensity and disability: grade 0 'no pain', grade 1 'low intensity and low disability' (disability points <3 and pain intensity <50), grade 2 'high intensity and low disability' (disability points <3 and pain intensity ≥50) and, grade 3 'moderate disability, regardless of pain intensity' (disability points = 3 or 4), grade 4 'high disability, regardless of pain intensity' (disability points = 4 or 5).

2.4. Daily measures

The diary consisted of 31 items to measure pain intensity, physical wellbeing (disability, physical activity), psychological wellbeing (positive and negative affect, self-esteem, completion of plans), social wellbeing (isolation, searched social contact), and perceived stigma on a daily basis (i.e., each evening). No total scores for physical, psychological, or social wellbeing were calculated. Pain intensity, disability, physical activity, completion of plans, positive affect, negative affect, self-esteem, isolation and searched social contact were included as separate constructs in the tested models. Following Geldhof and colleagues [28], a multilevel confirmatory factor analysis framework was used to measure level-specific reliabilities (see also [39]). Within - and between level alphas are reported.

Pain intensity

To measure *daily pain intensity* we adapted two items of the Graded Chronic Pain Scale [76] to a daily context. The items “On average, how much pain did you have today?” and “How intense was your worst pain today?” were rated on a scale from 0 (no pain) to 10 (pain as bad as it could be). A daily pain intensity score was calculated for each participant by averaging the scores on both items. The score was reliable (within-person □□□.89; between-person □□□.96).

Physical wellbeing

Daily disability was measured by an adapted item of the Graded Chronic Pain Scale [76]. The item “My pain hindered my activities today” was answered on an 11-point scale ranging from 0 (completely disagree) to 10 (completely agree).

Daily physical activity was assessed by means of the item “Today, I was physically active”. Participants answered this statement on an 11-point scale going from 0 (not at all true) to 10 (totally true). This item was developed by the research team informed by experts in the field.

Psychological wellbeing

Daily affect was measured through 17 adjectives describing 5 positive affective states (e.g., proud, happy, relaxed) and 12 negative affective states (e.g., sad, nervous, scared), derived from a validation study investigating the representation of emotion terms in a general population [26,75] and previously used in diary research within a pain context [63]. In the current study items were rated on a 7-point scale from 0 (totally disagree) to 6 (totally agree). A sum score was calculated for positive and negative affect. In the present study both scales were reliable (within-person □□ .90 and .91; between-person □□ .97 and .98 for positive respectively negative affect).

Daily self-esteem was measured by 4 adapted items of the Rosenberg Self-Esteem Scale [27,62]: “Today, all in all, I was inclined to feel that I am a failure”, “Today, I took a positive attitude toward myself”, “Today, on the whole, I am satisfied with myself”, and “Today, I thought at times that I am no good at all”. The four items were answered on a 4-point scale going from 1 (Strongly disagree) to 4 (Strongly agree). The first and last item were reverse scored after which the four items were summed. The score was reliable (within-person □□ .69; between-person □□□.93).

Completion of daily plans was assessed via a single item, i.e., “Today, I did all activities/tasks that I intended to do today” on an 11-point scale ranging from 0 (not at all true) to 10 (totally true). This item was developed by the research team to assess the degree to which people succeed in completing meaningful activities that they planned to do.

Social wellbeing

Daily isolation and *searched social contact* were measured by the following items, respectively “Today, I have isolated myself from the outside world” and “Today, I sought contact with other people”. Both items were answered on an 11-point scale ranging from 0 (not at all true) to 10 (totally true). These items were developed by the research team informed by experts in the field.

Perceived stigma

Daily perceived stigma was measured by means of 3 diary items, using a scale from 0 (not at all true) to 10 (totally true). We adapted two items of the Illness Invalidation Inventory (3*I) of Kool and colleagues [42], which measures perceptions of invalidating reactions from others on two subscales. The first item was adapted from the ‘discounting’ subscale of the 3*I questionnaire, i.e., “Today, others made me feel like I’m an exaggerator.” The second item was adapted from the subscale ‘lack of understanding’ of the 3*I: “Today, others did not take my complaints seriously”. A third item, “Today, others avoided me”, was included to assess perceived stigmatizing *behavior* of others. A daily perceived stigma score was obtained by averaging the participants’ scores on the three items. This item was developed by the research based upon consultation of several questionnaires (including the Stigma Scale of Chronic Illness; [60]) and experts in the field. The score was reliable (within-person □□□.71; between-person □□ .96).

2.5. Data handling and analysis plan

2.5.1. Descriptive analyses

Descriptive analyses and internal consistency of the pain intensity and disability score extracted from the GCPS were conducted in SPSS (v.26; IBM Statistics). First, we investigated sociodemographic data (i.e., gender, age, nationality, marital status, work status, and education) for each group and we examined whether the three groups (FM, RA and the dual diagnosis group) differed on each of these variables. Furthermore, we examined whether the three groups of participants differed regarding the level of reported pain duration.

2.5.2. Diary analyses

A total of 2504 complete end-of-day observations were obtained, i.e., 90.3% of the total potential of 2772 (198 individuals x 14 days) observations. Following Nezlek [37], we deleted records that were completed after 10 AM the next morning and before 4 PM the same day. Diary data of 2493 completed observations remained in the final analyses (i.e., 99.6% of observed complete end-of-day observations and 89.9% of total potential observations).

Using the lme4 package in R linear mixed models with within and between effects of daily pain and perceived stigma were fitted [2]. The diary data consisted of two levels, i.e., the within-person (i.e., daily) variables on level 1, and the between-person variables on level 2. Scores of daily pain and daily perceived stigma were group-mean centered to determine the within-subjects effects (i.e., the mean of the individual's daily scores on pain and perceived stigma was subtracted from each individual's daily score for pain and perceived stigma). The means of the individual's daily scores on pain and perceived stigma were used as the between-subjects effects of daily pain and perceived stigma respectively.

First, linear mixed model analyses were fitted to examine the difference between participants with FM, participants with RA, and participants with both diagnoses regarding their daily pain intensity, physical wellbeing, psychological wellbeing, social wellbeing, and perceived stigma. Because ANOVA - and *T*-tests showed that the three groups differed regarding age, pain duration, and daily pain (see section 3.1), we further examined whether the group differences remained significant when these possible confounding variables were included in the models. Finally, we investigated whether daily perceived stigma was related to lower physical, psychological, and social wellbeing. Linear mixed models were fitted with age, pain duration, and within - (level 1) and between (level 2) subjects effects of daily pain intensity included as control variables (see Table 3). Statistical significance level was set at 5% and 95% confidence intervals are reported.

3. Results

3.1. Descriptive characteristics

As indicated in Table 1, 85.9% of the participants in the final sample ($N = 198$) were female, 97.5% had a Belgian nationality (four participants had a Dutch nationality and one participant had a German nationality) and 30.3% was single. The mean age of the participants was 54.9 years ($SD = 11.13$; range: 19-86). Further, half of the participants had had an education beyond the age of 18, and 18.7% was working (full- or part-time). Participants with FM did not differ significantly from participants with RA or participants with both diagnoses with regard to gender ($X^2(2)= 3.52$, $p= .172$), nationality ($X^2(4)= 1.77$, $p= .777$), marital status ($X^2(6)= 5.32$, $p= .504$), or education ($X^2(6)= 6.85$, $p= .335$). In contrast, the three groups differed significantly from each other on work status ($X^2(16)= 34.20$, $p= .005$), indicating a greater number of participants with RA who are working and a smaller number of participants with RA who receive an invalidity allowance as compared to participants with FM and participants with both diagnoses. Furthermore, a one-way ANOVA with age as dependent variable showed a significant difference between the three groups ($F(2)= 75.94$, $p<.001$), indicating that participants with FM ($M= 51.94$, $SD= 8.61$) were younger than participants with RA ($M = 56.60$, $SD = 13.02$), and participants with both diagnoses ($M = 58.19$, $SD = 9.15$). Next, a one-way ANOVA with pain duration as the dependent variable showed a significant difference between the groups ($F(2)= 48.74$, $p< .001$), indicating that individuals with RA ($M= 158.52$, $SD= 138.55$) reporter a shorter period of pain symptoms (in months) as compared to individuals with FM ($M= 200.17$, $SD= 123.58$), and individuals with both diagnoses ($M = 228.10$, $SD= 140.50$). Finally, results also showed a significant difference regarding the distribution of pain grades between the three groups ($X^2(6)= 44.97$, $p< .001$) (see Table 1 for an overview).

3.2 Group differences in pain intensity and physical, psychological, and social wellbeing

All results regarding the comparison of wellbeing between the three groups group can be found in Table 2 and 3. In general, scores in the dual diagnosis group were highly similar to the scores in the FM group with regard to all daily measures. Differences between the RA and FM group are discussed below.

Pain intensity

Participants with FM experienced, on a daily basis, a higher *pain intensity* than participants with RA ($B= 1.99$, $SE= .26$, $t(195)= 7.50$, CI [1.46, 2.51], $p< .001$) (see Table 2 and 3).

Physical wellbeing

Participants with FM reported, on a daily basis, more *disability* than participants with RA (*B*= 2.05, *SE*= .30, *t*(194)= 6.95, *CI* [1.47, 2.64], *p*< .001) (see Table 2 and 3).

Participants with FM reported, on a daily basis, less *physical activity* than participants with RA (*B*= -.78, *SE*= .27, *t*(192)= -2.92, *CI* [-1.30, -.25], *p*< .01) (see Table 2 and 3).

After controlling for age, pain duration, and daily pain intensity differences between participants with RA and FM did not remain significant (see Table 2 and 3).

Psychological wellbeing

Participants with FM reported, on a daily basis, less *positive affect* than participants with RA (*B*= -4.03, *SE*= .93, *t*(189)= -4.32, *CI* [-5.87, -2.19], *p*< .001). Participants with FM reported, on a daily basis, more *negative affect* in comparison with participants with RA (*B*= 7.92, *SE*= 1.91, *t*(199)= 4.14, *CI* [4.15, 11.69], *p*< .001) (see Table 2 and 3).

Furthermore, individuals with FM reported lower daily *self-esteem* as compared to individuals with RA (*B*= -1.08, *SE*= .31, *t*(194)= -3.42, *CI* [-1.70, -.45], *p*< .001) (see Table 2 and 3).

In line with the previous results, participants with FM reported, on a daily basis, also less *completed plans* than participants with RA (B= -1.68, *SE*= .31, *t*(194)= -5.36, *CI* [-2.30, -1.06], *p*< .001) (see Table 2 and 3).

After controlling for age, pain duration, and daily pain intensity differences remained significant for completed plans (see Table 2 and 3).

Social wellbeing

Participants with FM reported, on a daily basis, more *isolation* than participants with RA (*B*= 1.47, *SE*= .28, *t*(192)= 5.15, *CI* [.90, 2.03], *p*< .001) (see Table 2 and 3).

Finally, participants with FM also reported, on a daily basis, less *searched contact* with other people than participants with RA (*B*= -1.44, *SE*= .31, *t*(194)= -4.61, *CI* [-2.05, -.82], *p*< .001) (see Table 2 and 3).

After controlling for age, pain duration, and daily pain intensity, differences for daily wellbeing between individuals with FM and individuals with RA remained significant for isolation and searched social contact (see Table 2 and 3).

3.3 Group differences in daily perceived stigma

Intraclass correlation revealed a substantial variance in perceived stigma within individuals (52%), and also between individuals (48%). The between subject variability did not significantly differ between the three groups. In contrast, the within subject variability in perceived daily stigma was significantly greater in the dual diagnosis group compared to the other two groups.

With regard to our second research question (see Table 2 and 3), the findings suggest that participants with FM reported more daily stigmatizing reactions in comparison with participants with RA (*B*= .35, *SE*= .19, *CI* [-.02, .71], *t*(195) = 1.87, *p*= .06); though, the difference just failed to reach significance. Results showed no significant difference between individuals with FM and individuals with both diagnoses (*B*= -.25, *SE*= .25, *CI* [-.73, .24], *t*(195)= -1.00, *p*= .32). The dual diagnosis group reported significantly higher levels of daily perceived stigma than the RA group (*B*= -.59, *SE*= .24, *CI* [-1.07, -.11], *t*(196)= -2.43, *p*= .02).

3.4 Is perceived stigma associated with lower physical, psychological, and social wellbeing on a daily basis?

Within-subject and between-subject effects of daily perceived sigma were added in the linear mixed models (reported in 3.2) to examine whether perceived stigma was related to daily physical, psychological, and social wellbeing after controlling for age, pain duration, and within-subjects and between-subjects effects of daily pain (see Table 4).

Results indicated that increased levels of perceived stigma were related to decreased levels of positive affect (within: *B*= -.22, *SE*= .09, *t*(1972)= -2.38, *p*< .05; between: *B*= -1.22, *SE*= .37, *t*(165)= -3.32, *p*< .01) and self-esteem (within: *B*= -.18, *SE*= .03, *t*(2026)= -5.71, *p*< .001; between: *B*= -.69, *SE*= .11, *t*(168)= -6.28, *p*< .001), and increased levels of negative affect (within: *B*= 1.06, *SE*= .19, *t*(1973)= 5.66, *p*< .001; between: *B*= 5.38, *SE*= .64, *t*(167)= 8.40, *p*< .001) and disability (within: *B*= .07, *SE*= .03, *t*(2042)= 2.48, *p*< .05; between: *B*= .15, *SE*= .06, *t*(171)= 2.42, *p*< .05), at the within-subjects level and the between-subjects level. This suggests on the one hand that daily variation in perceived stigma is related to variation in levels of positive affect, negative affect, disability, and self-esteem within an individual, and on the other hand that variation between individuals in the overall level (across days) of perceived stigma is related to differences between individuals in the overall level of positive affect, negative affect, disability, and self-esteem.

Furthermore, results indicated that increased levels of perceived stigma were related to increased levels of isolation (*B*= .48, *SE*= .11, *t*(167)= 4.43, *p*< .001), and decreased levels of searched social contact (*B*= -.34, *SE*= .13, *t*(168)= -2.64, *p*< .01) at the between-subjects level. This means that variation between individuals in the overall level of perceived stigma was related to differences between individuals in the overall level of isolation and searched contact. Results showed no effect of perceived stigma on physical activity and completion of plans (within- and between-subjects level), and on isolation and searched contact (within-subjects level).

4. Discussion

The present study aimed to elucidate potential differences in daily wellbeing between individuals with chronic pain associated with clearly defined symptoms and pathophysiology (RA) and individuals with chronic pain that is less well understood in terms of symptoms and pathophysiology (FM) using a *daily diary methodology*. Next, the study aimed to examine differences in daily perceived stigmatization between the two groups. Finally, we investigated the association between daily perceived stigmatization and daily wellbeing. Results can be readily summarized. Compared to individuals with RA, individuals with FM reported worse daily wellbeing. Furthermore, results suggested more daily stigmatization in individuals with FM than in individuals with RA. Finally, increased levels of perceived stigma were in general associated with decreased levels of wellbeing.

The finding that individuals with FM reported lower levels of wellbeing than individuals with RA is consistent with findings of previous studies [3,41,64,69,73,77]. One potential explanation might be that a diagnosis of FM comes along with uncertainty as the condition lacks a clear etiology [61]. Uncertainty is aversive for most people [51], subsequently this condition may be related to worse wellbeing as compared to conditions with a clear pathology. However, after controlling for age, pain duration, and daily pain only differences regarding social wellbeing and completion of plans remained significant. Subsequently, the question arises whether individuals with RA and FM differ primarily on features of social wellbeing, which could be examined in further research. Absence of well understood pathophysiology could lead to suspicion about the genuineness of the pain complaints [12,13,18,19]. Consequently, individuals with FM may hide their condition from others and avoid contact in order to protect themselves from experiences of disbelief [4], which may negatively impact their social wellbeing.

As previous studies and our results show worse wellbeing in individuals with FM as compared to individuals with RA, it seems important to examine factors related to these differences. For this reason, the present study also shed light on differences in daily perceived stigma between individuals with RA and FM. Absence of clearly defined symptoms and pathophysiology for chronic pain may elicit stigmatizing and invalidating responses, which in turn could be related to worse wellbeing [18-20]. The current results suggested more perceived daily stigmatizing reactions in FM, but the effect just failed to reach significance. This suggestion is in line with a previous study, in which individuals with FM reported significantly more invalidating reactions from family, medical professionals, colleagues, and social services as compared to individuals with RA [42]. As symptoms and pathophysiology are less well understood in FM, people could perceive individuals with FM as personally responsible for their condition, and therefore invalidate their symptoms due to lack of understanding [42], which ICPs may experience as highly stigmatizing. It has been argued before that ICPs reporting higher levels of pain severity or a severe impact of pain on their wellbeing, relative to physical pathology, appear particularly vulnerable to stigmatization [68]. In the current study participants with FM reported elevated daily pain intensity and worse daily wellbeing as compared to individuals with RA, which is in correspondence with the latter statement. However, another study did not find a difference between FM and RA with regard to perceived stigma [44], so further examination of stigma in individuals with well understood symptoms and pathophysiology and individuals with less well understood symptoms and pathophysiology is required. A possible explanation for the insignificant association between diagnosis and perceived stigma could be that the current stigma items were not sufficiently sensitive to capture differences in stigma between the two groups, and as such to differentiate between stigmatization related to chronic pain in general and stigma related to pain that is less well understood in terms of symptoms and pathophysiology. This is the first study that attempts to capture stigma experiences in individuals with chronic pain on a daily basis. Up till now, it is therefore not known whether and how stigma can be measured in daily diary research. Subsequently, these items should be further tested in future research. For example, qualitative research may provide more insight into the way patients complete these diary items in order to refine the items and increase their sensitivity. Another possible explanation for the insignificant association between diagnosis and stigma is that the latter might not be a transient daily experience, but something that builds up over time and reflects a more robust perception of other’s behavior and thoughts. Researchers indicated that salient stigmatizing events or experiences are probably better remembered by stigmatized individuals [74]. Also, when questioning people about stigmatizing experiences these salient events may form the centerpiece of the recalled experiences as the effects of the salient experience may linger over time. As such, daily diary methodologies may need other types of questions to capture salient stigmatizing events, for instance open-ended questions so that the reporting of stigmatizing events is not limited to pre-defined events. Another possibility is the use of Ecological Momentary Assessment with event-based reporting of stigmatizing events at periodic intervals during the day.

Findings show no significant differences between the dual diagnosis and FM group regarding daily wellbeing. If replicated, this could mean that having a pain condition that is less well understood in terms of symptoms and pathophysiology is detrimental for ICPs' wellbeing, regardless of the presence of other clearly defined symptoms. Further, our findings indicated better daily wellbeing in individuals with RA as compared to individuals with both diagnoses. A previous study found substantially more comorbid FM in RA patients who had more severe symptoms in comparison with RA patients with less severe symptoms [82]. This could explain why the dual diagnosis group reported worse wellbeing than the RA group, as the dual diagnosis group possibly experienced more severe pain complaints, which may be related to worse wellbeing. Furthermore, findings showed a higher level of perceived stigma in the dual diagnosis group as compared to the RA group. Again, the dual diagnosis group did not differ from the FM group as concerns daily perceived stigma.

Finally, the current study partially indicated that daily perceived stigmatization is related to worse daily wellbeing. This is in line with the Stigma Mechanisms in Health Disparities Model [6], which ascribes poorer physical and mental health to individuals who experience stigmatization. The current study is the first to approach the link between stigma and wellbeing in ICPs using daily diaries. Increased daily levels of perceived stigma were associated with decreased daily levels of positive affect and self-esteem, and increased daily levels of negative affect and disability. Additionally, increased overall levels of perceived stigma were related to increased overall levels of disability, negative affect, isolation, and decreased overall levels of positive affect, self-esteem, and searched social contact. This accords with previous research which showed that perceived invalidation was associated with lower psychosocial and physical wellbeing among individuals with FM or RA [41,42]. In addition, previous research also found a relationship between internalized stigma and self-esteem, self-efficacy, catastrophizing and sense of personal control [78], and an association between stigma on the one hand and depression and disability on the other hand [65]. Moreover, abundant research showed a negative relation between stigmatization and wellbeing in other stigmatized groups (e.g. HIV: [23]; depression: [15]). In the current study only daily physical activity and completion of plans were not associated with perceived stigmatization. This may be due to the fact that these two variables show a strong association with daily pain intensity, wherefore no residual variability in physical activity and completion of plans is related to variability in perceived stigmatization after controlling for pain intensity.

The Stigma Mechanisms in Health Disparities model illustrates that psychological stress may play an important role in explaining the relation between stigma and wellbeing [6]. Experiences of stigma can be very stressful, therefore stress is assumed to be one of the primary mediating processes by which stigma influences stigmatized individuals' wellbeing [6,58]. Moreover, ICPs are more susceptible to experience stress and are more vulnerable for the negative consequences of stress [22]. Further research could focus upon factors explaining the relationship between stigma and wellbeing, such as perceived stress.

The findings of the present study may have some clinical implications. Stigmatization may occur to the extent that observers think that ICPs are malingering, which may encourage observers to avoid contact and communication with these ICPs, which in turn could negatively impact ICPs' wellbeing [16]. Also, people adhering to a biomedical illness model might experience difficulties in communicating with ICPs, because their beliefs do not fit with the biopsychosocial nature of pain. Clearly, it seems highly important to focus on interventions targeted at diminishing stigma towards ICPs. For instance, interventions could first educate the public on pain and its symptoms, raise awareness about possible stigmatization against ICPs, and encourage the public to resist against negative evaluations of ICPs. Also, personal contact with the stigmatized group and perspective taking have been shown to be effective techniques to reduce stigma [25,31,32]. Intervention studies targeted at diminishing stigma in the general population have been shown to be effective in the context of mental and several other conditions illness (e.g. mental illness [71]), HIV (e.g. [1]), dementia (e.g. [7]). However, not all individuals are equally affected by stigmatization, some ICPs show resilience against these responses [14]. So, clinical practice could aim at raising resilience and diminishing self-stigma in ICPs, which often mediates the detrimental influence of perceived stigma on ICPs' wellbeing [10]. Self-stigma can be defined as a stigmatized person's awareness and agreement with stereotypes describing the stigmatized group and the acknowledgment of discrimination [9]. Therapies such as Acceptance and Commitment Therapy could focus upon decreasing the impact of perceived – and self-stigma related thoughts and feelings on their daily functioning (e.g. by helping ICPs to develop so-called defusion skills) and on encouraging ICPs to engage in meaningful activities despite the presence of stigmatization [45].

A major strength of the current diary design is that both within-subject effects and between-subject effects were included in the analyses, which provide insight in daily variations and in variations in overall levels of stigma and wellbeing. Some indications for future research may be provided, some of which are related to limitations of the current study. First, the current study is based upon self-reports of ICPs, which are often subjected to social desirability. For instance, it is possible that participants reported less stigmatizing responses because they felt uncomfortable and did not want to put their personal environment in an unfavorable light. These dynamics could be examined in future research. Also, the sample was predominantly female and caution is needed when generalizing the current findings to men with chronic pain. However, a meta-analysis showed that the prevalence of chronic pain in women is double the prevalence in men [47], implying that our sample may be representative for people experiencing chronic pain. Up till now, no research exists regarding differences in perception of stigma between men and women with chronic pain. This could be addressed in future research. Second, future research could investigate whether some categories of significant people (family, friends, colleagues, healthcare practitioners, etc.) in ICPs' social networks stigmatize more than others or have differential impact upon ICPs' wellbeing. Third, it might be that participants, who did not report stigmatizing responses, have not seen anyone or did not talk about their condition with others, which implies that stigmatizing responses were less likely to occur. Therefore, future studies could explore the dynamic relationship between stigma and social isolation. Fourth, the contribution of social support as a buffer against the negative outcomes associated with stigmatizing responses, must be further investigated. Fifth, a limitation of the current study is the exploratory nature of this study. As it was difficult to predict effect sizes a priori, we did not perform a sample size calculation before the start of the study. We relied on a convenience sample that resulted in two relatively large groups (FM and RA) and one small group (the combination). Given the longitudinal nature of the study (with 14 assessments), the study was sufficiently powered to detect clinically meaningful differences between FM and RA, but not with the dual diagnosis group. With 75 participants per group and 14 assessments per participants (assuming an intra-cluster correlation of 0.30), the study had about 80% power to detect a Cohen's d =0.25 at the 5% significance level. Furthermore, we did not perform any corrections for multiple testing, in line with recommendations of Perneger [59] and Nakawaga [52]. The robustness of the findings in the different outcome measures is however reassuring. The findings of this study await replication in future research. Sixth, the choice of the diary items was made based upon expert opinion. Despite this careful approach, we do however acknowledge that items were not systematically piloted in a patient sample, which could be done in future research. Though, the diary items for daily pain intensity, disability, positive and negative affect had been used before in other chronic pain studies of our research group [39,63]. The diary item regarding completion of plans did, however, not take into account whether these plans were meaningful for participants. Although this could be considered implicitly, future research should make this explicit as it is of crucial importance for people's wellbeing [34,79]. Also, the searched social contact item could be optimized in future research as it is not a typical item measuring social wellbeing. However, it is instructive because experiences of stigmatization may be related to not seeking contact with others in order to avoid possible stigmatization. Finally, further studies could focus upon factors that contribute to resilience against stigmatizing responses. These factors could be informing for future interventions and management strategies to empower ICPs, which are also indirectly lowering the social and economic burden chronic pain has on families and communities at large.

Conclusion

In conclusion, our findings provide insights into differences in daily wellbeing and perceived stigma between individuals with a pain condition associated with less well understood symptoms and pathophysiology versus a pain condition with more clearly defined symptoms and pathophysiology, and into the contribution of stigmatization towards ICPs' daily wellbeing. This was the first study to examine these dynamics on a daily basis. We provided further support to argue that wellbeing is worse in individuals with FM as compared to individuals with RA. Furthermore, we extended previous research by showing that perceived stigma is unfavorably related to ICPs' wellbeing on a daily basis. Upon replication, our findings may be informative for interventions focusing on diminishing stigma towards ICPs and on empowering ICPs to deal with stigmatizing responses.

Acknowledgements

This study was supported by a grant from the Fund for Scientific Research (FWO) – Flanders (G020118N). MM Mittinty is funded by the Endeavour Post-doctoral research fellowship, Department of Education and Training, Australian Government, Australia. There are no conflicts of interest that may arise as a result of the research presented in this manuscript.

References

1. Apinundecha C, Laohasiriwong W, Cameron MP, Lim S. A community participation intervention to reduce HIV/AIDS stigma Nakhon Ratchasima province, northeast Thailand. AIDS care 2007;19: 1157-65.
2. Bates D, Mächler M, Bolker B, Walker S. Fitting Linear Mixed-Effects Models Using lme4. Journal of Statistical Software 2015;67:1–48.
3. Birtane M, Uzunca, K, Taştekin N, Tuna H. The evaluation of quality of life in fibromyalgia syndrome: a comparison with rheumatoid arthritis by using SF-36 Health Survey. Clin Rheumatol 2007;26:679-84.
4. Brown, P. Naming and framing: The social construction of diagnosis and illness. Journal of Health and Social Behavior 1995; (Extra Issue):34–52.
5. Çeliker R, Borman P. Fibromyalgia versus Rheumatoid Arthritis: A Comparison of Psychological Disturbance and Life Satisfaction. Journal of Muscoloskeletal Pain 2001;9:35-45.
6. Chaudoir SR, Earnshaw VA, Andel S. “Discredited” versus “discreditable”: understanding how shared and unique stigma mechanisms affect psychological and physical health disparities. Basic and applied social psychology 2013;35:75-87.
7. Cheng S-T, Lam LCW, Chan LCK, Law ACB, Fung AWT, Chan WC, Tam CWC, Chan W-M. The effects of exposure to scenarios about dementia on stigma and attitudes toward dementia care in a Chinese community. International Psychogeriatrics 2011;23:1433-41.
8. Chibnall JT, Tait RC. Observer perceptions of low back pain - effects of pain report and other contextual factors. J Appl Soc Psychol 1995;25:418–39.
9. Chibnall JT, Tait RC, Ross LR. The effects of medical evidence and pain intensity on medical student judgments of chronic pain patients. J Behav Med 1997;20:257–71.
10. Corrigan PW, Larson JE, Ruesch N. Self-stigma and the “why try” effect: impact on life goals and evidence-based practices. World Psychiatry 2009;8:75–81.
11. Corrigan PW, Rao D. On the self-stigma of mental illness: stages, disclosure, and strategies for change. Can J Psychiatry 2012;57:464–9.
12. Craig KD, Badali MA. Introduction to the special series on pain deception and malingering. Clin J

Pain 2004;20:377–82.

13. Craig KD, Hill ML, McMurtry B. Detecting deception and malingering. In: Block AR, Kremer EF, Fernandez E, editors. Handb Pain Syndr Mahwah, NJ: Lawrence Erlbaum associates 1999; pp 41–58.
14. Crocker J, Major B, Steele C. Social Stigma. In: Gilbert T, Fiske S, Lindzey G, editors. Handbook Social Psychology. Oxford: Oxford University Press 1998; pp 504–53.
15. Cruwys, T., & Gunaseelan, S. “Depression is who I am”: Mental illness identity, stigma and wellbeing. Journal of affective disorders 2016;189:36-42.
16. DeRuddere L, & Craig KD. Understanding stigma and chronic pain: a-state-of-the-art review. Pain 2016;157:1607-10.
17. DeRuddere L, Goubert L, Prkachin KM, Stevens MAL, Van Ryckeghem DML, Crombez G. When you dislike patients, pain is taken less seriously. Pain 2011;152:2342–7.
18. DeRuddere L, Goubert L, Stevens M, Williams A, Crombez G. Discounting pain in the absence of medical evidence is explained by negative evaluation of the patient. Pain 2013;154:669–76.
19. DeRuddere L, Goubert L, Stevens M, Deveugele M, Craig KD, Crombez G. Health Care Professionals’ Reactions to Patient Pain: Impact of Knowledge About Medical Evidence and Psychosocial Influences. J Pain 2014;15:262–7.
20. DeRuddere L, Goubert L, Vervoort T, Prkachin KM, Crombez G. We discount the pain of others when pain has no medical explanation. J Pain 2012;13:1198–205.
21. Dewar A, White M, Posade ST, Dillon W. Using nominal group technique to assess chronic pain, patients’ perceived challenges and needs in a community health region. Heal Expect 2003;6:44–52.
22. Dysvik E, Natvig GK, Eikeland O-J, Linstrom TC. Coping with chronic pain. Inter J Nurs Stud 2005;42:297-305.
23. Earnshaw, V. A., Smith, L. R., Chaudoir, S. R., Amico, K. R., Copenhaver, M.M. HIV Stigma Mechanisms and Well-Being among PLWH: A Test of the HIV Stigma Framework. AIDS behav 2013;17:1785–95.
24. Eccleston C, & Crombez G.Worry and chronic pain. A misdirected problem solving model. Pain

2007;132:233–6.

25. Evans-Lacko S, London J, Japhet S, Rüsch N, Flach C, Corker E, Henderson C, Thornicroft G. Mass social contact interventions and their effect on mental health related stigma and intended discrimination. BMC Public Health 2012;12:489.
26. Fontaine J, Veirman E. The new novelty dimension: method artifact or basic dimension in the cognitive structure of the emotion domain? In: Fontaine J, Scherer K, Soriano C, editors. Ser Affect Sci Oxford: Oxford scholarship online 2013:233–42.
27. Franck E, De Raedt R, Barbez C, Rosseel Y. Psychometric properties of the Dutch Rosenberg self-esteem scale. Psychologica Belgica 2008;48:25-35.
28. Geldhof GJ, Preacher KJ, Zyphur MJ. Reliability estimation in a multilevel confirmatory factor analysis framework. Psychol Methods 2014;19:72–91.
29. Halfens R, Evers G, Abu-Saad H. Determinants of pain assessment by nurses. Int J Nurs Stud 1990; 27:43–9.
30. Häuser W & Fitzcharles MA. Facts and myths pertaining to fibromyalgia. Dialogues in clinical neuroscience 2018;20:53–62.
31. Hawke L D, Michalak E E, Maxwell V, Parikh S V, et al. Reducing stigma toward people with bipolar disorder: Impact of a filmed theatrical intervention based on a personal narrative. International Journal of Social Psychiatry 2014;60:741-50.
32. Hirsh AT, Miller MM, Hollingshead NA, Anastas T, Carnell ST, Lok BC, et al. A randomized controlled trial testing a virtual perspective-taking intervention to reduce race and SES disparities in pain care. Pain 2020;160:2229-40.
33. Holloway I, Sofaer-Bennett B, Walker J. The stigmatisation of people with chronic back pain. Disabil Rehabil 2007;29:1456–64.
34. Hooker SA, Masters KS, Vagnini KM, Rush CL. Engaging in personally meaningful activities is associated with meaning salience and psychological well-being. The journal of positive psychology 2019;15:821-31.
35. Iida M, Shrout PE, Laurenceau J-P, Bolger N. (2012) APA Handbook of Research Methods in Psychology: Vol . Foundations, Planning, Measures, and Psychometrics. American Psychological

Association. pp. 277-305.

36. Jackson JE. Liminality, and chronic pain: mind-body borderlands. American Ethnologist 2005;32:332-53.
37. J.B. N. Diary methods for social and personality psychology. Nezlek JB, editor. 2012; London: Sage Publications.
38. Kesmen H, Cengiz AK, Bilgici A. Effects of disease activity, illness perception, social support and coping methods on quality of life in patients with rheumatoid arthritis and fibromyalgia syndrome. Ann Rheum dis 2019;78:679.
39. Kindt S, Vansteenkiste M, Loeys T, Goubert L. Helping Motivation and Well-being of Chronic Pain Couples. Pain 2016;157:1551-62.
40. Kool MB, van Middendorp H, Boeije HR, et al. Understanding the lack of understanding: invalidation from the perspective of the patient with fibromyalgia. Arthritis Rheum 2009;61:1650–6.
41. Kool MB, van Middendorp H, Lumley MA, Bijlsma JWJ, Geenen R. Social support and invalidation by opthers contribute uniquely to the understanding of physical and mental health of patients with rheumatic diseases. Journal of Health Psychology 2013;18:86-95.
42. Kool MB, van Middendorp H, Lumley MA, Schenk Y, Jacobs JWG, Bijlsma JWJ, Geenen R. Lack of understanding in fibromyalgia and rheumatoid arthritis: the Illness Invalidation Inventory (3*I). Ann Rheum Dis 2010;69:1990–5.
43. Kronzer VL, Crowson CS, Sparks JA, Myasoedova E, Davis III J. Family history of rheumatologic, autoimmune, and non-autoimmune diseases and risk of rheumatoid arthritis. Arthritis Care & Research 2019: https://doi.org/10.1002/ACR.24115
44. Looper KJ, Kirmayer LJ. Perceived stigma in functional somatic syndromes and comparable medical conditions. Journal of Psychosomatic Research 2004;57:373-8.
45. Luoma JB, Platt MG. Shame, self-criticism, self-stigma, and compassion in Acceptance and Commitment Therapy. Current Opinion in Psychology 2015;2:97-101.
46. Maffei ME. Fibromyalgia: Recent Advances in Diagnosis, Classification, Pharmacotherapy and Alternative Remedies. International Journal of Molecular Sciences 2020;21:10.1007/s11427-020-

1822-4.

47. Mansfield KE, Sim J, Jordan JL, Jordan KP. A systematic review and meta-analysis of the prevalence of chronic widespread pain in the general population. Journal of pain 2016;157:55-64.
48. Marks EM, Hunter MS. Medically unexplained symptoms: an acceptable term? British Journal of Pain 2015;9:109-14.
49. Moore JE, Von Korff M, Cherkin D, Saunders K, Lorig K. A randomized trial of a cognitive behavioural program for enhancing back pain self-care in a primary care setting. Pain 2000;88:145–53.
50. Monsivais DB. Decreasing the stigma burden of chronic pain. J Am Assoc Nurse Pract 2013;25:551–6.
51. Montgomery, K. C. The role of the exploratory drive in learning. J Comp Physiol Psychol 1954;47:60–4.
52. Nakagawa, S. A farewell to Bonferroni: the problems of low statistical power and publication bias. Behavioral Ecology 2004;15:1044–5.
53. Nguyen RHN, Turner RM, Rydell SA, Maclehose RF, Harlow BL. Perceived stereotyping and seeking care for chronic vulvar pain. Pain Med 2013;14:1461–7.
54. OECD (2013), OECD Guidelines on Measuring SubjectiveWell-being, OECD Publishing. http://dx.doi.org/10.1787/9789264191655-en
55. Ofluoglu D, Berker N, Güven Z, Canbulat N, Yilmaz IT, Kayhan Ö. Quality of life in patients with fibromyalgia syndrome and rheumatoid arthritis. Clin Rheumatol 2005;24:490-2.
56. Ohly S, Sonnentag S, Niessen C, Zapf D. Diary studies in organizational research: an introduction and some practical recommendations. Journal of Personnel Psychology 2010;2:79-93.
57. Parsons T. (1985). Definitions of Health and Illness in the Light of American Values and Social Structure. In Patients, Physicians and Illness. E. Gartly Jaco, ed. Pp. 165- 187. Glencoe, IL: Free Press. Perspectives.
58. Pascoe EA, Richman SL. Perceived discrimination and health: meta-analytic review. Psych Bull 2009;135:531-54.
59. Perneger TV. What's wrong with Bonferroni adjustments. British Medical Journal

1998;316:1236–8.

60. Rao D, Choi SW, Victorson D, Bode R, Peterman A, Heinemann A, Cella A. Measuring stigma across neurological conditions: the development of the stigma scale for chronic illness (SSCI). Qual Life Res 2009;18:585-95.
61. Reich JW, Johnson LM, Zautra AJ, Davis MC. Uncertainty of illness relationships with mental health and coping processes in fibromyalgia patients. Journal of Behavioral Medicine 2006;29:307-16
62. Rosenberg, M. Conceiving the self. 1979; New York: Basic Books.
63. Rost S, Van Ryckeghem DML, Koval P, Sütterlin S, Vögele C, Crombez G. Affective instability in patients with chronic pain: a diary approach. Pain 2016;157:1783–90.
64. Salaffi F, Puttini PS, Girolimetti R, Atzeni F, Gasparini S, Grassi W. Health-related quality of life in fibromyalgia patients:a comparison with rheumatoid arthritis patients and the general population using the SF-36 health survey. Clinical and Experimental Rheumatology 2009;27:67-74.
65. Scott W, Yu L, Patel S, McCracken LM. Measuring stigma in chronic pain: preliminary investigation of instrument psychometrics, correlates, and magnitude of change in a prospective cohort attending interdisciplinary treatment. J Pain 2019;20:1164-75.
66. Tait RC, Chibnall JT. Observer Perceptions of Chronic Low Back Pain. J Appl Soc Psychol 1994; 24:415–31.
67. Tait RC, Chibnall JT. Physician judgments of chronic pain patients. Soc Sci Med 1997;45:1199–205.
68. Tait RC, Chibnall JT, Kalauokalani D. Provider judgments of patients in pain: seeking symptom certainty. Pain Med 2009;10:11–34.
69. Tander B, Cengiz K, Alayli G, Ilhanli I, Canbaz S, Canturk F. A comparative evaluation of health related quality of life and depression in patients with fibromyalgia syndrome and rheumatoid arthritis. Rheumatol Int 2008;28:859-65.
70. Taylor AG, Skelton JA, Butcher J. Duration of pain condition and physical pathology as determinants of nurses' assessments of patients in pain. Nurs Res 1984;33:4–8.

71. Tippin GK, Maranzan KA. Efficacy of a Photovoice-based video as an online mental illness anti-stigma intervention and the role of empathy in audience response: A randomized controlled trial. Journal of Applied Social Psychology 2019;49:381-94.
72. Toye F, Barker K. “Could I be imagining this?” - the dialectic struggles of people with persistent unexplained back pain. Disabil Rehabil 2010;32:1722–32.
73. Van Houdenhove B, Neerinckx E, Onghena P, Vingerhoets A, Lysens R, Vertommen H. Daily Hassles Reported by Chronic Fatigue Syndrome and Fibromyalgia Patients in Tertiary Care: A Controlled Quantitative and Qualitative Study. Psychother Psychosom 2002;71:207-13.
74. Vartanian LR, Pinkus RT, Smyth JM. The phenomenology of weight stigma in everyday life. Journal of contextual behavioral science 2014;3:196-202.
75. Veirman E, Fontaine JR. Revisiting the dimensional structure of the emotion domain. Cogn Emot 2015;29:1026–41.
76. Von Korff M., Ormel, J., Keefe, F. J., Dworkin, S. F. Grading the severity of chronic pain. Pain 1992;50:133-49
77. Walker EA, Keegan D, Gardner G, Sullivan M, Katon WJ, Bernstein D. Psychosocial Factors in Fibromyalgia Compared With Rheumatoid Arthritis: I. Psychiatric Diagnoses and Functional Disability. Psychosomatic Medicine 1997;59:565-71.
78. Waugh OC, Byrne DG, Nicholas MK. Internalized stigma in people living with chronic pain. J Pain 2014;15:550.e1-550.e10.
79. Westerhof G, Bohlmeijer E. Zingeving, Psychologie van de levenskunst. 2010; pp. 133-62; Amsterdam, Boom.
80. Williams A, Johnson M. Persistent pain: not a medically unexplained symptom. British Journal of General Practice 2011;61:638-9.
81. Wolfe F, Clauw DJ, Fitzcharles MA, Goldenberg DL, Katz RS, Mease P, Russell AS, Russell IJ, Winfield JB, Yunus MB. The American College of Rheumatology Preliminary Diagnostic Criteria for Fibromyalgia and Measurement of Symptom Severity. Arthritis Care and Research 2010;62:600-10.
82. Wolfe F, Michaud K. Severe rheumatoid arthritis (RA), worse outcomes, comorbid illness, and

sociodemographic disadvantage characterize ra patients with fibromyalgia. J Rheumatol 2004;31: 695-700.

Table 1

Sociodemographic characteristics

	FM	**RA**	**FM & RA**	
	M (SD) or N(%)	**M (SD) or N(%)**	**M (SD) or N(%)**	**χ^2 or F**
Gender				3.52
Female	72 (91.1%)	69 (80.2%)	29 (87.9%)	
Male	7 (8.9%)	17 (19.8%)	4 (12.1%)	
Age	51.94 (8.61)	56.60 (13.02)	58.19 (9.15)	75.94***
Nationality				1.77
Belgium	78 (98.7%)	83 (96.5%)	32 (97%)	
Other	1 (1.3%)	3 (3.5%)	1 (3%)	
Marital status				5.32
Married or cohabiting	46 (58.2%)	61 (70.9%)	21 (63.6%)	
In a relationship	4 (5.1%)	4 (4.7%)	0	
Single	29 (36.7%)	20 (23.3%)	11 (12.8%)	
Missing	0	1 (1.2%)	2 (2.3%)	
Work status				34.20**
Student	1 (1.3%)	0	0	
Working	10 (12.7%)	21 (24.4%)	6 (18.2%)	
Housewife/-man	3 (3.8%)	6 (7%)	0	
Unemployed	5 (6.3%)	4 (4.7%)	2 (6.1%)	
Full or partial allowance	52 (65.8%)	26 (30.2%)	17 (51.5%)	
Retired	7 (8.9%)	26 (30.2%)	7 (21.2%)	
Missing	1(1.3%)	3 (3.5%)	1 (3%)	
Education				6.85
Primary school	2 (2.5%)	3 (3.5%)	1 (3%)	
Lower secondary	16 (20.3%)	13 (15.1%)	2 (6.1%)	
Higher secondary	27 (34.2%)	21 (24.4%)	13 (39.4%)	
Higher education	34 (43%)	48 (55.8%)	15 (45.5%)	
Missing	0	1 (1.1%)	2 (6.1%)	
Pain duration (months)	200.17 (123.58)	158.52 (138.55)	228.20 (140.50)	48.74***
Pain grades				44.97***
Pain grade 0	0	0	0	
Pain grade I	2 (2.5%)	19 (22.1%)	0	
Pain grade II	3 (3.8%)	17 (21.5%)	6 (18.2%)	
Pain grade III	15 (19%)	23 (26.7%)	8 (9.3%)	
Pain grade IV	58 (73.4%)	25 (29.1%)	19 (57.6%)	
Missing	1 (1.3%)	2 (2.3%)	0	

FM = fibromyalgia, RA = rheumatoid arthritis. Pain Duration expressed in months. M = mean, SD = Standard deviation. Grade 0 = no pain, Grade I = low intensity and low disability, Grade II = high intensity and low disability, Grade III = moderate disability, regardless of pain intensity, Grade IV = high disability, regardless of pain intensity. *p < 0.05; **p ≤ 0.01; *** p ≤ 0.001.

Table 2

Means (M) and standard deviations (SD) of daily measures

	FM **M (SD)**	**RA** **M (SD)**	**FM & RA** **M (SD)**
Pain intensity (0-10)	6.42 (1.34)	4.44 (2.02)	5.89 (1.46)
Disability (0-10)	5.10 (2.43)	3.89 (2.82)	5.63 (2.44)
Physical activity (0-10)	4.79 (2.76)	5.61 (2.91)	4.61 (2.37)
Plans (0-10)	4.34 (3.16)	5.94 (3.04)	4.31 (2.8)
Positive affect (0-30)	12.20 (7.47)	16.22 (7.92)	12.08 (6.77)
Negative affect (0-72)	18.04 (17.03)	10.09 (13.14)	18.95 (15.8)
Self-esteem (1-16)	8.05 (2.75)	9.12 (2.41)	8.06 (2.37)
Isolation (0-10)	2.94 (3.35)	1.51 (2.60)	3.26 (3.16)
Contact (0-10)	5.11 (3.44)	6.51 (3.21)	5.31 (2.96)
Perceived stigma (0-10)	0.89 (1.70)	0.56 (1.41)	1.17 (1.92)

FM = fibromyalgia, RA = rheumatoid arthritis.

Table 3

Group differences in daily measures

	FM vs. RA		**FM vs. FM & RA**		**RA vs. FM & RA**	
	B	**SE**	**B**	**SE**	**B**	**SE**
Pain intensity	1.99***	0.26	0.53	0.35	-1.46	0.35
Disability	2.05***†	0.30	0.34	0.39	-1.72***†	0.39
Physical activity	-0.78**†	0.27	0.21	0.36	0.99**†	0.35
Plans	-1.68***	0.31	-0.04	0.42	1.64***	0.42
Positive affect	-4.03***†	0.93	0.08	1.27	4.11**†	1.26
Negative affect	7.92***†	1.91	-0.66	2.60	-8.58**	2.59
Self-esteem	-1.08***†	0.31	-0.05	0.42	1.03*†	0.42
Isolation	1.47***	0.28	-0.24	0.28	-1.70***	0.28
Contact	-1.44***	0.31	-0.24	0.42	1.20**†	0.41
Perceived stigma	0.35	0.19	-0.25	0.25	-0.59*	0.24

*p < 0.05; **p ≤ 0.01; *** p ≤ 0.001. FM = fibromyalgia, RA = rheumatoid arthritis. B = estimate, SE = standard error. † = effect was non-significant after controlling for age, pain duration, and daily pain.

Table 4

Effects of perceived stigma on daily outcome measures controlled for age, pain duration, and daily pain.

	Perceived stigma			
	Within-subjects		**Between-subjects**	
	B (SE)	**t (df)**	**B (SE)**	**t (df)**
Disability	0.07* (.03)	2.50 (2042)	0.15* (.06)	2.42 (172)
Positive affect	-0.22* (.09)	-2.38 (1972)	-1.24*** (.37)	-3.35 (166)
Negative affect	1.06*** (.19)	5.66 (1973)	5.39*** (.64)	8.44 (168)
Physical activity	-0.06 (.04)	-1.26 (2019)	0.005 (.11)	0.04 (167)
Isolation	0.05 (.05)	0.98 (2024)	0.48*** (.11)	4.46 (167)
Contact	-0.03 (.05)	-0.62 (2022)	-0.34** (.13)	-2.65 (169)
Plans	-0.07 (.05)	-1.51 (2022)	-0.22 (.12)	-1.84 (171)
Self-esteem	-0.17*** (.03)	-5.71 (2026)	-0.69*** (.05)	4.87 (168)

*$p < 0.05$; **$p \leq 0.01$; *** $p \leq 0.001$. B = estimate, SE = standard error. df = degrees of freedom.