



Universiteit
Leiden
The Netherlands

Multidisciplinary treatment approach for patients with fibromyalgia: are general practitioners referring patients to physical and mental health care?

Selter, Anna Katharina

Citation

Selter, A. K. (2022). *Multidisciplinary treatment approach for patients with fibromyalgia: are general practitioners referring patients to physical and mental health care?*.

Version: Not Applicable (or Unknown)

License: [License to inclusion and publication of a Bachelor or Master thesis in the Leiden University Student Repository](#)

Downloaded from: <https://hdl.handle.net/1887/3285188>

Note: To cite this publication please use the final published version (if applicable).



Multidisciplinary treatment approach for
patients with fibromyalgia: are general
practitioners referring patients to physical
and mental health care?

Anna Katharina Selter

Master Thesis Health and Medical Psychology

Faculty of Behavioural and Social Sciences – Leiden University

(March, 2022)

Student number: s3106675

First Examiner: Willeke Kitselaar, Health, Medical and Neuropsychology
Unit; Leiden University

Second Examiner: Julia Henrich, Health, Medical and Neuropsychology
Unit; Leiden University

Table of contents

| | |
|-----------------------------------|-----------|
| Scientific abstract | 3 |
| Layman's abstract..... | 4 |
| Introduction | 5 |
| Methods | 7 |
| <i>Design</i> | <i>7</i> |
| <i>Participants</i> | <i>7</i> |
| <i>Measures</i> | <i>7</i> |
| <i>Procedure.....</i> | <i>8</i> |
| <i>Statistical Analysis</i> | <i>9</i> |
| Results | 10 |
| Discussion | 14 |
| Conclusion..... | 17 |
| Appendix..... | 18 |
| Sources | 21 |

Scientific abstract

Objective: Fibromyalgia is a disease constituted of both somatic and psychological symptoms. Prior research found that multidisciplinary treatment approaches are the most effective. The present study wants to elaborate whether general practitioners apply a multidisciplinary approach when referring patients with fibromyalgia to health care professionals.

Design: An observational between-subject study has been conducted. The data used is taken from routine primary care databases of 82 general practices longitudinally. A patient group with depression acts as a control group to whom referral behaviour of general practices is compared.

Participants: Patients who were older than 18, have had either a diagnosis of fibromyalgia or depression, and who were registered at their general practice at least one year were included (N=2443).

Measures: Three outcome measures have been used: type of registration consisting of the two possible levels of fibromyalgia or depression, type of referral consisting of the three levels of mental health care, physical health care or both, and type of general practice consisting of 82 levels.

Statistics: Descriptive and frequency tables have been evaluated regarding case numbers per type of registration, type of referral and general practice. Further, chi-square tests with Monte Carlo's estimation of significance have been computed to analyse (in)dependence between registration type and referral type, and to analyse general practice-specific referral behaviour.

Results: Of the fibromyalgia patient group, 2.6% received multidisciplinary referrals. Patients were referred to MHC less than to PHC. Patients with depression were referred to MHC in the majority of cases. Further, statistical significance has been found for a dependence between registration and referral type ($p < .001$). Taking the different general practices into account, statistical significance has been found for a dependence between type of registration and general practice within the PHC referral sample ($p = .01$).

Conclusion and implication: Multidisciplinary treatment seems to not always be facilitated by general practitioners even though previous research showed that it seems to be the best treatment option. Thus, a change in general practitioner's referral behaviour might be needed. Future research should repeat the study with larger sample sizes per registration type to investigate general practices' specific referral behaviour more in depth.

Layman's abstract

Fibromyalgia is a chronic pain syndrome constituted of both physical and psychological symptoms including fatigue and low mood. As symptoms arise on both levels, treatment should focus on both too, and has also been found to be the most effective one (multi-disciplinary help).

However, whether both of these treatment options are actually given to patients with fibromyalgia is questionable, and this study aims to explore this in more depth. We worked with data recordings of general practitioners from Leiden and the Hague. The referral of patients with fibromyalgia or depression diagnoses were compared to each other, especially differentiating between mental health care, physical health care and both kinds of help. Furthermore, the study took the general practice the patient was enrolled in into account to observe possible differences between practices' referrals.

The study results showed that patients with fibromyalgia seem to get referred to both physical and psychological treatment quite rarely. Further, those patients seem to get access to psychological help less than patients who suffer from depression. Thus, whether a patient gets referred to psychological help may depend on the diagnosis, more extensively, whether the patient has fibromyalgia or depression. In addition, receiving physical health care referrals seems to depend on whether the patient has fibromyalgia or depression and on which general practice the patient is registered in.

Overall, receiving both mental health care and physical health care seems to be a rare scenario for patients with fibromyalgia. However, this study only investigated a rather small number of people with fibromyalgia, thus another study with more patients should be done in the future.

Introduction

Fibromyalgia is a chronic disease limiting the quality of life of patients to a remarkable extent due to the impact on work, social life and psychological well-being (Bernard et al., 2000). Patients diagnosed with fibromyalgia suffer from chronic widespread pain at so-called tender points. The widespread pain is often aligned with joint stiffness, as well as systematic symptoms such as fatigue, mood disorders or cognitive dysfunction (Bellato et al., 2012). In patients diagnosed with fibromyalgia, no far-reaching physical or somatic cause for the pain can be detected (Bellato et al., 2012), which differentiates it from other rheumatic or orthopaedical disorders. In Western-Europe, fibromyalgia is prevalent in 2.9% of the general population and in 14% of patients with rheumatological disorders (Branco et al., 2010). Due to the variety of symptoms and its effects on most parts of daily life, treatment options need to be available and as effective as possible.

Even though no treatment path has become established in routine care yet (van Koullil et al., 2007), evidence was found that a multidisciplinary treatment is most effective for treating fibromyalgia (Rooks, 2007; Turk & Adams, 2016). Multidisciplinary treatment entails an interdisciplinary understanding and philosophy about treatment approaches when helping the patient. Thus, physical health care (physiotherapy, medication, etc.) and mental health care (psychotherapy, relaxation techniques, pain therapy, etc.) need to be offered in appropriate proportions (Rooks, 2007; Turk & Adams, 2016; Boissevain & McCain, 1991). The extent to which patients with fibromyalgia receive mental as well as physical health care treatment may depend on the health care system of the country (gatekeeper-system or direct access to specialists) (Verhaak et al., 2004), as well as on the individual referral behaviour tendencies of physicians (Holtgrave et al., 1991).

Whether patients with fibromyalgia overall receive multidisciplinary treatment is questionable. Sitnikova et al. (2018) investigated the referrals of patients with Medically Unexplained Symptoms (MUS). MUS – which fibromyalgia is a sub-type of – is an umbrella term for disorders characterized by physical symptoms that limit the patient's functioning, while no somatic disease or cause can be found (Park & Gilmore, 2017; Sitnikova et al., 2018). Sitnikova et al.'s study found significant results which showed that psychological interventions were offered only in the minority of cases. Instead, general practitioners (GPs) reportedly focused on the physical interventions when it comes to MUS.

The minimal use of mental health treatment may be related to the stigmatization psychological problems suffer from (Ben-Porath, 2002). A wide-spread psychological disorder is depression, which is characterized by symptoms like low mood, loss of interest and less experience of pleasure (Paykel, 2008). Thus, it is dominated by psychological symptoms, even though patients often experience somatic symptoms like pain and loss of

energy as well (Tylee & Ghandi, 2005). Piek et al. (2011) stated that GPs in the Netherlands do refer most patients to mental health care when they were diagnosed with depression. Thus, GPs may differ in their openness to promote and offer mental health care referrals between patients with depression (as a major psychological disorder) and patients with fibromyalgia (as a multi-faceted disorder).

While GPs referral behaviour has previously been mapped for patients with persistent MUS (Sitnikova et al., 2018), there currently is a lack of literature on GPs referral behaviour specifically for patients with fibromyalgia. Therefore, the primary aim of the present study is to evaluate whether Dutch GPs apply a multidisciplinary treatment approach (i.e., referring patients to both physical and mental health care) for their patients with fibromyalgia. To get a deeper understanding of the variance in the GP's referral behaviour, the present study investigates whether the referral behaviour is specific to the GP. Variance in referral behaviour would give insight into possible causes for the limited mental health care referrals, as seen in the study by Sitnikova et al. (2018). It is hypothesized that offering patients with fibromyalgia both physical and mental health care treatment is GP-specific, which would underline a necessity of promoting multidisciplinary referrals by GPs for the patient group in question.

In addition, the frequency of mental health care referrals in patients with fibromyalgia is compared to the frequency of mental health care referrals in patients with depression. Depression as a common psychological disorder is expected to be treated psychologically (Piek et al., 2011), which entails that mental health care is possible and well-known. However, fibromyalgia as a disorder with psychological and physical manifestations, is expected to be treated less frequently with mental health care (Sitnikova et al.) even though research shows that it is as necessary as in depression (Rooks 2007, Rossy et al., 1999; Turk & Adams, 2016). A comparison between the two patient groups provides scientific information about the difference in referral behaviour (especially to mental health care) in depression versus fibromyalgia. Thus, it is hypothesized that patients diagnosed with fibromyalgia are not as often referred to mental health care as they are to physical health care. Further, patients diagnosed with depression are expected to be referred to mental health care more often than patients with fibromyalgia.

Methods

Design

The study uses data from the ELAN database. Data from this database is derived from routine primary care and covers approximately 300,000 patients. The patient data included is generated by 82 general practices in The Netherlands, specifically from the wider Leiden and The Hague area. The present cohort study is a longitudinal observation of patients with data from the timespan January 2008 to December 2019. Referrals are observed within one year after the first registration of fibromyalgia or depression; thus, only patients who were referred to mental or physical health care professionals within one year are included. For this study, only patients were included that were referred to a specialist that either belongs to the mental health care (MHC) or to the physical health care (PHC) category (see appendix A). The present study uses a between-subject design.

Participants

All patients included in the original dataset are older than 18 years and differ in their age and medical condition. Patients who were enrolled at the general practice for less than one year are excluded from the analysis. In the sub-set used for analysis, all patients included have had a diagnosis of either fibromyalgia or depression. Patients who have had both a depression and a fibromyalgia diagnosis were only included for their fibromyalgia diagnosis (i.e., only referrals after their fibromyalgia registration were investigated). Patients who have opted out of research participation are not included in the dataset. Further, patients who were not referred to specialists within one year after the first registration of fibromyalgia or depression were excluded. Only the patients that received a registration (diagnosis) in December 2018 at the latest were included in the present study. All patients were pseudonymized. Personal information subtracted from the ELAN database per participant are gender, birth of date, general practice, registration period at general practice, registrations of disorders and referrals.

Measures

Patients with the diagnoses in question were selected based on international classification of primary care (ICPC) codes, which act as a registration system of disorders and symptoms for GPs. Patients with the ICPC code L18.01 or with L18 and a free-text area indicating fibromyalgia were included in the fibromyalgia group. Patients with code P76 or P76.01 were included in the depression group.

For the analysis overall three measures are included and combined within the different analyses. First, "type of registration" is acting as one categorical variable with the

two levels 1=fibromyalgia and 2=depression. Second, the categorical variable “type of referral” includes three possible levels 1=MHC, 2=PHC and 3=both MHC and PHC referral. The referrals are based on GP’s recordings in the database of having referred a patient to a certain health care professional. Referrals that were included as PHC include physiotherapy, hospital (except psychiatric clinics), physical rehabilitation centres, and other physical professionals or clinics. Referrals counting among MHC are psychotherapy, nurse-practitioner specialized in psychology, psychiatric clinics and general psychology. A complete list of specialists included as PHC and MHC can be found in appendix A. All other referrals not belonging to one of the two categories were excluded. These categories used in the present study were created based on personal evaluation. Third, the “GP” acts as a categorical variable consisting of 82 different levels (each practice acting as one category). Each practice might contain several GPs; thus some levels of the GP variable might not act as one GP but as several.

Procedure

As all data has been conducted and recorded by GPs, data collection was not part of this research project. Consequently, in the present study, the patients did not undergo a specific procedure. The data was only accessible for researchers with specific ethical approved research projects. The data is stored at a secure university server. Data computations took place in Excel and SPSS. The practice data was sorted and adjusted for conducting the analysis to answer the research question.

More extensively, before the final analysis the database of general practices was filtered for patients with fibromyalgia and depression, and excluded all patients based on exclusion criteria (calculated minimum span of enrolment at general practice, only used in-person diagnostics and left out telephone or mail consultation). Further, different types of registration files were combined, variables were computed based on information spread over several locations, duplicate patient data that was saved in several files was deleted and patient data (biographic information) was combined with registrations of ICPC codes. In addition, referrals were categorized as MHC or PHC (or other) and combined with the patient file as well. It was filtered for referrals within one year after the ICPC registration per patient, and patients with both depression and fibromyalgia diagnoses were categorized as fibromyalgia patients. Afterwards, a final file with only information needed was created (e.g. deleted referral specialists not belonging to MHC or PHC) and variables for easier analysis were computed (e.g. depression or fibromyalgia with values 0 or 1, variable combining several referrals per patient into the three levels of referral).

Statistical Analysis

To compare the referral behaviour for the two registration types of fibromyalgia and depression with each other, means and sums for MHC, PHC and both types of referrals per group were explored and compared. The two-level analysis of MHC, PHC and multidisciplinary referrals with registration type reports the sum of cases and associated percentages per referral type that belong to fibromyalgia and to depression registrations respectively. These results will answer two of the hypotheses. For testing the third hypothesis, four chi-square tests for each referral type have been computed. Test assumptions include that the variables are categorical, that all observations are independent, that the cells in the contingency tables are mutually exclusive and that the expected value of the cells is larger than 5 in a minimum of 80% of all cells. The first chi-square test computes the level of dependence between registration type and referral type.

In addition to that, three sub-samples were created differentiating between the three referral levels (1=MHC, 2=PHC, 3=both). Three separate cross-tabulations have been created for the variable GP (82 levels) with registration type (2 levels). For the test of significance, the Monte Carlo simulation was used in addition to the classic asymptotic significance, as numerous cells have expected counts smaller than 5 (violation of the fourth test assumption). The Monte Carlo simulation can model the probability of different outcomes in the process that cannot be predicted easily because of the different cell frequencies. Thus, these three chi-square tests allow for analysing GP-specific referral behaviour on a predictive level.

All analyses will be performed in IBM SPSS Statistics version 26.0.

Results

After applying exclusion criteria, 2443 patients were included in the final sample. Table 1 summarizes the general characteristics of the full study sample and of the sub-samples per registration type separately. The average age of the full sample is 57, which does not deviate notably within the two sub-samples. The majority of patients included in the sample are female (64%). Comparing the gender distributions between the fibromyalgia group and the depression group yields some difference. For both sub-samples, the majority is female, but the proportion of females is larger in the fibromyalgia group than in the depression group (31% difference). The average number of years the patients were enrolled at the general practices is 12.2 years, which represents the average years of enrolment per sub-sample as well. The proportion of patients with a depression registration amounts to 93.7%, which is the majority of the sample.

Table 1.

Descriptive table of the complete sample and sub-samples per diagnosis.

| | | fibromyalgia ¹ | depression ² | total |
|---|-------------------|---------------------------|-------------------------|-------------|
| Gender, n (%) | female | 143 (92.3) | 1415 (61.8) | 1558 (63.8) |
| Age, mean (SD) ³ | | 56 (12) | 58 (16) | 57 (16) |
| Years of enrollment, mean (SD) | | 11.94 (8.8) | 12.21 (9.2) | 12.20 (9.2) |
| Year of ICPC ⁴ registration, n (%) | Between 2008-2013 | 95 (61.3) | 1393 (60.9) | 1488 (60.9) |
| | Between 2014-2018 | 60 (38.7) | 895 (39.1) | 955 (39.1) |

Patients included in the sample were enrolled in 82 different general practices and the patient frequency per practice varied between 2 (minimum) and 189 (maximum). Patients with depression were enrolled in all general practices included in the complete sample (82

¹ includes L18, L18.01 or a free-text area indicating fibromyalgia

² includes P76 and P76.01

³ standard deviation

⁴ international classification of primary care codes

practices), whereas the patients with a fibromyalgia registration were enrolled in a total number of 59 general practices, which covers 72% of all general practices.

Frequencies between the two sub-samples fibromyalgia and depression seem to differ. Within the fibromyalgia group, of 155 patients, 33 were referred to MHC and 126 were referred to PHC, which shows a majority of the PHC referrals and a minority of MHC referrals. In contrast to that, within the depression group, the majority received MHC referrals and a smaller portion received PHC referrals.

With regard to multidisciplinary referrals, 2.6% of fibromyalgia patients received both MHC and PHC. Also in the depression group, multidisciplinary referrals made up the smallest proportion of referrals. Table 2 provides exact numbers of frequencies of MHC referrals, PHC referrals and both types of referrals.

Table 2.

Referral frequencies and percentages per type of registration and total sample.

| | | Type of registration | | |
|--------------|------------------|---------------------------|-------------------------|--------------|
| | | fibromyalgia ⁵ | depression ⁶ | total |
| | | n (%) | n (%) | n (%) |
| referral (%) | Total | 155 (100.0) | 2288 (100.0) | 2443 (100.0) |
| | MHC ⁷ | 29 (18.7) | 1274 (55.7) | 1303 (53.3) |
| | PHC ⁸ | 122 (78.7) | 871 (38.1) | 993 (40.6) |
| | MHC and PHC | 4 (2.6) | 143 (6.3) | 147 (6.0) |

⁵ includes L18, L18.01 or a free-text area indicating fibromyalgia

⁶ includes P76 and P76.01

⁷ mental health care

⁸ physical health care

When combining the four patients with fibromyalgia that received multidisciplinary referrals (see table 2) with the practice they were enrolled in, it is found out that they were enrolled in four different practices. Thus, multi-referrals of GPs – GPs that refer multidisciplinary several times – do not occur in the fibromyalgia patient group. Overall, from the complete sample of 2443 patients, 1450 were referred to MHC (60%). Out of these 1450 patients, 33 had a fibromyalgia registration which accounts for 2% of all MHC referrals.

The first chi-square test was computed for the overall effect of the registration type on the referral type. All assumptions for conducting a chi-square test have been accepted. The asymptotic significance level shows to be significant ($p < .001$). As the effect size is .20, a moderate effect of this estimated dependence can be noted based on Cramer's V interpretation.

The distribution and (in)dependences between GPs and registration type per referral type is estimated in further chi-square tests, and the exact significance levels as well as effect sizes are summarized in Table 3. All test assumptions for chi-square testing have been fulfilled, except for the cell frequencies of >5 . However, this is solved by using the Monte Carlo's estimation for significance testing. For the sub-sample including patients who were only referred to MHC and for the sub-sample including patients who were referred to both types of care, no significant estimated values were found based on the Monte Carlo's estimation. However, for the multidisciplinary referral type, the asymptotic significance for the Pearson's Chi-Square is below .05, thus significant (with large effect size) (table 3).

A significant estimation was found for the sample with PHC referral type for the Monte Carlo's estimation test ($p = .011$) as well as for the asymptotic significance. This significant result has a moderate effect size of .34 based on Cramer's V interpretation (table 3).

Table 3.

Summarized Chi-Square test results per sub-group of referral type.

| | MHC ⁹ referral | PHC ¹⁰ referral | MHC + PHC referral |
|--------------------------|---------------------------|----------------------------|--------------------|
| Pearson Chi-Square value | 85.057 | 112.879 | 77.740 |
| n | 1303 | 993 | 147 |
| degrees of freedom | 78 | 80 | 54 |
| Monte Carlo Significance | .292 | .011¹¹ | .155 |
| Cramer's V value | .255 | .337 | .727 |
| Asymptotic Significance | .274 | .009 | .019 |

⁹ mental health care

¹⁰ physical health care

¹¹ bold printed numbers represent significance between GP and registration type in that sub-group

Discussion

Summary

This study aimed to examine the application of multidisciplinary referrals by GPs with regard to patients suffering from fibromyalgia. The results have shown that patients with fibromyalgia are not as often referred to MHC as they are to PHC. Further, the number of patients receiving multidisciplinary referrals was remarkably smaller than the number of patients receiving either MHC or PHC individually. The patients with fibromyalgia that received multidisciplinary referrals were enrolled in different practices, not indicating GP-specific referral behaviour within this sample. However, due to a sample size of 4, no general conclusions about GP-specificity can be drawn.

Comparing MHC referrals between patients with fibromyalgia and patients with depression, showed that a larger proportion of patients within the depression group received MHC referrals than patients within the fibromyalgia group. Additionally, results show significant differences in referrals between diagnoses indicating that there seems to exist some level of dependence between registration type and type of referral. Further, for the patients that received PHC referrals, there seems to exist a dependence between GP and type of registration, showing that not every GP refers patients with fibromyalgia and depression to PHC to the same extent.

Relation to prior research

The present study found that patients with fibromyalgia were referred less to MHC than to PHC. This is in line with a study by Sitnikova et al. (2018), which showed that for patients with MUS, most referrals are focused on physical symptoms and only a small number of referrals are taking all dimensions of symptoms into account. Furthermore, both Sitnikova's study and the present study found a limited number of patients referred to specialists of all symptom dimensions which would be the optimal treatment based on the Dutch guidelines for MUS patients (Olde Hartmann et al., 2013). In Sitnikova's study, only for a small proportion of patients (0.6%), MHC referrals (psychologist or psychiatrist) were offered.

Kappen & van Dulmen (2008) conducted a study whose results could serve as explanations for the present results. They explored initial responses of GPs to patients with MUS and assumed that GPs explore explicit concerns – specific physical burdens – in depth, but tend to miss inexplicit, psychosocial consequences of the disorder for patients. Their results indeed revealed a focus of the GPs on exploring medical explanations as they invested time for physical examinations and interventions, leaving out underlying, psychosocial aspects. These findings are in line with the present study results as mental

examinations (which entails referrals to professional health care) are used by GPs in a limited amount.

The results that were found in the present study based on GP data could be further explained by Perrot et al.'s (2012) study that used surveys to gain information on the experience of GPs with the treatment of patients with fibromyalgia. Their study found out that more than half of the GPs included in the study remarked their training about fibromyalgia as inadequate. In addition to that, 32% even claimed they were not knowledgeable about fibromyalgia (Perrot et al., 2012), which underlines the need to train GPs for the medical underpinnings and the multidisciplinary treatment approach of this disorder.

The hypothesis regarding GPs and their usage of referrals based on registration type revealed an unexpected result. Significance was only found for PHC referrals, which can be explained by the high number of PHC referrals within the fibromyalgia population and the low number within the depression population, which in itself is not surprising due to the primary somatic presentation of symptoms in patients with fibromyalgia (Bellato et al., 2012) and the primary psychological nature of depression (Paykel, 2008).

Overall, knowledge about and application of psycho-somatic help needs to be included in GP training as they seem to be responsible for the patient's treatment options given the gate-keeper system of Dutch health care (Verhaak et al., 2004). Murray et al. (2016) stressed the need to establish a multifactorial understanding of symptoms in diagnosing patients, which is underlined by the present results.

Strengths and Limitations

This study comes with several strengths and limitations. First, this study investigates referral behaviour of GPs in a sub-category of MUS, which is even more specific and has not been studied that way before. Another major strength is the usage of the ELAN-data warehouse that contains electronic medical records from 82 Dutch general practices and enables insights from routine care data. This data could be treated as a more objective one, as it does not include estimations and surveys of patients themselves (which might lead to biases), but registrations and referrals of GPs. Further, the large sample size enabled us to get insights into a diagnosis that is only present in a relatively small proportion of the general population.

However, there are also some limitations that should be taken into account. First, research indicates that registration of patient information can be inconsistent between GPs (Sitnikova et al., 2018; Kitselaar et al., 2021). Consequently, not all patients with fibromyalgia or depression might have been recognized and registered as such by the GPs. Further, patients who registered as having both depression and fibromyalgia were included in the fibromyalgia group. This may have caused confounding in the interpretation of their referrals

since they might already receive more MHC, and since it is less certain that the referral is related to fibromyalgia. However, the patient group with fibromyalgia already received less MHC referrals even though patients with both diagnoses were included. This enforces the present results even more.

Furthermore, this study took the referrals within one year after diagnosis into account to connect diagnoses and referrals to each other, which are stored separately. However, this may limit the results by not ensuring that a certain referral is a response to a certain diagnosis. Finally, a study using data that needs consent might always come with the bias that some patient populations might be more willing to agree to using their data for scientific research, and others to opt-out of research.

Implications for future research and clinical practice

This study provides unique insight into GP's referral behaviour following fibromyalgia and depression. Even though the ELAN-data warehouse provides a large sample size, future research and study replications should increase the sample sizes within each group, as in this study the fibromyalgia group was rather small. A larger population could possibly be reached via voluntary studies for patients with fibromyalgia. Even though those methods might lead to biases, surveys and questionnaires for patients about referrals of GPs could be combined with database information as we worked with here. Further, this study included all GPs, which means that different patient frequencies were involved. Thus, in order to analyse referral behaviour specifically per GP in the future and to gain more in-depth results, only practices with a minimum number of patients and including patients from both types of registrations should be included.

In addition, an interesting question for the future might be whether the referral behaviour also differs between patients with a mainly somatic disorder and fibromyalgia. Future research might take a mainly somatic disorder as another control group to compare all three types of disorders (mental, psychosomatic, somatic) and referrals, to inspect how GPs refer patients differently. Another interesting follow-up study would be to split the fibromyalgia patient group into two groups (only fibromyalgia vs. both fibromyalgia and depression) to investigate any differences in referral behaviour between patients who have had a psychiatric history or not and to see how this influences the GP's attitude.

Overall, the results show an underapplication of multidisciplinary referrals due to the seldom referrals to MHC for patients with fibromyalgia, which might lead to constant psychological symptoms and might even cause the symptoms to develop chronic. This shows that the psychological burdens in patients need to be reduced and MHC needs to be provided.

Conclusion

Overall, the present study found that patients with fibromyalgia seem to be referred to MHC too rarely. While PHC referrals are common, the shortage of MHC referrals leads to an under-application of multidisciplinary treatment although this would be the recommended treatment approach. This might lead to constant psychological symptoms in patients and leads to the possibility of becoming chronic when not treated. MHC referrals are possible which is demonstrated by a high number of referrals for patients with depression. Thus, GPs need to broaden their referrals of psychological help to psychosomatic disorders in order to treat the whole spectrum of symptoms patients with fibromyalgia experience. Future research should investigate individual GP's referral behaviour with larger sample sizes within disorders to investigate general or GP-specific lacks in multidisciplinary help. This could be done by including a lower number of GPs who contain more patients per GP. These two categories would result in larger sample sizes within practices which would enable in-depth comparison between GPs.

Appendix

A. Abbreviation list: categories of MHC, PHC and excluded specialists

| | <i>Mental Health Care (MHC)</i> | <i>Physical Health Care (PHC)</i> | <i>Other (excluded)</i> |
|-----------------------------|---|--|--|
| Specialists included | General social work, Primary care psychology, Mental health institution, Pedagogy, Psychiatry, Psychotherapy, Sexology, Social service | Anaesthesia, Dermatology, Cardiology, Cesar therapy, Surgery, Dietetics, Occupational therapy (ergotherapy), Physiotherapy, Geriatrics, Skin therapy, Internal medicine, Throat, nose, and ear medicine, Pneumologist, Mensendieck therapy, Gastrointestinal and liver doctor, Manual therapy, Neurology, Ophthalmology, Orthopaedic shoes or tools, Orthopaedics, Pain relief, Pedicure treatment, Podiatry, Rheumatology, Specialist geriatric medicine, Dentistry, | Abortion clinic, Acupuncture, Lawyer, Allergist, Alternative medicine, Ambulance service, Pharmacy, ARBO-service, Audiological centre, Doctor for the mentally handicapped, Occupational medicine, Cardiac surgery, Coronary care unit, CIZ, Consultation bureau TBC, Cytology, Haematology, Homeopathy, Intensive care unit, Diabetes, Youth health care, Ultrasound, First aid, Electrocardiography, Endocrinology, Fertility research, Phoniatriy, Job search, Venereal diseases, Municipality healthcare, |

| | | | |
|--|--|---------|--|
| | | Urology | GHOR, Gnathology, Gynaecology, General practitioner health care, Haptonomy, Oral surgery, Clinical genetic centre, Paediatrics, Laboratory, Speech therapy, Medical diagnostic centre, Medical microbiology, Medical kindergarten, Hotlines, Military medicine shift, Neurosurgery, Nephrology, Neonatology, Nuclear medicine, Obstetrics, Oncology, Optics, Optometry, Orthodontics, Orthopaedics, Pathological anatomy, Plastic surgery, Police, Prenatal diagnosis, Pastoral care, Unknown, Radiotherapy, Radiology, SCEN doctor, Endoscopy department, |
|--|--|---------|--|

| | | | |
|--|--|--|--|
| | | | Sports medicine, Thoracic surgery, Thrombosis service, Home care, Traumatology, Tropical medicine, Vascular surgery, Obstetrics (first line), Nursing home, Addiction treatment, Insurance medicine, Observation, District nursing, Other |
|--|--|--|--|

Sources

- Bellato, E., Marini, E., Castoldi, F., Barbasetti, N., Mattei, L., Bonasia, D. E., & Blonna, D. (2012). Fibromyalgia Syndrome: Etiology, Pathogenesis, Diagnosis, and Treatment. *Pain Research and Treatment*, 2012, 1–17. <https://doi.org/10.1155/2012/426130>
- Ben-Porath, D. D. (2002). Stigmatization of Individuals Who Receive Psychotherapy: An Interaction Between Help-seeking Behavior and the Presence of Depression. *Journal of Social and Clinical Psychology*, 21(4), 400-413. <https://doi.org/10.1521/jscp.21.4.400.22594>
- Bernard, A. L., Prince, A., & Edsall, P. (2000). Quality of life issues for fibromyalgia patients. *Arthritis & Rheumatism*, 13(1), 42–50.
- Boissevain, M. D., & McCain, G. A. (1991). Toward an integrated understanding of fibromyalgia syndrome. I. Medical and pathophysiological aspects. *Pain*, 45(3), 227–238. [https://doi.org/10.1016/0304-3959\(91\)90047-2](https://doi.org/10.1016/0304-3959(91)90047-2)
- Branco, J. C., Bannwarth, B., Failde, I., Abello Carbonell, J., Blotman, F., Spaeth, M., Saraiva, F., Nacci, F., Thomas, E., Caubère, J.-P., Le Lay, K., Taieb, C., & Matucci-Cerinic, M. (2010). Prevalence of Fibromyalgia: A Survey in Five European Countries. *Seminars in Arthritis and Rheumatism*, 39(6), 448–453. <https://doi.org/10.1016/j.semarthrit.2008.12.003>
- Holtgrave, D. R., Lawler, F. & Spann, S. J. (1991). Physicians' Risk Attitudes, Laboratory Usage, and Referral Decisions. *Medical Decision Making*, 11(2), 125–130. <https://doi.org/10.1177/0272989x9101100210>
- Kappen, T. & van Dulmen, S. (2008). General practitioners' responses to the initial presentation of medically unexplained symptoms: a quantitative analysis. *BioPsychoSocial Medicine*, 2(1). <https://doi.org/10.1186/1751-0759-2-22>
- Kitselaar, W. M., Numans, M. E., Sutch, S. P., Faiq, A., Evers, A. W. & van der Vaart, R. (2021). Identifying persistent somatic symptoms in electronic health records: exploring multiple theory-driven methods of identification. *BMJ Open*, 11(9), e049907. <https://doi.org/10.1136/bmjopen-2021-049907>
- Murray, A. M., Toussaint, A., Althaus, A. & Löwe, B. (2016). The challenge of diagnosing non-specific, functional, and somatoform disorders: A systematic review of barriers to diagnosis in primary care. *Journal of Psychosomatic Research*, 80, 1–10. <https://doi.org/10.1016/j.jpsychores.2015.11.002>
- Olde Hartmann, T., Blankenstein A, Molenaar A, Bentz van den Berg D, van der Horst H, Arnold I, Burgers J, Wiersma T, Woutersen-Koch H. NHG guideline on medically unexplained symptoms (MUS) (in Dutch) (2013). *Huisarts Wet.*, 56(5), 222–30.

- Park, J. & Gilmore, H. (2017). Medically unexplained physical symptoms (MUPS) among adults in Canada: Comorbidity, health care use and employment. *Health Reports*, 28(3), 3-8.
- Paykel, E. S. (2008). Basic concepts of depression. *Dialogues in Clinical Neuroscience*, 10(3), 279–289. <https://doi.org/10.31887/dcns.2008.10.3/espaykel>
- Penninx, B. W., Milaneschi, Y., Lamers, F. & Vogelzangs, N. (2013). Understanding the somatic consequences of depression: biological mechanisms and the role of depression symptom profile. *BMC Medicine*, 11(1). <https://doi.org/10.1186/1741-7015-11-129>
- Perrot, S., Choy, E., Petersel, D., Ginovker, A. & Kramer, E. (2012). Survey of physician experiences and perceptions about the diagnosis and treatment of fibromyalgia. *BMC Health Services Research*, 12(1). <https://doi.org/10.1186/1472-6963-12-356>
- Piek, E., van der Meer, K., Penninx, B. W., Verhaak, P. F. M, & Nolen, W. A. (2011). Referral of patients with depression to mental health care by Dutch general practitioners: an observational study. *BMC Family Practice*, 12(41). <https://doi.org/10.1186/1471-2296-12-41>
- Rooks, D. S. (2007). Fibromyalgia treatment update. *Current Opinion in Rheumatology*, 19(2), 111–117. <https://doi.org/10.1097/bor.0b013e328040bffa>
- Rossy, L. A., Buckelew, S. P., Dorr, N., Hagglund, K. J., Thayer, J. F., McIntosh, M. J., Hewitt, J. E., & Johnson, J. C. (1999). A meta-analysis of fibromyalgia treatment interventions. *Annals of Behavioral Medicine*, 21(2), 180–191. <https://doi.org/10.1007/bf02908299>
- Sitnikova, K., Pret-Oskam, R., Dijkstra-Kersten, S.M.A., Leone, S.S., van Marwijk, H.W.J., van der Horst, H.E., & van der Wouden, J.C. (2018). Management of patients with persistent medically unexplained symptoms: a descriptive study. *BMC Family Practice*, 19(88). <https://doi.org/10.1186/s12875-018-0791-9>
- Turk, D. C., & Adams, L. M. (2016). Using a biopsychosocial perspective in the treatment of fibromyalgia patients. *Pain Management*, 6(4), 357–369. <https://doi.org/10.2217/pmt-2016-0003>
- Tylee, A. & Gandhi, P. (2005). The Importance of Somatic Symptoms in Depression in Primary Care. *The Primary Care Companion to The Journal of Clinical Psychiatry*, 07(04), 167–176. <https://doi.org/10.4088/pcc.v07n0405>

- van Koulik, S., Effting, M., Kraaimaat, F. W., van Lankveld, W., van Helmond, T., Cats, H., van Riel, P. L. C. M., de Jong, A. J. L., Haverman, J. F., & Evers, A. W. M. (2007). Cognitive-behavioural therapies and exercise programmes for patients with fibromyalgia: state of the art and future directions. *Annals of the Rheumatic Diseases*, 66(5), 571–581. <https://doi.org/10.1136/ard.2006.054692>
- Verhaak, P. F. M. (2004). Demand and supply for psychological help in general practice in different European countries: Access to primary mental health care in six European countries. *The European Journal of Public Health*, 14(2), 134–140. <https://doi.org/10.1093/eurpub/14.2.134>