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Differences in patient characteristics, number of treatments and recovery rates between referred and self-referred non-specific neck pain patients in manual therapy; a secondary analysis

Running head: Self-referral in manual therapy practice

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ABSTRACT

Introduction: In various countries patients can visit a physiotherapist via self-referral. The aim of this study were to evaluate whether there is a difference between patients with non-specific neck pain that consult a manual therapist via self-referral and those who do so via referral by a physician concerning patient characteristics, number of treatments and recovery; and whether (self-)referral is associated with recovery.

Methods: This study is part of a prospective cohort study with post-treatment and 12 months follow up in a Dutch manual therapy setting. Adult patients with non-specific neck pain were eligible for participation. Baseline measurements include demographic data and data concerning neck pain. At follow-up, number of treatments, recovery and satisfaction were assessed. To evaluate differences between the groups we used the chi square test or the independent t-test. A logistic regression analysis was used to evaluate association between referral status and recovery.

Results: In total, 272 manual therapists participated and 1311 patients were included. Of 831 patient's referral data are available of which about half the patients consulted the manual therapist by self-referral. The mean treatment number was 5.4 and did not differ between both groups. Also, we found no differences between the groups concerning age, gender, pain intensity at baseline or recovery rates. Patients in the self-referral-group experienced acute neck pain more frequently, had recurrent complaints more often and reported less disability compared to the referred group. Referral status was not associated with recovery.

Conclusion: We found several small differences between the self-referred and the referred patients.

INTRODUCTION

Neck pain is defined as pain in the neck that lasts at least one day.¹ It is the 6th leading global cause of disability, ranking among the top 10 causes of disability worldwide.² The mean point prevalence of non-specific neck pain is 14%, the mean 1-year prevalence 26%, and the 1-year incidence ranges from 10% to 21%.³ In the Netherlands, costs associated with neck pain represent 1% of healthcare expenditures and the number of people experiencing neck pain is predicted to increase to 50% by 2040.⁴ The prognosis of patients presenting with an acute episode of neck pain in primary care is poor as 47% of the patients still experience symptoms after 1 year.⁵

Patient self-referral, or direct access, means that patients can be examined, evaluated, and treated by physiotherapists without the requirement of a physician's referral. Since January 2006 it is possible in The Netherlands for patients to consult a physiotherapist/manual therapist without referral. This decision is evaluated 5 years later using data from a longitudinal database registry in Dutch Primary care.⁶ It was found that the number of patients with musculoskeletal disorders that consulted the physiotherapist using self-referral increased from 27.8% in 2006 to 44.2% in 2010 and 56% in 2017.⁷ Furthermore, a slight difference was found between referred and self-referred patients in the number of treatments. Self-referred patients needed on average 3 treatment sessions less than referred patients; about 10 versus 13.⁶ A recent systematic review found that self-referred patients needed less physiotherapy treatments, visits to physicians, imaging performed, required fewer non-steroidal anti-inflammatory drugs and secondary care referrals.⁸ The self-referred patients were quite often younger, with a higher level of education and mostly they presented a less severe clinical condition and a more acute complaint. The systematic review suggests that self-referral to physiotherapy is feasible, safe and cost-efficient.⁸

Manual therapy (or musculoskeletal physiotherapy) is considered a specialised physiotherapy treatment in The Netherlands. Manual therapists focus predominantly on spinal complaints and frequently perform spinal manipulations and mobilisations aimed at reducing the time to recovery.⁹

It remains unclear whether the differences found between referred and self-referred patients in physiotherapy also holds in manual therapy practice.

Therefore, this study aims to evaluate whether there is a difference (two-tailed) between patients with non-specific neck pain that consult a manual therapist via self-referral or via referral by a physician concerning patient characteristics, number of treatments and recovery; and whether (self-)referral is associated with recovery post-treatment.

METHODS

Design

This study is part of a prospective cohort study (the Amersfoort Nekonderzoek of the Master Manuele therapie Opleiding (ANiMO)) of individuals with neck pain patients consulting a manual therapist, with post-treatment and 12 months follow up. Ethical approval was obtained from the Medical Ethical Committee (MEC-2007-359) from the Erasmus University Medical Centre, Rotterdam, The Netherlands.

Participants

Manual therapists. In total 279 manual therapists (MTs) attending an educational program were asked to participate in this study and all of them were participating as part of the course. All therapists were licensed MTs and registered by the Royal Dutch Society for Physical Therapy. They were all working in primary or secondary health care settings. We consider this a random sample of Dutch MTs as all MTs have to follow this educational program to keep their license.

Patients. All participating MTs were asked to include at least 5 patients of 18 years and over that consulted them for their neck pain between November 2008 and April 2009. Excluded were all patients with known self-reported specific causes of neck pain (e.g. known vascular or neurological disorders, neoplasms, rheumatic conditions, referred pain from internal organs).

Baseline measurement

Manual therapists. Socio-demographic and professional data were collected at baseline and comprised gender, age, occupational setting, number of hours at work, number of years of experience with the management of non-specific neck pain patients. Furthermore, during each treatment session, the MTs registered the number of treatments, their process of clinical reasoning and the chosen treatment modalities in their patient's treatment diary. MTs gathered this data independently from the patient.

Patients. All patient's filled in a baseline questionnaire independently including: age, gender, pain intensity (using the Numeric Rating Scale (NRS)), duration of complaint (acute, subacute or chronic), recurrent complaints (yes/no), medication use (yes/no), work status (yes/no), disability (using the Neck Disability Index (NDI) and Neck Bournemouth Questionnaire (NBQ)), fear avoidance (using the Fear Avoidance Beliefs Questionnaire (FABQ)) and whether they had previous experiences consulting a MT (yes/no).¹⁰⁻¹⁴

The NRS measures momentary pain intensity; it is an 11-point scale ranging from 0 (no pain) to 10 (unbearable pain). The NDI is a questionnaire consisting of 10 items that deals with the limitation caused by the complaint, both in work-related activities as well as in non-work-related activities. For each item, the degree of limitation is determined with 0 (no limit) and 5 (huge constraint). All scores are added up and converted to percentages reflecting the degree of disability. The NBQ highlights the bio-psychosocial dimensions of pain; behavior and environment affect the development, progress and perception of pain. The NBQ is a questionnaire consisting of 7 items in which each item can be displayed on an 11-point scale ranging from 0-10, with higher scores indicating more pain and/or limitation for the given activity. Ultimately, the total score is calculated by taking the sum of the 7 items in a range of 0-70. The FABQ measures the extent to which physical activities (FABQ -PA) and work-related activities (FABQ-W) affect the pain. The questionnaire consists of 16 items and each question is measured on a 7-point scale (ranging from 0-6 points) indicating the extent to which it affects the pain. The first five questions relate to the extent the physical activity affects the pain;

with a total FABQ-PA score ranging from 0-30 points. The remaining 11 questions are related to the degree to which work influences the pain, with a total FABQ-W score ranging from 0-66 points. The higher the score the more the activities influences the pain.

Post treatment measurement

Manual therapists. At the end of the treatment episode, the MT assessed the number of treatment sessions and reported in the treatment diary the reason for stopping the treatment episode.

Patients. At the end of the treatment episode patients completed a post-treatment questionnaire including the NRS, NDI, NBQ and the FABQ. Recovery of the complaint and treatment satisfaction were both measured using the Global Perceived Effect (GPE) scale.¹⁵⁻¹⁷ The GPE-recovery scale asks the patient to rate, on a 7-point numerical scale, how much their condition has improved or deteriorated since baseline and ranges from totally recovered to worse than ever. The GPE-satisfaction scale indicates, on a 7-point numerical scale, how satisfied the patient is about the received treatment. For this question the scale ranges from absolutely satisfied to absolutely not satisfied.

All patient data were gathered using paper-based questionnaires. A research assistant entered the data in SPSS statistical software package and we performed a random 10% check to check for mistakes. To collect the data from the MT's, a custom-made digital survey was carried out. Personal login codes were provided per MT during the educational program. MT's only had access to their own data. Only the principal investigator had access to all personalized data and recoded the MT's to numbers. All analyses were performed on coded data.

Analysis

To summarize the baseline data, we used descriptive statistics. We presented data on the total groups as well as the self-referral and the referral-group. The duration of the complaint is divided into: acute (0-6 weeks), sub-acute (6 weeks to 3 months) and chronic (longer than three months).

The recovery data were dichotomized into “recovered” (scores: ‘completely recovered’ and ‘much improved’) and “not recovered” and for satisfaction into “satisfied” (scores ‘absolutely satisfied’ and ‘very satisfied’) and “not satisfied”.

Next, the difference between the self-referral and the referral groups at baseline is tested. For the dichotomous variables, we used the chi square test and for the continuous variables, we used the independent t-test. We checked whether the continuous data were normally distributed using the Shapiro-Wilk test. In case the data were not normally distributed, we used a non-parametric test (Mann-Whitney U test) for assessing (median) differences.

Lastly, we evaluate whether referral is a 1 of the predictors of recovery in a logistic regression model, using Backward Wald regression. Predictors were selected based on the literature (age, gender, duration of complaint, recurrent complaints, pain (NRS) and function (NDI)).^{3,5} Some extra predictors were added to explore their association with recovery (referral, number of treatments, previous experience (expectancy of the patient)). In the selection we aimed to comply to at least ten predictors per case in the smallest group, meaning a maximum of nine predictors. We checked a priori multicollinearity between the predictors using the correlation matrix.

All analyses were done in SPSS 24.

RESULTS

Participants

Manual therapists. In total 272 MTs participated and included between 1 and 5 patients. The MTs provided data on the number of treatments of 1090 patients, and data on referral of 831 (76.2%) patients. For 259 patients, data on referral were missing.

Patients. In total 1311 patients are included in the cohort, of which 1190 provided data at baseline. The mean age of the patients was 44.7 years and 69.4% was female (see table 1). Almost half of the patients had chronic complaints (47.9%), and more than half mentioned that their complaints were recurrent (66.9%). The average pain intensity was moderate (4.8 on a 11-point NRS), as was the

average disability measured with the NDI as well as the NBQ (see table 1). Not all continuous data were normally distributed.

Follow-up

Post treatment, 747 patients (62.8%) provided data of which the majority stated to be recovered (61.6%) and satisfied with the treatment (71.2%), see table 1. The mean number of treatments was 5.4 (standard deviation (SD) = 2.6). The range of number of treatments was from 1 – 32 with a median of 5, see figure 1

Referral

Of all 831 patients with information on the referral 413 (49.7%) consulted the MT via self-referral, 372 (44.8%) were referred to the MT by their general practitioner, 45 by a medical specialist and 2 by their company doctor. Table 1 presents the differences at baseline and follow-up between the self-referral and referral group. Overall most baseline variables were comparable. About one third of the people had previously been to a MT, but the number was slightly lower in the self-referral group compared to the referred patients (mean difference is 5.7%). In the self-referral-group patients on average had acute complaints more often (mean difference is 8.9%), experienced less disability (mean difference is 2.9 on a 0 - 100 scale) and experienced recurrent complaints more often (mean difference is 9.6%). These differences are small but reached statistical significance.

At follow-up, the number of treatments was comparable between the groups. Most patients were satisfied with their treatment, and there was a slight difference in recovery in favor of the self-referral group (mean difference is 5.7%).

For the regression analysis all correlations were below 0.46, so no multicollinearity was present.

Furthermore, referral was not a predictor for recovery when evaluated in a prognostic model (see table 2). The explained variance of the model was low: 7.2%. This model showed that males with an acute complaint and low disability at baseline have the best chance to recover.

DISCUSSION

Main findings

In Dutch manual therapy practice about half the patients consult the MT via self-referral. This group of patients more often has acute and recurrent complaints and less disability compared to the referred patients. These differences are small, all below 10%.

Comparison with the literature

Our finding of the percentage of self-referrals is consistent with findings from a longitudinal database registry in Dutch Primary Care (NPCD).⁶ In contrast with other studies we found no difference in number of treatment sessions, age and gender between self-referrals and referred patients.⁸ We found e.g. no differences in treatment numbers compared to direct access in physiotherapy, which might lead to the assumption that direct access might not impact health care costs as much as in physiotherapy. Like the findings in the systematic review we also found that the self-referred patients more often presented to the MT with acute complaints. In comparison to referred patients, the self-referred patients reported slightly less often that they had a previous experience with MT. This has not been evaluated before, but our assumption was that if patients had a good experience with a MT treatment, they would probably more frequently self-refer to the MT for new or recurrent complaints. This assumption does not hold in our data.

When compared to the NPCD, the average number of treatments on our study was much lower.⁶ We found an average of 5.4 treatment sessions, compared to 10 - 13 in the NPCD. Our finding is comparable with the findings in a recent randomized clinical trial where the average MT number of treatments was 6.1 and the average number of physiotherapy treatments was 10. It might be that because of the low number of treatments, we were unable to find a difference between referred and self-referred patients.

Strengths and limitations

This is one of the largest prospective cohort studies in patients with non-specific neck pain. A limitation of this study is the amount of missing data. Data come from two different sources, either the MTs treatment diary or from the patient at baseline and follow-up. Of several patients we only had treatment data from the MT; these patients, although having filled in an informed consent, did not complete any questionnaire. At baseline some patients did not fill in all questions, for instance on age and gender; others did not fill in the questionnaires on disability or fear avoidance. In addition, we suffered from a loss-to follow-up of 37.2%. This non-response leads to incomplete data and estimates are less precise and statistical analysis has less power. If the drop-out is selective, the non-response can lead to a systematic distortion of the results, but we have no indication of selective drop-out in this cohort.

CONCLUSION

This study shows that there are several statistically significant but small differences between the self-referral and the referral-group. In general, self-referred patients report less disability and more often recurrent and acute complaints when consulting the MT. Self-referred patients had similar average numbers of treatment sessions and recovery rates than referred patients.

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Conflict of interest

All authors declare that there is no conflict of interest.

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Table 1: Patient characteristics.

	<i>Self-referral (n=413)</i>	<i>Referral (n=418)</i>	<i>Total (n=1311)</i>
Baseline			
Age (n=1170): mean (SD) / median	44.5 (13.6) / 44	46.2 (14.5) / 46	44.7 (13,7)
#Gender (n=1186): male (%)	116 (30.5)	123 (31.5)	363 (30.6)
Pain intensity (NRS: 0-10) (n=1183): mean (SD) / median	4.7 (2.1) / 5	4.9 (2.1) / 5	4.8 (2.1)
#Duration of the complaint (n=1071): yes (%):			
- Acute (<6 weeks)	149 (42.8)	126 (35.5)*	420 (39.2)
- Sub-acute	45 (12.9)	40 (11.3)	138 (12.9)
- Chronic (> 3 months)	154 (44.3)	189 (53.2)*	513 (47.9)
#Recurrent complaint (n=1129): yes (%)	256 (70.3)	227 (60.9)*	755 (66.9)
#Use of medication (n=1190): yes (%)	173 (45.4)	202 (51.5)	560 (51.6)
#Work status (n=1163): yes (%)	291 (77.8)	278 (72.4)	896 (77)
#Smoking (n=1190): yes (%)	92 (24.1)	97 (24.7)	300 (25.2)
NDI (0-100) (n=1096): mean (SD) / median	10.7 (8.8) / 4	13.6 (10.6) / 6*	12.3 (9.7)
#Previous experience with MT (n=1169); yes (%)	126 (33.3)	150 (39)	407 (34.8)
NBQ (0-70) (n=1171): mean (SD) / median	26.7 (12.2) / 26	28.8 (13.4) / 28*	28.3 (12.9)
FABQ-PA score (0-30) (n=1103): mean (SD) / median	12.3 (7.4) / 13	13.9 (7.5) / 14*	13.2 (7.3)
FABQ-W score (0-66) (n=1129): mean (SD) / median	11.9 (11.3) / 10	15.3 (13.6) / 12	13.4 (12.2)
Post treatment			
Treatment number (n=1092); mean (SD)	5.3 (2.5)	5.6 (2.5)	5.4 (2.6)
#Recovery (n=730): yes (%)	158 (64)	141 (58.3)	450 (61.6)
#Satisfied (n=747): yes (%)	179 (71)	176 (51.5)	532 (71.2)

#Chi-square test used; *Statistical significant difference: p < 0.05

SD: Standard deviation

NB: Due to missing data percentages may differ

Table 2: Prediction of recovery

Variable	Beta	OR (95% CI) Complete model	OR (95% CI) Model based on Backward wald selection
Number of treatments (continuous)	-0.03	0.97 (0.88-1.06)	
Referral (yes)	-0.15	0.86 (0.56-1.34)	
Age (continuous)	0.005	1.0 (0.99-1.02)	
Gender (male)	0.44	1.62 (1.0-2.62)	1.54 (0.97-2.46)
Recurrent complaint (yes)	-0.20	0.82 (0.51-1.34)	
Expectancy (yes)	-0.02	0.98 (0.61-1.58)	
Pain intensity (continuous)	-0.08	0.92 (0.81-1.04)	
Sum score NDI (continuous)	-0.07	0.95 (0.90-1.0)	0.93 (0.89-0.97)
Duration of complaint (acute)	0.60	1.88 (1.16-3.05)	1.83 (1.15-2.91)
Performance measures			
Constant		0.740	0.367
Explained variance		8.6%	7.2%
Hosmer & Lemeshow test		P = 0.99	P = 0.764

Figure 1: Treatment frequency

