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Referral patterns and utilization of physiotherapy services following a one-time physiotherapist consultation in general practice

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The purpose of this study was to describe the influence of a one-time consultation of physiotherapists (PTs) by primary care physicians (PCPs) on utilization of physiotherapy services, functional outcomes, and number of treatment sessions per treatment episode. A 7-month observational study with 59 pairs of randomly selected PTs and PCPs was conducted, with a prospective follow-up study of patients being referred for physiotherapy (treatment) after the consultation. The main variables measured were: (1) characteristics of patients who were referred for physiotherapy after consultation compared to those who were not referred for physiotherapy after consultation; (2) number of sessions per treatment episode predicted by the consulting PT compared to the actual number; and (3) functional outcomes of physiotherapy. The primary study sample consisted of 352 patients referred for a one-time PT consultation. Of these patients 224 were referred for physiotherapy treatment after consultation. Patterns of referral for physiotherapy after consultation were positively related ($p < 0.05$) with increased age, lower levels of education, longer duration of complaints, and a decrease in physical functioning in terms of number of impairments and disabilities. Functional outcomes were better than data of the national reference database of patients directly referred by PCPs for physiotherapy treatment. The mean number of sessions per treatment episode, including the one-time consultation, was lower ($p < 0.05$).

INTRODUCTION

The rising costs of physiotherapy services in the Netherlands led up to examination of utilization patterns, patient satisfaction, and outcome data of physiotherapy treatment. Outcome research in physiotherapy is necessary to determine the effectiveness of physiotherapy services, to develop efficient treatment strategies, and to satisfy patient needs (Swanson, 1995; Hendriks, 2000; Hendriks et al, 2000b).

Cost containment in health care highlights the role of family doctors/primary care physicians (PCPs) in The Netherlands, as care managers and gatekeepers to various health care services (Geijer et al, 1999). Within the Dutch health care system physiotherapy is only accessible after referral for treatment by a physician (Bersee & Pluimakers, 1993). Since 80 percent of the patients treated by physiotherapists (PTs) are referred by PCPs, PTs function as important collaborating partners for PCPs (Kerssens & Curfs, 1993; Rijken, Van Heugten, & Dekker, 1996; Hendriks, 2000). This is particularly true for patients with disorders and complaints of the locomotor system (Geijer et al, 1999; Rijken, Van Heugten, & Dekker, 1996; Dekker & van Baar, 1995; Van der Valk, Dekker, & Boschman, 1995; Lamberts, 1991).

A barrier preventing optimal collaboration between PCPs and PTs, lies in poor communication (Hendriks et al, 1996; Hendriks, 2000), doubt about the effectiveness of or indications for physiotherapy treatment (Beckerman et al, 1993; Newman, 1997; MacIntyre, McAuley & Parker-Taillon, 1999), and lack of knowledge about the changing—research based—physiotherapy practice (Jette & Jette, 1997; Higgs & Titchen, 1998; MacIntyre, et al, 1999; Hendriks et al, 2000a, 2000b). These problems can, to a large extent, be dealt with when PCPs and PTs increase cooperation by regular and efficient communication with each other (Hendriks et al, 1996; Hendriks, 2000).

It is suggested that physicians' use of conservative services (e.g., physiotherapy) may be suboptimal for patients with long-term functional problems, established needs, and for preventive therapy (Mielenz et al, 1997; Overman, Kent, Uslan, & Lewis, 1998). There are also claims that physiotherapy services are underutilised, because physicians often fail to recognize patients' functional needs, lack familiarity with physiotherapist's skills, and lack structured collaboration with PTs (Hart, Pinkston, Ritchey & Knowles, 1990; Hendriks, 2000).

An interesting strategy could be to provide the PCP with an opportunity to refer the patient for a one-time PT consultation¹ before deciding whether to refer the patient for further treatment by the PT, for more expensive diagnostic evaluation or therapy by medical specialists, or to treat the patient him / herself (Hendriks et al, 1996; Mielenz et al, 1997; Overman et al, 1998; Hendriks, 2000). If a PCP is uncertain about the appropriateness of referral or lacks insight into the possibilities of physiotherapy, the consultation can provide the PCP information to support decision-making.

To our knowledge no studies have been published to describe the influence of a onetime PT consultation on utilization of physiotherapy services, number of treatment sessions, and functional outcome (Hendriks, 2000). A one-time PT consultation could either increase or decrease the utilization of physiotherapy services. Should the PCP decide, after consultation, to refer the patient for treatment, the treatment objectives and strategy will at that time be known and explicitly communicated by a written report by the PT. However, pertinent to uncertainties about the appropriateness of physiotherapy treatment and the capability of PTs to predict or estimate the maximum achievable functional outcome or possibilities of physiotherapy treatment, a one-time PT consultation could also result in unnecessary referrals and overutilization of physiotherapy services.

Health service utilization literature of physiotherapy suggest that patients' sociodemographic and health status related variables may indicate the utilization of physiotherapy services (Anderson & Campbell, 1992; Dekker, van Baar, Curfs & Kerssens, 1993; Kerssens & Curfs, 1993; Jette, Smith, Haley & Davids; 1994; Jette & Jette, 1996; Jette & Delitto, 1997; Jette & Jette, 1997; Yoshida & Allison, 1997) and the number of sessions (thus the costs) of one episode of physiotherapy treatment (Kerssens & Groenewegen, 1990; Kerssens & Curfs, 1993; Jette & Jette, 1996; Mielenz et al, 1997;

¹ "Consultation" is defined as: "a written request by a PCP to a PT to examine and evaluate a patient to generate information regarding a (functional) diagnosis and prognosis to facilitate the treatment plan of the PCP, specifically when it concerns the possibilities for physiotherapeutic interventions" (Hendriks et al, 1996; Hendriks, 2000).

Roach et al, 1998; Freburger, 1999; Hendriks et al, in press a). In an earlier report on the effects of a one-time PT consultation from the perspective of the PCP, it was stated that PCPs were satisfied with the outcome and process of consultation, and that most PCPs (93 percent) agreed with the recommendations of the PT. As a result 50 percent of the cases were managed in a different manner than was intended before the PT consultation (Hendriks et al, in press b).

To determine the extent to which physiotherapy services can be utilized and efficiently provided, data collected in a prospective follow-up study of patients being treated by PTs after a one-time PT consultation were analysed. The purpose of this study was to investigate the influence of a one-time PT consultation on the utilization of physiotherapy services, functional outcome, and number of sessions per treatment episode.

To understand the role of a one-time PT consultation on the utilization of physiotherapy services, functional outcome, and the number of sessions per treatment episode, this research focuses on four key questions:

1. Do patient characteristics of patients who are referred to and treated by a PT following a one-time PT consultation differ from those in patients who are not referred to a PT after the consultation?
2. How many sessions per treatment episode are required?
 - How many treatment sessions were expected by PTs for patients who, after a one-time PT consultation, were referred for physiotherapy treatment?
 - Is the prognosis of the number of sessions given by the consulting PT in accordance with the actual number of sessions given?
 - Is the actual number of treatment sessions of patients treated by PTs following a one-time PT consultation different from the treatment records catalogued in the national reference database of patients directly referred by PCPs for physiotherapy treatment (Dekker & van Baar, 1995; Van der Valk, Dekker, & Boschman, 1995)?
3. What is the functional outcome of physiotherapy treatment?
 - Is the functional outcome of patients treated by PTs following a one-time PT consultation different from the treatment records catalogued in the national reference database of patients directly referred by PCPs for physiotherapy treatment?
4. What is the opinion of the PT regarding the process of a one-time PT consultation?

METHOD

Study design

A group of patients referred by PCPs for a one-time PT consultation was studied during a 7-month observational study. In a prospective follow-up study the number of sessions per treatment episode of patients being referred to and treated by a PT—after the one-time PT consultation—was recorded.

For the purpose of the study one PT was paired with one PCP, stratified for degree of urbanization (i.e., rural, semi-urbanized, or urban) since PCP referral patterns tend to be related to geographical location of both PCPs and patients (Hendriks, 2000). A random sample of 72 PTs, working in different practices in primary care, was drawn from the total PT population as listed in the national reference database in four different regions of The Netherlands ($n=1533$). As a PT has a referral relationship with several PCPs, the PCP was randomly selected from a list of PCPs who had a regular referral relationship with the participating PT. If a selected PCP did not agree to participate another PCP was randomly selected from that list.

Sample of participants

The willingness to participate in the study for PTs and PCPs was 86 percent and 74 percent, respectively. Of the 62 PCP-PT pairs originally created, 59 completed the study: three PCPs withdrew from the study for personal reasons. Six PCPs did not use a single consultation request. The 53 PCPs who used at least one consultation request had a mean age of 43.5 years ($SD=7.0$). The majority of them were male (92 percent). The mean number of registered patients per PCP was 2316 (range 250-3150) and nearly half the PCPs worked single-handed. A small number of PCPs had recently completed their training while 60 percent had more than 10 years of experience in primary care.

Comparison of the data of 53 PCPs, representing a population of 122,748 patients with all PCPs in primary care ($n=6,548$) shows that the PCPs in this study were representative for gender, age, years of establishment in general practice, personal list size, and number of professional partners (Hendriks, 2000). The 53 PTs had a mean age of 36.7 years ($SD=6.1$). The majority of the PTs (66 percent) were male and had wide working experience in terms of years of establishment (59 percent longer than 10 years). Comparing the data of the selected PTs with the data of all PTs working in primary health care in the Netherlands ($n=10,187$) shows a good representation in terms of gender, age and type of postgraduate courses or specialties (Hendriks, 2000).

The Royal Dutch Society for Physical Therapy acknowledges several specialties of PTs. In this study 41 of the 53 PTs with an acknowledged specialty were comprised of 15 manual therapists, 15 sports PTs, 6 pediatric PTs, and 5 trained PTs in womens' health problems.

The distribution of the private practices of participating PTs showed an under-representation of single-handed practices (11 percent vs. 35 percent), an over-representation of group practices (more than one partner: 81 percent vs. 44 percent) and a greater than average working experience in primary care.

Training of PTs

The participating PTs were trained in the process of a one-time PT consultation, the use of standardized patient registration and communication forms, including operational definitions, and the data collection procedures (Hendriks et al, 1996; Hendriks, 2000).

Process of consultation

The process of a one-time PT consultation by written communication was as follows:

1. The PCP is undecided as to the possible benefit of physiotherapy treatment.
2. The PCP decides to refer the patient to a PT for a one-time PT consultation.
3. The PCP communicates the reason for the request for consultation and the patient's clinical status to the PT.
4. The PT evaluates the patient's condition and functional status.
5. The PT communicates the findings and treatment recommendations in a written document presented to the PCP within a week after the consultation.
6. The PCP evaluates the additional information and the recommendations given by the PT, and decides on the preferred patient management.

No attempt was made to influence the PCPs' management decisions. All patients received information about the purpose and procedures of the study.

Three hundred fifty-two patients were referred for a one-time PT consultation over an enrollment period of seven months. Although none of the patients refused the PT consultation, 10 patients preferred to see a PT of their own choice rather than one of the PTs participating in the study.

Referral path after the one-time PT consultation

Based on the information given by the PT, the PCP could decide:

1. To refer the patient to a PT for treatment;
2. To refer the patient to a medical specialist;
3. To treat the patient themselves;
4. To refer the patient to another physician / health professional (e.g., podiatrist)

In the follow-up of the 342 patients referred for a one-time PT consultation to a matched participating PT, 243 patients were indicated for physiotherapy treatment (71.1 percent), 53 were referred to a medical specialist (15.5 percent), 40 were treated by the PCP (11.7 percent), and 6 patients were treated otherwise (1.8 percent).

Nineteen of 243 patients (5.6 percent) were lost to follow-up because they were being treated by a PT not participating in the study as recommended by the consulting PT. Therefore data from 323 patients initially referred for a one-time PT consultation and a sample of 224 patients being treated by PTs after the consultation are included in this analysis. All patients signed the informed consent.

Data collection

Background information about the PTs, relevance of the consultation procedures according to the PTs, and a global assessment by the patient of the effect of physiotherapy treatment were collected with questionnaires. Standard forms were used to collect data of the consultation process and the process and outcomes of physiotherapy treatment.

Questionnaires

The *baseline questionnaire* provided data at the beginning of the study on the PT's practice and personal and professional experience. In addition, the frequency of the PT's patient communication with their matched PCP was quantified as once or less than once per month versus more than once per month, and their perception about the cooperation was measured on a five-point Likert scale (excellent [1] –poor [5]). At the conclusion of the study, questionnaires were given to PTs for responses relevant to the appropriateness and practicality of the one-time PT consultation and the standard forms.

Patients referred to and treated by a PT after the one-time consultation reported their global assessment of effect of physiotherapy treatment measured on a *patient questionnaire* using a five point-Likert scale (completely recovered [1] –vastly worsened [5]) at the completion of the treatment period.

Standard forms for the one-time PT consultation

Patient characteristics were collected during the process of consultation by both PCPs and PTs using standard forms (Hendriks et al, 1996; Hendriks, 2000). Upon referral for a one-time PT consultation, the PT registered relevant data of the patient such as the patient's personal and sociodemographic data. For this purpose, a registration form was developed based on the guidelines for documentation of the Royal Dutch Society for Physical Therapy (Koninklijk Nederlands Genootschap voor Fysiotherapie [KNGF], 1993). The medical diagnosis, referral data, and types of complaints were classified according to the International Classification of Primary Care (ICPC) (Lamberts & Wood, 1987). The PT reported the patient's functional status in terms of impairments and disabilities (World Health Organization [WHO], 1980, 1997). The PT assessed whether an impairment or disability was "present" and indicated its severity on a three-point Likert scale. The standard form was designed as a generic tool for assessing physical functioning according to the International Classification of Impairments, Disabilities, and Handicaps (ICIDH) (WHO, 1980; Heerkens, Brandsma, Lakerveld-Heijl, & Van Ravensburg, 1994). The form listed 36 impairments and 27 disabilities (Hendriks et al, 1997; see also the Appendix). In a reliability study, the interobserver reliability of these items was found to be sufficiently high (Hendriks et al, 1997).

The PT's report form was used to document clinical findings, functional status, conclusions and recommendations. In the report form the expected number of treatment sessions, the duration of a treatment episode and the expected functional outcome (in terms of impairments and disabilities) were also stated for those patients whom the PT thought there was a need for physiotherapy treatment.

Standard forms for physiotherapy treatment

If the PCP decided to refer for physiotherapy treatment following the one-time PT consultation, the PT collected treatment data and provided information on a standard registration form at each patient's discharge. The total number of sessions given and functional outcome on the impairment and disability level as measured on a five-point Likert scale (completely recovered [1]; substantial improvement [2]; stabilized [3]; deteriorated [4]; vastly worsened [5]) were registered. A treatment episode was defined as all therapy sessions provided between the initial and discharge session.

Comparison with data from the national reference database

To evaluate the influence of a one-time PT consultation on the number of treatment sessions and functional outcome for those patients referred for physiotherapy treatment after a one-time PT consultation, data from this study were compared with concurrent data of 17,201 patients included in the national reference database of patients who were directly referred by PCPs for physiotherapy treatment (Dekker & Van Baar, 1995; Van der Valk, Dekker, & Boschman, 1995).

Data analysis

Descriptive statistics were used:

1. to compare the demographic and health status related characteristics of patients who were being referred to and treated by a PT with those patients who were being treated by a PCP or referred to a medical specialist after a one-time PT consultation;
2. to compare the predicted and actual number of sessions per treatment episode of patients who were being treated by PTs after the consultation;
3. to compare the actual number of sessions after a one-time PT consultation and data of the national reference database of patients directly referred by PCPs for physiotherapy treatment ($n=17,201$) (Dekker & van Baar, 1995; Van der Valk, Dekker, & Boschman, 1995); and
4. to describe the opinion of the PT regarding the process of a one-time PT consultation.

Data on treatment goals and number of sessions were aggregated on the level of treatment episodes. All data were entered into SPSS-X (Release 4.1. Chicago, III: SPSS Inc; 1991) for analysis. Standard statistical methods were used and included chi-square test for independent proportions and categorical data and Student's t-tests or ANOVA for comparison of group means (non-parametric analysis was used to confirm t-test or ANOVA results). Testing was in all cases two-sided. The level of statistical significance for all tests was set at $p<0.05$.

RESULTS

PCP-PT-pairs

Thirty-nine PTs (74 percent) were sufficiently (28 / 53) or very (11 / 53) satisfied about their cooperation with their matched PCP (Hendriks, 2000).

Referral

A four-by-four table (Table 1) was generated to compare the before-and-after referral direction. Table 1 compares the number of patient referrals that the PCP would have referred for physiotherapy treatment if the PT had not been consulted with the actual number of patients being referred for physiotherapy after a one-time PT consultation. PT consultation resulted in more patient referrals for physiotherapy treatment (179 vs. 224: $p=0.018$) and in less referrals to medical specialists (101 vs. 53: $p=0.001$). The number of patients treated by other health professionals (5 vs. 6) or by the PCPs themselves (38 vs. 40) did not change. Caution should be exercised in interpreting these changes in referral pattern since the changes are more complex than the marginal totals of the table indicate. Table 1 shows that of the 179 patients that would have been referred to a PT, 133 (74 percent) were referred for physiotherapy treatment. In the other 46 of those 179 patients (26 percent) the initial referral decision for physiotherapy treatment was changed after the consultation. The initial management decision for referral to a medical specialist or to treat the patient by themselves was changed in 81 of 101 (80 percent) and 28 of 38 patients (74 percent), respectively. Overall, the intended treatment policy was changed in 50 percent (160 / 323) of the patients, resulting in a different referral pattern.

[TABLE 1]

Demographic and health status related characteristics

The patients' baseline demographic and health status related characteristics associated with utilization of physiotherapy compared with those treated by a PCP or medical specialist after a one time PT consultation are presented in Table 2. A study of the proportions in the demographic and health status related variables, for each treatment group, suggests differences between the three groups in 6 of the 12 measured variables: age, level of education, duration of the complaint, previous physiotherapy and affected joint or nerve tissue.

[TABLE 2]

Comparisons of proportions of patients being treated by PTs with those treated by the PCP or referred to a medical specialist suggests that patient profiles being treated by PTs and medical specialists are more alike.

Patients being treated by medical specialists differed in gender, health insurance, and affected nerve-tissue. Differences between groups of patients treated by PTs and those treated by PCPs were located in 8 out of 12 variables. Patients differed in age (mean=38.2 years [SD=15.4] compared with 30.1 years [SD=12.8]), and more patients treated by PTs had a low level of education, long-term conditions, psychosocial problems, and more often had received previous physiotherapy and medical diagnostic interventions for the same complaint in the past 12 months. The specific body parts / tissues indicating utilization of physiotherapy were problems of the joint(s) and muscle(s).

Impairments and disabilities

Differences in prevalences between groups in impairments and disabilities are reported in Table 3. Eighteen of the 36 impairments had a prevalence of ten percent or more and were included for further analysis. Overall analysis showed that there were significant differences in 7 of the 18 impairments between groups (right column of Table 3; $p < 0.05$).

[TABLE 3]

Patients treated by PTs compared with those treated by PCPs were different in 7 out of 18 impairments and in the mean number of impairments. Patients treated by PTs more frequently had pain following movement, impaired pain sensation, pain behaviour, decreased range of motion and muscle strength, impairments in body posture and joint position. The mean number (SD) of impairments in patients referred for physiotherapy treatment was 7.5 (SD=3.2) versus 5.3 (SD=2.6) of those treated by the PCPs ($p=0.001$). Patients treated by PTs compared with those treated by medical specialists were different in 2 of the 18 included impairments, namely tiredness and sensibility.

On the level of disabilities, 17 of the 27 disabilities had a prevalence of ten percent or more. The overall analysis showed that “disabilities in recreational activities” were significantly different between groups. Patients treated by a PT compared with those treated by a PCP more often had disabilities in complex skills: disabilities in domestic activities, in work related activities, and in recreational activities. There were no significant differences between groups in the elementary sensory motor disabilities and disabilities in locomotion (see Appendix).

Predicted and actual number of treatment sessions related to physical functioning

Table 4 shows that 27 percent of the patients (60 / 224) treated by a PT following a one-time PT consultation were treated in six treatment sessions or less, 53 percent of the patients (118 / 224) were treated in nine or less and 74 percent of the patients (165 / 224) were treated in 12 or less treatment sessions. In 17 percent (38 / 224) of the patients the PTs needed more than 18 sessions per treatment episode.

[TABLE 4]

These proportions were different when compared with data of the national reference database ($p=0.04$; $X^2=17.15$; $df=4$) of patients directly referred for physiotherapy treatment. The mean number of treatment sessions, including the one-time consultation was 11.3 (SD=6.7) and was significantly ($p=0.03$) lower when compared with the data of the national reference database (mean=13.0; SD=11.0). The average length of the treatment episode was 7.3 weeks (SD=6.4).

Table 5 compares the predicted number of treatment sessions with the actual number of treatment sessions. In two patients the PTs were not able to predict the number of treatment sessions needed because they found the condition of their patients very unstable or unpredictable; these two patients were excluded from the analysis ($n=222$ patients). The percentage of agreement within categories of six treatment sessions was 48 percent (106 / 222). In 29 percent of the cases (65 / 222) there was an

overestimation whereas in 23 percent of the cases (51 / 222) the expected number of treatment sessions was underestimated.

[TABLE 5]

Impairments and disabilities

Table 6 presents the outcome of physical functioning at the level of impairments and disabilities as measured by the PT and the patient's global assessment of the effect of physiotherapy treatment as experienced by the patient. The overall percentage of "substantial" or "complete" improvement in physical functioning was 84 percent on both the impairment and disability level. The patient-rated assessment of substantial or complete improvement of their health problem was 78 percent versus 69 percent when compared with the data of the national reference database (Van de Valk, Dekker, & Boschman, 1995). There were no differences in outcome on the level of physical functioning, patient's global assessment of effect, and mean number of treatments between subgroups of patients in which the intended referral for physiotherapy was changed ($n=93$) or not ($n=133$) after a one-time PT consultation.

[TABLE 6]

Physiotherapists' opinions on the process of a one-time consultation

Results from the questionnaire at the conclusion of the study indicated that 94 percent (50 / 53) of the PTs believed that the process of consultation could easily be incorporated into their daily practice. Nineteen percent (10 / 53) of the PTs indicated that it was sometimes difficult within the requested time period. The PTs were generally satisfied with the standard consultation request and report forms as allowing the PTs insight into the patient's health problem, the PCP's management policy, a clearly stated consultation request, and structured written communication. The average amount of time taken to complete the history and physical examination (including the research questions and use of standard forms) was 55 minutes (range =50-70 min). The time needed for writing the report was within a range of 10-30 minutes. All PTs indicated that a one-time PT consultation offered them an important communication tool for individually-tailored and joint patient care. PT consultation will also contribute to making both PCPs and PTs aware of the specific expertise and the scope of both professions and of the goals of physiotherapy treatment.

DISCUSSION

Health care

The issue of cost containment continues to dominate the debate regarding strategies for organizing and financing health care services (Joint Working Party of the Welsh Council of the Royal College of General Practitioners, 1994; American Board of Internal Medicine, 1994; Geijer et al, 1999). An issue of particular concern in this regard has been the increasing prevalence of disorders of the locomotor system, the continuing increase in help-seeking behaviour, and an increase in the consumption of primary care services (Centraal Bureau voor de Statistiek, 1998; Lubeck, 1995; Yelin & Callahan, 1995; Overman, Kent, Uslan, & Lewis, 1998).

A study of health care utilization in The Netherlands highlights the role of PCPs today as gatekeepers, controlling the distribution of resources to the various health care providers (selection-influence) (Geijer et al, 1999; Hendriks, 2000). Although the literature on the utilization of health services is extensive, the literature is scarce when focussed on utilization of physiotherapy services (Kerssens & Curfs, 1993; Yoshida & Allison, 1997; Mielenz et al, 1997; Roach et al, 1998; Freburger, 1999; Hendriks et al, in press a). The present observational study, validated against data of the national reference database for patients directly referred by PCPs for physiotherapy treatment (Van der Valk, Dekker, & Boschman, 1995; Dekker & van Baar, 1995) shows the influence of a one-time PT consultation on the utilization of physiotherapy services for a broad range of disorders of the locomotor system. The study included 352 patients referred for a one-time PT consultation by 53 PCPs during a 7-month enrollment period, with a follow-up of 224 patients being treated by PTs after the

consultation. Additional information on its use and influence on referral pattern is reported elsewhere (Hendriks et al, in press b).

Patient characteristics

One of the objectives of the study was to identify patient characteristics related to utilization of physiotherapy treatment. In our previous report we found that the patients who were referred for a one-time physiotherapy consultation were different for the patients in the national reference database of patients directly referred by PCPs for physiotherapy treatment (compared to the patients represented in the national reference database the group of patients selected by the PCPs for a one-time PT consultation had a greater percentage of patients below the age of 25, a lower percentage older than 65, and a greater percentage of patients with a high-level education).

Although not reported in this paper, the characteristics of patients referred for physiotherapy treatment following a one-time PT consultation were still different from those in the national reference database (Hendriks et al, in press b).

The findings of this study suggest that the probability of patients being treated by a PT was increased with low education, long-term complaints, psychosocial problems, previous physiotherapy treatment, and medical diagnostic testing for the same complaint in the past 12 months. Patients who had received physiotherapy previously were more likely to be treated by a PT than those who were not. One of the explanations for this may be that patients who had been previously treated by a PT were satisfied with their improvement or the recovery from their condition, and the care they had received. Furthermore, patients with a decrease in physical functioning, measured in terms and number of impairments and disabilities, and patients with a chronic condition (more than 13 weeks) were more likely to be treated by PTs than by the PCPs themselves. The findings also indicate that demographic and health status related characteristics are important predictors for the utilization of physical therapy services rather than the medical diagnosis alone.

These findings could have important implications when comparisons are made in the (functional) outcomes from different providers. Unequal baseline characteristics, measured in terms of impairments and disabilities in patients with the same medical diagnosis, could lead to inappropriate conclusions about the effectiveness of physiotherapy (Van der Windt et al, 1996; Mielenz et al, 1997; Hendriks et al, 2000b). In future studies, therefore, it is important to examine health status characteristics and their impact on distinct levels of functioning, rather than on the medical diagnosis.

Treatment sessions

On the one hand, the findings in this study lead to the conclusion that the more severe the health problem, the more likely the patient is to be referred for physiotherapy treatment. On the other hand, the more severe and / or the more chronic the condition of the patient, the worse the prognosis of early recovery and the more treatment sessions are required.

However, an increase in the number of sessions per treatment episode is an outcome measurement with cost implications. Knowledge of the expected number and determinants of the actual number of treatment sessions related to functional outcome is therefore extremely relevant for health care policy makers with regard to the maximum number of treatment sessions per episode of care. We should realise that a remuneration system, related to a further restricted number of sessions per treatment episode, may drastically affect the optimal achievable functional outcomes of physiotherapy treatment.

The mean number of treatment sessions in our study (11.3; SD=6.7) was one less than the mean number of treatment sessions (13.0; SD=11.0) for patients directly referred by PCPs for physiotherapy treatment, as catalogued in the national reference database (Van der Valk, Dekker, & Boschman, 1995; Dekker & van Baar, 1995), with better functional outcomes. According to the National Data Base almost 70 percent of the patients directly referred by PCPs for physiotherapy treatment improved substantially or completely (Van der Valk, Dekker, & Boschman, 1995). In our study 78 percent of the patients were improved substantially or completely as indicated by themselves, and even 84 percent of the patients were improved substantially or completely as rated by the PT on both impairment and disability levels. These figures suggest that indication setting for physiotherapy treatment by a PT, particularly in cases when the PCP is uncertain whether physiotherapy treatment would be beneficial for a specific patient, leads to more efficient care.

Functional status

The challenge for the physiotherapy profession is to optimize functional status for persons with a higher prevalence of physically, emotionally, and socially disabling musculoskeletal conditions within acceptable costs (Jette, 1994; Verbrugge & Jette, 1994; Johnston, 1996) and also to neutralize unexplained clinical variation between PTs and unnecessary heterogeneity in the processes used to care for patients. Current knowledge about psychosocial factors affecting health outcomes (Waddell, 1998; Hope & Forshaw, 1999; Linton & Halden, 1999) such as chronic pain behaviour, fear/avoidance beliefs, anxiety (Main & Watson, 1995; Vlaeyen, Kole-Snijders, Boeren, & Van Eek, 1995; Turk, 1997; Waddell, 1998), and psycho-educative strategies (Hopman-Rock, 1994; Turk, 1997) must be used when developing systems for more uniform musculoskeletal illness management. This requires continuous education of PTs in evidence-based treatment strategies (MacIntyre, McAulley, & Parker-Taillon, 1999; Turner & Whitfield, 1999; Hendriks et al, 2000a, 2000b), and stresses the importance of coping behaviour and methods of patient education to enhance adherence to treatment and to change negative behaviour patterns (Turk, 1997; Sluijs, Kerssens, & van der Zee, 1998; Waddell, 1998; Kerssens et al, 1999; Watson, 1999).

Study design

Although the results of this study are promising, this study has several of the usual limitations of a real world observational study. The first limitation of this study is that it was not designed as a randomized comparison. The availability of concurrent data from the national reference database strengthened the study's results by providing an opportunity for the comparison of utilization outcome data and solved part of the validity problem. Another limitation is that the functional outcome measures by themselves were crude, and greater detail is needed for a more profound understanding of physiotherapy service utilization. However, the functional outcome in terms of impairments and disabilities from the PTs' point of view, and the subjective recovery on a five-point scale, are indicative of reflecting the actual state from the patients' point of view. The study made use of PTs' self-reports on the effects on improvement rates. Self-report measures are known to be susceptible to bias (De Bie, 1998). However, we also used the patients' self-rated outcome on the perceived benefit of physiotherapy treatment. The (functional) outcome, measured by both the patient and PT, are of the same order. The results of the study are also limited by the fact that only the outcomes of physical therapy services were examined. The outcomes of treatment by other health professionals as well as the long-term results for patients treated by the PCP, a medical specialist, or a PT were not noted. For these reasons one should be cautious in the interpretation of the findings.

The multiple comparisons suggest statistically significant findings that may have occurred by chance alone. However, almost all statistical comparisons were in the same direction. Nevertheless, the results suggest that a one-time PT consultation increases communication with the PCP and leads to more appropriate referral for physiotherapy treatment, joint care, and satisfying functional outcomes. This is specifically true when we consider the heterogeneous group of patients with musculoskeletal disorders referred for a one-time PT consultation, in which the indication for physiotherapy treatment beforehand was not entirely clear to the PCP.

PT consultation can contribute to an integration of care disciplines but requires good communication skills to ensure good results. Successful implementation of a one-time PT consultation requires additional training of consultative skills and professional communication of both PTs and PCPs, and (evidencebased) guidelines for the procedure, communication forms, and treatment (Hendriks et al, 2000a), which is something that needs to be developed further by both professional organizations.

CONCLUSION

The results of the study suggest that when PCPs use the possibilities of a one-time PT consultation, better utilization of physiotherapy services can be reached. Patterns of utilization of physiotherapy services after a one-time consultation were related to a decrease in physical functioning and differences in demographic and health status related characteristics of the patient. Future studies should use more specific physiotherapy diagnostic categories, rather than the broad range of medical categories only, when studying the effectiveness and efficiency of physiotherapy treatment. Although

the results of this study may not be generalized, they provide a starting point for further research to optimise interdisciplinary collaboration (and communication) and utilization of physiotherapy services and to achieve optimal patient outcomes and thus the reduction of costs of health care.

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TABLES AND APPENDIX

Table 1

Comparison of the number of patients treated by family physicians/primary care physicians (PCP), medical specialists, (MS) or physiotherapists (PT) before (fictitious policy) and after (actual policy) a one-time physiotherapist consultation

		No. of Patients by Care Provider Before a One-time Physiotherapist Consultation				Total
		PCP	MS	PT	Other	
No. of patients by care provider after a one-time physiotherapist consultation	PCP	10	12	18	—	40
	MS	9	20	24	0	53*
	PT	19	67	133	5	224*
	Other	—	2	4	—	6
Total		38	101	179	5	323

*Significant difference in number of referrals before and after a one-time physiotherapist consultation (increase in number of patients treated by physiotherapists: $p = 0.019$ [Student's t-test]; decrease in number of patients treated by medical specialists: $p < 0.001$ [Student's t-test]).

Table 2
Comparison of demographic and health status related characteristics among the three groups (and pairwise) of patients: patients referred to and treated by physiotherapists, patients treated by primary care physicians and patients referred to medical specialists after a one-time physiotherapist consultation: percentage(%) (No.) unless otherwise stated

	Physiotherapist (n = 224)		Primary care Physician (n = 40)		Medical Specialist (n = 53)		Total (n = 317)		P-value ^d
	%	(No.)	%	(No.)	%	(No.)	%	(No.)	
Demographic data									
Gender (male)	46	(106)	33	(13)	57	(30)*	46	(147)	0.07
Mean (SD) age (yr)	38.2	(15.4)	30.1	(12.8) St	37.3	(15.8)	37.1	(16.9)	0.03 ^{An}
Insurance (private)	25	(57)	20	(8)	36	(19)*	27	(84)	0.18
Education									0.00
Low	46	(104)	23	(9)	43	(23)	43	(136)	
Middle	42	(94)	47	(19)	45	(24)	43	(137)	
High	12	(26)	30	(12)	11	(6)	14	(44)	
Employed (yes)	50	(113)	53	(21)	53	(28)	51	(162)	0.88
Marital status (single)	9	(20)	8	(3)	13	(7)	10	(30)	0.61
Health status related characteristics									
Duration complaint									0.00
<1 wk	3	(7)	15	(6)	8	(4)	5	(17)	
1 wk–12 wks	39	(87)	60	(24)	36	(19)	41	(130)	
13 wks–1 year	28	(63)	13	(5)	28	(15)	26	(83)	
>1 year	30	(67)	13	(5)	28	(15)	27	(87)	
Psychosocial problems	25	(56)	10	(4)*	25	(13)	23	(73)	0.14
Previous physiotherapy ^a	24	(54)	10	(4)*	11	(6)	20	(64)	0.05
Previous medical interventions ^a									
Diagnosis	42	(93)	25	(10)*	34	(18)	38	(121)	0.18
Therapy	22	(50)	19	(4)	25	(13)	21	(67)	0.19
Affected organ/tissue^b									
Bone	25	(56)	18	(7)	19	(10)	23	(73)	0.54
Joint	81	(181)	56	(23)*	71	(38)	76	(242)	0.01
Muscle	71	(154)	55	(22)*	70	(37)	69	(218)	0.21
Nerve	13	(29)	15	(6)	30	(16)*	16	(51)	0.00
Type of disorder in terms of ICPC^c									
Back (L02)	19	(43)	18	(7)	15	(8)	18	(58)	0.81
Knee (L15)	17	(39)	20	(8)	19	(10)	18	(57)	0.84
Shoulder (L08)	8	(18)	20	(4)	9	(5)	9	(27)	0.84
Neck (L04)	7	(16)	5	(2)	8	(4)	7	(22)	0.88

^a For the same complaint.

^b More than one option was possible.

^c International Classification of Primary Care (ICPC) (Lamberts & Wood, 1987).

^d P-values of differences using Chi-square test or Anova between the three treatment groups.

^{An} Anova.

St Student's t-test.

*Significant differences (pairwise comparison) using Chi-square Student's t-test between two groups: (1) patients referred to and treated by physiotherapists compared with those treated by primary care physicians, and (2) patients referred to and treated by physiotherapists compared with those referred to medical specialists ($p < 0.05$).

Table 3

Significant differences in prevalence of physical functioning in terms of impairments and disabilities among the three groups of patients: patients referred to and treated by physiotherapists, patients treated by primary care physicians and patients referred to medical specialists after a one-time physiotherapist consultation: (No.) unless otherwise stated

	Physio- therapist (n = 224)		Primary Care Physician (n = 40)		Medical specialist (n = 53)		Total (n = 317)		P-value ^b
	%	(No.)	%	(No.)	%	(No.)	%	(No.)	
Impairments ^a									
Pain during movement	80	(179)	60	(24)*	76	(40)	77	(243)	0.04
Pain sensation	36	(81)	23	(9)*	32	(17)	34	(107)	0.24
Pain behavior	34	(76)	18	(7)*	19	(10)	29	(93)	0.04
Decreased range of motion	63	(141)	35	(14)*	64	(34)	59	(189)	0.00
Muscle strength	42	(95)	15	(6)*	45	(24)	39	(125)	0.00
Body posture	44	(98)	23	(9)*	32	(17)	39	(124)	0.04
Joint position	38	(84)	20	(8)*	32	(17)	34	(109)	0.14
Sensibility	11	(25)	10	(4)	30	(16)*	14	(45)	0.00
Tiredness	15	(33)	10	(4)	28	(15)*	16	(52)	0.02
Mean number (SD) of impairments	7.5	(3.2)	5.3	(2.6) St	7.8	(3.8)	7.4	(3.3)	0.00 ^{An}
Disabilities in complex skills ^a									
In domestic activities	32	(72)	15	(6)*	34	(18)	30	(96)	0.09
Related to work	52	(117)	35	(14)*	47	(25)	49	(156)	0.21
Related to recreation	60	(134)	32	(13)*	55	(29)	55	(176)	0.01
Mean number (SD) of disabilities	5.7	(4.0)	4.6	(4.6)	5.8	(4.8)	5.7	(4.2)	0.38 ^{An}

^a In total 18 impairments and 17 disabilities were included based on a prevalence more than 10 percent. Items are listed on a standard registration form (Hendriks et al, 1997) based on the International Classification of Impairments, Disabilities, and Handicaps (ICIDH) (WHO, 1980, 1997) (see also Appendix).

^b P-values of differences using Chi-square test or Anova between treatment groups.

^{An} Anova.

St Student's t-test.

*Significant differences (pairwise comparison) using Chi-square or Student's t-test between two groups: (1) patients referred to and treated by physiotherapists compared with those treated by primary care physicians and (2) patients referred to and treated by physiotherapists compared with those referred to medical specialists ($p < 0.05$).

Table 4

Comparison in categories and mean number (SD) of treatment sessions of patients referred and treated by physiotherapists following a one-time physiotherapist consultation with patients directly referred by the PCP for physiotherapy treatment as listed in the national reference database

Treatment sessions*	No. of patients (%) referred to and treated by a physiotherapist following a one-time physiotherapist consultation (n = 224)		No. of patients (%) treated by a physiotherapist following direct referral for treatment (n = 17,201)	
	No. (%)	cum. (%)	No. (%)	cum. (%)
≤ 6	60 (27)	27	4,713 (27)	27
7-9	58 (26)	53	2,924 (17)	44
10-12	47 (21)	74	4,472 (26)	70
13-18	21 (9)	83	2,234 (13)	83
≥ 19	38 (17)	100	2,876 (17)	100
Mean (SD) [†]	11.3 (6.7)		13.0 (11.0)	

* $p = 0.04$ ($\chi^2 = 17.1$; $df = 4$).

[†] $p = 0.03$ (Student's t-test).

Table 5

Comparison of the expected and actual number of treatment sessions in four categories for patients referred to and treated by physiotherapists after a one-time physiotherapist consultation

		Actual number of treatment sessions				Total
		≤ 6	7–12	13–18	≥19	
Expected number of treatment session	≤ 6	29	20	1	0	50
	7–12	26	66	13	25	130
	13–18	3	17	5	6	31
	≥19	2	3	0	6	11
	Total	60	106	19	37	222*

*Two patients were excluded because the physiotherapists found their condition very unstable or unpredictable.

Table 6

Outcome measures and differences among subgroups* of patients treated by a physiotherapist

Outcome	Percentage (and No.) of patients with complete recovery or substantial improvement	Chi-square or Student's t-test St (p-value)
Physiotherapist		
Impairment level		
All patients referred for physiotherapy (<i>n</i> = 224)	84 (188)	0.81
Referral for physiotherapy not changed (<i>n</i> = 133)	86 (111)	
Referral for physiotherapy changed (<i>n</i> = 91)	81 (74)	
Disability level		
All patients referred for physiotherapy (<i>n</i> = 224)	84 (188)	0.071
Referral for physiotherapy not changed (<i>n</i> = 133)	88 (117)	
Referral for physiotherapy changed (<i>n</i> = 91)	78 (71)	
Patient		
Global perceived effect		
All patients referred for physiotherapy (<i>n</i> = 224)	78 (174)	0.55
Referral for physiotherapy not changed (<i>n</i> = 133)	76 (101)	
Referral for physiotherapy changed (<i>n</i> = 91)	80 (73)	
Mean number (<i>SD</i>) of treatment sessions		
All patients referred for physiotherapy (<i>n</i> = 224)	11.6 (7.8)	0.09
Referral for physiotherapy not changed (<i>n</i> = 133)	11.3 (7.1)	
Referral for physiotherapy changed (<i>n</i> = 91)	12.2 (8.3)	

*Subgroups of patients being treated by a physiotherapist in which the intended referral for physiotherapy treatment was changed (*n* = 91) or not (*n* = 133) following a one-time consultation.

Appendix: List of included impairments and disabilities in the study

Impairments	Disabilities
1. pain	Disabilities in sensory motor skills
2. pain following movement	1. maintaining postures
3. pain during movement	2. changing postures
4. pain at rest	3. carrying
5. pain during static stress	4. lifting
6. pain sensation	5. picking up
7. pain behavior	6. pulling
8. decreased range of motion	7. pushing
9. increased range of motion	8. reaching
10. impairment in gait	9. moving objects
11. decreased active stability	10. handling objects
12. decreased passive stability	11. grasping
13. impairment in coordination	12. squatting
14. increased resting tone	13. kneeling
15. decreased resting tone	14. bending over
16. impairment in proprioception	15. crawling
17. impairment in kinesthesia	16. other
18. impairment in muscle strength	
19. trophic impairment	Disabilities in locomotion
20. impairment in body posture	17. walking
21. impairment in joint position	18. climbing stairs
22. impairment in pliability of skin	19. cycling
23. impairment in sensibility	20. other
24. impairment in circulation	
25. edema	Disabilities in complex skills
26. impairment in mucusproduction/transport	21. personal care
27. impairment in respiration	22. domestic activities
28. impairment in respiratory movement	23. related to work
29. impairment in continence	24. related to recreation
30. intellectual and psychological impairments	25. psychosocial skills
31. eye and visual impairments	26. communication
32. ear and hearing impairments	27. other
34. dizziness	
35. tiredness	
36. other impairments	

Source: Hendriks et al, 1997.