Continuing Professional Development Is Associated With Increasing Physical Therapists' Roles in Arthritis Management in Canada and the Netherlands

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Background and Objective. This study explored the relationships among the roles assumed by physical therapists in arthritis care and their previous participation in arthritis courses for continuing professional development (CPD).

Design. A cross-sectional mail survey was conducted.

Method. A total of 600 Canadian physical therapists and 461 Dutch physical therapists practicing in orthopedics were randomly selected to participate in a mail survey. The questionnaire covered areas related to their clinical practice, previous participation in arthritis-related CPD courses, and roles in the management of osteoarthritis (OA) and rheumatoid arthritis (RA). Poisson regression was used to explore the associations between physical therapists' participation in arthritis-related CPD courses and the number of roles they assumed in OA and RA care, after adjusting for personal characteristics, arthritis caseload, and country of practice.

Results. The survey response rates were 47.7% in Canada and 50.5% in the Netherlands. A total of 424 participants (Canada=224, the Netherlands=200) had treated patients with OA in the previous month, and 259 participants (Canada=68, Netherlands=191) had treated patients with RA in the previous month. The most common roles reported by participants were providing traditional physical therapy interventions and providing postsurgical care. Arthritis-related CPD courses significantly increased (ie, multiplied) the expected number of roles assumed by physical therapists by a factor of 1.32 (95% confidence interval=1.11, 1.56) in OA management and 1.69 (95% confidence interval=1.34, 2.13) in RA management.

Limitations. Physical therapists' roles in arthritis management were obtained through self-reporting, which might differ from their actual clinical practice.

Conclusions. This exploratory analysis highlights the association between participation in arthritis-related CPD courses and the roles assumed by physical therapists in OA and RA management. Further research is needed to understand the effects of CPD activities on other areas of physical therapist practice and on patients' outcomes.

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Arthritis is the most common cause of severe, chronic pain and disability.[1,2] From the patient's perspective, the most important goals of arthritis care are to control pain,[3–5] to limit functional debility, and to maintain a normal life.[6] In 2005, 21.4 million Americans aged 65 years and over reported having arthritis or chronic joint symptoms, and this number is expected to double by 2030.[7] In Canada, the estimated prevalence of arthritis in individuals aged 15 years or older was 16% in 2000,[2] and it was projected to increase by almost 1% every 5 years.[2,8] A similar trend has been observed in Europe.[9–11] However, despite the increasing demands for arthritis care, there is a shortage of arthritis specialists in some countries. For example, the Canadian Rheumatology Association recommended 1 rheumatologist per 70,000 Canadians,[12] meaning that there should be about 480 rheumatologists in Canada. However, there are only 353 rheumatologists, with most of them practicing in urban regions.[13]

To address the gap in the demand and supply in arthritis care, new health services models have been developed that involve expanding the roles of rehabilitation professionals.[14,15] Physical therapists are in a unique position to expand their roles in arthritis care because of their knowledge of the musculoskeletal system and their skills in assessing and managing orthopedic conditions. For example, physical therapists in the United Kingdom may receive on-the-job training from medical specialists so they can work as consultants to triage primary care referrals to rheumatology and orthopedic clinics.[16–18] In Canada, physical therapists may work as primary therapists who function as case managers and multiskilled health care providers (ie, the therapist may provide physical therapy and occupational therapy interventions).[19–22] Some physical therapists have begun to work in advanced practice roles, which may involve conducting comprehensive assessments, ordering investigative tests, and monitoring medications under medical directives.[15,23]

To enhance physical therapists' knowledge of and skills in arthritis management, a number of continuing professional development (CPD) programs have been developed. In Canada, The Arthritis Society (TAS) and the Mary Pack Arthritis Program provide standardized workshops for physical therapists who work with patients with arthritis and other orthopedic conditions. The TAS program is a 1-week course that focuses on the assessment of inflammatory arthritis.[19,20] The Arthritis Continuing Education (ACE) Program, offered by the Mary Pack Arthritis Program in the province of British Columbia,[24] is a 3-day course that focuses on the management of inflammatory arthritis and osteoarthritis (OA). Both programs are taught by rheumatologists and experienced rehabilitation professionals. For physical therapists who want to work in advanced practice roles in rheumatology, extensive training programs, such as the Advanced Clinician Practitioner in Arthritis Care Program offered by St. Michael's Hospital[25] in the province of Ontario, are available.[26,27] This 10-month program is taught by rheumatologists and requires a significant commitment of resources from the physical therapists and their employers (eg, time off for the therapist to attend courses and internships). To our knowledge, fewer than 1% of physical therapists practicing in orthopedics and rheumatology have completed this type of advanced program in Canada.[26]

A number of European countries also have developed rheumatology CPD programs for physical therapists, although the organization and availability of these programs vary across countries. In the Netherlands, physical therapists practicing in rheumatology may complete a 10-day course on arthritis management provided by the Dutch Institute of Allied Health Care.[28] The training provided by this private organization is accredited by the Royal Dutch Society for Physical Therapy,[29] the Dutch professional association for physical therapists. Postprofessional (post–entry-level) training in the physical therapy management of rheumatic diseases at the master's level also is available at one Dutch university of applied sciences. This clinical master's level program is accredited by the Nederlands-Vlaamse Accreditatieorganisatie,[30] the accreditation organization of the Netherlands and Flanders.

A few studies have demonstrated benefits to patients treated by physical therapists who have successfully completed arthritis CPD training. In a randomized controlled trial (RCT), Bell et al[31] found short-term improvement in morning stiffness, self-efficacy, and disease knowledge in patients who received treatment for rheumatoid arthritis (RA) from a TAS-trained physical therapist compared with patients on a waiting list. A more recent RCT showed that patients with RA treated by a TAS-trained primary therapist were more likely than those treated by a physical therapist or an occupational therapist with no TAS training to achieve a 20% or greater improvement in at least 2 of the following measures: pain, physical function, and knowl-

edge.[14] Primary therapists were physical therapists and occupational therapists who functioned as multiskilled workers (ie, the therapist assumed more roles to provide both physical therapy and occupational therapy treatments and case management).[21,22] Primary therapists with a physical therapy background might use their occupational therapist colleagues in a consultative fashion rather than transferring the case to another rehabilitation discipline for completion of the treatment.[21,22] This model of care also has been used in pediatric rehabilitation.[32] Li et al[33] showed that the TAS-trained primary therapist provided a cost-effective alternative to traditional rehabilitation treatment.

Developing CPD activities such as arthritis training programs requires a substantial investment of resources. However, it remains unclear whether CPD activities have contributed directly to physical therapists assuming more roles in the management of arthritis. To address this knowledge gap, the primary objective of this study was to conduct an exploratory analysis to assess the relationship between the average number of roles assumed by physical therapists in arthritis care and their previous participation in arthritis CPD courses. We hypothesized that participation in CPD activities was a significant predictor of physical therapists assuming a larger number of roles in the management of OA and RA, after accounting for the country of practice, personal characteristics, and arthritis caseload. Our secondary objective was to explore the associations between previous participation in arthritis courses and specific OA and RA roles.

Method

The survey instrument was originally developed for the Canadian Physiotherapist Arthritis Care Survey[34] and was subsequently translated and adapted for physical therapists in the Netherlands. Details of the survey administration in Canada are described elsewhere.[34] Briefly, however, individuals were eligible if they were licensed by one of the provincial regulatory colleges to practice physical therapy and were practicing in orthopedics in Canada. Of the 10 regulatory colleges of the physical therapy profession, 9 agreed to participate and subsequently provided assistance to identify eligible physical therapists (n=6,994). The college in the province of British Columbia declined to participate due to its internal policy. A computer-generated table of random numbers was used to randomly select 600 physical therapists to receive the questionnaire. Individuals received their survey package in March 2007. Names and addresses of eligible physical therapists were obtained from 8 of the regulatory colleges. One regulatory college (College of Physical Therapists of Alberta) provided a list of computer-generated identification numbers of all eligible physical therapists for randomization due to their confidentiality policy. We then provided the survey packages and reminder letters for the Alberta regulatory college to mail to the selected participants.

The questionnaire also was sent to 2 groups of physical therapists in the Netherlands in April 2007: (1) all 211 physical therapists who were members of 1 of 10 regional arthritis networks (referred to as "physical therapists in arthritis care"); eligibility for membership varies across networks, with some networks requiring their members to complete arthritis CPD courses; and (2) 250 physical therapists who were randomly selected from the remaining 20,367 registrants of the Royal Dutch Society for Physical Therapy (referred to as "registered physical therapists"). Thus, a total of 461 Dutch physical therapists received the questionnaire.

The full questionnaire covered 4 areas related to clinical practice, knowledge, and attitude toward physical therapists' roles in rheumatology: (1) current practice and roles in assessment and treatment; (2) therapists' confidence in arthritis management; (3) content of rheumatology training; and (4) general opinions on certification, specialization, and extended scope of practice. We defined *certification* as a "program and process where a learner completes prescribed training and passes an assessment with a minimum acceptable score." The World Confederation for Physical Therapy defined *physical therapist specialization* as "the application of advanced clinical competence by a physiotherapist qualified in a defined area of practice within the field of activity recognised as physiotherapy."[35] For *extended scope practitioners*, we used the definition provided by The Chartered Society of Physiotherapy (United Kingdom), which describes these physical therapists as those "who are working beyond the recognized scope of practice of the profession of interest in innovative or non-traditional roles."[36] These roles may include "requesting investigations (eg, blood tests, scans, nerve conduction studies); using the results of investigations to assist clinical diagnosis and appropriate management of patients; and listing for surgery and referring to other medical and paramedical professionals."[36] Because advanced practice roles for physical therapists have not been legislated in Canada and the Netherlands, physical therapists require facility-specific medical directives to provide treatment that is outside the traditional scope of practice. Examples of medical directives may include physical therapists ordering radiography or laboratory tests on behalf of physicians in the same facility under specific terms and conditions.[37]

For the current study, we asked each participant: "Did you take any course(s)/workshop(s) in arthritis assessment and/or management after your entry-level training?" In addition, those who indicated that they had seen patients with OA or RA in the previous month were asked whether they assumed the following roles (Appendix 1):

1. Providing assessment and treatment traditionally provided by a physical therapist.
2. Providing assessment and treatment traditionally provided by other rehabilitation disciplines (eg, occupational therapy interventions).
3. Providing assessment and treatment outside the scope of physical therapist practice (eg, ordering investigative tests, providing injections).
4. Screening patients for physicians.
5. Providing public education.
6. Providing consultation together with another health care professional.
7. Referring patients to medical professionals.
8. Referring patients to other rheumatology rehabilitation professionals.
9. Providing presurgical care.
10. Providing postsurgical services.

The items were selected based on consensus of the Canadian research team (consisting of 3 rheumatology researchers, 1 physical therapy educator, 1 rheumatology physical therapist, and 1 rheumatologist[34]) and then were verified by the Dutch research team (consisting of 2 rehabilitation researchers and 1 rheumatologist/health services researcher[38]). We believed that these items represented major roles assumed by physical therapists in managing OA and RA in Canada and the Netherlands. This assumption was confirmed by a subsequent systematic review of models of RA care, in which roles of physical therapists, nurses, and other health care professionals were examined.[39] The 10 items were presented in the questionnaire without further explanation (Appendix 1).

The questionnaire was originally developed in English and was pretested for face and content validity with physical therapists working in orthopedics (n=8) or rheumatology (n=6). The content subsequently was revised and reviewed by the same volunteers before it was used for the survey. It then was translated into French for physical therapists in the province of Quebec, Canada, and into Dutch for physical therapists in the Netherlands. A rigorous process of forward-backward translation was used to ensure accuracy (details described elsewhere[34]).

Both the Canadian and Dutch surveys used the modified Dillman technique[40,41] in order to elicit the fullest participation. For the first mailing, a letter explaining the intent of the study was included with the survey questionnaire. Three weeks later, a reminder postcard was sent to nonrespondents. Second and third reminder letters and another copy of the survey questionnaire were sent to the remaining nonrespondents 6 weeks and 8 weeks after the initial mailing.

The Canadian survey was approved by the University of British Columbia Behavioural Research Ethics Board (application number: B06-0719). The Dutch survey received ethics approval from the medical ethics committee of the Leiden University Medical Center (application number: 06-097).

Statistical Analysis

Only participants who indicated that they saw at least one patient with OA in the previous month were included in the OA role analysis, and a similar criterion was applied for the RA role analysis. Participant characteristics were assessed using frequencies, or means and standard deviations, depending on the measure. For the primary objective, we assessed the association between the expected (ie, average) number of roles (minimum=0, maximum=7) assumed by physical therapists and their participation in arthritis CPD courses using Poisson regression. Only roles 4 to 10, which involved screening patients, providing referral, consultation and public education, and surgical care, were included in the analysis. Roles 1 to 3 were excluded from the model because they could be perceived as including a wide range of activities, including those that were already covered by roles 4 to 10. For example, "providing assessment and treatment traditionally provided by a physical therapist" might include providing public education (role 5), providing consultation with another health care professional (role 6), and providing presurgical and postsurgical care (roles 9 and 10).

Osteoarthritis and RA were modeled separately. The Poisson regression model was selected over a linear regression model because of the poor fit of data, especially for RA, in linear regression models. Furthermore, it was selected over binomial models because, in a separate analysis, the Poisson model yielded a lower Akaike's Information Criterion value, indicating that it was a better fit.

Analyses were adjusted for baseline covariates, including sex, age (≥35 years versus <35 years), number of

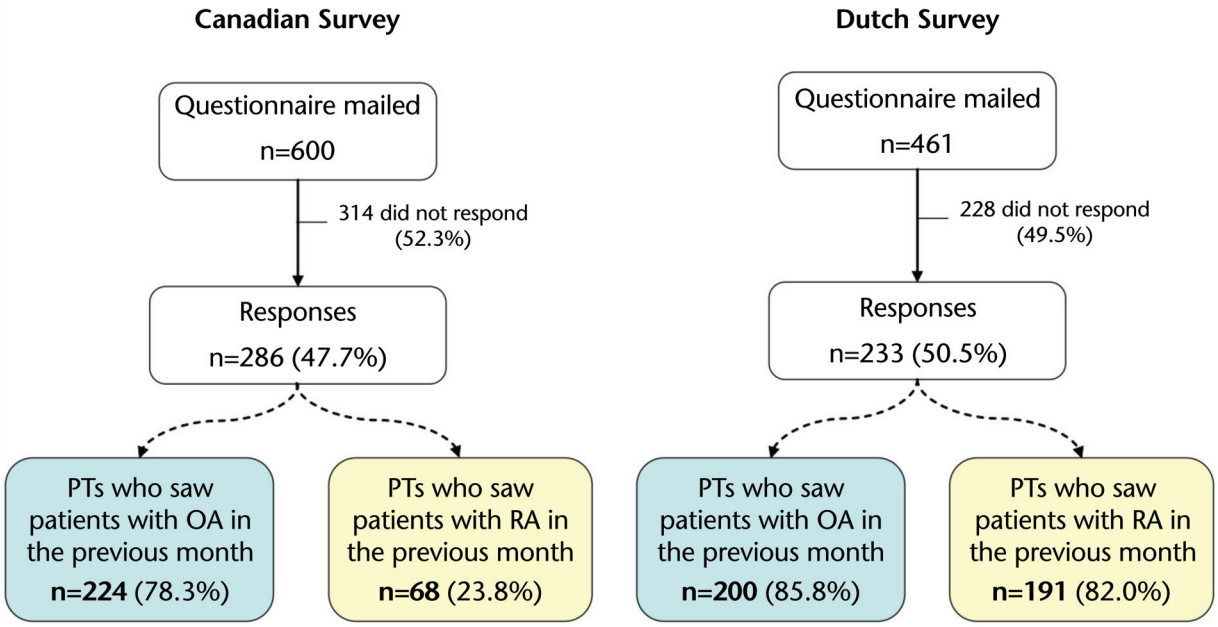

Figure.
Survey sampling results. Physical therapists (PTs) might see only patients with osteoarthritis (OA), only patients with rheumatoid arthritis (RA), or both in the previous month.

years since graduation from entry-level training (≤10 [eg, recent graduates] versus >10), arthritis caseload (>40% versus ≤40% of patients with OA or RA), and country (Canada versus the Netherlands). The categories were selected based on the categories used in the survey (Appendix 2). We allowed for a possible interaction between participation in arthritis CPD courses and country. We assessed model fit by examining the deviance residual plots and the scaled deviance. Poisson regression coefficients represent effects on log expected role count. If coefficient β represents the effect on log expected role count per unit increase in variable x, then a δ_x change in x additively increases log expected role count by $\beta\delta_x$, or equivalently multiplies the expected role count by exp ($\beta\delta_x$) (ie, the expected role count multiplier). The level of statistical significance was set at $P \leq .05$.

For the secondary objective, we fit logistic regression models to predict each of the 10 roles assumed by physical therapists in OA and RA management, respectively. These models contained the same explanatory variables as the Poisson regression models. The adjusted odds ratio (OR) and 95% confidence interval (CI) were calculated to determine the magnitude of association between previous participation in CPD courses and each specific role.

Results

The Canadian survey received 286 completed questionnaires (response rate=47.7%). Forty-seven survey packages (7.8%) were returned by the post office. The Dutch survey received 233 replies (overall response rate=50.5%; physical therapists in arthritis care: 112/211, response rate=53.1%; registered physical therapists: 121/250, response rate=48.4%). Four survey packages for the physical therapists in arthritis care (1.9%) and 9 survey packages for the registered physical therapists (3.6%) were returned by the post office. Among the responders, 424 physical therapists (Canada=224; the Netherlands: physical therapists in arthritis care=99, registered physical therapists=101) had seen patients with OA in the previous month, and 259 physical therapists (Canada=68; the Netherlands: physical therapists in arthritis care=101, registered physical therapists=90) had seen patients with RA in the previous month (Figure).

Participants' demographic and practice characteristics are summarized in Table 1. Of those who had seen patients with OA or RA in the previous month, a higher proportion of the Dutch physical therapists in arthritis care (treated patients with OA=63.6%; treated patients with RA=63.4%) had completed at least one arthritis CPD course compared with the Dutch registered physical therapists (treated patients with OA=24.8%; treated patients with RA= 26.7%) or the Canadian physical therapists (treated patients with OA=25.9%; treated patients with RA=32.4%).

Table 1.
Demographic and Practice Characteristics[a]

Variable	Physical Therapists Who Saw Patients With OA, n (%)			Physical Therapists Who Saw Patients With RA, n (%)		
	Canada	The Netherlands		Canada	The Netherlands	
	Physical Therapists in Orthopedic Care (n=224)	Physical Therapists in Arthritis Care (n=99)	Physical Therapists in All Areas of Practice (n=101)	Physical Therapists in Orthopedic Care (n=68)	Physical Therapists in Arthritis Care (n=101)	Physical Therapists in All Areas of Practice (n=90)
Sex						
Female	157 (70.1)	56 (56.6)	49 (48.5)	50 (73.5)	57 (56.4)	44 (48.9)
Male	67 (29.9)	42 (42.4)	50 (49.5)	18 (26.5)	43 (42.6)	45 (50.0)
Not stated	0 (0.0)	1 (1.0)	2 (2.0)	0 (0.0)	1 (1.0)	1 (1.1)
Age (y)						
20–34	78 (34.8)	21 (21.2)	30 (29.7)	31 (45.6)	21 (20.8)	23 (25.6)
35–49	105 (46.9)	37 (37.4)	41 (40.6)	25 (36.7)	36 (35.6)	37 (41.1)
50–64	38 (17.0)	40 (40.4)	28 (27.7)	11 (16.2)	43 (42.6)	29 (32.2)
65+	3 (1.3)	0 (0.0)	0 (0.0)	1 (1.5)	0 (0.0)	0 (0.0)
Not stated	0 (0.0)	1 (1.0)	2 (2.0)	0 (0.0)	1 (1.0)	1 (1.1)
≤10 y since graduation from entry-level physical therapy training	83 (37.1)	23 (23.2)	28 (27.7)	28 (41.2)	23 (22.8)	23 (25.6)
OA or RA caseload higher than 40% in a typical week	67 (29.9)	16 (16.2)	12 (11.9)	26 (38.2)	16 (15.8)	10 (11.1)
Completed 1 or more post entry-level courses on arthritis	58 (25.9)	63 (63.6)	25 (24.8)	22 (32.4)	64 (63.4)	24 (26.7)

[a] OA=osteoarthritis, RA=rheumatoid arthritis.

The most common roles reported by participants were to provide traditional physical therapy assessment and treatment and postsurgical management (Tab. 2). Interestingly, 4% of the Canadian physical therapists and 1.5% of the Dutch physical therapists performed tasks outside the scope of physical therapist practice when treating patients with OA. The same was reported by almost 6% of the Canadian physical therapists and 0.5% of the Dutch physical therapists who saw patients with RA. The majority of physical therapists reported assuming ≤2 roles when they treated patients with OA or RA (Tab. 3).

Poisson regression models demonstrated adequate fit, with deviance residuals free of patterns against the explanatory variables. Table 4 lists the Poisson regression coefficients and expected role count multipliers. For both the OA and RA models, the interaction term between participation in CPD courses and country was not statistically significant (OA: $P=.72$; RA: $P=.49$); therefore, we dropped the terms in the models. For the OA model, arthritis CPD courses significantly increased (ie, multiplied) the expected number of roles by a factor of 1.32 (95% CI=1.11, 1.56) after adjusting for country, personal characteristics, and arthritis caseload. Of the remaining variables, country was a significant predictor, with the Dutch physical therapists showing a lower expected role count compared with those from Canada by a factor of 0.81 (95% CI=0.68, 0.97) after adjusting for covariates. For the RA model, CPD courses significantly increased the expected number of roles by a factor of 1.69 (95% CI=1.34, 2.13). None of the remaining variables emerged as significant predictors.

Table 5 contains the results of logistic regression of arthritis CPD courses on the odds of assuming individual roles after adjusting for the same variables as the role count models. We dropped the nonsignificant interaction in the analyses ($P=.11$–$.99$). For the management of OA, physical therapists who completed arthritis CPD courses were more likely to refer patients to other rheumatology rehabilitation profes-

Table 2.
Roles in Managing Osteoarthritis and Rheumatoid Arthritis in the Previous Month Reported by Physical Therapists[a]

Role	Physical Therapists Who Saw Patients With OA, n (%)			Physical Therapists Who Saw Patients With RA, n (%)		
	Canada	The Netherlands		Canada	The Netherlands	
	Physical Therapists in Orthopedic Care (n=224)	Physical Therapists in Arthritis Care (n=99)	Physical Therapists in All Areas of Practice (n=101)	Physical Therapists in Orthopedic Care (n=68)	Physical Therapists in Arthritis Care (n=101)	Physical Therapists in All Areas of Practice (n=90)
Providing assessment and treatment traditionally provided by a physical therapist	217 (96.9)	83 (83.8)	78 (77.2)	64 (94.1)	85 (84.2)	56 (62.2)
Providing assessment and treatment traditionally provided by other rehabilitation disciplines	37 (16.5)	6 (6.1)	5 (5.0)	17 (25.0)	12 (11.9)	1 (1.1)
Providing assessment and treatment that are outside the scope of physical therapist practice	9 (4.0)	1 (1.0)	2 (2.0)	4 (5.9)	1 (1.0)	0 (0.0)
Screening patients for physicians	9 (4.0)	13 (13.1)	14 (13.9)	5 (7.4)	20 (19.8)	11 (12.2)
Providing public education	32 (14.3)	12 (12.1)	7 (6.9)	11 (16.2)	14 (13.9)	6 (6.7)
Providing consultation together with another health care professional	49 (21.9)	22 (22.2)	14 (13.9)	17 (25.0)	28 (27.7)	12 (13.3)
Referring patients to medical professionals	83 (37.1)	18 (18.2)	10 (9.9)	23 (33.8)	41 (40.6)	23 (25.6)
Referring patients to other rheumatology rehabilitation professionals	15 (6.7)	9 (9.1)	2 (2.0)	10 (14.7)	19 (18.8)	11 (12.2)
Providing presurgical care	62 (27.7)	39 (39.4)	31 (30.7)	11 (16.2)	33 (32.7)	17 (18.9)
Providing postsurgical services	155 (69.2)	59 (59.6)	57 (56.4)	25 (36.8)	53 (52.5)	23 (25.6)

[a] OA=osteoarthritis, RA=rheumatoid arthritis.

sionals (OR=8.45; 95% CI=2.93, 24.42) and provide presurgical care (OR=2.03; 95% CI=1.25, 3.29) compared with those who had not completed a course. For the management of RA, physical therapists who completed arthritis courses were more likely to refer patients to other rheumatology rehabilitation professionals (OR=4.64; 95% CI=1.91, 11.28), provide presurgical care (OR=3.98; 95% CI=1.91, 8.30), provide public education (OR=2.95; 95% CI=1.09, 7.96), provide traditional physical therapy treatment and assessment (OR=2.24; 95% CI=1.05, 4.78), and provide postsurgical care (OR=2.12; 95% CI=1.15, 3.89) compared with those who had not completed a course. The model for "providing assessment and treatments outside the scope of physical therapist practice" did not converge due to a sparse distribution, especially in the Dutch data (Tab. 2); therefore, logistic regression was not conducted.

Discussion

This bi-nation study provides novel data for understanding the value of arthritis CPD courses and the roles of physical therapists in the management of OA and RA. Our analysis supports the hypothesis that participation in arthritis CPD activities is associated with a higher average number of roles assumed by physical therapists. In a systematic review, Davis et al[42] concluded that interactive and mixed didactic/interactive

Table 3.
Distribution of the Total Number of Roles[a] Assumed by Physical Therapists Who Saw Patients With Osteoarthritis or Rheumatoid Arthritis in the Previous Month[b]

No. of Roles Assumed by Physical Therapists	Physical Therapists Who Saw Patients With OA, n (%)			Physical Therapists Who Saw Patients With RA, n (%)		
	Canada	The Netherlands		Canada	The Netherlands	
	Physical Therapists in Orthopedic Care (n=224)	Physical Therapists in Arthritis Care (n=99)	Physical Therapists in All Areas of Practice (n=101)	Physical Therapists in Orthopedic Care (n=68)	Physical Therapists in Arthritis Care (n=101)	Physical Therapists in All Areas of Practice (n=90)
0	32 (14.3)	26 (26.3)	35 (34.7)	20 (29.4)	29 (28.7)	49 (54.4)
1	73 (32.6)	22 (22.2)	22 (21.8)	23 (33.8)	22 (21.8)	11 (12.2)
2	59 (26.3)	26 (26.3)	27 (26.7)	11 (16.2)	16 (15.8)	11 (12.2)
3	35 (15.6)	10 (10.1)	10 (9.9)	5 (7.4)	8 (7.9)	9 (10.0)
4	17 (7.6)	10 (10.1)	6 (5.9)	5 (7.4)	9 (8.9)	9 (10.0)
5	7 (3.1)	3 (3.0)	1 (1.0)	3 (4.4)	9 (8.9)	1 (1.1)
6	1 (0.5)	1 (1.0)	0 (0.0)	0 (0.0)	7 (6.9)	0 (0.0)
7	0 (0.0)	1 (1.0)	0 (0.0)	1 (1.4)	1 (1.0)	0 (0.0)

[a] Roles included in the analysis: screening patients for physicians, providing public education, providing consultation together with another health care professional, referring patients to medical professionals, referring patients to other rheumatology rehabilitation professionals, providing presurgical care, and providing postsurgical services.
[b] OA=osteoarthritis, RA=rheumatoid arthritis.

continuing education sessions significantly improved health professional practice. Our findings provide further evidence that CPD activities may enhance physical therapists' roles in arthritis care. It should be noted that CPD activities are different from guideline implementation interventions. The former are usually initiated by the learner, with the main goal of maintaining competencies and improving clinical performance.[43] Guideline implementation interventions, however, have been described as the "change agent in the health care system,"[43(p6)] with the main goal of closing gaps in care based on the best evidence. One example of guideline implementation intervention is the use of a social marketing campaign to change health care professionals' beliefs and practices in acute low back pain management.[44-46] In this context, the health care professional is only one component within a mix of factors, including his or her interaction with patients and peers, organizational support, availability of health care system resources, and health policy.[43] This complexity may explain why CPD courses, which focus mainly on the clinician's knowledge

Table 4.
Poisson Regression Coefficients and Expected Physical Therapy Role Count Multipliers With 95% Confidence Intervals[a]

Variable	OA Role Count Model		RA Role Count Model	
	Coefficient (95% CI)	Multiplier (95% CI)	Coefficient (95% CI)	Multiplier (95% CI)
Completed post−entry-level arthritis course	0.27 (0.10, 0.44)	1.32[b] (1.11, 1.56)	0.53 (0.29, 0.76)	1.69 (1.34, 2.13)
The Netherlands (vs Canada)	−0.21 (−0.38, −0.03)	0.81 (0.68, 0.97)	−0.10 (−0.36, 0.17)	0.91 (0.70, 1.19)
Female	0.00 (−0.17, 0.16)	1.00 (0.84, 1.18)	−0.01 (−0.25, 0.22)	0.99 (0.78, 1.25)
Age ≥35 y	−0.04 (−0.38, 0.29)	0.96 (0.68, 1.34)	0.35 (−0.38, 1.08)	1.42 (0.69, 2.94)
Recent entry-level graduate (≤10 y)	0.03 (−0.30, 0.36)	1.03 (0.74, 1.43)	0.19 (−0.53, 0.91)	1.21 (0.59, 2.49)
High arthritis caseload (>40%)	0.17 (−0.01, 0.34)	1.18 (0.99, 1.41)	0.21 (−0.05, 0.47)	1.23 (0.95, 1.60)

[a] OA=osteoarthritis, RA=rheumatoid arthritis, CI=confidence interval.
[b] The model suggests that physical therapists who have completed at least one post–entry-level arthritis course assume 1.32 times more OA roles than those who have not completed any post–entry-level arthritis courses, after accounting for country, sex, age, years after graduation, and arthritis caseload.

Table 5.
Odds Ratios of Completing Arthritis Continuing Professional Development Courses for Predicting Physical Therapists' Roles in Managing Osteoarthritis and Rheumatoid Arthritis[a]

Role	OR (95% CI) Predicting OA Role	OR (95% CI) Predicting RA Role
Providing assessment and treatment traditionally provided by a physical therapist	1.80 (0.82, 3.98)	2.24 (1.05, 4.78)
Providing assessment and treatment traditionally provided by other rehabilitation disciplines	1.24 (0.60, 2.57)	0.62 (0.22, 1.75)
Providing assessment and treatment that are outside the scope of physical therapist practice	0.37 (0.04, 3.24)	DNC
Screening patients for physicians	1.02 (0.44, 2.32)	1.49 (0.61, 3.66)
Providing public education	1.31 (0.65, 2.63)	2.95 (1.09, 7.96)
Providing consultation together with another health professional	1.26 (0.72, 2.18)	1.12 (0.56, 2.24)
Referring patients to medical professionals	1.72 (0.99, 2.98)	1.38 (0.74, 2.56)
Referring patients to other rheumatology rehabilitation professionals	8.45 (2.93, 24.42)	4.64 (1.91, 11.28)
Providing presurgical care	2.03 (1.25, 3.29)	3.98 (1.91, 8.30)
Providing postsurgical services	1.17 (0.73, 1.89)	2.12 (1.15, 3.89)

[a] Odds ratios were adjusted for country, sex, age, recent entry-level graduate, and arthritis caseload. OR=odds ratio, OA=osteoarthritis, RA=rheumatoid arthritis, DNC=did not converge.

and skills, contribute limited benefits in changing clinical practice and patient outcomes when used as a tool for guideline implementation,[47,48] but are associated with a larger number of roles assumed by physical therapists in the management of arthritis, as indicated in our findings.

Our results also highlight a few trends regarding physical therapists' roles in the management of OA and RA. First, although the vast majority of participants continued to provide traditional physical therapy treatments, a small proportion of physical therapists reported providing treatments that were outside the traditional scope of practice. This finding may reflect physical therapists' growing interests in advanced practice roles[26] and the increasing support of clinical facilities for physical therapists to work in these roles.[15,23,37,49]

Second, our results showed that participation in CPD was associated with physical therapists' referring patients to other rheumatology rehabilitation professionals and the provision of presurgical care to patients with OA or RA. Furthermore, those who completed CPD courses were more likely to have provided RA-related physical therapy interventions, postsurgical care, and public education. These findings reflect the similarities and differences in the management of OA and RA. Osteoarthritis is a chronic joint disease with hallmarks including cartilage degeneration, joint pain, and stiffness after prolonged inactivity. Most people with OA can be effectively treated with interventions such as therapeutic exercise, braces, orthoses, and weight management strategies.[50,51] For those with severe disease, joint replacement surgery may be required. Physical therapists, in general, have received in-depth training in exercise prescription. In a separate analysis, we found 77.5% of Canadian physical therapists said that their entry-level training adequately covered exercise prescription for OA management, but far fewer reported the same for the assessment and prescription of hand orthoses (9.1%), knee braces (17.7%), and foot orthoses (13.8%).[34] It was likely that CPD courses emphasized the use of these interventions and consequently prompted therapists to refer patients to other rehabilitation professionals when they are required.

For RA, one of the common chronic systemic inflammatory joint diseases, current guidelines emphasize early medical treatment (ie, the use of disease-modifying anti-rheumatic drugs within 3 months of symptom onset) combined with nonpharmacological interventions, as needed.[52] The latter interventions may include exercise, patient education, thermotherapy, and vocational counseling,[52] some of which are considered treatments traditionally provided by physical therapists. Results from our study showed that CPD courses might increase the odds of physical therapists providing these treatments to patients with RA. It was

also encouraging that those who participated in CPD courses were more likely to provide public education. Given the recent research indicating delays in seeking help for initial symptoms of RA,[53] it is important that physical therapists contribute to increasing the public's awareness about arthritis and the importance of early treatments.

To meet the challenges of the increasing number of people with arthritis forecast for the next 20 years, a significant amount of work has been done to improve the knowledge and skills of health care professionals who deliver arthritis care. In the United Kingdom, standards for entry-level rheumatology curricula have been developed in nursing, physical therapy, and occupational therapy to ensure that students receive adequate rheumatology content.[54] Similar work also has been initiated for medical students in Canada.[55] However, although these initiatives are essential for new practitioners, they do not address the continuing learning needs of those already in clinical practice. We argue that there is a need to direct resources to develop arthritis-related CPD activities. In a separate analysis of the Canadian survey,[34] we identified important discrepancies in the entry-level rheumatology education received by physical therapists. Areas that were inadequately covered included the assessment of active and damaged joints for RA; back assessment for ankylosing spondylitis; and the assessment and prescription of assistive devices, braces, and orthoses.[34] Furthermore, only 19% were satisfied with what they learned about community resources for patients, and only 16% were satisfied with the coverage of professional resources for arthritis management. Yet these skills are essential when providing arthritis care. Currently, physical therapists' roles in arthritis management concentrate on the period after diagnosis; however, there is an opportunity to expand these roles to the stage before diagnosis, where physical therapists could be the first point of contact for assessment and could facilitate appropriate management by primary care physicians.[39,56] Further development of standards for arthritis CPD activities would serve as the first step for enhancing the roles of physical therapists to serve this population.

There are several caveats about the interpretation of these results. First, a portion of physical therapists were drawn from local arthritis networks in the Netherlands but not in Canada. The differences in sampling strategy have inflated the proportion of physical therapists working with a primary focus in arthritis and the amount of CPD taken in the Netherlands. Because of the sampling bias, we recommend against any direct comparison of the practice characteristics between the 2 countries. Second, physical therapists' roles in OA and RA management were obtained through self-reporting, which might differ from their actual clinical practice. Furthermore, we did not ask therapists to indicate other roles in arthritis management; thus, the list might not capture all the roles currently assumed by physical therapists in the 2 countries.

Third, about 50% of the physical therapists did not return the questionnaire, and so the findings may be subjected to response bias. In the Canadian survey, because the information of the selected physical therapists registered with the College of Physical Therapists of Alberta was not available, we were unable to evaluate whether the responders and nonresponders were systematically different. However, when compared with Canadian physical therapists in the workforce in 2007, respondents to the Canadian survey appeared to be younger (those less than 35 years of age=34.8%–45.6% versus 32.3% in the general physical therapist population[57]) and have a lower proportion of women (70.1%–73.5% versus 78.7% in the general physical therapist population[57]). Similar information was not available for a comparison with the Dutch physical therapists. It should be noted that 7.8% of the questionnaires were returned by the postal office in Canada. The response rate might have been higher if these individuals were replaced. Nonetheless, our response rate is comparable to those of other recent physical therapy surveys on practice patterns in North America, with a response rate between 36% and 41%.[58,59]

Fourth, although we were able to identify therapists who completed arthritis-related CPD courses, we did not know the content of the courses. This was a potential concern for the Canadian survey because the available arthritis courses ranged from short workshops to extensive advanced practice training programs. However, because fewer than 1% of orthopedic physical therapists have completed these extensive training programs, we believe that our findings reflect mainly the roles of those who have completed the shorter courses.

Finally, due to differences in health care systems and physical therapist practices across countries, the results may not be directly applicable to jurisdictions outside of Canada and the Netherlands. Nonetheless, our findings may be relevant to health care professionals in the United States, as that country is undergoing health care reform, which may affect the future roles of physical therapists in the management arthritis and other chronic diseases. We recognize that it is considered illegal in the United States for physical therapists to practice outside the scope of physical therapy. On the

other hand, the profession is beginning to explore issues such as direct access and advanced scope of practice, and their impact on patient care. The recent Summit on Direct Access and Advanced Scope of Practice, co-hosted by the American Physical Therapy Association and the Canadian Physiotherapy Association, has marked the beginning of this endeavor.[60] As the roles of physical therapists continue to evolve across countries, we believe that the current study can contribute to the important discussion about physical therapists' roles and scope of practice by providing evidence about the relationship between CPD activities and the roles in arthritis care.

Conclusion

This exploratory study demonstrated the association between arthritis CPD courses and the roles assumed by physical therapists in arthritis care in Canada and the Netherlands. Although a direct causal inference cannot be made, the results may inform health care administrators' decisions about staff requests to attend CPD courses. As with entry-level physical therapy training, standardized rheumatology CPD curricula for practicing physical therapists will help meet their continuing professional development needs. We recommend that future research should focus on evaluating the effects of CPD on other areas of physical therapist practice and on patients' outcomes.

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Appendix 1.

Questions From the Canadian Physiotherapist Arthritis Care Survey About Participants' Roles in the Management of Osteoarthritis (OA) and Rheumatoid Arthritis (RA)[a]

11a. Did you see any patient with OA in the previous month?

☐ **Yes** (*Go to OA column*) ☐ **No** (*Go to 11b*)

b. Did you see any patient with RA in the previous month?

☐ **Yes** (*Go to RA column*) ☐ **No** (*Go to 12*)

What was your role when you saw people with OA or RA in the previous month? (*Check all that apply*)

	OA	RA
1. Provide assessment and treatment that are traditionally provided by a PT	☐	☐
2. Provide assessment and treatment that are traditionally provided by other rehabilitation disciplines (eg, occupational therapy interventions)	☐	☐
3. Provide assessment and treatment that are outside the scope of physical therapist practice (eg, ordering investigative tests, providing injection)	☐	☐
4. Screen patients and help schedule priority appointments for physicians	☐	☐
5. Public education	☐	☐
6. Provide consultation together with another health care professional (eg, PT, OT, family physician)	☐	☐
7. Refer patients to medical professionals (eg, family physician, rheumatologist)	☐	☐
8. Refer patients to other rheumatology rehabilitation professionals	☐	☐
9. Presurgical care	☐	☐
10. Postsurgical care	☐	☐

[a] PT=physical therapist, OT=occupational therapist.

Appendix 2.

Questions From the Canadian Physiotherapist Arthritis Care Survey About Personal and Practice Characteristics[a]

This section contains questions about the general characteristics of your practice. Please check the appropriate box or fill in the blank as required.

1. Are you practicing clinically?

☐ **Yes** → ☐ **Full-time** ☐ **Part-time**

☐ **No (including maternity leave)** → ***Go to Question 17***

2. In an average work week, how many patients do you see?

_____ Patients per week

3. What is your primary area of practice? (*Check one only*)

☐ Orthopedics
Number of years in orthopedics: _____

☐ Rheumatology
Number of years in rheumatology: _____

☐ Other (*Please specify:* _____)
Number of years in this area: _____

4. In a typical 1-week period, what percentage of patients do you see primarily for osteoarthritis?

☐ 81%–100%
☐ 61%–80%
☐ 41%–60%
☐ 21%–40%
☐ 20% or less

5. In a typical 1-week period, what percentage of patients do you see primarily for rheumatoid arthritis?

☐ 81%–100%
☐ 61%–80%
☐ 41%–60%
☐ 21%–40%
☐ 20% or less

This section contains questions about your background. The information will be used for data analysis only. Please check the appropriate box or fill in the blank as required.

19. What is your age?

☐ 20–34
☐ 35–49
☐ 50–64
☐ >65

20. Please indicate your gender.

☐ Female ☐ Male

21. In what year did you graduate from the entry-level physical therapy program? _____

22. Please list the degree(s) you have received. (*Check all that apply*)

☐ Entry-level PT (Baccalaureate degree or Diploma)
☐ Entry-level PT (Clinical Master degree)
☐ Entry-level OT (Baccalaureate degree or Diploma)
☐ Entry-level OT (Clinical Master degree)
☐ Thesis-based Master degree
☐ PhD/DSc
☐ Other (*Please specify:* _____)

23. Are you a member of the Canadian Physiotherapy Association Orthopaedic Division?

☐ Yes
☐ No

24. Are you a member of the Arthritis Health Professions Association (Canada)?

☐ Yes
☐ No

25. Are you a member of the Association of Rheumatology Health Professionals (USA)?

☐ Yes
☐ No

[a] PT=physical therapist, OT=occupational therapist.