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Factors Contributing to Possession and Use of Walking Aids Among Persons With Rheumatoid Arthritis and Osteoarthritis

M. VAN DER ESCH,[1] M. HEIJMANS,[2] AND J. DEKKER[3]

1M. Van der Esch, PT: Jan van Breemen Institute, Amsterdam, The Netherlands; 2M. Heijmans, PhD: Netherlands Institute for Health Services Research, Utrecht, The Netherlands; 3J. Dekker: Vrije Universiteit University Medical Center, Amsterdam, The Netherlands.
Address correspondence to M. Van der Esch, Jan van Breemen Institute, Center for Rehabilitation and Rheumatology, Jan van Breemenstraat 2, 1056 AB Amsterdam, The Netherlands. E-mail: M.van.der.Esch@planet.nl.

Objective. To investigate the possession and use of walking aids among patients with rheumatoid arthritis (RA) or osteoarthritis (OA), and to identify factors contributing to possession and actual use of these aids. Methods. A random sample of 640 patients with RA or OA was derived from a database of 6,500 registered patients. A total of 410 (64%) patients (223 RA, 187 OA) completed a questionnaire on possession and use of walking aids. Demographics, disease-related characteristics, and information about possession and use were assessed. Logistic regression analyses were used to determine which factors are associated with the possession and use of walking aids. Results. Forty-nine percent of the RA patients and 44% of the OA patients owned a walking aid. Canes, forearm crutches, walkers, and orthopedic footwear were most frequently possessed. In the RA group, age, education, frequency of pain, and disability were associated with possessing a walking aid. In the OA group, age and disability were associated with possession. Approximately 30% of the owners did not use their walking aid. Factors associated with the actual use of an aid included higher age, a high intensity of pain, more disability, decrease in morning stiffness by the aid, and a positive evaluation of the aid. Conclusion. Almost half of patients with RA or OA possess a walking aid. Disability, pain, and age-related impairments seem to determine the need for a walking aid. Nonuse is associated with less need, negative outcome, and negative evaluation of the walking aid.

INTRODUCTION

Walking aids include such devices as a walking stick (cane), forearm crutch, walker, brace, and orthopedic footwear. These aids substitute for impairments in range of motion, muscle strength, joint stability, coordination, and endurance. Furthermore, by diminishing the load on affected joints, these aids reduce pain. By substituting for impairments and by reducing pain, walking aids contribute to independent functioning in patients with rheumatoid arthritis (RA) and osteoarthritis (OA) (1).

Information about the exact need for these aids is scarce and is mostly based on expert opinion. Only a few studies deal with this issue (1–8). These studies show that possession and use of technical aids by patients with arthritis is associated with age, sex, disease severity, pain, disability, and the presence of comorbidity. In particular, the extent of disability increases the probability of owning and using aids. These studies concern technical aids in general. Studies specifically focussing on walking aids

are scarce (5,6). Furthermore, none of these studies assessed factors contributing to the possession of walking aids. Simpson and Pirrie (9) assessed walking aids in the elderly, but this study does not focus on arthritis specifically. Thus, to improve the understanding of the need for these aids, a study specifically focussing on walking aids in patients with arthritis is required.

The aim of the present study is twofold. First, to describe the possession and use of walking aids among patients with RA and OA in hips or knees, and second, to identify factors contributing to the possession and use of these aids.

PATIENTS AND METHODS

Patients. A total of 640 patients were randomly selected from a group of 6,500 RA and OA patients registered at an outpatient rheumatology rehabilitation clinic in The Netherlands. Diagnosis of RA was based on the American College of Rheumatology (ACR; formerly American Rheumatism Association) criteria (10). A diagnosis of OA was based on the ACR classification criteria for OA of the hip (11) and knee (12). Patients who had had an operation on the hip or the knee were excluded.

Questionnaire. The questionnaire contained demographic and disease-related questions and parts of the Health Assessment Questionnaire (HAQ) (13) and Evaluation of the Daily Activity Questionnaire (EDAQ) (7,8).

The demographics collected included age, sex, highest level of education, and living situation. Education was divided into 3 levels: low (vocational training), medium (high school), and high (college or university). Living situation was dichotomized in living with a partner versus living alone.

Duration of disease was recorded as time since diagnosis was made. Perceived general health status and physical functioning were rated on a 5-point scale, derived from the Short Form 36 (14). The frequency of pain was rated on a 5-point scale (ranging from seldom or never to always). Intensity of pain as a result of RA or OA was rated on a 5-point scale (ranging from hardly to unbearable).

The level of disability in activities of daily living was assessed. Items related to walking aids were selected from the HAQ (13) and the EDAQ (7,8). Items from the HAQ referred to rising from a chair, getting in/out of bed, walking outside on flat ground, walking up stairs, rising from a toilet, getting in/out of a car, shopping every day, and dish washing. Added to these items were vacuum cleaning and walking indoors from the EDAQ. Supplementary was an item on gardening. Patients rated the performance of these activities on a 4-point scale ranging from “independent, without any difficulty” to “not possible independently.” A disability score in activities of daily life was computed by adding the responses to the 8 items.

The type of the walking aid, who had prescribed the walking aid, and the frequency of using this aid (5-point scale) were assessed. Frequency of use was dichotomized in nonuse (including the responses “never” and “a few times a week”) and use (including the responses “on a daily basis,” “several times a day,” and “continuously”).

Perceived effect and evaluation of walking aids items were derived from Nordenskio¨ ld et al (7,8). The effect of the walking aid on pain was evaluated on a 6-point scale, from “no diminishing of pain due to use of walking aid” to “absence of pain due to use of walking aid.” A similar item concerned morning stiffness. The value of the walking aid was assessed by rating 8 statements on a 5-point scale ranging from “totally disagree” to “totally agree.” The statements were: “using a walking aid is unpleasant,” “a walking aid is hard to handle inside the house,” “a walking aid is hard to handle outside the house,” “with a walking aid, walking goes slower,” “with a walking aid, walking goes faster,” “with a walking aid, I am able to walk larger distances,” “using a walking aid makes me more independent,” “by using a walking aid, I have more energy.” Factor analysis with varimax rotation revealed that 2 scales to underlie these 8 statements together explained 69% of the variance: functional outcome of the walking aid (able to walk larger distances, more energy, more independent, and walking goes faster) and evaluation of the walking aid (unpleasant and hard to handle inside or outside the house).

Statistical analysis. All analyses were performed for RA and OA separately (with the exception of the logistic regression for use of walking aids). Differences in demographic and disease-related characteristics between owners and nonowners and between users and nonusers were tested using

independent sample *t*-tests and chi-square tests. Logistic regression analyses were used to assess which factors were independently associated with possession and use of walking aids. Different models were tested with the maximum likelihood estimation to find the best fitting logistic regression model (15). Independent variables in the analysis on possession of walking aids comprised age, sex, education level, living situation, physical function, general health, frequency and intensity of pain, and the level of disability in activities of daily life. Independent variables in the analysis on use of walking aids were the same as for possession, plus the patients' rating of perceived effect on pain and stiffness, functional outcome, and evaluation of the walking aid. All analyses were conducted using SPSS for Windows, version 10.0 (Chicago, IL).

RESULTS

Of 640 selected patients, 440 (69%) agreed to complete the questionnaire. Of this group, 30 were not included in the study because of incomplete answers, not having a diagnosis of OA or RA in the hips or knees, or not able to fill in a questionnaire for physical reasons. Finally, 223 RA patients and 187 OA patients were included, resulting in a response rate of 64% (410 of 640).

Patients. RA patients were predominantly female (67%), married (70%), and had a low (43%) or medium (41%) level of education. Their mean age was 63.1 years (SD 14.2 years) and they had a mean duration of disease of 13.1 years (SD 10.1 years). OA patients were predominantly female (80%), married (58%), and most (52%) had a low level of education. The mean age of the OA patients was 65.6 years (SD 12.6 years). Their mean illness duration was 13.0 years (SD 11.4 years). RA patients and OA patients were not significantly different with respect to age, disease duration, or level of education. There were significantly more women ($P < 0.001$) and more patients living alone in the OA group ($P < 0.01$).

Possession of walking aids. Within the group of RA patients, 49% (n = 110) owned a walking aid, compared with 44% (n = 82) in the group of OA patients. RA patients most frequently possessed orthopedic footwear, walkers, and canes. OA patients possessed walkers, canes, and forearm crutches most frequently (see Table 1). Most walking aids were obtained without a physician's prescription: only 35% of the crutches, 20% of the walkers, 36% of the knee braces, and 15% of the orthopedic footwear were prescribed by a general practitioner or medical specialist.

[TABLE 1]

Possession: bivariate analyses. In RA patients, owners were older, had a longer history of disease, and were more often female than nonowners (see Table 2). The same results were also observed in OA patients; in addition, owners of a walking aid had a lower level of education and were more often living alone than nonowners. In both patient groups, owners judged their general health status and physical function worse than did nonowners. Owners experienced pain more often and experienced more disabilities during their daily activities. In addition, in the RA group owners experienced a higher level of pain than patients without a walking aid.

[TABLE 2]

Possession: multivariate analysis. Results of the logistic regression analyses for RA and OA patients are shown in Table 3. The results indicate that the variables predictive for the possession of a walking aid in the RA group were higher age, higher level of education, more disability in daily activities, and higher frequency of pain. This model explained 81.9% of the variance in possession of a walking aid in the RA group. For the OA group, the predicting variables for the possession of a walking aid were higher age and more disability during daily activities. This model explained 71.5% of the variance in the OA group.

[TABLE 3]

Use of walking aids. For analyses regarding the actual use of walking aids, nonowners were excluded. Of the total group of owners of a walking aid (n = 192), approximately 30% did not use their aid. Nonuse was 25% among RA patients and 32% among OA patients. Nonuse was highest among owners of walking sticks and crutches (27–32%) and lowest among owners of orthopedic footwear (15%).

Use: bivariate analysis. Patients with RA who did not use their walking aid were younger, felt less disabled, and experienced less decrease in pain when using their aid. In addition, nonusers in the RA group also rated the functional outcome more negatively (see Table 4). Nonusers in the OA group judged their physical functioning and general health to be better, they experienced less pain and less disability in daily life, and they evaluated the walking aid negatively (i.e., unpleasant and hard to handle inside and outside the house).

[TABLE 4]

Use: multivariate analysis. Results of the logistic regression analysis to predict the use of the walking aid are shown in Table 5. Because of a relatively small number of patients, the RA and OA group were combined in these analyses. The first step was to adjust the regression analysis for the type of disease (RA or OA). This variable was not found to be a significant predictor for the use of a walking aid. Overall, the model was able to correctly classify 78.6% of the respondents as users or nonusers. The results indicate that the variables associated with more usage of walking aids were higher age, higher intensity of pain, more disability in activities of daily life, higher decrease of morning stiffness by using the aid, and less negative evaluation of the walking aid (i.e., unpleasant and hard to handle inside and outside the house).

[TABLE 5]

DISCUSSION

In both RA and OA, almost half of the patients had a walking aid. Orthopedic footwear (46%), walkers (37%), and canes (31%) were among the walking aids most frequently in the possession of RA patients. Walkers (42%), canes (40%), and forearm crutches (27%) were most frequently owned in the OA group.

To our knowledge, this is the first study in rheumatology examining factors contributing to possession and use of walking aids. In the multivariate analysis, disability, frequency of pain, and age were found to be predictors of the possession of walking aids. Thus, disability and pain seem to be primary determinants of the need for walking aids. Because many impairments are age related, the finding with regard to age could be interpreted as evidence that impairments (e.g., reduced stability, reduced range of joint motion, reduced muscle strength) also determine the need for walking aids. In the RA group, the level of education contributed to possession of walking aids. Education is an indicator of socioeconomic status; it may be that these patients could afford to buy a walking aid. An alternative explanation is that higher-educated patients are more assertive in acquiring these aids.

The use of walking aids was higher in patients with a higher intensity of pain, more disability, and a higher age. This finding seems to indicate that those patients most in need tend to use the walking aids. Conversely, nonuse is high in patients less in need of using an aid. In addition, use was highest in patients reporting a decrease in stiffness as a result of using the walking aid and in patients experiencing the aid as less unpleasant or hard to handle. Thus, both outcome and evaluation of the aid seem to affect how frequently patients use the aid. Surprisingly, the perceived functional outcome of the aid (e.g., more independence due to using the aid) was not associated with the frequency of use. One interpretation of this finding is that walking aids did not improve functional outcome. However, the cross-sectional design of this study precludes definite conclusions on the functional outcome of

walking aids. Conclusions on functional outcome can only be reached in well-controlled clinical trials on walking aids.

Several limitations of the present study should be acknowledged. First, the patients in this study were registered at an outpatient rheumatology rehabilitation clinic. Although it was a random sample, not specifically selecting patients under active treatment, there is a possibility that this population is rather disabled. This may have caused a relatively high estimate of the possession and use of walking aids. Second, by studying factors associated with possession and use, we aimed at understanding the need for walking aids. This approach yields preliminary evidence only. Ideally, the prescription of walking aids should be evidenced based: well-controlled clinical trials evaluating the functional outcome of walking aids are required for this purpose. Third, we did not assess impairments (e.g., joint stability, muscle strength). Because many impairments are age related, we interpreted the association of age with possession and use as evidence that impairments contribute to the need for walking aids. Of course, this is circumstantial evidence only. In future research on the need for walking aids, impairments should be evaluated, as well as pain and disability. Fourth, we did not assess the effect of patient's expectations and patient education on the possession and use of walking aids. Finally, 36% of the patients did not respond. The causes of nonresponse could not be determined. It is possible that patients not owning a walking aid did not respond. This would have caused an overestimation of possession. On the other hand, very disabled patients may not have been able to complete the questionnaire. This would have caused an underestimation of possession.

In conclusion, about half of the patients with RA or OA possess a walking aid. Disability, pain, and age (age-related impairments) determine the need for walking aids. Nonuse of walking aids seems to be associated with less need for a walking aid, negative outcome of using the walking aid, and a negative evaluation of the walking aid. The need for walking aids in RA and OA should be evaluated more thoroughly in well-controlled trials on the functional outcome of using walking aids.

TABLES

Table 1. Percentage of patients possessing walking aids*

Aid	Total group (n = 192)	RA (n = 110)	OA (n = 82)
Walking stick, cane	35	31	40
Elbow crutch	19	15	27
Triceps crutch	1	2	0
Wheeler	39	37	42
Knee brace	6	5	7
Orthopedic footwear	36	46	22
Other	26	25	28

* RA = rheumatoid arthritis; OA = osteoarthritis.

Table 3. Results of logistic regression analysis for possession of walking aids*

	Exp(B)	95% CI	*P*
RA			
Age	1.06	1.02–1.09	0.001
Education	2.81	1.55–5.09	0.001
Frequency of pain	1.62	1.10–2.39	0.015
Disability	8.16	3.91–17.01	0.000
OA			
Age	1.04	1.01–1.07	0.008
Disability	4.31	2.37–7.84	0.000

* Exp(B) = standardized regression coefficient; 95% CI = 95% confidence interval; RA = rheumatoid arthritis; OA = osteoarthritis.

Table 2. Characteristics of owners and nonowners of walking aids*

	RA n = 223			OA n = 187		
	Walking aids n = 110	No walking aids n = 113	*P*	Walking aids n = 82	No walking aids n = 105	*P*
Age, years, mean (SD)	67.8 (13.9)	58.6 (13.0)	0.000	69.4 (12.9)	62.6 (11.7)	0.000
Illness duration, years, mean (SD)	15.8 (10.9)	10.0 (8.0)	0.000	16.6 (13.7)	10.2 (8.2)	0.000
Female, %	74	60	0.023	87	75	0.030
Living alone, %	35	25	0.109	50	36	0.034
Education level, %			0.542			0.010
Low	41	46		43	64	
Medium	44	37		46	25	
High	15	17		11	11	
Physical functioning, mean (SD)	2.71 (0.83)	3.47 (0.65)	0.000	2.57 (0.78)	3.19 (0.88)	0.000
General health, mean (SD)	3.25 (0.76)	3.63 (0.64)	0.000	3.12 (0.76)	3.49 (0.74)	0.002
Pain frequency, mean (SD)	3.55 (1.16)	2.57 (0.99)	0.000	3.70 (1.12)	3.10 (1.28)	0.002
Pain intensity, mean (SD)	2.99 (0.78)	2.47 (0.67)	0.000	3.18 (0.79)	2.98 (0.79)	0.110
Disability in ADL, mean (SD)	1.37 (0.78)	0.41 (0.50)	0.000	1.14 (0.61)	0.60 (0.56)	0.000

* RA = rheumatoid arthritis; OA = osteoarthritis; ADL = activities of daily living.

Table 4. Characteristics of users and nonusers of walking aids*

	RA n = 110			OA n = 82		
	User n = 83	Nonuser n = 27	*P*	User n = 56	Nonuser n = 26	*P*
Age, years, mean (SD)	69.7 (13.1)	62.3 (15.1)	0.02	69.5 (13.3)	69.2 (12.1)	NS
Illness duration, years, mean (SD)	15.7 (10.8)	16.2 (11.3)	NS	15.5 (14.0)	19.1 (13.2)	NS
Female, %	75	70	NS	86	92	NS
Living alone, %	35	37	NS	54	42	NS
Education level, %			NS			NS
Low	39	49		64	64	
Medium	42	35		24	28	
High	19	16		14	8	
Physical functioning, mean (SD)	2.66 (0.83)	2.88 (0.82)	NS	2.44 (0.86)	2.86 (0.47)	0.01
General health, mean (SD)	3.18 (0.79)	3.46 (0.65)	NS	3.02 (0.79)	3.35 (0.65)	0.01
Pain frequency, mean (SD)	3.63 (1.17)	3.33 (1.14)	NS	3.78 (1.12)	3.50 (1.14)	NS
Pain intensity, mean (SD)	2.99 (0.73)	3.00 (0.92)	NS	3.35 (0.82)	2.76 (0.54)	0.001
Disability ADL, mean (SD)	1.45 (0.73)	1.14 (0.84)	0.05	1.25 (0.60)	0.90 (0.57)	0.01
Functional outcome of the aid, mean (SD)	3.55 (0.99)	3.20 (0.91)	0.03	3.09 (1.15)	3.36 (0.45)	NS
Evaluation of the aid, mean (SD)	2.50 (1.04)	2.71 (0.86)	NS	2.48 (1.06)	2.87 (0.76)	0.01
Decrease in pain, mean (SD)	3.09 (1.49)	2.50 (1.29)	0.05	2.67 (1.49)	2.95 (1.79)	NS
Decrease in morning stiffness, mean (SD)	3.12 (2.19)	2.67 (2.25)	NS	2.71 (2.09)	3.09 (2.3)	NS

* Nonowners of aids excluded from analysis. RA = rheumatoid arthritis; OA = osteoarthritis; NS = not significant; ADL = activities of daily living.

Table 5. Results of logistic regression analysis for use of walking aids*

Variable	Exp(B)	95% CI	*P*
Type of disease	1.005	0.343–2.948	0.992
Age	1.045	1.007–1.084	0.020
Decrease in stiffness	0.525	0.335–0.823	0.005
Intensity of pain	2.901	1.236–6.808	0.014
Disability	2.817	1.134–6.995	0.026
Evaluation of the aid	0.538	0.313–0.924	0.025

* Rheumatoid arthritis and osteoarthritis patients are combined. Exp(B) = standardized regression coefficient; 95% CI = 95% confidence interval.

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