Participation in Paid and Unpaid Work by Adults with Rheumatoid Arthritis

CATHERINE L. BACKMAN, SUSAN M. KENNEDY, ANDREW CHALMERS, and JOEL SINGER

ABSTRACT.

Objective. To define determinants of participation in paid and unpaid work by adults with rheumatoid arthritis (RA).

Methods. A survey was designed in consultation with working age (< 65 yrs) adults with RA and sent to 269 patients recruited through 5 rheumatology practices. Hours worked "last week" was the measure of participation in employment and unpaid work (household, home maintenance, caregiving, studying, and volunteering). Potential determinants, conceptually organized as attributes of the person, environment, or occupation, were ascertained.

Results. Recruitment response rate was 40% of patients invited, and 89% of those recruited submitted complete surveys. The 239 respondents were mostly women (81%), with mean age 50 years and duration of RA 13 years. Respondents reported an average of 47 hours of work: 19 paid and 28 unpaid hours. Regression analyses indicated more hours of paid work were associated with psychologically demanding work, higher social function, less pain, being male, managerial job type, and lower ratings of occupational balance. More hours of unpaid work were associated with more children in the household, greater perceived physical and psychological demand of the work, social support from family, and having a post-secondary education. Work limitations, reported by 73 respondents, were associated with lower functional status, more pain, and less psychologically demanding work.

Conclusion. Factors associated with greater participation in paid work differed from those associated with unpaid work. Work
limitation affects both paid and unpaid workers. Work-related rehabilitation and education programs may be enhanced by addressing factors identified by this sample of paid and unpaid workers. (J Rheumatol 2004;31:47-56)

Key Indexing Terms:
RHEUMATOID ARTHRITIS
WORK DISABILITY
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From the School of Rehabilitation Sciences, the Department of Health Care and Epidemiology, and the School of Occupational and Environmental Hygiene, The University of British Columbia, Vancouver, British Columbia, Canada.

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C.L. Backman, PhD, OT(C), Associate Professor, School of Rehabilitation Sciences, Research Scientist, Arthritis Research Centre of Canada; S.M. Kennedy, PhD, Professor, Department of Health Care and Epidemiology, and School of Occupational and Environmental Hygiene; A. Chalmers, MD, FRCPC, Associate Professor, Department of Medicine; J. Singer, PhD, Professor, Department of Health Care and Epidemiology, The University of British Columbia, and British Columbia Centre for Excellence in HIV/AIDS.

Address reprint requests to Dr. C. Backman, School of Rehabilitation Sciences, The University of British Columbia, T325-2211 Wesbrook Mall, Vancouver, BC, V6T 2B5. E-mail: backman@interchange.ubc.ca

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Work represents a major life role for most adults. Paid employment is necessary for economic self-sufficiency, and all forms of work (including employment, household work, home and
person's sense of productivity and self-worth. Participation in paid and unpaid work is a determinant of health because inability to engage in these productive activities may threaten an individual's economic, social, physical, or mental well-being. In this report, paid work refers to all forms of employment, and unpaid work refers to household work, home maintenance, care-giving, studying, and volunteer work.

Limitations in participation in paid work secondary to arthritis have been widely studied. Canadians reporting arthritis and rheumatism have lower rates of participation in the labor force and reduced working life expectancy. People with rheumatoid arthritis (RA) experience rates of work disability in the neighborhood of 22% to 38%. Older age, lower functional status, longer disease duration, pain, non-managerial or non-professional job type, greater job autonomy, and physically demanding work were associated with work disability in most, but not all studies. Co-worker support was associated with work retention in one study, and social support was associated with work loss in an initial cross-sectional study but did not remain significant over time. Work disability is most frequently defined as cessation of paid employment, but has also been defined as receiving work disability benefits. These definitions may not include people who choose to work less than full-time for reasons unrelated to their arthritis, and fail to account for the individual's definition of work limitations. This study addresses participation in terms of hours of work, and asks participants to define work limitation for themselves.

Few studies have examined participation in unpaid work among adults with RA, and only one investigated paid and unpaid work simultaneously. Adults with RA work significantly fewer hours of paid and unpaid work than healthy controls. In a sample of 142 women with RA, more than half reported limitations in household cleaning, doing laundry, and shopping, and among those with young children, 29% reported limitations caring for them. Women with severe RA reported doing a lower proportion of their household's work compared to women with mild or no RA. Having children increased the time spent on household work, and lower functional status, less social support, and pain have been associated with household work limitations.

We investigated relationships among several factors influencing participation in paid and unpaid work using the Person-Environment-Occupation (PEO) model as a conceptual framework (Figure 1). The PEO model proposes that optimal
occupational performance depends on the fit among characteristics of the person, the environment in which they perform, and the demands of the work. This study investigated person, environment, and occupation characteristics associated with hours of work participation in adults with RA. The intent was to inform rehabilitation and education programs that assist people with RA to maintain or improve their ability to work in both paid and unpaid domains.

**MATERIALS AND METHODS**

*Design.* A mail survey was developed in consultation with 18 working-age adults with RA. The survey was field-tested with a convenience sample of 12 adults with RA to assess its utility and the reliability and concurrent validity of the outcome variables created for this study. Field-test participants reported the survey took less than 45 minutes to complete. The final survey was then mailed to community-dwelling adults with RA. Ethical approval for both the developmental phase and cross-sectional study was obtained through the University of British Columbia's Behavioural Research Ethics Board.

*Recruitment.* Potential study participants were identified through 5 rheumatology private practices (representing 7 rheumatologists) in British Columbia, Canada. Typically, outpatients are referred to rheumatology private practices by family physicians, are seen regularly for rheumatologic care, and are referred back for general problems unrelated to arthritis. Thus, study participants were representative of community-dwelling outpatients with RA in this region. Letters of invitation were sent from the rheumatologists to all eligible and current patients. Eligible patients were of working age (18–65 yrs), with a diagnosis of RA confirmed by the rheumatologist, and able to read and write English. Letters briefly introduced the project and provided a reply form and stamped envelope addressed to the principal investigator. Patients who released their name and address to the investigator were considered registered for the study. Patients were contacted only once to invite participation. This process was used to protect the confidential physician-patient relationship in accord with university guidelines for approaching human subjects.

*Mail survey procedures.* A cover letter explaining the purpose of the study and consent details, together with the survey, stamped return envelope, and easy-grip pen were mailed to all patients who registered for the study. Reminder postcards were sent after 2 and 4 weeks. A final reminder telephone call was made to
Variables. Questions adapted from the Statistics Canada General Social Survey were used to measure the outcomes of paid and unpaid work. Paid work was the number of hours worked "last week" in paid employment. Unpaid work was the number of hours worked "last week" in 5 categories: housework (e.g., cleaning, cooking), home maintenance (repairs, yard work), care-giving (for children or ill family members), studying, and volunteer work. The question, "Do you work as many hours as you would like to?" was used to assess work limitation, with 3 possible responses: (1) Yes; (2) No, I work more than I want to; or (3) No, I work less than I want to. Followup questions ascertained the reason for negative responses. Those who worked less than they wanted to because of their arthritis were classified as having work limitation.

Demographic information included age, sex, education level, disease duration, household size and composition (marital status, adults and children under 18), household income, education, and main occupation. Paid work occupations were classified into 4 job types: management, professional, services, and trades. Commuting difficulty (for paid work only) was measured on a 10-point scale with low scores representing more difficulty. The concept of occupational balance was measured using a 10-point scale in response to the question, "How satisfied are you with the balance of time you spend on work, self-care, leisure, and rest?", with high scores representing greater satisfaction. Global disease status was measured using 10 cm visual analog scales (VAS) for disease activity, pain, and fatigue. To measure additional constructs identified as important by the group of RA patient-consultants, the following scales were incorporated into the survey:

The SF-36 Health Survey, a generic measure of health status widely used in both population and clinical studies, consists of 36 items measuring 8 dimensions: physical function, role limitations due to physical health, bodily pain, social functioning, mental health, role limitations due to emotional health, vitality (or fatigue), and general health perceptions. Higher scores indicate a more desirable health state.

The modified Health Assessment Questionnaire (HAQ) disability index was used to measure functional status. Respondents report their level of difficulty doing 8 activities of daily living on a 0–3 scale, with higher scores indicating greater disability. The scale score is the mean of the items. Although redundant with the physical function subscale of the SF-36, it was included in the
survey to facilitate comparison with previous studies.

The Arthritis Self-efficacy Scales (ASES)\textsuperscript{30} were designed "to measure patients' perceived self-efficacy to cope with the consequences of chronic arthritis" (p. 37). Respondents indicated how certain they were that they could perform 20 specific behaviors on a scale of 10 (very uncertain) to 100 (very certain). The mean is calculated for 3 subscales: function, pain, and symptoms. Higher scores indicate greater self-efficacy.

The Multidimensional Scale of Perceived Social Support (MSPSS)\textsuperscript{31} is a 12 item self-report measure of perceived social support from significant other, family, and friends. Scores range from 1 to 7, with higher scores indicating greater social support.

The Job Content Questionnaire (JCQ)\textsuperscript{32-34} measures the "content" of work tasks in terms intended to be broadly applicable to all jobs and all workers. The JCQ addresses characteristics of the work and work environment, such as physical and psychological work demands, skill discretion, decision latitude, and co-worker and supervisory support. Higher scores for each subscale indicate strong agreement that the characteristic is present. Participants could choose to complete the JCQ for their main work, or for both paid and unpaid work. (Supervisory and co-worker support subscales were not applicable to unpaid work.)

Sample size. For linear regression analyses, the recommended sample size is 5 to 10 times the number of variables to be entered in the equation\textsuperscript{35,36}. For the hierarchical approach planned, the number of variables considered was up to 14, suggesting a sample size of 70–140.

Data analysis. Data from surveys were entered into SPSS (version 9.0 for PC), and accuracy of data entry was assessed by searching for out of range values and random spot checks. Missing values for items within pre-existing scales were handled in accord with the procedures for that scale. Differences between subgroups were assessed using t tests, and univariate regression was used to evaluate the association between each potential explanatory variable and the outcomes of paid and unpaid work. Alpha of 0.05 was used to infer statistical significance.

Linear regression models were constructed with hours worked (paid or unpaid) as dependent variables, and logistic regression was used for work limitation (a binary outcome). It was anticipated there would be intercorrelations among explanatory variables, and
a hierarchical model was employed using 8 variables (selected *a priori*) as an initial model, followed by systematically assessing the contribution of each remaining independent variable in turn. In this way, the intercorrelations did not mask the effect of any one variable because variables were evaluated one at a time. The variables in the initial model were age, sex, pain, functional status (HAQ), skill discretion, decision authority, physical demand, and co-worker support (for paid work model) or family social support (for unpaid work model). Residual analyses were used to check that model assumptions had not been violated and to identify potential influential cases.

RESULTS

Figure 1. The Person-Environment-Occupation model organizing potential explanatory variables for study. *Variables applicable to paid work only.*

**Respondent characteristics.** Detailed response rate information is illustrated in Figure 2. The response rate was 40% of those invited. Of those registering for the study, the response rate was 89% and the proportion from each physician's practice was roughly equal (83–93%). Thirty patients who declined to participate provided basic demographic information, and they did not differ significantly from respondents in terms of age, sex, disease duration, or job type. The final sample was 239 adults, of which 194 were women (81%). Their mean age was 50.3 years (SD 10.3)
secondary education. On average, they reported having RA for 12.7 years (SD 9.6), with median disease duration 11 years. Roughly 75% stated they were taking at least one disease modifying antirheumatic drug (DMARD), alone or in combination with other DMARD, nonsteroidal antiinflammatory drugs (NSAID), or analgesics. Of those taking DMARD, 11% were taking antimalarials alone; other DMARD reported were gold, methotrexate, sulfasalazine, minocycline, and cyclosporine. Fifteen percent were taking NSAID alone, 5% were taking no medication, and 5% did not specify their medications.

Figure 2. Response rate flow chart.

Thirty-six participants (15%) stated they received a disability pension. The median annual household income category was $40,001–50,000 (Cdn). This is similar to the 1999 median family income in Canada ($47,300), and slightly lower than the median family income for the city of Vancouver ($52,600). The majority of participants (94%) resided in the Greater Vancouver and Fraser Valley areas of British Columbia.

Paid and unpaid hours worked. Overall, the sample reported an average of almost 47 hours of work in the week prior to completing the survey, just under 19 hours paid work and 28 hours unpaid work (Table 1). Asked about their main form of work, 127 labeled themselves as paid workers (76 full-time, 31 part-time, and 20 self-employed), 96 were unpaid workers (87 household workers, 3 students, 6 volunteers), and 16 were retired (but reported unpaid work in the survey). There were sex differences in
all categories of work hours except for studying. Women performed significantly more hours of household work, caregiving, and volunteer work, and less home maintenance than did men. Although men worked more paid hours than women, when adjusted for unequal variances in the 2 groups, this difference was significant at the p = 0.06 level. The difference in total work hours between men and women was not significant.

Table 1. Average hours (standard deviation) of paid and unpaid work "last week" by adults with RA.

Work limitation. Respondents were initially placed in one of 3 categories: those limited by their arthritis (n = 72), those working as much as they wanted to (n = 112), and those working more than they wanted to (n = 55). Comparing hours of work across these 3 categories showed that people limited by their arthritis worked fewer hours overall than both of the "not limited" groups (data not shown). When the categories were reduced to 2, limited versus not limited, the results were similar, with those who reported work limitation due to RA working an average of 6.3 (SD 11.5) paid hours per week compared to 23.8 (SD 19.8) hours by those not reporting limitations (p < 0.001). There were no significant differences between these 2 groups in hours worked for any of the unpaid work categories.

Those who reported work limitation due to RA reported more active disease (5.4 vs 4.3 cm on VAS; p = 0.004), more pain (5.2 vs 4.1 cm; p = 0.005), and more fatigue (6.1 vs 4.5 cm; p < 0.001) than those who stated they worked as many or more hours than they would like. Comparing paid workers to unpaid workers, there were no statistically significant differences for global disease activity, pain, or fatigue.

Person, environment, and occupation characteristics of sample. Those identifying themselves as mainly unpaid workers tended to be older than paid workers (52.2 compared to 47.7 yrs; p = 0.001). Unpaid workers reported slightly but significantly lower functional status than paid workers, as measured by both the HAQ and the physical function scale of the SF-36 (Table 2). Unpaid workers reported significantly less confidence in their ability to do everyday activities (lower self-efficacy function scores), but were more satisfied with the balance of time they spent on work, self-care, leisure, and rest (occupational balance).

Table 2. Person characteristics. Means (standard deviations) for all participants and for 2 comparison groups.
Differences in age, sex distribution, education level, and disease duration were not significant when the "work limited" group was compared with the "not limited" group (data not shown). Of the health and functional status variables assessed, only mental health and role limitations due to emotional health were not significantly different between the group with work limitation and those not limited in their work (Table 2). Among the environment characteristics studied, there were no significant differences between groups (data not shown); however, there were trends toward social support from family members and household size being greater for those workers who identified themselves as not limited compared to those whose work was limited by their RA.

Occupation characteristics measured by the JCQ are reported in Table 3. Unpaid workers rated their work tasks as requiring less skill discretion, more decision authority, less psychological demand and less physical demand (isometric) than did paid workers. Those whose work was limited by their RA reported less skill discretion and lower psychological demand than those whose work was not limited by RA. For paid workers, jobs were classified into 4 categories, and the respective proportions were managerial 14%, professional 29%, services 48%, and trades 9%. There was no significant difference in the distribution of job classifications for paid workers who reported work limitations compared to paid workers not limited by RA.

Table 3. Occupation characteristics. Means (standard deviations), for all participants, and for 2 comparison groups.

Factors associated with paid and unpaid work hours: univariate analyses. The following relationships were noted in univariate analyses (data not shown). Age was significantly associated with fewer hours of both paid and unpaid work, and women performed significantly more unpaid and less paid work than men. Because age and sex demonstrated potential to confound or modify the effect of other factors, univariate analyses for the outcomes of paid work and unpaid work were adjusted for age and sex. Self-efficacy function was positively and significantly associated with hours of paid and unpaid work, but self-efficacy symptoms were not associated with either type of work, and self-efficacy pain was only associated with paid work hours. However, the presence of pain, as measured by the SF-36, was a predictor of fewer hours of both paid and unpaid work.
Additional factors significantly associated with more hours of unpaid work in univariate analyses were being a post-secondary graduate, having more children in the household, and reporting higher levels of psychological and physical demand of the work. Factors significantly and inversely associated with paid work hours were functional status (HAQ), SF-36 subscales for general health, physical function, role: physical and social function, and perceived occupational balance (balance of time spent in self-care, leisure, rest, paid and unpaid work). Psychological demand of the work was significantly and positively associated with paid work hours.

Factors associated with hours of paid and unpaid work: multivariable models. For the model predicting paid work hours, the analysis was limited to the 143 respondents who rated paid work characteristics (127 "paid workers" plus 16 "unpaid workers" who completed work-characteristic items for both paid work and unpaid work, using their paid work ratings). From the cluster of 8 a priori variables, sex and pain emerged as predictors of paid work hours (p = 0.06 and 0.02, respectively). In the systematic trial adding each potential explanatory variable to pain and sex, 4 additional variables were identified: occupational balance, social function, psychological demand of the work, and managerial job type. Using a forward stepwise procedure with these 6 variables, the result was a model explaining 25% of the variance in paid work hours (Table 4). More paid work hours were associated with being male, less pain, better social function, more psychologically demanding work, managerial job type, and lower satisfaction with occupational balance.

The model for unpaid work was limited to the 110 respondents who rated unpaid work characteristics (96 "unpaid workers" plus 14 "paid workers" who completed work-characteristic items for both paid work and unpaid work, using their unpaid work ratings). In the initial model using the 8 a priori variables, younger age, less pain, more social support from family, and higher physical demand (exertion) of the work were strongly associated with unpaid work hours.
In the systematic trial adding each potential explanatory variable in turn, 6 additional variables were identified: education level, self-efficacy pain, physical role limitations (SF-36 subscale), marital status, number of children in the household, and psychological demand of the work. A final model using the forward stepwise procedure predicted 43% of the variance in unpaid hours of work, and contained 5 predictors (Table 5). More support from family, more children in the household, physically and psychologically demanding work, and being a post-secondary graduate were associated with more unpaid work.

**Table 5.** Final multivariable model for participation in unpaid work. For each one-unit change in the predictor variables, the unstandardized coefficient represents the anticipated change in the outcome, number of hours of unpaid work. For education level, the unstandardized coefficient represents the change in hours for post-secondary graduates compared to participants with less than post-secondary graduation.

Factors associated with work limitations. Seventy-three respondents indicated their work participation was limited due to RA. The full sample of 239 was included in the logistic regression analysis. Of the initial 8 variables, lower functional status, more pain, less skill discretion, and greater decision authority were significantly associated with work limitation. When each of the remaining candidate variables was assessed in turn, 3 were significantly associated with work limitation: psychological demand, being a household worker, and physical function (SF-36 subscale). Psychological demand and job classification were added to the 4 variables from the initial model. Because the HAQ and SF-36 physical function subscale were highly correlated and measured the same construct, only the HAQ was retained for entering into a final model. Skill discretion and decision authority were no longer significant predictors of work limitation once psychological demand was added (Table 6). Work limitation was associated with lower functional status, more pain, less psychologically demanding work, and being a household worker.

**Table 6.** Odds ratios for variables in final model predicting work limitation. Odds ratios (and 95% CI) represent the effect of a one-unit change in each variable listed for predicting the outcome, work limitation. For the categorical variable job type, the OR (95% CI) reflect the category household workers relative to all paid job types.

Post hoc analyses. Because the presence of children appeared to have a strong influence on the prediction of unpaid work, and
children under 18 at home, the entire model-building process was repeated for the group of unpaid workers without children. The final multiple regression model is shown in Table 7. Higher physical demand of the work and more social support from the family remained significantly associated with more hours of unpaid work, while psychological demand and education level did not. Two new variables entered the model: decision authority and disease duration.

To determine if predictors of work limitation varied for unpaid workers compared to paid workers the logistic regression analysis was repeated for these 2 subgroups. The odds ratios remained similar to those reported for the entire sample, with the exception of the OR for functional status (HAQ). The OR was 13.5 (95% CI 2.8–65) for unpaid workers and 1.78 (95% CI 0.50–6.4) for paid workers.

DISCUSSION

The purpose of the study was to describe participation in paid and unpaid work and identify factors associated with work participation and work limitation in adults with RA. Most respondents engaged in both paid and unpaid work. Compared to findings from the Statistics Canada 1998 General Social Survey, this sample of adults with RA reported roughly 8 fewer hours of work per week (in total) than the general population of the same age. The difference was largely in paid work hours for men, which is consistent with previous reports. For women, however, the RA sample worked about the same paid hours per week as the general population but fewer household hours. This finding may indicate that women in the RA sample were, on average, just beginning to experience work disability and had started to reduce the more discretionary unpaid work hours while maintaining their paid work hours. Although they worked less than the general population, our RA sample worked more than those studied by MacKinnon and colleagues. Their RA sample was similar in composition to our sample (Canadian, 75% female, with an average age of 50). Summing their hours of market work, household/yard work, child care, and studying to estimate total work, MacKinnon's sample worked an average of 37 hours
compared to the present sample's 47 hours per week (4 fewer hours of paid work and 6 fewer hours of unpaid work). Based on HAQ scores, the present sample is "relatively able," and perhaps worked more than others with RA because they had fewer physical limitations. (MacKinnon, et al did not report functional status.)

Factors associated with participation in unpaid work. Only one personal characteristic, education level, was associated with more hours of unpaid work. Being a post-secondary graduate was a significant predictor in both univariate regression and the final multiple regression model. Other characteristics of the person, specifically age, sex, and perceived pain, were significant in univariate analyses but did not enter the final predictive model. Interestingly, in Allaire and colleagues' study of homemakers, being a college graduate was associated with less household work. Unpaid work, as defined in our study, included caregiving, volunteering, and studying — people with higher education may seek more parental or professional volunteer opportunities, or engage in continuing education, creating more unpaid work. Those with a post-secondary education may be more likely to have partners who are also highly educated, with higher paying jobs, which enable the partner with RA to stay home and assume more household responsibility.

Number of children made the largest contribution to predicting hours of unpaid work in the final model: for each child in the household, unpaid work increased by about 12 hours per week. By comparison, for each unit of change on the MSPSS subscale for social support from family members, unpaid work increased by 2.5 hours. These are 2 different aspects of the environment. Having children generates more unpaid work, while social support enables more work to be done. Only about one-third of the unpaid workers had children under 18 living at home, so the magnitude of the effect of children on unpaid work is remarkable. This factor needs to be considered when advising mothers about managing their time, energy, and work.

Among the occupation characteristics studied, only 2 were significantly associated with hours of unpaid work. Increased physical demand (exertion) and increased psychological demand were associated with increased hours of unpaid work, in both univariate and multivariable models. For unpaid work, the time spent doing it increases to meet the demands of the household, and as the demand increases perhaps perceived exertion increases. Work perceived as psychologically demanding, however, may reasonably require more concentration or be more interesting, and
thus engage the individual in more hours of work.

Prior to conducting the analysis, functional status and pain were considered natural predictors of work participation because it would be reasonable to work less in the presence of physical impairment or pain. However, this was not the case for unpaid work among the respondents in this study. The majority of respondents had HAQ scores less than 1, and were therefore more able than patients in previous studies. Perhaps functional status is a predictor only for people experiencing greater functional limitations. Other researchers identified lower functional status as a predictor of limitations in performance of household work. In our study, functional status was a predictor of work limitation (in the logistic regression model) and the odds ratio was much higher for unpaid workers than paid workers, but function was not significantly related to work participation (in the linear regression model), as measured by hours of work. This is not really a contradictory finding, considering that work limitation was defined by the participants as "working less than I want to because of my RA." The 30% of participants who reported work limitation were still performing unpaid work, but perhaps the work was taking longer, explaining the differing effects of functional status in the 2 analyses.

While pain was associated with unpaid work in univariate analyses and the initial multiple regression model, it was excluded from the final model when other candidate variables were considered. The relative importance of pain as a predictor of unpaid work appears to be mediated by other factors.

Factors associated with participation in paid work. The association between men and more hours of work is likely a reflection of societal norms. Men may be more likely to be full-time employees and women more likely to take advantage of part-time employment opportunities in order to juggle home and work responsibilities. The association between less pain and more hours of work may be an indicator of the influence of RA on paid work. More pain was a predictor of work disability in previous studies, and it was anticipated that it would also predict hours of paid work. Higher social function makes sense as a predictor, because paid work often requires socializing with others. People with good social skills who value contact outside the home may be more likely to continue working or seek more work than those possessing a less social nature. A mother who participated in the consultation process for the study noted that paid work was important because it afforded opportunities to interact with adults.
Possibly more severe disease has a negative impact on both social function and work participation, thus contributing to this association.

Social support was not associated with participation in paid work. This contrasts with the finding of Allaire and colleagues\(^4\), who noted that more co-worker support was significantly associated with remaining employed. Others found that less social support was associated with work disability in a cross-sectional study, but was not significant in a followup longitudinal study\(^12\). Different measures were used in each study, and conflicting results may be due to that, rather than the construct itself.

Occupation characteristics associated with paid work included psychological demand and managerial job type. If the work is challenging or demanding, it may attract and maintain the individual's interest, leading to more time spent doing it. Managerial jobs are less likely to have rigidly scheduled hours and may demand more hours of work when problems arise or deadlines must be met. In contrast, service workers may have a more regular schedule, or even fewer hours, since service workers include job types that take advantage of part-time employees instead of incurring the costs associated with full-time contracts.

*Work limitation secondary to RA.* Unlike previous studies of work disability (which examine factors associated with work cessation), participants identified themselves as experiencing work limitation if they were working less than they wanted to due to RA. Regardless, several predictors of work limitations were similar to those reported for work disability, including pain and functional status. Participants with work limitations reported lower health status on all of the SF-36 subscales except the 2 assessing mental and emotional health.

The lack of association between work limitations and emotional or mental health status was in contrast to previous findings of an association between work limitations and psychological distress\(^19\) and depression\(^20\). Although RA is a condition with physical impairments, it would not be unusual for physical limitations to take an emotional toll. If occupation is a determinant of health, then those who are limited in pursuing valued occupations might find that their emotional health is affected. In this sample, those who reported work limitation worked fewer paid hours but similar unpaid hours compared to those not reporting work limitation. Perhaps engagement in unpaid work was sufficient to maintain a sense of productivity and prevent adverse effects on emotional
health. Or, respondents may have been reluctant to report problems with respect to emotional well-being.

In contrast to previous work disability studies, age was not a significant predictor of work limitation. Respondents whose work was limited by RA were, on average, about the same age as those not limited, and work limitation was reported across the age span of the sample studied. The mean self-efficacy function score for those reporting work limitation was 19% lower than for those not limited by arthritis. Additionally, both paid and unpaid workers had stronger self-efficacy with regard to function than they did with regard to managing pain or other symptoms. Efficacy-enhancing strategies have been shown to change behavior and improve arthritis symptoms\(^{40,41}\), perhaps they can improve work outcomes as well.

**Limitations.** Several limitations should be noted. The cross-sectional design of the study cannot establish cause and effect between "predictors" and "outcomes." There may be a selection bias, given that 40% of those invited agreed to participate. Perhaps only those who were actively engaged in paid and unpaid work responded to the invitation, a "healthy-worker effect" where more able workers are over-represented\(^42\). However, participants did not differ in terms of age or disease duration compared to a subgroup of 30 nonparticipants. The analysis of paid work hours was limited to respondents who are currently employed. Those who left paid work prematurely because of their RA have been excluded, which may result in underestimating the effect of some factors on hours of paid work. The prediction of paid work hours may have been limited by the character of paid work itself. There is a natural "ceiling effect" on paid work hours provided by work schedules or contracts that dictate a full-time week of 35 or 40 hours for some employees. Thus, the association observed between predictor variables and work hours may have been underestimated.

**Implications for practice and future research.** The study aimed to identify factors associated with participation in work that could subsequently influence the content of programs designed to assist people with arthritis maintain or return to work. While it is not possible to change the number of children in a household, it is possible to improve functional capacity, enhance self-efficacy, manage pain, and modify task demands. For example, it would be interesting to test a program of exercise (to improve physical capacity) and efficacy-enhancing strategies (to mediate pain and increase confidence in functional ability) for reducing work limitations and enhancing participation in paid and unpaid work.
Factors such as pain, functional status, type of work, and physical work demands were expected to be associated with work participation based on previous research findings. This study offers additional variables for future consideration in predicting participation in paid and unpaid work: social function, psychological work demands, self-efficacy, and perceived occupational balance. Although paid and unpaid work are both productive occupations, our study demonstrated several differences between paid and unpaid workers. Work retention/work rehabilitation programs may need to consider different approaches for clients based on their primary form of work.

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