

Work ability and work disability evaluation in Saudi patients with rheumatoid arthritis

Special emphasis on work ability among housewives

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ABSTRACT

الأهداف: تقييم القدرة على العمل والرضا في العمل لدى المرضى في المملكة العربية السعودية المصابين بمرض التهاب المفاصل الروماتويدي ومقارنة نتائج القدرة على العمل ومستويات الرضا في العمل بين ربات البيوت والذين يقومون بعمل بأجر ممن يعانون من التهاب المفاصل الروماتويدي.

الطريقة: أجريت دراسة مستعرضة وغير تداخلية شملت 120 شخص بأجر ممن يعانون من التهاب المفاصل الروماتويدي. تم استخدام مقياس الكم-الكيف (Quantity-Quality) لتقييم جودة العمل، واستبيان مقدار الرضا عن القدرة على العمل لتقييم أثر مرض التهاب المفاصل الروماتويدي على القدرة على العمل من المرضى المسجلين في هذه الدراسة. وجرى تقييم شدة المرض باستخدام مقياس نشاط المرض.

النتائج: أظهرت النتائج أن متوسط كمية العمل كانت 5.45 ± 2.533 ، وكان متوسط درجة جودة العمل 6.22 ± 2.5218 وكان متوسط درجة الرضا في العمل 6.26 ± 2.963 . كما كانت إنتاجية العمل المفقودة بسبب المرض 3.64 ساعة. وأظهرت الدراسة أن 5% فقط من المرضى لم يكن للمرض تأثير على كمية عملهم. مقارنة مع العامل أجرا المشمولة في الدراسة، وكانت نتائج ربات البيوت أقل بكثير من العاملين بأجر من حيث كمية العمل ($p=0.041$)، ونوعية العمل ($p=0.021$)، ورضا العمل ($p=0.040$).

خاتمة: ربات البيوت الذين يعانون من التهاب المفاصل الروماتويدي قد يعانون من نتائج أسوأ عند قياس قدرتهم على العمل مقارنة مع العاملين بأجر. وهذا يستدعي المزيد من الاهتمام لهذه الفئة من المرضى ويسلط الضوء على الحاجة إلى اتخاذ تدابير محددة لمزيد من تقييم القدرة على العمل بين مرضى التهاب المفاصل الروماتويدي عامة وبين ربات البيوت منهم خاصة.

Objectives: To assess work ability and work satisfaction in Saudi Arabian patients with rheumatoid arthritis (RA) and to compare work ability outcomes and work satisfaction levels between housewives and paid workers both suffering from RA.

Methods: This is a cross sectional study on 120 patients with RA conducted at 3 hospitals between September 2011 and May 2012. The Quantity-Quality Method (Q-Q Method) and the Work Satisfaction Questionnaire were used for the assessment of the impact of RA on the work ability of the patients enrolled in this study. The RA disease severity was assessed using Disease Activity Score-28 (DAS-28) and Health Assessment Questionnaire (HAQ).

Results: The mean \pm standard deviation scores were: 5.45 ± 2.533 (work quantity); 6.22 ± 2.5218 (work quality); and 6.26 ± 2.963 (work satisfaction). Work productivity lost due to RA was estimated to be 3.64 hours. Compared with paid workers included in the study, housewives had significantly lower work quantity ($p=0.041$), quality ($p=0.021$), and work satisfaction ($p=0.040$) scores. Fatigue, swollen joint count, tender joint count, HAQ, and the use of biologic therapy were found to be the variables that were significantly related to work quantity.

Conclusion: Housewives with RA suffer worse work ability outcomes and poorer work satisfaction compared to paid workers with RA.

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Rheumatoid arthritis (RA) is a chronic inflammatory disease with autoimmune features and a complex genetic component that affects 0.5-1.0% of the adult population globally.¹⁻³ In RA patients, inflammation and joint damage can result in mental and/or emotional limitations, increased pain and fatigue, and even loss of physical function. Rheumatoid arthritis patients are not only disabled by pain due to a high disease activity but also suffer from an impaired quality of life (QoL) and a high prevalence of fatigue.^{4,5} Both early and longstanding RA patients have a high prevalence of work disability; it has been shown that approximately 40% of the early and approximately 60% of the longstanding RA patients are unable to work.^{6,7} In fact, RA has been ranked among the highest of all chronic diseases for effect on health-related quality of life and socioeconomic productivity.^{8,9} Rheumatoid arthritis relates to the degree of functional disability, a disease activity marker.¹⁰ In addition, RA generates high societal costs as a result of reduced functionality, sick leave, and early retirement.¹¹⁻¹⁵ There have been few studies on the impact of RA on household work,¹⁶ as well as studies in a setting where female unemployment is considered part of the normal culture, as in most of the Arab countries.¹⁷ In this study, we compared work ability outcomes, as well as work satisfaction levels between housewives and paid workers both suffering from RA, plus inquiring into the factors that may lead to poor work ability measures in this population. In a QUEST-RA study, it was found that among 1,754 patients with RA whose symptoms had begun during the year 2000, and were working at baseline, the rates of probability (95% confidence interval) to continue working were 80% (78-82%) at 2 years, and 68% (65-71%) at 5 years in a similar pattern to women and men.¹⁸ One study concluded that work disability prevalence in United States is high (35% within 10 years disease duration).¹⁹ Another study highlighted that arthritis may marginalize women and men in different ways. Women may be more likely to leave employment, whereas men may be more likely to remain working and report negative workplace experiences. This underlines the fact that working women with RA may become housewives at one point of their career.²⁰ More research is

necessary to further understand the work ability among women, especially housewives. This non-interventional study was conducted to examine the effect of active RA on work ability and work satisfaction in Saudi Arabia with a special emphasis on housewives' work ability. The research attempted to determine the factors that predict poor work ability among RA patients in Saudi Arabia.

Methods. Study population. Between September 2011 and May 2012, patients diagnosed with adult-onset RA according to the American College of Rheumatology criteria for diagnosis of RA were consecutively recruited at the outpatient clinics of 3 hospitals in Saudi Arabia (Dr. Soliman Fakeeh Hospital - Jeddah, Heraa General Hospital - Makkah, and Al Noor General Hospital - Makkah). No intervention was performed in regard to the ongoing treatment strategies of the subjects during the data collection period. Patients with disease duration less than 6 months and/or taking contraindicated medications were excluded. The hospital ethics committees approved the study, and all patients gave informed consent prior to study inclusion.

Data collection. Three research coordinators who were experienced in data collection and questionnaire administration were appointed to collect patient data. Treatment history, including duration and comorbidities, if any, were recorded following direct interview and review of patient records. Medications were categorized into non-steroidal anti-inflammatory drugs (NSAIDs), steroids, methotrexate (MTX), other disease modifying anti-rheumatic drugs (DMARDs), and biologics. Profession was defined as housewife, student, teacher, labor worker, clerk, or others. All patient data was collected in a structured (cross-sectional) fashion and recorded into the clinic database systematically.

Assessment tools. Work ability was assessed using the Quantity-Quality Method (Q-Q Method),^{21,22} and work satisfaction was assessed using a Work Satisfaction Questionnaire.²³⁻²⁵ The ability of study subjects to perform basic daily activities was assessed via the Multidimensional Health Assessment Questionnaire (MAHAQ).²⁶ All questionnaires used were adapted for use in the Arabic language. In addition, active disease was classified using the Disease Activity Score based on 28 joints (DAS-28), which included measurements of tender joint count (TJC), swollen joint count (SJC), and erythrocyte sedimentation rate (ESR).²⁷ The percentage of RA patients who consider themselves work disabled in response to the question "Do you consider yourself work disabled due to RA?" was also assessed.

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Statistical analysis. Data were summarized using means, medians, and standard deviations for continuous variables, and tables of frequencies and percentages for categorical variables. The work quantity score (with 0 = practically doing no work, and 10 = doing normal quantity of work), the work quality score (with 0 = very poor quality and 10 = normal quality), and the work satisfaction score (with 0 = very dissatisfied and 10 = completely satisfied) were all summarized as means and standard deviations. Differences in work quality, work quantity, and work satisfaction scores between housewives and paid workers were analyzed using independent groups t-tests, with higher scores means better outcome. Multivariable regression was used to estimate associations of work quantity with various demographic and clinical characteristics (age, gender, disease duration, comorbidities, fatigue, DAS, HAQ, use of biologics, ESR, SJC, TJC). All analyses were performed with 2-tailed $\alpha = 0.05$.

Results. A total of 120 consecutive patients with RA were enrolled into the study (78.3% of Arabic descent), including 13 males (10.8%) and 107 females (89.2%). Additional demographic information is presented in Table 1. Results for work quality, quantity, and satisfaction are summarized in Table 2. Patients scored 5 points or less in their work quantity (55%), work quality (45%), and work satisfaction (42.5%) scores. Only 5% stated that RA had no effect on their work ability. The mean \pm SD scores for housewives (84.1% of the sample) were: 5.18 \pm 2.47 (work quantity); 5.91 \pm 2.53 (quality), and 5.96 \pm 3.02 (satisfaction). These were significantly lower than the mean \pm SD for work quantity (6.27 \pm 2.59, $p=0.041$), quality (7.13 \pm 2.27, $p=0.021$), and satisfaction scores for paid workers (7.17 \pm 2.26, $p=0.040$). Fifty-nine percent of patients included in the study suffered from at least one comorbidity, mainly diabetes mellitus (13.3%) and hypertension (23.3%) (Table 3). The mean scores for patients with no comorbidities were: 5.69 (work quantity); 6.39 (work quality); and 6.37 (satisfaction); and mean scores for patients with comorbidities were: 5.28 (work quantity); 6.10 (quality); and 6.18 (satisfaction). There was no significant difference between the absence or presence of comorbidities on work quantity ($p=0.25$), work quality ($p=0.98$), or work satisfaction ($p=0.69$) in these patients. All patients enrolled in this study were concurrently undergoing treatment for RA. A total of 12.5% of patients were on MTX alone, 48.3% on MTX plus steroids, and 19.2% on MTX plus other DMARDs (all grouped as conventional therapy), while 16.7% were being treated with biologics. As

Table 1 - Characteristics of the population included in a study conducted at 3 hospitals in the Kingdom of Saudi Arabia (N=120).

Characteristics	Mean \pm standard deviation
Age	46.60 \pm 11.9
Female, n (%)	107 (89.2)
Body mass index	31.34 \pm 7.08
Disease duration, years	6.43 \pm 6.36
Tender joint count	5.34 \pm 5.33
Swollen joint count	1.89 \pm 2.22
Erythrocyte sedimentation rate (mm/hr)	41.55 (27.34)
Disease activity score	3.98 \pm 1.79
Health assessment questionnaire	1.01 \pm 0.67

Table 2 - Work ability assessment results of the population included in a study conducted at 3 hospitals in the Kingdom of Saudi Arabia.

Assessments	Mean \pm standard deviation
Work quantity score	5.45 \pm 2.533
Work quality score	6.22 \pm 2.52
Work satisfaction score	6.26 \pm 2.96
Patients reported a >50% drop in their work quantity, n (%)	66 (55.0)
Patients reported a >50% drop in their work quality, n (%)	54 (45.0)
<50% of patients are satisfied with their level of work due to RA, n (%)	29.4 (42.5)

RA - rheumatoid arthritis. Scoring method: work quantity - 0 (practically doing no work), and 10 (doing a normal quantity of work); work quality - 0 (very poor quality) and 10 (normal quality); work satisfaction - 0 (very dissatisfied), and 10 (completely satisfied)

Table 3 - Comorbidities of the population included in a study conducted at 3 hospitals in the Kingdom of Saudi Arabia.*

Comorbidities	n	(%)
None	49	(40.8)
Hypertension	28	(23.3)
Diabetes mellitus	16	(13.3)
Dyslipidemia	14	(11.7)
Osteoarthritis	11	(9.2)
Osteoporosis	10	(8.3)
Thyroid disturbance	8	(6.7)
Gastrointestinal tract disorder	7	(5.8)
Others	5	(4.2)
Cardiovascular disease	3	(2.5)

*Other comorbidities included 3 patients with asthma, one patient with depression, and one patient with neurologic disorder

Table 4 - Work ability scores on conventional therapy versus biologics of the population included in a study conducted at 3 hospitals in the Kingdom of Saudi Arabia.

Scores	Biologics	Non-biologics	P-value
Patients, n (%)	20 (16.7)	100 (83.3)	
Work quantity score*	7.70 \pm 2.13	5.00 \pm 2.37	0.0001
Work quality score*	7.85 \pm 1.69	5.89 \pm 2.53	0.0001
Work satisfaction score*	8.20 \pm 1.91	5.87 \pm 2.99	0.0001

*mean \pm standard deviation

Table 5 - Logistic regression to identify predictors of poor work quantity, work quality, and work satisfaction of the population included in a study conducted at 3 hospitals in the Kingdom of Saudi Arabia.

Predictors	Work satisfaction			Work quality			Work quantity		
	Beta	t	P-value	Beta	t	P-value	Beta	t	P-value
Age	0.055	0.791	0.431	-0.003	-0.041	0.967	-0.011	-0.166	0.868
Gender	-0.049	-0.726	0.469	-0.033	-0.515	0.607	-0.104	-1.55	0.124
Fatigue	-0.356	-5.093	0	-0.353	-5.274	0	-0.33	-4.758	0
TJC	0.217	2.33	0.022	0.014	0.153	0.879	0.316	3.421	0.001
SJC	-0.202	-2.467	0.015	-0.211	-2.7	0.008	-0.233	-2.876	0.005
DAS	-0.057	-0.547	0.586	0.219	2.187	0.031	-0.054	-0.522	0.602
HAQ	-0.445	-5.189	0	-0.378	-4.609	0	-0.44	-5.167	0
Comorbidity	-0.027	-0.403	0.687	-0.075	-1.163	0.247	0.002	0.024	0.981
Biotherapy use	0.153	2.132	0.035	0.3	4.364	0	0.185	2.6	0.011
Disease duration	-0.05	-0.734	0.465	-0.089	-1.37	0.174	-0.101	-1.492	0.139
ESR (mm/hr)	-0.081	-0.871	0.386	-0.16	-1.792	0.076	-0.088	-0.951	0.344

TJC - tender joint count, SJC - swollen joint count, DAS - Disease Activity Score,
HAQ - Health Assessment Questionnaire, ESR - erythrocyte sedimentation rate

shown in Table 4, patients on conventional therapy had significantly lower work quality, quantity, and satisfaction scores than patients on biological therapy. A multivariable regression model was developed to assess the predictive value of age, gender, fatigue, presence of comorbidities (including overweight/obesity), SJC, TJC, DAS, HAQ, disease duration, ESR (mm/hr), and the use of biologics on work quantity scores. The model fit was good (adjusted $R^2=0.549$). Of these factors, only fatigue, SJC, DAS, HAQ, and biologic therapy use were found to be significantly related to work quantity (Table 5).

Discussion. This study observed that work ability of these patients was affected by their condition, strongly correlating with disease severity, as measured via DAS and HAQ. There was also a high prevalence of being overweight and obese along with cardio-metabolic comorbidities in these individuals. Housewives seemed to suffer worse work ability outcomes than working population, and the use of biologics may improve work ability scores. The RA is known for its long-term disabling outcomes, and for its destructive effect on patient's quality of life, including the diminished capacity in ability to work. Thus, work productivity loss is a serious and common problem even for patients with very early RA. In fact, when RA patients were asked to prioritize the dimension of health they would like to improve, almost one-third of them cited health status related to work as the most important priority.²⁸

A recent RA studies have highlighted the significance of this issue. Merkesdal et al²⁹ found that within the first 3 years after RA diagnosis, there was an average

of 82 days of sick leave per person-year, and 26% of the patients lost work because of RA. Eberhardt et al³⁰ investigated work disability rates over 15 years in an early RA cohort, where the mean duration of RA was 11 months at baseline. The work disability rate increased from 28% at baseline, to 35% after 5 years of follow up. In their study published in 2005, Meerding et al³¹ found the mean work quantity score \pm SD for workers with health problems to be 8.2 ± 2.6 , and the mean work quality score was 8.9 ± 1.9 ; the results of our study is showing poorer quantity and quality of RA patients in Saudi Arabia compared to these figures (5.45 ± 2.5 [the mean work quantity score] and 6.22 ± 2.5 [mean work quality score]). The results of the 2 studies are not being directly compared however this may suggest that RA is associated with poorer workability outcomes than expected. In that study, the investigators calculated the hours lost due to illness based on the following formula: $([10 - \text{quantity score}]/10) \times 8$ hours. The authors stated that based on this calculation, the average hours/day lost due to musculoskeletal problems was 1.9 hours/day, and when we applied the same calculation on our patients, the average hours lost was 3.64 hours/day.

There have been few studies on the impact of RA on work ability of housewives. In their study, Habib et al¹⁷ included 107 Arab females (89.2%), and 90 (75% of the whole study population) were housewives. There are no published studies assessing the household work disability in such a socio-economic setting of the Arabian Gulf region, which undermines our understanding of RA disease burden in this part of the world. In their study published in 2009, Kaptein et al²⁰ concluded that women may be more likely to

leave employment than men, this means women with RA may turn their activities at one point of their career from an outdoor into a household one, which may encourage for more research to be carried out to further understand the work ability among households. A total of 59.2% of RA patients included in our study displayed at least one co-morbidity, mainly diabetes mellitus (13.3%) and hypertension (23.3%). Such population is not uncommon in Saudi Arabia or the Arabian Gulf region,²⁰ and further assessment for the reasons of work ability in such "complex" population may be needed. Our results showed that RA disease activity and fatigue are the major factors affecting work ability and not comorbidities. This gives more hope to such patients that by controlling their RA disease activity, their work ability may improve even in the presence of cardio-metabolic comorbidities.

An interesting finding of this study was that the addition of biologic therapies to DMARD therapy could improve the quality of life of RA patients, because those undergoing biological therapy showed increased work quantity, quality, and satisfaction relative to non-biological, DMARD only, strategies. Although these results are particularly promising, we must note that these preliminary findings were based on 20 patients undergoing biological (biologic agent plus DMARD) therapy (16.7% of the total cohort) only. However, a recent literature review agrees with this trend, reporting positive results of biological agents on work participation compared to DMARDs.³² Together, these data add more hope that biological treatments for RA might hold the key for controlling, or delaying the work ability loss caused by this disabling disease. Currently, rheumatology studies are underway to assess if enhanced results for RA patients can be achieved through long-term use of biologics. One interesting finding from this study was that housewives showed a significantly worse work ability outcomes compared to the working population. Thus, our data suggest the need for additional research to assess why the work ability of housewives is suffering due to RA, particularly since this group constitutes the biggest sector of RA patients in Saudi Arabia, and it is getting bigger worldwide, as more women are quitting their work and turning into housewives. This is especially important because most of the cost-effectiveness models assessing the impact of RA treatment are written for working, retired, or unemployed patients and not housewives.

This study has several limitations. First, the small sample size can result in representation of only a selected population, or a narrow spectrum of patients. However, we sequentially enrolled eligible patients at 3

separate hospitals in order to reduce bias in selection, and to approximate the demographic variety within Saudi Arabia. In addition, this study is not currently part of any clinical registry system, which could be used for future validation of these findings in a larger population. Another limitation was the use of self-reported data to assess the percentage of RA patients who consider themselves work disabled, which is well known to be associated with potential bias. Altogether, these limitations can be overcome through continued study of work ability in Saudi Arabian RA patients.

We believe that this report is an important first step for future development of strategies that will prolong the ability of RA patients to be productive members in Saudi society. Moreover, we conclude that measuring work ability is a valuable patient assessment tool, which should be incorporated into the daily management of RA and monitored as a fundamental targeted outcome for all RA patients, including housewives.

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