Work Disability and Rheumatoid Arthritis: Predictive Factors

Abstract

BACKGROUND: Rheumatoid arthritis is often associated with work disability, a term used to describe the inability to be or to remain employed. Work disability is a common implication of rheumatoid arthritis.

OBJECTIVE: This review aims to identify and analyze the predictive factors of work disability among patients with rheumatoid arthritis, as well as to group these factors into broader categories, based on the most current studies in this field.

METHODS: An electronic search was conducted using Google Scholar, MEDLINE and PsycINFO databases. Eighty-six international journal articles were finally selected.

RESULTS: The results suggest that occupational, personal, medical and societal factors are the main predictive categories of work disability for people with rheumatoid arthritis.

CONCLUSIONS: Medical progress has had a positive effect on the development and the rates of work disability among patients with RA. Work disability is, however, not only defined by medical factors. Occupational, personal and societal factors interact with each other and affect the development of work disability in RA. The results of this review emphasize the need for medical and vocational therapy interventions, social support and state policies that target the work status of patients with RA. Future holistic research approaches to the field are required for a complete picture and concrete solutions with the aim of keeping patients with RA employed.

Keywords: Rheumatoid arthritis, employment, work disability, predictive factors, vocational rehabilitation

1. Introduction

Rheumatoid arthritis (RA) is an inflammatory, chronic disease [1] and the most common of rheumatological conditions [2, 3]. Approximately 0.5-1% of the world's population suffer from RA [4, 5], with higher prevalence rates in low- and middle-income countries [6]. The main symptoms of RA are progressive damage of the joints, swelling, stiffness, pain and fatigue [7, 8]. Activity disruption due to RA symptoms may occur during the earliest stages of the disease, even before the diagnosis [9]. The fear of disability associated with RA is one of the most frequently reported fears among patients [10]. RA can lead to disability [1] if not diagnosed early and properly treated and the damage to the joints affected is total and permanent [8].

The new identity of people with RA upon diagnosis impacts all of their previous identities, with a transition period being established for accepting life changes [9]. The main life changes caused by RA concern employment conditions and work participation [11]. Continuing to work has been proven to be beneficial for patients with RA [12] as work can increase self-esteem [13, 14] and ensure financial independence [14]. Less symptoms of fatigue and an improvement in patients' mental health as result of more social participation and a reduced feeling of helplessness have been attributed to being occupationally active after the onset of RA [12].

As a consequence of RA, patients are at risk of work instability, which is a temporary transitory phase where the employee's abilities cannot meet the work demands, placing the individual at risk of job loss [15]. Difficulties related to work for patients with RA are psychological and physical problems, the adaptations of the conditions of employment required, sick-leaves and their impact, returning from and going to work and disclosing that they have RA to their employer [16].

Work instability is associated with work disability [15], which RA commonly leads to [1, 17-19], not only when the disease is longstanding but also in its early stages [11, 20, 21]. Work disability is described as a ‘major economic’ [14: p.1570] and ‘devastating’ [p.672] consequence of RA, but not a ‘self-evident’ [p.676] one, due to the medical progress noted, especially in early RA [22]. Work disability linked with RA apart from the medical dimension is additionally a ‘serious social problem’ [p.1631], with social causative factors and consequences for RA patients [23].

There is a scarcity of research on the predictive factors of work disability as a whole among patients with RA. This review aims to identify and analyze the predictive factors of work disability in RA, as well as to group these factors into broader categories based on the most current studies in this field and the literature of the last 25 years regarding these subjects.

2. Methods

An electronic literature search was conducted using the Google Scholar, MEDLINE and PsycINFO databases, on key concepts based on the terminology related to work disability due to RA. The search terms used were: ‘employment’, ‘work productivity’, ‘disability’, ‘limitations’, ‘work disability’, ‘risk factors’, ‘work participation’ and ‘work status’. Additional articles were identified by manual searches through the reference lists of the included articles.

The inclusion criteria for the articles chosen were the following:

1. Publications associated with work disability due to RA;
2. Published date within the last 25 years;
3. Selected condition being RA and no other arthritis condition;
4. Original research based on primary data and review articles; and
5. Publications in the English language.

Two hundred and eleven (211) articles were selected through the database and the manual search. Of the initial findings, 43 articles were duplicates and 82 did not meet the inclusion criteria. Eighty-six (86) articles were finally chosen and grouped into the following two themes according to the categorization of Rudestam and Newton [24]: Twenty-four (24) articles regarding general information attributed to introductory sections and related to work disability due to RA; and 62 articles regarding specific information on the predictive factors of work disability. The methods section is summarized in Figure 1.

3. Defining work disability in relation with RA

The term 'work disability' in RA is used to describe the inability to work in the same job position and work hours as they could before the onset of the disease, or in general, the inability to remain employed [17]. However, there are multiple approaches to the term, based on different criteria and instruments. For instance, Druce et al [25] define the term as the impact of RA on the work and the daily activities of the patients over a period of seven days measured with the Work Productivity and Activity Impairment-Special Health Problems (WPAI:SHP) scales. Wallenius et al [26] consider those who receive a permanent disability pension as work disabled persons due to RA. Scott, Smith and Kingsley [21], in their review, use as a work disability measure the Health Assessment Questionnaire (HAQ) or other health measures. Chung et al [27] take as a starting point the onset of work disability and measure up to the last working date due to the disease, as reported by the patient with RA. Lacaille et al [20] specify work disability due to RA as unpaid activity for at least six months, which is a time period used by most insurance companies as a determining factor of long- term disability, whereas Tang et al [28] identify five

modular and psychometric instruments for the measurement of work disability and productivity in RA.

Despite the subjective definition or the instrument use of each researcher, it is common assumption that work disability characterizes a temporary or permanent change in the work routine or in the work prospects of a person with RA.

4. The role of work productivity

Productivity is a multidimensional concept. From an economic point of view, productivity mainly expresses the relationship between working hours and the result produced [29] or the concept of efficiency between the more or fewer hours required for the specific result [30]. Productivity, which refers to work, mainly paid, is called work productivity [30] and is affected by additional factors such as changes in the labor market, technological progress, the role of the employee, presenteeism, or absenteeism from work [29], the effort made, and the skills acquired [31]. A variance of measurement instruments for work productivity reveals the difference in the research approaches and the lack of a universally accepted measure of the term that could incorporate all the parameters [29, 32].

Work productivity for people with RA is measured with reference to a scale that starts with normal productivity, continues to presenteeism, where the productivity is being reduced, moves to absenteeism, which includes temporary absence with sick leaves, and ends in permanent absence, which covers permanent work disability and work withdrawal [14, 33]. The work status of patients with RA in the first three stages of the scale is employed, and in the fourth is unemployed [33]. Loss in work productivity is a possible consequence of RA [34, 35]. The number of workdays missed, which is substantially higher among employees with RA in comparison to employees without RA, is also taken into consideration [34]. A significant loss in

productivity is connected to stiffness, late work arrival and early retirement among patients with RA throughout Europe [36]. Pain and fatigue in RA are added factors that affect presenteeism, absenteeism, disease activity and ultimately a loss of productivity [25, 37]. The economic impact of RA on the loss of productivity is reflected in the high indirect costs, mainly related to absenteeism and work disability costs [38], but also in the loss of patients' annual earnings, which according to Wolfe et al [39] is estimated at approximately 9-11%.

5. Associated factors with work disability

According to Barrett et al [17], the factors associated with work disability in RA fall into the following three main categories:

a) Work type, workplace and other occupational factors,

b) Personal factors, and

c) RA factors.

Gomes et al [40] distinguish three categories of factors related to job retention in RA· patients' individual characteristics, socioeconomic background and degree of disability. Stamm et al [41] talk about personal and environmental factors with regards to the performance of everyday activities in RA, while Lacaille et al [20] identify health related and work related predictive factors of work disability due to RA. Based on the above categorizations, this review distinguishes and analyzes the following four main categories of predictive factors of work disability in RA that have been commonly indicated in the research viewed:

a) Occupational factors,

b) Personal factors,

c) Medical factors, and

d) Societal factors (Figure 2).

5.1. Occupational factors

5.1.1. Work type

Manual and heavy work, in comparison to sedentary and less physically demanding work, has been found to be one of the main factors leading to work disability [20, 23, 42, 43], as the former can be correlated with more physical pain, less chances for ergonomic adaptations and greater job strain [20]. Shift work, defined as a work schedule beyond typical work hours on a daily or a nightly basis, is also associated with increased and decreased RA risk respectively [44]. In particular, day-shift work is associated with increased RA risk, possibly due to sleep reduction, and permanent night-shift work with decreased RA risk, hypothesized as being attributed to decreased melatonin production [44]. Moreover, self- employment of individuals with RA is related to a lower risk of work disability and attributed to greater autonomy and flexibility that allows them to plan their work around their needs and limitations due to RA [20]. Flexible work timings and working from home can promote remaining employed among the RA patients [18].

5.1.2. Working conditions

Apart from the types of work that can be considered factors that lead to or prevent work disability, working conditions play also a significant corresponding role. High exposure to dust, cigarette smoke, fumes, chemicals and metals, which are encountered especially in occupations which have traditionally been male-dominated, such as among miners, construction workers, electrical workers, farmers, and asphalt pavers, are considered to be triggers for RA [45]. Furthermore, flexibility in the assigned tasks, arranged working hours or the required changes to the physical working environment is associated with greater productivity and more chances of remaining employed for RA patients [18].

5.2. Personal factors

5.2.1. Individual characteristics

Advanced age and the low educational level of patients with RA are predictors of work disability [46] as they are correlated with longer durations of work disability and a greater loss in productivity [47, 48] and working hours [49]. Older people are less likely to have equal employment opportunities or chances for vocational rehabilitation in comparison with younger people [48]. Additionally, RA patients with a higher educational level are more likely to have better employment chances which are more compatible to their medical status and will secure easier adjustment to new work environments, in comparison to patients with a lower educational level [23, 50]. One reason for this is that a lower educational level is associated with more physically challenging jobs [26, 48], which is supposed to be a significant risk factor for work disability in RA [26, 43], although it is also argued to be the opposite [48].

The female gender is another predictor of work disability, as women are approximately three times more likely to be affected by RA than men [51, 52] and three to four times more likely to become work disabled due to RA [26, 49, 50]. In contrast to these findings regarding the consequences of RA on the female gender, Berner et al [46] suggest that women with RA have better work ability and employment chances in comparison to men.

Van der Zee-Neuen et al [53] summarize the above-mentioned points, in support of the female gender, older age and lower educational level being considered as significant predictors of fewer chances of employment among patients with RA.

5.2.2. Self- perception of health

Self-perception of health among patients with chronic diseases varies. A patient with RA may feel ill due to a flu and not RA [54]. Additionally, discordance is often

detected between the patients' and physicians' views on the effect of RA on the patient, which can be correlated with decreased work productivity and increased disease activity for the patient [55]. Patients with RA and having work disability are more likely to return to work when a clinical intervention takes place before they have entered full time disability pension, because after that point very few re-obtain their ability to work [47]. In contrast to with the previous statement, it is argued that self-perception of health among patients with RA as perceived pain is a less significant factor of work disability [23].

5.2.3. Value of work

There is a process of re- evaluation among patients with RA of the meaning of work in their lives as part of their self- identity, pointing out a more valuable and the 'hugely important' [p.30] role of work after the diagnosis [11]. It is supported that work, as a daily activity, is given the highest priority among adults with RA [56]. In the study conducted by Meunier et al [16], it is proven the discussion topic between patients with RA and their rheumatologists with a very high frequency, occurs once during every two consultations. Work is, in many, cases seen by patients as the way to retain normalcy in their lives despite RA: a way to be productive, earn their living, be socially active and shift their attention from the symptoms of the disease [18]. Patients' evaluation of the meaning of work is a predictive factor of work disability in RA, with greater importance leading to reduced risk of work disability [20]. The attributed great importance given to work is considered a decisive factor for the patients remaining employed despite RA [18]. In accordance with that assumption, the desire to stay at home due to RA is regarded as the most significant predictor of work disability [23].

It is noteworthy that for women with RA, work, as a sub-identity or part of the individual identity is given the highest priority, among motherhood and managing life with RA [57]. Women pay great attention towards continuing to be active and able to perform their everyday activities despite RA [58]. However, the loss of a desired job position, the inability to work or even to wear at work their preferred shoes can change the way patients with RA identify themselves and their roles in life [9]. As a result, there is a high number of women with RA who, due to the limitations caused by the disease or the issues related to the children and their role as mothers, reappraise the priority to continue working [57] and declare themselves to be housewives [59].

5.3. Medical factors

5.3.1. RA and Health- related factors

The severity of RA, intense and persistent disease activity [23, 42, 43, 60], worsening physical function and functional capacity [26, 60], as well as a longer duration of RA [26] are important factors for measuring work disability. Lower scores in the HAQ or in the Disease Activity Score (DAS28) are correlated with worse physical functioning [61] and a negative impact on RA patients' chances of employment [47, 53]. Disease-related factors and particularly high levels of disability due to RA are additionally connected to more work presenteeism [62]. An independent factor regarding work disability in RA is the worsening of patients' mental health [26]. On the other hand, early response of patients with RA to medical treatment during the first few months is a predictor of later disease remission and increased work participation [63].

Another health-related factor of major concern for patients with RA is pain due to the impact of RA on their everyday activities. People with RA face more limitations in performing the activities required, and are more dependent on others and more likely to feel frustrated when they are not able to function properly [56].

That leads to the conclusion that the reduction of pain in RA is related to the facilitation of daily activities [56], physical function [64] and improvement in muscle strength to work ability promotion [46].

Additionally, there is a strong association between RA and chronic fatigue [65]. High levels of fatigue are noted in a significant number of patients with RA, and they seem to persist despite new treatments [66]. It is indicated that low fatigue along with quality of life, work ability and disease activity are conditions, which in association with each other, contribute to higher rates of work participation for people with RA [67].

5.3.2. Medical treatment

Conventional synthetic Disease-Modifying Antirheumatic Drugs (csDMARDs) therapy for RA has a positive impact on work disability, especially if medication is administered intensively and in the early phases of the disease [48, 49]. Early aggressive treatment based on csDMARDs can act against the expansion of work disability [48], whereas the treat-to-target therapy strategy for patients with early RA using csDMARDs can keep the disease activity at low levels and preserve their work capacity for longer periods [49].

The treatment procedure of RA has changed rapidly after the introduction of biological DMARDs (bDMARDs), as an anti- tumor necrosis factor (anti-TNF) and targeted synthetic DMARDs (tsDMARDs), as Janus kinase inhibitors, with apparent positive effects on the clinical status and the work disability of patients. These novel therapies can enhance the disease remission offered by csDMARDs plus corticosteroids treatment, when used according to the European League Against Rheumatism (EULAR) or to the American College of Rheumatology (ACR) recommendations [1].

Understanding RA pathogenesis improved treatment and transformed RA from a disabling disease to a disorder in which remission is possible [1]. Specifically, anti-TNF therapy is correlated with an improvement in symptoms, disease ability, functional disability and ultimately work ability, particularly within the first six months of treatment [68, 69]. If the patients respond to early introduced anti-TNF therapy, it leads to better medical results and higher chances for future prevention of work disability [70]. Additionally, methotrexate plus glucocorticoids treatment, followed by other bDMARDs (anti-TNF, IL-6R antibodies) or Janus kinases inhibitors, can prevent disability caused by RA if provided on time [4]. Anti-TNF treatment acts even when the patient has reached the point of work disability, provided that the treatment starts within five years after the onset of the disease, as then the chances of regaining work ability over the next three years are more than double in comparison to that of later treatment administration [47].

The positive effect of biological agents on absenteeism and particularly on sick leaves has been shown, however there is limited research about their effect on the presenteeism of employees with RA [14]. New treatments reduce absenteeism, but keep presenteeism at high rates, showing that the difficulties in full employment for employees with RA have not been solved yet [37]. Conversely, is reported that biological in comparison to conventional DMARDs have a significantly more positive effect on both absenteeism and presenteeism [35, 71] as well as work productivity due to the rapid medical improvement of patients with RA [35]. In any such way early diagnosis and treatment have a crucial role in ensuring better results with regards to both absenteeism and presenteeism [14].

At the same time, it is supported that combination therapies with csDMARDs do not prevent the disease's progression and the development of permanent work

disability for a significant part of employees with RA within a decade's period [72]. 20-25% of RA patients do not achieve remission or low disease activity with current drugs [4]. This rate might increase in low-income countries due to limited access to the expensive biological factors [73]. Despite the clinical improvement of patients with RA, there is still a lot to be done, including, first of all, understanding the key role of several factors in pathogenesis of RA including environmental, genetic - epigenetic factors and combining them with therapy [1].

5.4. Societal factors

5.4.1. Socioeconomic background

Socioeconomic factors within countries, as applied legislation, economic background, social policies and social security systems have a great impact on the work outcomes for people with RA and are significant risk factors of work disability [27, 42, 53, 63]. Based on these assumptions, work disability has been broadly defined as the outcome of interactivity between the disease, social factors and state policies [74]. In particular, the low socioeconomic development of a country is considered a predictor of higher disease activity (DAS 28) among patients with RA, attributed mostly to less access to rheumatologists and treatment with biological factors [75]. Lower levels of economic and human development of a country are, in addition, linked to fewer chances for employment, higher percentages of absenteeism and unexpectedly in some cases, to lower percentages of presenteeism among patients with RA, probably due to the existence of lower work pressure among poorer countries in comparison to wealthier ones [53].

Furthermore, legislative changes and the change in attitude of the patients, and medical and state authorities towards the approach of work disability connected with RA have an impact on the rates of the work disability pensions of employees with RA

[22]. People with RA and a low income are more likely to retain their employment in comparison to those with higher incomes, probably due to the coexistence of a lack of information on their right to retirement, as well as the economic issues that force them to continue working [40].

5.4.2. Social support

For patients with RA there is an increased need for support from their closest acquaintances, family and friends [21]. Social support provided by the family members is of crucial importance for employees with RA to remain employed [20], whereas social support provided by family members and friends is strongly associated with a better degree of adjustment to RA within employment [11].

The work environment of patients with RA is composed of the social and the physical environment [11]. The need for social support at the workplace for employees with RA is pointed out, to achieve unobstructed work participation [69]. The workplace social support received by employees with RA from their employers and coworkers is associated with a higher or lower level of work ability [76], especially in terms of maintaining their employment [17], as well as with regards to their degree of adjustment to RA within employment [11]. It is noted that workplace support in the form of detailed information regarding the work, duties and work environment should be provided at the earliest after the onset of the RA [17].

Although there is limited research examining the impact of RA on the social functioning, it is assumed that satisfactory levels of social functioning may not be reached by patients with RA despite treatments [66]. The lack of employers' support is related to the difficulty in the management of work by employees with RA, while the lack of coworkers' support, expressed in form of 'unsympathetic comments' [p.1249], is associated with feelings of isolation for them [56]. The positive and

negative attitudes of employers and coworkers have an impact on pain respectively for employees with RA [56]. Supportive and understanding coworkers do seem to contribute to the management of pain caused by RA, whereas a lack of understanding displayed by the employers and coworkers, like pretending that their pain does not exist or by showing their annoyance to their reports of pain, is connected to hurt feelings and disappointment for employees with RA [7]. Unsupportive workplace behavior can even lead employees with RA to make the choice of non-disclosure of pain in order to avoid making a bad impression, being a burden or simply getting excessive advice regarding therapies [7]. Van der Meer et al [69] indicate that lack of employers or co-workers' support for employees with RA stems from communication problems between them or even from the disorientation that medical improvement causes with regards to employees with RA's true boundaries and abilities. Employees with RA often do not adequately communicate their needs due to their disease and as a result, employers or coworkers do not provide the appropriate support.

Although workplace social support consists of the support provided by employers and coworkers [77], health care professionals and vocational rehabilitation specialists seem to play an additional crucial role in providing information, improving understanding and raising awareness among all interested parties in order to be in position to fully support employees with RA [69]. The support of employers and colleagues within the work environment, and of health care professionals aside from vocational rehabilitation specialists outside the work environment, is necessary for employees with RA to remain employed [42, 69].

6. Conclusions

The purpose of this review is to record, comprehensively analyze and categorize the updated factors related to work disability in patients with RA, assuming that these

factors are the first step to facilitate further work participation in RA. The results suggest that occupational, personal, medical and societal factors are the main categorized predictive factors of work disability in RA (Table 1).

The inevitable connection of RA with disability is mostly with regards to the past, as new treatment strategies in connection with early diagnosis can successfully prevent irreversible damages and occurred disability [4] or at least decrease disease activity and increase physical activity respectively, improving patients' work and encouraging broader social participation [1]. Smolen et al [1] state that 'clinical assessment and therapy of RA has reached a state that no one dreamed of 2 decades ago' [p.18]. Despite this, however, the introduction of new biological treatments in the last decade having considerably improved the structural damage caused by RA and the functional status of patients, there are still unmet needs relating to subjective symptoms, such as pain and fatigue hindering their daily activities, including work, that need to be addressed [21, 66]. New ways that can better manage RA symptoms are required for patients with RA to perform their daily or routine activities after the onset of RA [9].

Medical progress has had a positive effect on the development and the rates of work disability among patients with RA. Early diagnosis and treatment are associated with a decline in the development of work disability in early RA, due to better and on-time outcomes of disease activity [22]. Work disability rates within early RA patients have additionally improved in comparison to previous years as a result of the improvement in patients' clinical status [27]. Work disability is, however, not only defined by medical factors. It is supported that HAQ scores effect mostly RA patients' decision to stop or continue being employed and do not represent their actual ability to work [65]. Occupational, personal and societal factors interact with each other and

affect the development of work disability in RA [17, 20, 40-42, 74]. This is why it is of great importance for people with RA to overcome, among others, the social barriers they face and to be seen as having equal ability as people without RA, and focus more on performing their tasks in an ordinary way rather than completing them [78].

The results of this review emphasize the need for interventions that target the work status of patients with RA. Medical and vocational therapy interventions, social support and state policies are all parts of a holistic approach to this direction. There is a need for early medical and vocational intervention, as the starting point of work disability is detected early after the disease's onset [20]. Patients with RA face multiple dilemmas with relation to their preferred everyday activities and health limitations, which health care professionals need to keep in mind in order to be able to fully address the patients' needs [79]. Awareness of the role of work in the lives of persons with RA is the starting point of the vocational interventions [11]. A collaboration between patients with RA, health care professionals from primary care physicians to rheumatologists, physiotherapists, and specialist nurses, and vocational rehabilitation specialists, as occupational therapists, is necessary for promoting coping strategies for RA and preventing work disability [43, 80-84]. Vocational rehabilitation specialists of people with RA should also bear in mind the societal factors that concern the two genders. Women appear more flexible in adopting activities other than paid work, as society can justify such roles taken on by them in comparison to men, where the measures regarding paid work are stricter [41]. The timing of interventions and help by vocational rehabilitation specialists is also crucial. Interventions should be provided at the time needed, neither before nor after, and customized with the periods of exacerbation and remission of RA symptomatology [11]. Furthermore, the findings of this review point out the need for targeted state

policies that will enhance workplace social support and promote working conditions for employees with RA [85, 86], that will address their needs and provide them with motivation to remain employed after the onset of RA.

There are limitations that have to be considered for the interpretation of the conclusions reported. There is a lack of consistency of measures, instruments or definitions for each term reached regarding work disability. The choice of the researchers varies according to their scientific approach and to the time period that their research has been conducted in. For instance, disease activity is being measured in most recent studies with DAS28, whereas in the study of Reisine, McQuillan and Fifield [23] it is measured by the number of flare-ups during the first year of the disease. Moreover, the findings are based on studies from various countries with differences among their cultural and socioeconomic status, which could put at stake their generalizability.

This review approaches the work disability of individuals with RA in a multidimensional way and contributes to the understanding that work disability is not only the result of a medical condition, but an interaction of personal, societal and occupational factors. The findings suggest that when only the disease is recognized as a cause for work disability in RA, we cannot see the forest for the trees. Future holistic research approaches to the field are required for a complete picture and concrete solutions with the aim of keeping patients with RA employed.

Conflict of Interest There are no conflicts of interest to declare.

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