



## Health-related quality of life and its predictors among patients with rheumatoid arthritis



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### ABSTRACT

**Background:** Limited studies have examined the predictors of HRQoL among patients with rheumatoid arthritis. This study helped to ascertain the predictors of HRQoL from the pool of influencing factors identified by previous studies. **Aim:** This study investigated the health-related quality of life (HRQoL) of adult patients with rheumatoid arthritis and its predictors.

**Methods:** Using a descriptive correlational design, this study explored the relationship between HRQoL and pain, functional disability, anxiety, depression, medication adherence and social support. Eligible outpatients (n = 108) were recruited via their attending doctors who were co-investigators of this study. Informed consent forms were distributed and questionnaires administered in a teaching hub by the main researcher.

**Results:** Significant correlations were found between HRQoL and all of the study variables. Pain, functional disability and depression were main predictors of HRQoL.

**Conclusions:** Future evidence-based interventions focusing on pain relief, delaying disability or improving functional ability and reducing depressive symptoms are required to enhance the HRQoL of patients with rheumatoid arthritis.

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### 1. Introduction

Health-related quality of life (HRQoL) is a broad, multifaceted concept related to the impact of a given health condition on an individual's physical, mental and social well-being (Lillegraven & Kvien, 2007), as well as on the individual's physical ability and capacity to function in a variety of social and emotional roles (Nicassio et al., 2011). HRQoL is regarded as an essential outcome variable measuring patients' perceived well-being that informs treatment and clinical practice (Groessl, Ganiats, & Sarkin, 2006; Kvien & Uhlig, 2005). For example, HRQoL has been used to evaluate the efficacy of existing treatment of disease activity of patients with rheumatoid arthritis (RA) (Smolen et al., 2010). Patients with RA are confronted with various chronic stressors such as pain, joint swelling and stiffness, functional impairment, fatigue and psychological distress on a daily basis (Clancy &

Hasthorpe, 2011; Morris, Yelin, Wong, & Katz, 2008) that lead to significantly reduced QoL (Cho, Kim, Jun, Bae, & Sung, 2013) and heightened mortality rates (Birnbaum et al., 2010). Most of the studies conducted previously have focused on medical treatment to reduce pain, and on improving functional ability to enhance HRQoL (Pascual-Ramos, Contreras-Yáñez, Villa, Cabiedes, & Rull-Gabayet, 2009; Pollard, Choy, & Scott, 2005; Stockl et al., 2010; Strand et al., 2012); however, there is lack of studies examining the predictors of HRQoL in patients with RA from a variety of possible influencing factors. Considering that the understanding of predictors of HRQoL of patients with RA can provide evidence to health professionals to consider other interventions to improve patients' quality of life (QoL), it is imperative to conduct this study.

HRQoL is associated with multiple factors such as pain, functional disability, anxiety, depression, medication adherence and social support (Cho et al., 2013; Corbacho & Dapuetto, 2010; Dirik & Karanci, 2010; Leung & Lee, 2005; Li, Blum, Von Feldt, Hennessy, & Doshi, 2010). These factors constitute the respective physical, psychological and social domains that determine the overall HRQoL (Ferrans, Zerwic, Wilbur, & Larson, 2005).

An integrated review of literature on HRQoL of patients with RA (Wan, Wang, Mak, Cheung, & He, 2015) showed that six quantitative studies reported pain to be the main predictor of HRQoL in patients

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with RA (Cadena et al., 2003; Cho et al., 2013; Hodkinson et al., 2012; Rupp, Boshuizen, Dinant, Jacobi, & van den Bos, 2006; Strand et al., 2012; Strating, van Schuur, & Suurmeijer, 2007). A longitudinal study by Rupp et al. (2006) reported that among variables of joint damage, disease activity, pain, depressive symptoms and disability, pain was the strongest predictor of Physical Component Summary (PCS) scores of the 36-Item Short Form Health Survey (SF-36). Meanwhile, pain also weakly predicted Mental Component Summary (MCS) scores of SF-36 (Rupp et al., 2006). However, three other studies reported functional disability to be the strongest predictor of HRQoL (Bazzichi et al., 2005; Kojima et al., 2009; Uhlig, Loge, Kristiansen, & Kvien, 2007). Only one study reported pain and functional disability to simultaneously predict HRQoL (Cho et al., 2013).

Apart from pain and functional disability, several studies have also reported the predictive strength of poor psychological well-being on HRQoL. For example, a study by Mok, Lok, and Cheung (2012) demonstrated the predictive ability of depression on HRQoL (SF-36) ( $\beta = -0.23$ ;  $p < 0.001$ ) after adjusting for other sociodemographic variables such as age, gender and marital status. Morris et al. (2008) suggested that depressive symptoms could undermine well-being and contribute to poor QoL. This is supported by other studies, which reported depression to be a major determinant of HRQoL (SF-36) (Ho, Fu, Chua, Cheak, & Mak, 2011; Nicassio et al., 2011; Rupp et al., 2006). With regards to anxiety, however, such evidence is lacking, given that only one study has found a significant correlation between anxiety and HRQoL (Cadena et al., 2003).

Additionally, existing literature has demonstrated increased HRQoL among general adherers. A quasi-experimental study evaluated adherence to injectable RA medications (e.g., etanercept, infliximab, adalimumab) in patients undergoing disease therapy management (DTM) and found those adherent to their medication regimens throughout the DTM program demonstrating improved functional ability and HRQoL (Stockl et al., 2010). Similarly, studies which quantified adherence to oral therapies such as disease-modifying anti-rheumatic drugs (DMARDs) and corticosteroids (e.g., prednisolone) also found improvements in HRQoL-associated variables among patients who exercised high medication adherence (Pascual-Ramos et al., 2009; Waimann et al., 2013). These HRQoL-associated variables included depression, disease activity and functional ability, which have been commonly reported to influence HRQoL as described earlier (Waimann et al., 2013). Social support was reported to predict QoL in only one study based on hierarchical regression results (Leung & Lee, 2005).

Despite the obvious associations among pain, functional disability, anxiety and depression, medication adherence, social support and HRQoL (Cho et al., 2013; Corbacho & Dapuerto, 2010; Dirik & Karanci, 2010; Leung & Lee, 2005; Li et al., 2010), not a single study has examined the effects of all of these interrelated factors on patients' HRQoL. Not a single study has examined these interrelated factors concurrently when considering HRQoL; most of the previous studies explored only the relationships between HRQoL and one or two other variables. Moreover, the focus in these studies has been on the use of medication therapy to reduce pain and improve functional ability, in turn enhancing the HRQoL among patients with RA (Pascual-Ramos et al., 2009; Stockl et al., 2010; Strand et al., 2012; Waimann et al., 2013; Westhovens et al., 2006). A review of the literature shows a need to expand existing knowledge on other factors that could predict the HRQoL of patients with RA to enable the development of complementary interventions to improve patients' HRQoL.

The aims of this study were to examine the level of HRQoL and its predictors in patients with RA in Singapore. The research questions were: (a) What are the levels of HRQoL, pain, functional disability, anxiety and depression, medication adherence and social support of patients with RA? (b) What is the difference in HRQoL between/among various sociodemographic and clinical subgroups? (c) What are the relationships between HRQoL and other aforementioned variables? (d) What are the predictors of HRQoL of patients with RA?

## 2. Research methods

### 2.1. Study design and participants

This study adopted a cross-sectional, descriptive correlational design. The study was conducted at a public tertiary hospital in Singapore. Participants attending either the rheumatology clinic or inflammatory arthritis clinic for medical services (e.g., consultation, blood tests, follow-up) at the study hospital were recruited through convenience sampling. The inclusion criteria were patients who: (a) had been diagnosed with RA for more than 6 months based on the 2010 American College of Rheumatology/European League Against Rheumatism (ACR/EULAR) classification criteria for RA at the time of data collection; (b) were 21 years old and above; and (c) were able to read, speak and understand English and/or Mandarin. The exclusion criteria were patients who: (a) had visual and/or hearing impairments/difficulties despite the use of aids; (b) had mental disorder(s) diagnosed under the DSM-IV-TR 2000 and were currently actively seeking any form of psychiatric treatment or intervention including the use of medications, or had been previously diagnosed with mental disorders as identified in their medical records; (c) had cognitive impairments identified in their medical records; (d) had terminal illness such as cancer, late stage cardiovascular diseases; and/or (e) had experienced bereavement within the last 6 months. The exclusion criteria was set to ensure that patients were able to understand and fill out the questionnaires, and to ensure that they did not have conditions that might affect the outcomes, such as depression.

The sample size was calculated through power analysis for multiple regression analysis. We expected a medium effect size by convention in the regression with more than 8 independent variables (including pain, functional disability, anxiety and depression, medication adherence, social support and other sociodemographic and clinical variables) based on the literature review. To achieve a power of 80% at the 0.05 significant level (two-sided), a minimum of 107 participants was required (Cohen, 1992).

### 2.2. Outcomes and measurements

Using a self-administered questionnaire, self-reported socio-demographic data (e.g. gender, age, marital status, monthly household income, education, employment status, ethnicity) were collected. Clinical data (duration of RA, Anti-Cyclic Citrullinated Peptide, rheumatoid factor, tender and swollen joint counts) of participants were extracted from records. Outcomes of HRQoL, pain, functional disability, anxiety and depression, medication adherence, and social support were measured by the following instruments: European Quality of Life-5 Dimensions (EQ-5D), Numerical Rating Scale (NRS), Health Assessment Questionnaire-Disability Index (HAQ-DI), Hospital Anxiety and Depression Scale (HADS), Morisky Medication Adherence Scale-8 items (MMAS-8) and Medical Outcomes Study Social Support Survey (MOS-SSS). These instruments and their validity and reliability are described in Table 1.

### 2.3. Data collection procedure and ethical considerations

Data were collected between October 2013 and February 2014. Ethical approval was obtained from the Institutional Review Board of the participating hospital (NHG DSRB Ref.: 2013/00749). Ethical principles including written informed consent, voluntary participation and maintenance of data confidentiality were adhered to. Participants who showed anxiety and/or depressive symptoms (as measured by HADS) or any signs of distress during data collection were referred back to their attending physicians if the participants agreed to. Upon obtaining ethics approval, data were collected on the days when patients had their scheduled consultation with their physicians. A total of 124 eligible participants were approached, of which 108 completed and returned the questionnaires. The study participants were approached either during

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