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Original Article

Public Health Section

An Assessment of an Adapted Version of the Arthritis Impact Measurement Scales Short-Form Questionnaire to Determine Health-Related Quality of Life in Vietnamese Patients with Arthritis

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ABSTRACT

Introduction: Arthritis significantly decreases the physical and psychological health of patients and is a leading cause of disability. In recent years, the importance of measuring Health-Related Quality of Life (HRQOL) is increasingly recognised by clinicians and policy-makers in informing patient management and policy decisions, especially in the management of patients with chronic diseases.

Aim: The primary objective was to evaluate the psychometric properties of a culturally adapted (Vietnamese) version of the internationally recognised Arthritis Impact Measurement Scales short-form (AIMS2-SF) questionnaire for use in Vietnamese-speaking patients with Osteoarthritis (OA) and Rheumatoid Arthritis (RA) (Vie-AIMS2-SF). The secondary objectives were to demonstrate the HRQOL of patients with arthritis and identify socio-demographic factors that impacted on HRQOL.

Materials and Methods: This observational, cross-sectional study was conducted on a convenience sample of Vietnamese patients (n=333, 207 women), presenting at a public, specialist orthopaedic hospital in Ho Chi Minh City, southern Vietnam, from January to March 2018. The patients were directly interviewed with the Vie-AIMS2-SF. The reliability and validity of the questionnaire were evaluated by using Cronbach's alpha coefficient (α) and Exploratory Factor Analysis (EFA) respectively.

Results: The Vie-AIMS2-SF met the criteria of reliability and validity. Twenty-six items were identified and categorised as five key components: physical (upper and lower limb function), affect, symptom, role and social interaction. Cronbach's alpha coefficient for the Vie-AIMS2-SF Questionnaire ranged from 0.52 to 0.88 indicates a good internal consistency. Regarding HRQOL score, the mean score ranged from 2.3±1.7 for the physical component to 5.0±2.3 for the symptom one. After applying the multivariable linear regression, monthly income and income satisfaction were found to be statistically significant with majority of components ($p<0.050$).

Conclusion: The Vie-AIMS2-SF questionnaire was found to be a valid and reliable instrument to use as assessing HRQOL of Vietnamese patients with arthritis. HRQOL was observed to be "moderate" and several socio-demographic factors should be taken into account in order to improve the HRQOL in this population.

Keywords: AIMS2-SF, Arthritis, Arthritis Impact Measurement Scales, Quality of life, Reliability, Validity, Vietnam

INTRODUCTION

"Arthritis" is an umbrella term that is used to describe over 100 different conditions which are chronic, painful and debilitating. In particular, OA contributes significantly to the global disability burden and continues to increase in prevalence internationally [1]. The average estimated annual prevalence of doctor-diagnosed arthritis inpatients in the United States of America was 54.4 million (23% of the overall population) from 2013-2015 [2]. This figure is expected to reach 78 million (26%) by 2040 [3]. The prevalence of arthritis is similarly high in Australia (22-23% of the overall population) [4,5]. The rate of self-reported rheumatic disease confirmed by physicians in various population-based studies ranged from 15% in Pakistan to 27% in Greece [6-10]. Arthritis significantly decreases the physical and psychological health of patients and is a leading cause of disability [11]. Adults with arthritis are employed less often than those without it [12].

In recent years, the importance of measuring HRQOL is increasingly recognised by clinicians and policy-makers in informing patient management and policy decisions, especially in the management of patients with chronic diseases [13].

The Arthritis Impact Measurement Scales (AIMS) questionnaire originally developed by Meenan RF et al., and the Health Assessment Questionnaire designed by Fries were the first self-administered arthritis questionnaires used to identify HRQOL in this population [14,15]. In 1992, AIMS2, an expanded version of the original was released and validated in several countries [16,17]. A time-saving (Short-Form) version of AIMS2 (AIMS2-SF) was subsequently developed by Guillemin F et al., [18]. It was endorsed for use in France, Norway and the Netherlands for RA and in the USA for patients with arthritis [18,19]. Validation of AIMS2-SF has not yet been carried out in the Vietnamese context and only few studies have assessed the HRQOL of Vietnamese patients with arthritis. Therefore, the primary objective of the current study was to evaluate the psychometric properties of a culturally adapted version of the internationally recognised AIMS2-SF questionnaire for use in Vietnamese-speaking patients with OA and RA in Vietnam. The secondary objectives were to demonstrate the HRQOL of patients with arthritis and identify factors that impacted on HRQOL.

MATERIALS AND METHODS

Design, Setting and Study Population: This observational cross-sectional study was conducted on a convenience sample of Vietnamese patients (n = 333; 207 females), presenting at a public, specialist orthopaedic hospital in Ho Chi Minh City, southern Vietnam, from January to March 2018. Three hundred and thirty-three patients, diagnosed with either OA or RA, and agreed to

participate in the study (written informed consent), were recruited. An inclusion criterion was the absence of any serious physical or mental illness. Exclusion criteria were a diagnosis of inflammatory arthritis, current evidence of soft tissue rheumatism, a fracture or the need for surgery, or clinically recognisable cognitive impairment. The patient names were not available to the researchers to ensure anonymity.

Data Collection Process: After receiving approval to conduct the study, the recruiting researcher introduced himself/herself to the targeted study subjects, informed them of the research objectives, described the data collection procedures and ethical considerations. The researcher recorded the socio-demographic data and health-related information taken from the patients' medical records and as per their interview responses. A culturally adapted Vie-AIMS2-SF questionnaire was administered to each patient. The interview process took approximately 5-10 minutes.

Socio-Demographic Characteristics of the Patients: The socio-demographic patient characteristics were recorded as potential determinants of HRQOL, and included age, gender, educational attainment, occupation, location, living status, marital status, duration of arthritis, type of arthritis, monthly income and satisfaction with income.

Research instrument: Vie-AIMS2-SF questionnaire: AIMS2-SF, a shortened version of AIMS2, was first published in 1997. It is used to determine the health status of people with arthritis. The current measure consists of 26 items relating to physical functioning, pain, psychological status and social interactions. The AIMS2-SF is scored in a consistent fashion whereby a low value indicates enhanced health. However, in order to avoid systematic response bias, the order in which the questions appear is mixed so that the last response is not always or necessarily an indication of poor health status. Thus, a number of items must be recorded, having been properly administered, before the score can be calculated. Once the raw responses have been recoded, the scores obtained for each item within the scale are added. The range into which the final score falls is dependent on the number of items in the scale. For this reason, a normalisation process is performed to ensure that the scores are expressed as similar units. Thus, the scoring ranges from 0-10, where 0 represents a good health status and 10 reflects a poor health status [18].

Questionnaire Translation and Cultural Adaption: The translation and cultural adaptation process followed adhered to that in the published guidelines [20]. The original English version of the AIMS2-SF was translated into Vietnamese by two independent professional translators, one of whom was aware of the questionnaire. The two forward translations were reviewed and compared with each another, and with the original English version, by the translators and one of the authors. Conceptual rather than literal translation was needed to preserve the meaning of each item and in this regard, guidance was provided to the translators. The aim was to reduce misunderstanding as far as possible and thus the amount of missing data. Consensus was finally reached after discussing any discrepancies. Two professional translators independently and blindly performed a translation of the Vietnamese version of the questionnaire back into English. Thereafter, an expert committee (comprising two physiotherapists, two rheumatologists and an outcome methodologist) examined the translation having taken into consideration the cultural adaptation processes applied and provided a pre-final version of the questionnaire.

Reliability and Validity of the Questionnaire: The reliability and validity of the Vie-AIMS2-SF was evaluated. Internal consistency reliability was determined using Cronbach's α coefficient which measures the overall correlation between items within a scale. As the heterogeneity of content-related items is usually a major source of unreliability, Cronbach's α coefficient is a good method of estimating reliability within multi-item scales. α provides an estimate of internal consistency and reflects the number of items and the average correlation among them. The Cronbach's α value ranged from 0 (signifying a lack of internal consistency) to 1 (signifying identical results). The higher the α coefficient is, the greater the reliability gains, and the lower the standard error of measurement is. In the current study, high internal consistency was considered to be represented by a value of 0.50–0.70 for group comparisons [21,22]. EFA using varimax rotation of the principal components was conducted to determine construct validity [23]. In the current study, the latent structure of the Vie-AIMS2-SF was considered using EFA to identify a viable factor structure for the 24 items. A principal components extraction method involving varimax rotation was used. Factors with eigen value ≥ 1.0 were identified for factor retention [24].

STATISTICAL ANALYSIS

The categorical variables for the socio-demographic characteristics of the study subjects were expressed as frequencies and percentages. The HRQOL score for each component was summarised as the mean±Standard Deviation (SD). Student's t-test and analysis of variance were used to compare differences between the means of the individual HRQOL scores across different socio-demographic categories for the normally distributed variables. The Mann-Whitney U and Kruskal-Wallis tests were utilised to evaluate the non-normally distributed variables. A multiple linear regression model was designed to test the independent effects of the socio-demographic factors on five key components of the Vie-AIMS2-SF questionnaire. Data analysis was performed using Microsoft Excel spreadsheets and conducted using SPSS version 23.0. Two-sided p-values were used. A p-value of < 0.050 was considered to represent statistical significance.

Ethical Considerations: Permission to conduct this study was granted by the Faculty of Pharmacy, University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam. Informed consent was obtained from the director of the hospital, the head of the clinical unit and the study participants. The participants were advised of their right to refuse to participate in or to withdraw from the study at any stage without prejudice to them. The anonymity and confidentiality of the participants was guaranteed.

RESULTS

Descriptive Statistics for the Participants: The socio-demographic characteristics of the study population are illustrated in [Table/Fig-1]. The majority of the participants were aged 50-59 years (37%). Those aged 30-39 years accounted for the lowest percentage (2%). Two hundred and seven (62%) of the study subjects were women. Over half of the respondents had had arthritis for < 5 years (62%). The education level was generally high; 32% and 31% of the participants had received a secondary and tertiary education, respectively. Three quarters of the participants had OA (78%). About a third of participants earned an average income ranging from US Dollars (USD) 200-400 (34%).

Characteristics	N(%)
Age (years)	
<30	32(9.6)
30-39	6(1.8)
40-49	54(16.2)
50-59	122(36.6)
60-69	70(21.0)
70- 79	27(8.1)
≥80	22(6.7)
Gender	
Male	126(37.8)
Female	207(62.2)

Education	
Postgraduate	18(5.4)
Graduate	104(31.2)
High school	107(32.1)
Secondary	46(13.8)
Primary	46(13.8)
Illiteracy	12(3.7)
Occupation	
Famer	51(15.3)
Worker	30(9.0)
Officer	45(13.5)
Businessman	53(15.9)
Housewife	28(8.4)
Unemployed	8(2.4)
Retired	49(14.7)
Others[a]	69(20.8)
Living status	
Alone	16(4.8)
Family	301(90.4)
Relatives	8(2.4)
Friends	8(2.4)
Marital status	
Married	244(73.3)
Single	48(14.4)
Widowed/Divorced	41(12.3)
Duration (years)	
<1	35(10.5)
1 - <2	53(15.9)
2 - <5	118(35.4)
5 - <10	69(20.7)
≥10	58(17.5)
Type of arthritis	
Osteoarthritis	258(77.5)
Rheumatic arthritis	75(22.5)
Location	
Urban	172(51.7)
Rural	161(48.3)
Monthly income (USD)	
0	46(13.8)
<200	124(37.2)
200-<400	112(33.6)
400-<650	25(7.5)
≥650	26(7.9)
Income satisfaction	
Yes	249(74.8)
No	84(25.2)

[Table/Fig-1]: The demographic characteristics of the study population in 2018 (n=333).
Note: [a]Others (doctor, pharmacist, lecturer, machinist, and so on)

Translation and Cultural Adaption of the Vie-AIMS2-SF Questionnaire: Minor modifications were made to the original questionnaire to ensure that the questionnaire was culturally and socially relevant to Vietnamese populations. For example, for item 1, "drive a car" was changed to "ride a motorbike" as this is the most common means of transportation in Vietnam. Similarly, for item 23, "meeting at a church" was changed to "a religious meeting" as there is a multitude of religious beliefs in Vietnam.

Validation of the Vie-AIMS2-SF Questionnaire:

The results of EFA of the Vie-AIMS2-SF with varimax rotation are depicted in [Table/Fig-2]. Five key components, identified from the 24 items using factor analysis, accounted for 63% of the total variance including (1) Upper limb function (items 5-12): 31% of the variance; (2) Lower limb function (items 1, 2, 4 and 13-15): 11% of the variance; (3) Affect (items 16-19): 9% of the variance; (4) Symptom (items 3, 20 and 24): 7% of the variance; (5) Social interaction (items 21-23): 5% of the variance. With the aim of retaining the content as well as scoring of the component of the original questionnaire, Upper limb function and Lower limb function were combined in the Physical component. Two items in role component (items 25 and 26) were excluded from factor analysis because they only applied to patients who were still working at the time that the study was conducted. As the results, Vie-AIMS2-SF consisted of five components: Physical,

Vie-AIMS2-SF items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
	Upper limb function	Lower limb function	Affect	Symptom	Social Interaction
Variance contributed by each factor (%)	30.8	10.8	9.1	6.9	5.0
08.Turn a key in a lock	.893	-	-	-	-
07.Button a shirt or blouse	.888	-	-	-	-
09.Comb or brush your hair	.780	-	-	-	-
06.Write with a pen or pencil	.773	-	-	-	-
11.Need help to get dressed	.656	-	-	-	-
12.Need help to get out of bed	.630*	-	-	-	-
05.Unable to walk unless assisted	.554	-	-	-	-
10.Reach shelves that were above your head	.531*	-	-	-	-
14.Morning stiffness last more than one hour	-	.766	-	-	-
13.Severe pain from your arthritis	-	.740	-	-	-
15.Pain make it difficult for you to sleep		.673			
04.Trouble walking hundreds of meters or climbing a few flights of stairs	-	.670	-	-	-
02.In a bed or chair for most or all of the days	-	.537	-	-	-
01.Ride motorbike or use public transportation	-	.533	-	-	-
17.Bothered by nervousness or your nerves	-	-	.887	-	-
16.Felt tense or high strung	-	-	.860	-	-
18.In low or very low spirits	-	-	.772	-	-
19.Enjoyed the things you do	-	-	.393	-	-
03.Trouble doing vigorous activities	-	-	-	.739	-
20.Feel like a burden to others	-	-	-	.596	-
24.Family or friends sensitive to your personal needs	-	-	-	.486*	-
22.On the telephone with close friends or relatives	-	-	-	-	.800
23.Go to a meeting of a religious areas, club, team, or other groups	-	-	-	-	.758
21.Get together with friends or relatives	-	-	-	-	.757

[Table/Fig-2]: The factor analysis results for the 24 items (excluding two role component items) of the Vietnamese version of the short-form Arthritis Impact Measurement Scales 2 questionnaire.
* The highest loading of each item. The value of the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) is 0.813 and the Bartlett's Test of Sphericity is statistically significant (p<0.001). The initial eigenvalues of each factor is greater than 1.10. Total variance explained: 62.6%.

Affect, Symptom, Social Interaction and Role.

The results of internal consistency reliability for each component of the Vie-AIMS2-SF questionnaire measured using Cronbach's α coefficient are presented in [Table/Fig-3]. The Cronbach's α value ranged from 0 (signifying a lack of internal consistency) to 1 (signifying identical results). High internal consistency was represented by an α value ranging from 0.50-0.70 for group comparisons [25]. Internal consistency of the total items was good (α = 0.88) and the average α value for the five components was higher than the recommended range (i.e., 0.50-0.70). Cronbach's α coefficient for the Vie-AIMS2-SF questionnaire ranged from 0.52 for the role component to 0.88 for that pertaining to upper limb function. The internal consistency of the role component was only 0.52 but this component comprised only two items.

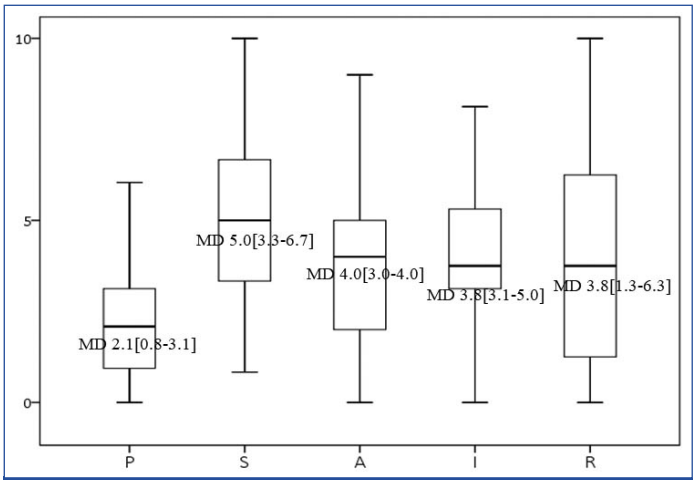
HRQOL scores according to Vie-AIMS2-SF Questionnaire: The baseline scores for the five components; namely mean, standard deviation, minimum and maximum score, median score, and the 25th and 75th quartile, are highlighted in [Table/Fig-4]. The mean score ranged from 2.3 (the physical component) to 5.0 (the symptom component). A maximum score of 9.0 was attributed to most of the components. The highest median pertained to the symptom component (5.0) and the lowest median to the physical component (2.1). A median of 3.8 was reported for both the social interaction and role components. Among these components, the average score for the physical one was lower than that for the others, suggesting that patients achieved the better HRQOL. HRQOL scores evaluated against the five key components identified following administration of the Vie-AIMS2-SF questionnaire were represented [Table/Fig-5].

Component	Number of items	Cronbach's alpha
Upper limb function	8	0.88
Lower limb function	6	0.79
Affect	4	0.79
Symptom	3	0.65
Social Interaction	3	0.73
Role	2	0.52
Total	26	0.88

[Table/Fig-3]: The internal consistency (reliability) results for each component of the Vietnamese version of short-form Arthritis Impact Measurement Scales 2 questionnaire measured using Cronbach's alpha.

Component	n	Mean±SD[1]	Range (Min – max)	MD[2] (Q1-Q3)[3]
Physical	333	2.3±1.7	0.0–8.8	2.1(0.8-3.1)
Symptom	333	5.0±2.3	0.8-10.0	5.0(3.3-6.7)
Affect	333	4.0±1.9	0.0-9.0	4.0(3.0-4.0)
Social Interaction	333	4.1±1.7	0.0-9.4	3.8(3.1-5.0)
Role	97	3.7±3.0	0.0-10.0	3.8(1.3-6.3)

[Table/Fig-4]: The baseline score obtained by patients for each arthritic item in the Vietnamese version of the short-form Arthritis Impact Measurement Scales 2 questionnaire.
Note: [1]SD: Standard Deviation;[2] MD: Median;[3] Q1-Q3: 25th and 75th quartile.



[Table/Fig-5]: A boxplot of health-related quality of life according to the five components of the Vietnamese version of the short-form Arthritis Impact Measurement Scales 2 questionnaire.
P: Physical component, S: Symptom component, A: Affect component, I: Social interaction component, R: Role component.

Association between HRQOL and Socio-Demographic Factors: The association between the patient characteristics and the score attained for each component is depicted in [Table/Fig-6]. Age and occupation were strongly associated with HRQOL, as reflected by the p-value < 0.050 across all the components. A statistically significant difference was found between patient characteristics (p<0.050) and the average scores recorded for the physical component. The average score for the symptom component was associated with age, education, occupation, marital status, duration of illness, the type of arthritis, location and monthly income (p<0.050). Similarly, age, occupation, marital status, living status, monthly income and income satisfaction (p<0.050) were found to correlate with the score for the affect component in this study. A statistically significant difference was found between most items (with the exception of living status, duration of illness, type of arthritis and monthly income) and the score attained for the social interaction component. Lastly, the score recorded for the role component was shown to correlate with six characteristics: age, education, occupation, living status, duration of illness and monthly income (p<0.050). Multiple linear regressions were employed to analyse the association between patient characteristics and the five key components of the Vie-AIMS2-SF [Table/Fig-7]. The following items were independently predictive of the status of: 1) Physical HRQOL: Age, occupation, illness duration, type of arthritis, monthly income and income satisfaction (p < 0.050); 2) Symptom HRQOL: Illness duration, type of arthritis and monthly income (p<0.050); 3) Affect HRQOL: Age, monthly income and income satisfaction (p<0.050); 4) Social interaction HRQOL: Gender and education (p<0.050); 5) Role HRQOL: Education, illness duration and monthly income (p<0.050).

Characteristics	Components				
	P	S	A	I	R
Age	0.000	0.000	0.000	0.000	0.000
Gender	0.000	0.237	0.138	0.004	0.803
Education	0.000	0.000	0.117	0.000	0.000
Occupation	0.000	0.000	0.024	0.002	0.000
Marital status	0.000	0.014	0.030	0.034	0.100
Living status	0.023	0.669	0.002	0.657	0.049
Duration	0.000	0.000	0.337	0.176	0.000
Type	0.000	0.000	0.052	0.315	0.702
Location	0.035	0.017	0.737	0.000	0.153
Monthly income	0.000	0.000	0.000	0.136	0.001
Satisfaction	0.000	0.063	0.000	0.002	0.300

[Table/Fig-6]: Association between the patient characteristics and score obtained for each component based on the Vietnamese version of the short-form Arthritis Impact Measurement Scales 2 questionnaire.
Note: p-value <0.050 is statistically significant.

DISCUSSION

The psychometric properties of the Vie-AIMS2-SF questionnaire were evaluated in this study in terms of their ability to determine HRQOL in 333 Vietnamese patients with OA and RA. The reliability and validity of the Vie-AIMS2-SF questionnaire was assessed. Twenty-six items were identified and categorised as five key components; physical (upper and lower limb function), affect, symptom, role and social interaction. The Vie-AIMS2-SF was found to satisfy the conventional psychometric criteria. In addition, HRQOL in Vietnamese patients with OA and RA was found to be moderate. Various independently

Variables	ß coefficients	p-value	95%CI*
P (R^2=0.405, Adjusted R^2=0.384)			
Age	0.126	0.045	0.003 - 0.249
Occupation	0.064	0.047	0.001 - 0.127
Duration	0.496	0.000	0.352 - 0.639
Type of arthritis	1.158	0.000	0.819 - 1.498
Monthly income	-0.170	0.047	-0.340 - 0.000
Income satisfaction	0.640	0.002	0.246 - 1.035
Constant	-1.950	0.011	-3.442- -0.457
S (R^2=0.280, Adjusted R^2=0.262)			
Duration	0.614	0.000	0.389 - 0.839
Type of arthritis	1.568	0.000	1.042 – 2.095
Monthly income	-0.279	0.019	-0.513 - -0.046
Constant	1.868	0.030	0.183 – 3.553
A (R^2=0.153, Adjusted R^2=0.138)			
Age	-0.187	0.006	-0.319- -0.054
Monthly income	-0.341	0.003	-0.561 - -0.121
Income satisfaction	0.935	0.001	0.407 – 1.462
Constant	4.855	0.000	3.189 – 6.522
I (R^2=0.115, Adjusted R^2=0.099)			
Gender	0.396	0.000	0.011 – 0.780
Education	0.302	0.044	0.119 – 0.495
Constant	2.340	0.001	1.433 – 3.247
R (R^2=0.240, Adjusted R^2=0.213)			
Education	0.780	0.001	0.336 – 1.223
Duration	0.711	0.001	0.311 – 1.110
Monthly income	-0.432	0.046	-0.857 - -0.007

[Table/Fig-7]: Coefficients entered in the multiple linear regression model for the patient characteristics and five components of the Vietnamese version of the short-form Arthritis Impact Measurement Scales-2 questionnaire.
Note: (*) CI: confidence interval. The predictors of HRQOL score's items (P, S, A, I, R score) were identified by using multiple linear regression and p-value <0.050 is statistically significant

predictive socio-demographic characteristics were identified with the objective of improving the HRQOL scores of the patients.

Five components, i.e., upper limb function, lower limb function, symptom, affect and social interaction remained after conducting EFA as assessing the construct validity of the Vie-AIM S2-SF questionnaire: The same five key factors from the AIMS2-SF questionnaire were similarly identified in other research following the use of EFA [18,26-28]. Physical, psychological and social factors were also found to have more statistical significance after the application of this form of analysis in a Dutch study [19]. However, the amount of attributable variance in this study was reported to be low (only 47%). These three components were set apart from the rest after factor analysis in a German study [25]. Using a different approach i.e., that of confirmatory factor analysis, a more reasonable five-component structure was isolated in a study on 279 patients with RA after the administration of the AIMS2-SF questionnaire [29]. Satisfying results were achieved in this study using Cronbach's α in terms of upper limb function, lower limb function, the affect and symptom scales (which were quite similar) and even social interaction (α =0.73), higher than those reported elsewhere (α = 0.32 [18], α= 0.63 [19], α= 0.67 [26] and α = 0.66. [30]). The Cronbach's α recorded for the role component (0.52) in the current study was acceptable because it consisted of only two items. The value of α is influenced by the number of items in a scale and decreases when the number of items diminishes.

In the current study, the mean score for each component was below average, except for the symptom scale (5.0 ± 2.3), meaning that an above-average health status was evident in this population in each component. In a Persian study on 350 patients, a similar average score was observed (≥ 5.00 for all components) [28]. The questions focused on pain assessment in a study on French and Dutch patients (6.70 and 5.85, respectively), with the lowest score being attributed to the symptom component [18,19]. This suggests that pain management plays an important role in improving HRQOL among patients with arthritis. Further research in this area is warranted.

Several socio-demographic characteristics were identified to have a strong impact on the HRQOL of OA and RA patients in the current study. This has also been the subject of previous research [26,30,31]. Age was a positive predictor of the scores attained for the physical component (p<0.050), in line with the findings of a previous study [30]. However, a lower score was found for elderly patients for the affect component, suggestive of enhanced health status (ß = -0.187, p<0.001). Elsewhere, better scores were attained for younger patients compared to older ones [32]. Higher levels of education were demonstrated to correspond with enhanced HRQOL, especially in the social interaction and role components (p<0.050), similar to the findings of Rosemann T et al., and Salaffi F et al., Gender was also associated with HRQOL in arthritis patients which were similar to the results on Italian and German patients [30,31]. An association between disease duration and HRQOL was established in a study by Ren XS et al., conducted on OA patients, similar to the finding of the current study [26]. Interestingly, monthly income was a negative predictor of the physical component, and the symptom, affect and role components. The implication of this is that patients with a higher monthly income achieve a lower HRQOL score than those with a lower monthly income, i.e., they have a better HRQOL status. This could be explained by the fact that annual family income relates to patient satisfaction about their health [33].

This study is the first to evaluate HRQOL in Vietnamese patients with arthritis using a culturally adapted version of the internationally recognised AIMS2-SF questionnaire, describe HRQOL in the targeted population and explore the impact of HRQOL-related factors with a view to improving those HRQOL.

However, there were limitations. In particular, the results of a hospital-based study cannot be easily extrapolated to the general population.

CONCLUSION

The Vie-AIMS2-SF questionnaire was found to be a valid and reliable instrument to use as assessing HRQOL of Vietnamese patients with arthritis. HRQOL was observed to be "moderate" in Vietnamese patients with arthritis when the symptoms of arthritis were excluded. To facilitate the clinical use of the Vie-AIMS2-SF questionnaire and improve the quality of the research, comprehensive validation of this instrument across a wider geographical area and larger population is warranted. Cross-cultural validation could also be explored in future research. Consideration should be given to wide range of socio-demographic characteristics in future studies in order to accurately determine HRQOL scores in patients with arthritis.

Disclosure statement

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

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Author Contributions

Conceptualization: TQV, NXV; Data curation: TQV, ATP, OTNV, NXV; Formal analysis: TQV, ATP; Investigation: TQV, ATP, OTNV; Methodology: TQV, ATP, KNCD, OTNV, NXV; Project administration: TQV, ATP, KNCD, OTNV; Supervision: TQV; Validation: TQV, ATP, KNCD; Visualization: TQV, ATP, KNCD, OTNV; Writing – original

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