

Validation of the Arabic Version of the WHO-ILAR COPCORD Core Questionnaire for Community Screening of Rheumatic Diseases in Kuwaitis

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ABSTRACT. Objective. (1) To adapt the Community Oriented Program for the Control of Rheumatic Disease (COPCORD) Core Questionnaire (CCQ) for use as a rheumatic screening instrument among Kuwaitis, including translation, back translation, assessment of cross cultural equivalence, and reliability. (2) To determine the screening characteristics of the Arabic version of the CCQ for detecting rheumatic diseases compared to clinical examination by a rheumatologist.

Methods. Translation and assessment of cross cultural equivalence were undertaken using standard methods. Back translation was done by an Arabic-speaking rheumatologist. Interviewer agreement was assessed using a convenience sample. Sensitivity, specificity, and positive and negative predictive values were assessed first by administering the CCQ followed by full clinical examinations of a randomly selected sample of 359 Kuwaiti persons aged 15 years or older.

Results. (1) Cross cultural equivalence and back translation of the translated questionnaire were satisfactory. Interviewer agreement was acceptable. (2) The prevalence of rheumatic diseases based only on CCQ screening was 69% compared to 73% based on clinical examination. The sensitivity and specificity of the Arabic CCQ were 94.4% and 97%, respectively, and the positive and negative predictive values of the instrument were 98.8% and 86.4%, respectively.

Conclusion. The Arabic version of the CCQ appears promising as a screening tool to detect rheumatic diseases in Arabic speaking communities. The findings suggest that the Arabic CCQ followed by clinical examinations in positive respondents can provide an acceptable estimate of prevalence of rheumatic diseases. We intend to use this instrument to screen for the prevalence of rheumatic diseases among Kuwaiti nationals. (J Rheumatol 2002;29:1754-9)

Key Indexing Terms:

COPCORD-CCQ ARABIC VERSION
SCREENING CHARACTERISTICS
KUWAIT

CROSS CULTURAL ADAPTATION
RHEUMATIC DISEASE PREVALENCE
PILOT STUDY

Arthritis and other rheumatic conditions are prevalent worldwide, especially among women and particular ethnic groups. In 1992, arthritis was the leading cause of disability

in the United States, associated with total direct and indirect costs of \$64.8 billion¹. Projections indicate that by 2020, rheumatic diseases will affect 59.4 million (24.2%) persons in that country¹. Statistics from other developed countries show a similar trend and it has been postulated that in the new millennium the health burden of rheumatic diseases will increase^{2,3}.

The World Health Organization (WHO) and the International League Against Rheumatism (ILAR) initiated the Community Oriented Program for the Control of Rheumatic Diseases (COPCORD) project in 1981⁴. The aim of the program was to collect data on the burden of illness brought about by rheumatic disease and to institute preventive measures such as educational interventions. A number of countries have participated in this program and have used the WHO-ILAR COPCORD Core Questionnaire (CCQ) to determine the prevalence rates of rheumatic diseases in their countries. The COPCORD-CCQ has been used in the Philippines⁵, Indonesia⁶, Taiwan⁷, Thailand⁸, Canada⁹, China¹⁰, Pakistan¹¹, Brazil, Chile and Mexico¹². However, no studies have been conducted in Kuwait or other Gulf or

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Arabic-speaking countries to determine the prevalence of rheumatic diseases using this instrument.

Our goal was to translate the COPCORD-CCQ from English into Arabic and to determine the screening characteristics of this Arabic questionnaire among Kuwaitis.

MATERIALS AND METHODS

This study was carried out in 2 stages: (1) we translated and adapted the English language version of the CCQ into Arabic for use in Kuwaitis; and (2) we evaluated the screening properties of the resulting Arabic language version of the CCQ for sensitivity, specificity, and positive and negative predictive values in detecting rheumatic diseases compared to the actual clinical examination.

Stage 1: Adaptation of the CCQ

Four aspects of instrument adaptation were considered: (1) CCQ content; (2) translation of the CCQ instrument to Arabic, assessment of cross cultural equivalence, and blind back translation; (3) CCQ pretesting; and (4) interviewer agreement.

CCQ content. The English version of the CCQ includes questions on 7 domains: pain, symptoms (tenderness, swelling, and stiffness), trauma, functional ability, coping, health-seeking behavior, and treatments received. Questions on each of the 7 domains were as shown in Figure 1. Only the question on ethnicity was omitted from the CCQ because the screening covered only Kuwaiti nationals, i.e., almost ethnically homogeneous. The objective of stage 2, the community validation study, was to assess the sensitivity and specificity of questions on pain, symptoms (tenderness, swelling, and stiffness), and trauma only.

Translation to Arabic and assessment of cross cultural equivalence. The English version of the CCQ was translated into Arabic by a professional with expertise in medical and Arabic language translation using standardized methods. Each CCQ item in both the English and Arabic translations was reviewed by a team of professionals in the areas of rheumatology, pathology, and research methodology to assess semantic, idiomatic, experiential, and conceptual equivalence¹³. Following this review, the Arabic version of the CCQ was back translated independently and blindly by an Arabic-speaking rheumatologist.

CCQ pretest. A pretest was conducted on a number of patients. The objectives were (1) to determine whether the CCQ could discriminate individuals with rheumatic diseases from those without rheumatic diseases; (2) to assess the clarity of wording; (3) to review cultural appropriateness of items; (4) to assess the feasibility of using teams of trained interviewers; and (5) to estimate the time required for completion of the study instrument.

Thirty consecutive series of patients with rheumatic diseases and 30 controls (without rheumatic diseases) aged 15 years and over were interviewed by trained interviewers using the Arabic version of the CCQ. The rheumatic disease group was divided into the following 6 diagnostic categories of 5 patients each: rheumatoid arthritis (RA), osteoarthritis (OA), fibromyalgia (FM), systemic lupus erythematosus (SLE), gout, and ankylosing spondylitis (AS). The control group was divided into the following 5 diagnostic categories of 6 subjects each: stroke, hypertension, heart disease, healthy subjects < 65 years old, and healthy subjects ≥ 65 years of age.

CCQ reliability. Following the pretest, we conducted a second study to evaluate interviewer agreement. Twenty-four trained interviewers collected the data. They formed 12 teams, each team comprising one man and one woman. They were trained over a 2 week period to standardize the method of data collection, to ascertain reliability of the interviewers, and to minimize interobserver variations. At the end of the training, the reliability test was conducted on 5 randomly selected interviewers. They interviewed the same patient with a rheumatic disease in the hospital and interviewer agreement for each item of the CCQ was determined.

Stage 2: Community Validation Study

Our objective was to evaluate the usefulness of the Arabic CCQ to detect the presence of rheumatic disease by comparing it with the clinical examination administered by a rheumatologist. This allowed us to determine the sensitivity and specificity of the CCQ compared to the actual clinical findings, and whether it was reliable to use the CCQ as a screening instrument in studying the prevalence of rheumatic diseases in the Kuwaiti nationals.

Study setting. Kuwait state is situated on the northeastern corner of the Arabian peninsula and is surrounded by Iraq on the north, Saudi Arabia on the south and west, and the Arabian Gulf to the east. At the time of the survey in 2000, Kuwait was administratively divided into 5 governorates, namely, the Capital, Hawalli, Farwaniya, Jahra, and Ahmadi. The survey was carried out in all the 5 governorates.

Sample size. A sample size of 359 Kuwaiti subjects aged 15 years and older was randomly selected from the 5 governorates (91 from the Capital, 90 from Hawalli, 60 from Farwaniya, 58 from Jahra, and 60 from Ahmadi). The selection was proportional to the population size in each governorate. Based on an expected rheumatic disease prevalence of about 30%, this sample size was expected to yield 107 cases with rheumatic diseases. The 95% confidence interval (CI) on the observed rheumatic disease prevalence, given a sample size of 359, was therefore within 5% from the estimate.

CCQ interviews. The trained interviewers conducted the interviews with household members during home visits. One male interviewer who interviewed male subjects and one female interviewer who interviewed female subjects visited each selected house. This agreed with Kuwait tradition and cultural norms.

CCQ pattern of omitting questions. In this initial evaluation of the Arabic CCQ, all the respondents received the questions about pain, symptoms, and trauma. Only a subset received the questions about functional ability, coping, health-seeking behavior, and treatments, depending on their response to the questions about present and past pain and symptoms. Figure 1 shows the 8 sections of the CCQ and the omission pattern used.

Clinical examination. All CCQ respondents were given an appointment to report to the rheumatic disease clinics at one of the 2 accredited teaching hospitals, Mubarak or Al-Amiri. The clinical examination was performed within one week of the CCQ interview. Fully trained rheumatologists blind to the CCQ results conducted the clinical examinations.

Diagnostic criteria. Different definitions guided the assessment of the different rheumatic diagnostic groups¹⁴. The revised criteria of the American College of Rheumatology (ACR) were used for the diagnosis of RA¹⁵, OA¹⁶, FM¹⁷, SLE¹⁸, gout¹⁹, AS²⁰, and mixed connective tissue disease (MCTD)²¹. Low back pain was operationally defined as pain in the lower third of the back, with or without pain radiating to the legs. Soft tissue rheumatism pain included shoulder pain, tennis elbow, tenosynovitis of the flexor tendons of the hands, de Quervain's tenosynovitis, FM, achilles tendinitis, and trochanteric, anserine and calcaneal bursitis. Standard criteria were used as much as possible for the diagnosis of other rheumatic diseases and low frequency rheumatic diseases. Confirmatory laboratory and radiological investigations were carried out whenever necessary. Privacy and confidentiality of data were maintained, and approval of the Medical Research Ethics Committee of Kuwait University was obtained for the study. Informed consent was obtained from each subject before interview. In addition to the consent of the subjects who were under the age of 18 years, the guardian's co-signature was obtained.

Data analysis. The data were coded and analyzed using the SPSS statistical package (version 10) using the cutoff level for significance $p \leq 0.05$. Descriptive statistics on demographic variables were produced and the diagnostic characteristics of the screening test such as sensitivity, specificity, and positive and negative predictive values were calculated. The prevalence rates for different categories of rheumatic diseases for adult Kuwaiti men and women were determined. Pearson chi-square and Fisher exact tests were used for assessing the association between 2 categorical variables, and an independent t test was used to evaluate significance

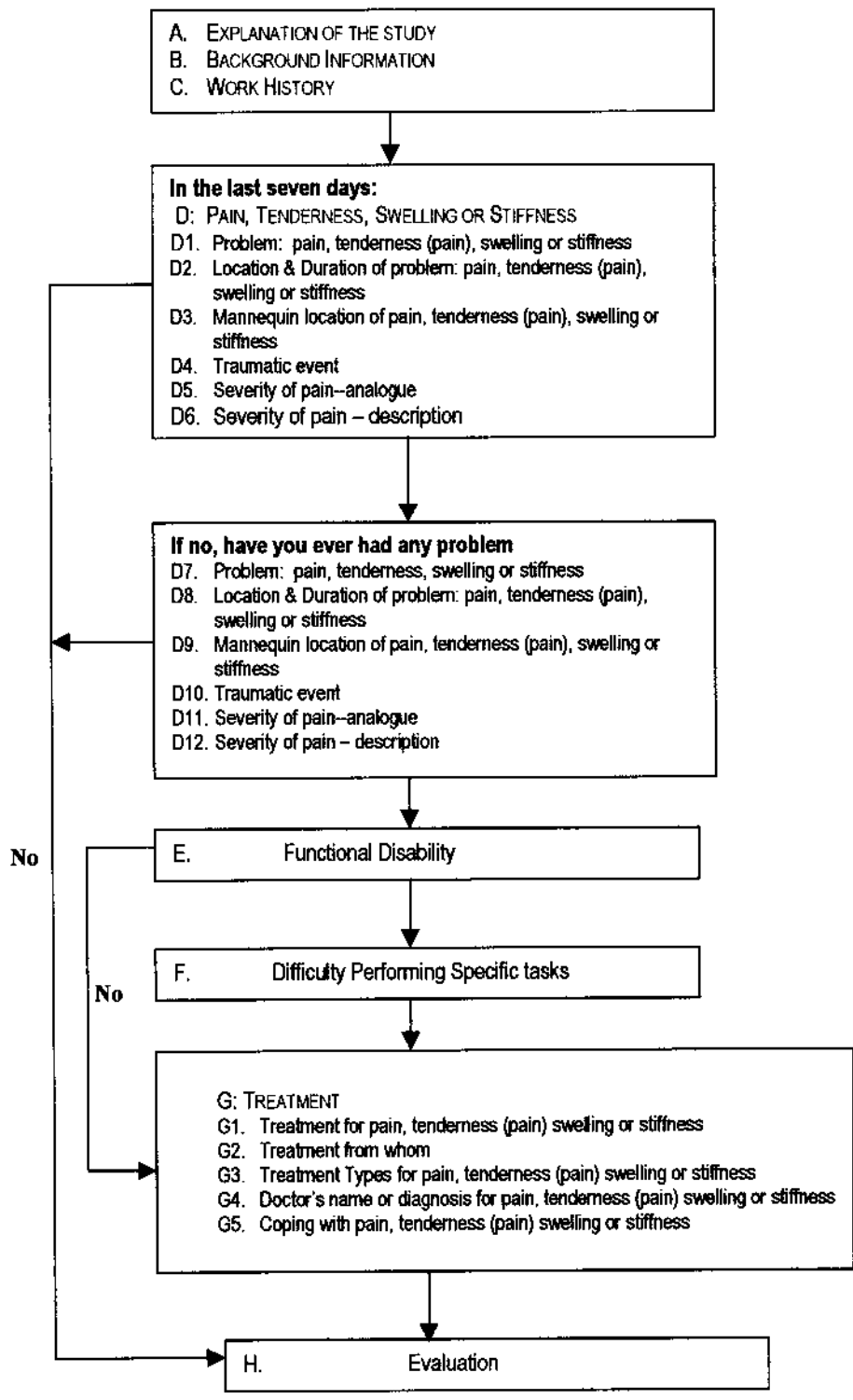


Figure 1. Content of CCQ and sequence of interview questions.

Table 1. Arabic translation (AT) and back translation (BT) of screening questions for pain, symptoms, and trauma.

Present pain and symptoms

* Have you in the last 7 days had any problem that is pain, tenderness (pain on pressure), swelling or stiffness, in your bones, joints or muscles?

AT : هل عانيت في الأيام السبعة الأخيرة من أي مشكلة مثل الألم، الألم عند الضغط، التورم أو التيبس في عظامك، مفاصلك أو عضلاتك؟

BT: Did you suffer during the last 7 days from any problem like pain, pain on pressure, swelling or stiffness, in your bones, joints or muscles?

* Was there a traumatic event (i.e. strain or injury) before the pain, tenderness (pain on pressure), swelling or stiffness?

AT : هل كان هناك عارض أو صدمة (بمعنى الشد أو الإصابة) قبل الألم، الألم عند الضغط، التورم أو التيبس ؟

BT: Was there an accident or trauma (strain or injury) before pain, pain with pressure, swelling or stiffness?

Past pain and symptoms

* If you have had no problem, that is pain, tenderness (pain on pressure), swelling or stiffness, in your bones, joints or muscles in the last 7 days, have you EVER had any problem, that is pain, tenderness (pain on pressure), swelling or stiffness, in your bones, joints or muscles?

AT : إذا لم يكن لديك أي مشكلة مثل الألم، الألم عند الضغط، التورم أو التيبس في عظامك، مفاصلك أو عضلاتك في الأيام السبعة الأخيرة، فهل كان لديك أي مشكلة على الإطلاق مثل الألم، الألم عند الضغط، التورم أو التيبس في عظامك، مفاصلك أو عضلاتك؟

BT: If you did not have any problem like pain, pain with pressure, swelling or stiffness in your bones, joints or muscles during the last 7 days, have you ever had any problem like pain, pain with pressure, swelling or stiffness in your bones, joints or muscles?

* Was there a traumatic event (i.e. strain or injury) before the pain, tenderness (pain on pressure), swelling or stiffness?

AT : هل كان هناك عارض أو صدمة (بمعنى الشد أو الإصابة) قبل الألم، الألم عند الضغط، التورم أو التيبس ؟

BT: Was there an accident or trauma (strain or injury) before pain, pain with pressure, swelling or stiffness?

between means of 2 quantitative variables. Internal consistency of variables and reliability between the questionnaire outcome and clinical diagnosis of rheumatic disease were assessed by Cronbach alpha.

RESULTS

Stage 1: Adaptation of the CCQ

Cross cultural equivalence. Table 1 shows the translation and back translation of the questions used to evaluate the sensitivity and specificity in stage 2, the community validation study.

CCQ pretest. The questions on present and past pain and symptoms detected a high number of respondents with rheumatic disease. All those with rheumatic diseases had positive CCQ results. The instrument identified 18 out of 30 (60%) control subjects as having rheumatic problems. Clinical examinations and investigations confirmed the results. Therefore, the CCQ was sensitive to detect patients

with rheumatic disorders and specific in isolating negative rheumatic subjects. Reliability was measured by Cronbach's $\alpha = 0.97$. This indicated the questionnaire was reliable in detecting subjects with rheumatic diseases.

CCQ reliability. Interviewer agreement was satisfactory. The overall agreement was 80%.

Stage 2: Community validation study

The results of the community validation study are presented in Tables 2 through 4. Only 34% of those who completed the CCQ came for the clinical examination. Table 2 shows the validation study sample characteristics. There were 174 Kuwaiti subjects who had pain, tenderness, swelling, or stiffness in joints, bones, or muscles and 185 subjects without complaints. Females and married subjects predominated in the complainer group in contrast to the noncom-

Table 2. Characteristics of the 359 Kuwaiti subjects who completed the Arabic CCQ.

	With Rheumatic Complaints N = 174 n (%)	Without Rheumatic Complaints N = 185 n (%)	p [†]
Sex			
Male	67 (38.5)	112 (60.5)	< 0.001*
Female	107 (61.5)	73 (39.5)	< 0.001*
Marital status			
Single	31 (17.8)	83 (44.8)	< 0.001*
Married	129 (74.1)	95 (51.4)	< 0.001*
Widowed	9 (5.2)	3 (1.6)	
Divorced	5 (2.9)	4 (2.2)	
Working status			
Working	70 (42.1)	70 (40.5)	
Nonworking	96 (57.8)	103 (59.5)	
Housewife	47 (28.3)	16 (8.6)	< 0.001**
Student	24 (14.5)	70 (40.5)	< 0.01**
Retired	25 (15.1)	17 (9.8)	< 0.01**
Age, yrs mean ± SD	41.5 ± 15.2	31.6 ± 14.1	< 0.001***

The number does not add up to the total in some variables due to missing numbers.

† Complainers vs noncomplainers. * Chi-squared test, ** normal Z test, *** Student t test.

plainer group. Age was significantly higher ($p < 0.001$) in those with musculoskeletal complaints compared to those without complaints (mean ± SD = 41 ± 15.2 vs 31 ± 14.1 yrs). As well, there was a significantly higher ($p < 0.01$) number of housewives and retired subjects, and lower ($p < 0.01$) number of students in the group of complainers compared to noncomplainers. The mean duration of administration of the questionnaire was 10 minutes per subject.

The total number of subjects who had clinical examinations was 122. Eighty-nine (73%) were discovered to have rheumatic diseases. The mean age (± SD) of the females was 47.8 (± 15.5) years and for males 46.0 (± 14.8) years. Table 3 shows diagnoses found on clinical examination. The

Table 3. Specific diagnoses of the 89 subjects found to have rheumatic disorders by clinical examination.

	n (%)
Sex	
Female	60 (67)
Male	29 (33)
Specific diagnosis*	
Soft tissue rheumatism	62 (45.6)
OA	40 (29)
Low back pain	21 (15)
RA	1 (0.7)
Gout	1 (0.7)
Ankylosing spondylitis	1 (0.7)
Miscellaneous	10 (7.4)

* 136 clinical diagnoses.

Table 4. Sensitivity and specificity of the Arabic CCQ compared with clinical examination.

CCQ	Clinical Examination	
	Rheumatic Disease Present	Rheumatic Disease Absent
Positive rheumatic complaints (n = 85)	84	1
Negative rheumatic complaints (n = 37)	5	32
Total (n = 122)	89	33

male:female ratio was 1:2.1, with a preponderance of females. Soft tissue rheumatism, OA, and low back pain constituted the main specific diagnoses (45.6%, 29%, and 15%, respectively).

Table 4 shows the sensitivity and specificity of the Arabic CCQ for detecting rheumatic diseases compared to clinical examination. The sensitivity of the CCQ was 94.38% and the specificity 96.97%. The positive and negative predictive values were 98.82% and 86.49%, respectively.

DISCUSSION

The aim of this study was to translate the English version of the WHO-ILAR COPCORD questionnaire into Arabic and to test if the Arabic version could be reliably used for the screening of rheumatic diseases in Kuwaitis. We used the standard approach¹³ to adapt the questionnaire with respect to translation, cross cultural equivalence, back translation, and reliability.

The translation of the CCQ to Arabic was successful, as confirmed by the back translation. The results of the CCQ pretest and reliability showed the CCQ was clear in wording and culturally appropriate, and could discriminate individuals with rheumatic disease from those without. It also took between 10 and 12 minutes to administer. We concluded the Arabic version of the WHO-ILAR COPCORD questionnaire was a suitable instrument for screening of rheumatic diseases among Kuwaitis since it was culturally acceptable and easily understood. These findings were in agreement with studies in other countries⁵⁻¹².

In the community validation study, we adopted a slightly different approach on the question about pain. If the subject answered "Yes" to the question about pain, they were asked directly the question about history of trauma without asking about the severity of the pain. Using this approach the Arabic version of the CCQ was found to show high specificity and sensitivity and positive and negative predictive values for detecting individuals with rheumatic diseases. We therefore propose to use this instrument in future studies of the prevalence of rheumatic diseases in Kuwaiti nationals.

We observed a disparity between the number of respondents who completed the questionnaire and the number of people who reported for the clinical examination. The low

number of people who turned up for clinical examination compared with the number that completed the CCQ might be attributed to a number of factors. The interviews were conducted during the evenings, when people were usually available, whereas the clinical examinations were conducted in the 2 hospitals in the mornings when people would be expected to be at work. A better approach would have been to examine the respondents at home, but this was not feasible because of the shortage of rheumatologists in Kuwait. A second factor for the low turnout for clinical examination might be that examination was performed in 2 hospitals that, in many cases, were far from respondents' homes. No doubt, the low response rate also has statistical implications in the sense that those patients who did not report for clinical examinations might have different characteristics from those who did. Naturally, statistical analyses will only reflect the measurements and characteristics of those patients who reported for clinical examination. As well, the test's power for detecting statistical significance will be affected by the low response rate. Therefore during the future expansion of this study we intend to conduct clinical examinations in polyclinics, which are equally distributed in all districts close to respondents' homes. The female preponderance in rheumatic diseases and their prevalence reported during the pilot study were consistent with previous studies^{8,11,12}. The preliminary findings that female sex, increasing age, marriage, and being a housewife or retired were associated with high prevalence of rheumatic diseases need to be confirmed by the major study.

The Arabic version of the WHO-ILAR COPCORD CCQ would appear to be a reliable, culturally acceptable, sensitive, specific, and easy instrument for the screening of rheumatic diseases in Arabic-speaking communities. We intend to use it to study the prevalence of rheumatic diseases among Kuwaitis and recommend its use in other Arabic-speaking countries.

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