



Original Investigation

Cultural adaptation and validation of the COPCORD questionnaire for the detection of rheumatic diseases in the indigenous Misak population



Alex Jhonier Imbachí Salamanca^a, Juan David Orozco Burbano^{a,*},
Ana Isabel Ospina Caicedo^a, Beatriz Eugenia Bastidas Sánchez^b,
Ingris Peláez Ballestas^{c,d}, María Verónica Castro Andrade^e,
Edgar Alfonso Castro Franco^b, Diana Karolina Rodríguez Cerón^f,
Jorge Andrés Rosero Narváez^f, Brayan Reyes Burgos^f, Giovanna Maritza Cortés Bolaños^f

^a Departamento de Medicina Interna, Facultad de Ciencias de la Salud, Universidad del Cauca, Popayán, Colombia

^b Departamento de Medicina Social y Salud Familiar, Facultad de Ciencias de la Salud, Universidad del Cauca, Popayán, Colombia

^c Facultad de Medicina, Universidad Nacional Autónoma de México (UNAM), Ciudad de México, México

^d Departamento de Reumatología, Hospital General de México, Ciudad de México, México

^e Departamento de Fisioterapia, Facultad de Ciencias de la Salud, Universidad del Cauca, Popayán, Colombia

^f Programa de Medicina, Facultad de Ciencias de la Salud, Universidad del Cauca, Popayán, Colombia

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ABSTRACT

Introduction: The objective was to adapt and validate in a culturally sensitive way the methodology of the community-oriented programme for the control of rheumatic diseases (COPCORD) in the indigenous Misak community of Colombia.

Material and methods: A culturally sensitive validation of the COPCORD questionnaire in Spanish was carried out, translating into the *nam trik wam* language used by the Misak community of Guambia town. It was adapted to the context of this population and later a back-translation to Spanish was carried out. Finally, it was validated applying the survey with the support of bilingual translators. Participants with pain, stiffness or swelling in any joint in the previous 7 days and/or at any time in life were evaluated by physicians and physiotherapists and were then, upon confirming the diagnosis of a musculoskeletal disorder, subsequently examined by a rheumatologist.

Results: In this population (n = 106), 58.5% were women with an average age of 45.5 years. In the last 7 days, 51 subjects (48.1%) reported having musculoskeletal pain and 7 (44.3%) reported pain at some time in their life. Of those who received treatment, 53.1% reported using traditional medicine, 34.4% homeopathic treatment, and 25% allopathic treatment. The COPCORD Misak demonstrated an adequate capacity to detect musculoskeletal disorders, with a sensitivity of 63.3% and a specificity of 80.3%, with a positive likelihood ratio of 3.2, and area under the curve of 0.71.

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* Corresponding author.

E-mail address: jdorozco@unicauca.edu.co (J.D. Orozco Burbano).

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Conclusion: The COPCORD methodology is a valid screening tool to detect musculoskeletal disorders in the Misak community.

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Adaptación cultural y validación del cuestionario COPCORD para la detección de enfermedades reumáticas en la población indígena Misak

R E S U M E N

Palabras clave:

Misak
Copcord
Enfermedades reumáticas
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Introducción: El objetivo fue adaptar y validar de forma culturalmente sensible, la metodología del Programa Orientado a la Comunidad para el Control de Enfermedades Reumáticas (Copcord) en la comunidad indígena misak de Colombia.

Material y métodos: se realizó una validación culturalmente sensible del cuestionario Copcord en español, que se tradujo al *nam trik wam*, lengua usada por el pueblo misak del resguardo de Guambia. El cuestionario se adecuó al contexto de esta población y posteriormente se llevó a cabo una retrotraducción al español. Por último, se validó aplicando la encuesta con el apoyo de traductores bilingües. Los participantes con dolor, rigidez o hinchazón en cualquier articulación en los siete días previos, o en cualquier momento de la vida, fueron evaluados por médicos y fisioterapeutas. Al confirmarse el diagnóstico de una enfermedad musculoesquelética, los participantes eran examinados por un reumatólogo.

Resultados: De la población estudiada ($n=106$), el 58,5% fueron mujeres, con una edad promedio de 45,4 años. En los últimos siete días, 51 sujetos (48,1%) informaron tener dolor musculoesquelético y siete (44,3%) refirieron dolor en algún momento de su vida. Quienes recibieron tratamiento reportaron el uso de medicamentos tradicionales en un 53,1% de los casos, homeopáticos en el 34,4% y alopáticos en el 25%. El cuestionario Copcord Misak demostró una adecuada capacidad para detectar los trastornos musculoesqueléticos, con una sensibilidad del 63,3%, una especificidad del 80,3%, una razón de verosimilitud positiva de 3,2 y un área bajo la curva de 0,71.

Conclusión: La metodología Copcord es una herramienta válida de cribado de enfermedades musculoesqueléticas en el pueblo misak.

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Introduction

Musculoskeletal discomfort (MSD) and rheumatic diseases are a group of conditions that can generate marked morbidity and mortality, impact quality of life, and high treatment costs.¹ Faced with this problem, the World Health Organization (WHO) and the International League of Rheumatology Associations (ILAR) developed the Community Oriented Program for the Control of Rheumatic Diseases (COPCORD), to identify, prevent, and control rheumatic diseases in developing countries.²

The COPCORD is a simple and reliable methodology that seeks to obtain standardized epidemiological records of rheumatic diseases, following three stages: (1) application of a community survey to detect patients with suspected MSD (positive COPCORD) to be evaluated by doctors, as well as to diagnose rheumatic diseases; (2) creation of educational strategies and dissemination of treatment of the most prevalent diseases; and (3) generation of control and prevention strategies focused on the identified risk factors. In the case of Colombia, using this methodology, a prevalence of MSD between 48% and 73%³ has been established.

In recent years, great interest has arisen in knowing the impact of rheumatic diseases in indigenous populations, derived from previous genetic and epidemiological studies, where it has been documented that some of these diseases, such as rheumatoid arthritis (RA), are present with greater prevalence or severity in these populations.^{4,5} The Latin American Group for the Study of Rheumatic Diseases in Indigenous Peoples (Gladerpo) has reported interesting epidemiological data using the COPCORD strategy in indigenous groups in Mexico, Venezuela, Argentina, and Ecuador.^{6–11} In Colombia, there are no specific epidemiological studies on rheumatic diseases in the indigenous population. According to the 2018 Colombian national census, this population grew by 36.8%, constituting 4.4% of the country's total, with Cauca as the second department that houses the largest number of individuals belonging to it.¹² The Misak community is represented by approximately 22,000 people, of which 65% say they speak the local language *nam trik wam* fluently,¹³ an endangered language that needs to be strengthened, as proposed by the Native Languages Law (Law 1381 of 2010).¹⁴

Under this reality, a process of adaptation of instruments such as the COPCORD to the sociocultural context is required, since the perception of health/illness can vary due to the inci-



Fig. 1 – Village division of the indigenous reservation of Guambia, Silvia. Department of Cauca. Colombia. Source: own elaboration.

dence of cultural patterns, beliefs, preferences in medical care, or difficulty accessing the different levels of medical care²; In addition, it is necessary to expand the epidemiological information on rheumatic diseases in the country's indigenous population. The present study aims to adapt and validate, with cultural sensitivity, the COPCORD instrument in the Misak population, as a first step to carrying out epidemiological studies of rheumatic diseases in this population.

Materials and methods

Design

A cross-cultural adaptation and validation to *nam trik wam* of the methodology and the COPCORD screening questionnaire (Spanish version), to identify MSD and rheumatic diseases, used in the Mayan-Yucatecan indigenous people of Mexico was conducted.⁶ Sections of the COPCORD Colombia questionnaire were also considered to complement instrument.¹⁵ The process was held between August 1–30, 2019.

Population

The Misak people live mainly in the department of Cauca, Colombia, in reservations located in the municipalities of Silvia, Jambaló, Totoró, Caldono, and Toribío; the areas with the highest population density are the reservations of Guambia and Quisgó in the municipality of Silvia.¹⁶ The Guambia region, in which around 16,000 people live, is characterized

by being rainy and cold, with an altitude between 2,500 and 3,500 m asl, with an average temperature of 12 °C.^{17,18}

This study included subjects older than 18 years belonging to the Misak community, residents of the Guambia reservation, who voluntarily accepted the application of the COPCORD questionnaire. The reservation is divided into nine zones and these, in turn, are divided into trails. Participants from 11 villages (Las Delicias, Bujíos, San Fernando, Agua Blanca, Tapias, Guambia Nueva, Santiago, Puente Arriba, Sierra Morena, Pueblito, and Trejo) of the Guambia Nueva area were selected for convenience. In this place, the Mamá Dominga Hospital (a first-level care center for western medicine) and Casa de Plantas Sierra Morena, a care center for traditional medicine were located (Fig. 1).

The sample size was calculated at convenience; it was considered that it should include at least 100 observations, as suggested by Terwee et al. for the validation of questionnaires on the state of health.¹⁹

COPCORD questionnaire

This questionnaire has several sections, which include: an explanation of the study and informed consent, demographic information, recent pain (last seven days), historical pain (sometime in your life), anatomical location of pain on a figure of the human body, pain severity (assessed using the categories intense, strong, moderate, little or mild, no pain), pain duration, care-seeking, previous diagnosis, treatment received, functional limitation, functional capacity measured by the Health Assessment Questionnaire (HAQ -DI), history of

comorbidities, economic situation and, finally, a section on the assessment of the questionnaire and suggestions.

In this study, the definition of positive COPCORD was the presence of new (within the last 7 days) or historical (at any time in life) musculoskeletal pain, stiffness, or swelling, unrelated to self-reported trauma.

Cross-cultural adaptation

The COPCORD questionnaire (Mexican-Spanish version), used with the Yucatec Mayan people,⁶ was adapted to Colombian Spanish and the cultural context of the Misak people, constructing the first version and generated for translation. A few modifications were made, including changing the order of the sections and including additional variables—for example, whether you can read and write Wam, considering that it is a predominantly oral language. In the pain section, a Likert-type scale was maintained for pain grading; in the treatment section, it was added if they attended the traditional, alternative, or western doctor; and in the section biomechanical load the weight load was adjusted in arrobas, since this term is more understandable for the study population, and weaving or spinning was added to daily activities through which manual functionality was assessed. In the section on comorbidities and exposures, exposure to wood smoke was also asked. The human diagram of COPCORD Colombia was used; the section on demographic data and econometrics was taken from it, without asking directly about net income, since it is a sensitive question for the community; the latter was changed to multiple questions related to material possessions and services.

Once the version in Colombian Spanish was built, the seven-step process was undertaken to achieve the final version, adapting Beaton's proposals²⁰; these steps include: (1) translation; (2) synthesis of the translation; (3) back translation; (4) review by an expert committee; (5) evaluation of the prefinal version; (6) review of the document by researchers and people from the community; and (7) establishment of a final version of the questionnaire. In a transversal way, adaptations were also performed to the Spanish version, according to the target population, culture, language, and country, following community recommendations.

Step 1. Translation of the questionnaire: three bilingual volunteer translators belonging to the community were selected, who independently carried out a written and oral translation from Spanish into *nam trik wam* of the COPCORD document in Mexican Spanish, used in the Mayan-Yucatecan community.⁶

Step 2. Synthesis of the translation: a meeting was held between the three translators and the representatives of the research group, in which the three translations were analyzed, doubts were resolved, and the first version of the COPCORD misak questionnaire was established by consensus techniques. This version was applied to five monolingual people from the community to verify their comprehension.

Step 3. Back translation: two bilingual translators, belonging to the Misak community (different from the translators in step 1), independently performed a back translation of version

1 of the COPCORD Misak questionnaire from the *nam trik wam* language into Spanish.

Step 4. Committee review process: discussion sessions were held between representatives of the research group, the translators of steps 1 and 3, a linguist from the community, and an anthropologist, to obtain version 3 of the questionnaire, verifying a culturally semantic appropriate language, conceptual, and cultural equivalence.

Step 5. Evaluation of the pre-final version: 20 monolingual *wam* people were surveyed with version 3 of the questionnaire, to check that during the process of completing the instrument, accessibility, and respect for the traditions and customs of the misak.

Step 6. Presentation of the committee of experts and participating researchers: a meeting was held with the translators, the community linguist, the anthropologist, and the research group, in which the comments, suggestions, and recommendations were taken into account to establish a final version of the document.

Step 7. Validation of the final version: the purpose of this phase of the project was to assess the performance of the COPCORD misak questionnaire. For this, the final version of the questionnaire was applied to a sample of 100 individuals selected for convenience within the indigenous community.

For the application of the final questionnaire, three filters were established: filter 1, constituted by interviewers trained to fill out the COPCORD misak questionnaire; filter 2, made up of an internal medicine specialist (or internal medicine fellow) trained in the detection of rheumatic diseases and a physiotherapist; and filter 3, a rheumatologist. The interviews and medical evaluations were carried out house by house, with individuals over 18 years of age who voluntarily decided to participate.

Positive COPCORD patients identified through the instrument applied by filter 1 were immediately evaluated by filter 2, to establish a presumptive diagnosis of musculoskeletal disease, rule it out, and redirect attention to other diseases causing the symptoms. Patients suspected of musculoskeletal disease were immediately evaluated by filter 3, to generate a definitive diagnosis using the internationally established diagnostic criteria for rheumatic diseases.

Ethical aspects

The present research respected the principles of bioethics: respect for people, beneficence, and justice ensured the voluntary participation of individuals, which was done using informed consent, in which the benefits and risks of the research, the commitments of the researchers, and the right to withdraw from their participation were explained. The Resolution 8430 of 1993 of the Colombian Ministry of Health was considered. This project is registered in the Vice-Rector for Research of the Universidad del Cauca (ID 5083 - Resolution 0329 of March 2019) and was endorsed by the ethics committee in a session in April 2019. The endorsement and disclosure of the results by the Indigenous Council of the Guambia Reserve, using a format of ethic aspects for research in communities/ethnic groups, communicated to the Office of the Vice-Rector for Investigations of the Universidad del Cauca using an official letter dated November 14, 2018, in which the

commitment of the community to participate in the research project is also exhibited.

Statistical analysis

The analysis included descriptive statistics for all study variables, which are reported as measures of central tendency and dispersion, and proportions for dichotomous or ordinal variables. Cronbach's alpha coefficient was used to measure internal consistency and dimensionality; the lowest values were interpreted as multidimensional and those above 0.70 as unidimensional.²¹ Correlation matrices were prepared for the dimensions of the questionnaire.

Construct validity: MSD and medical treatment were compared with the clinical assessment of the rheumatologist.

Performance as a screening test: Pain symptoms (in the last seven days and historical pain) were compared with the clinical assessment and final diagnosis provided by a rheumatologist by assessing sensitivity, specificity, likelihood ratio, areas under the curve (AUC), and their 95% confidence intervals (CI).¹⁷ Analysis was performed using Stata v.12.0 (Stata Corp, College Station, TX, USA).

Results

The instrument was applied to 106 people belonging to the Guambia reservation. Among the sociodemographic characteristics, an average age of 45.5 years stands out and most of the population is female (58.5%). Hence, 63% of those surveyed spoke and wrote the *nam trik wam* language (Table 1).

The comorbidities self-reported by the study population were gastritis (dyspepsia) in 25 (23.6%) cases, anxiety in 14 (13.2%), heart disease in 10 (9.4%), chronic arterial hypertension in 7 (6.6%), chronic venous insufficiency in 7 (6.6%), dyslipidemia in 6 (5.7%), cerebrovascular disease in 3 (2.9%), type 2 diabetes mellitus in one (0.9%) and obesity in one (0.9%).

The manifestation of musculoskeletal pain in the last seven days was present in 51 individuals (48.1%), and at some point in their lives in 47 (44.3%). Of 61 (57.5%) subjects who responded to the question of current functional limitation, only 17 (27.9%) stated that they present it. The opposite occurred with previous functional limitation, in which of 55 (51.9%) people who answered this variable, 23 (40%) stated that they had presented it, highlighting that in 7 (12.7%) patients, the involvement was more than one year. Table 2 reports the data from the HAQ-DI.

Regarding pain treatment, 32 (30.2%) respondents stated that they had received some type of management, of which 17 (53.1%) used traditional medicines, 11 (34.4%) consumed homeopathic medicines, and 8 (25%) received allopathic therapy.

After medical evaluation by rheumatology, a diagnosis of rheumatological disease was made in 30 (28.3%) patients, of which 9 (8.5%) had more than one diagnosis, and 9 (8.5%) cases of inflammatory-type disease were found. Table 3 describes the rheumatic diseases detected.

Table 1 – Sociodemographic description.

Variable	Total, n = 106 (%)
Gender, n (%)	
Male	44 (41.51)
Female	62 (58.49)
Age, mean (SD; range)	45.47 (16.72;16–80)
Educational level	
Did not study	24 (23.53)
Elementary	43 (42.16)
High-school	25 (24.51)
Technician or technologist	3 (2.94)
University	4 (3.92)
Specialization, Masters or PhD	3 (2.94)
Speak and write <i>wam</i> yes, (n = 101) n%	63 (62.38)
Speak and write Spanish yes, (n = 96) n%	77 (80.21)
Village (n = 104) n%	
Treyo	11 (10.58)
Guambia Nueva	24 (23.08)
Santiago	7 (6.73)
Tapias	13 (12.50)
Agua Blanca	1 (0.96)
Puente Arriba	13 (12.50)
Delicias	14 (13.46)
Sierra Morena	2 (1.92)
Pueblito	4 (3.85)
San Fernando	11 (10.58)
Bujios	4 (3.85)
Marital status	
Single	21 (20.39)
Married	42 (40.78)
Widower	34 (33.01)
Free union	6 (5.83)
Occupation before n (%) / occupation after n (%)	n = 67
Household trades	14 (20.90) / 18 (26.87)
Employee of a company	3 (4.48) / 7 (10.45)
Patron or employer	1 (1.49)
Student	9 (13.43) / 3 (4.48)
Farmer	22 (33.85) / 22 (33.85)
Retired or pensioner	3 (4.48)
Independent worker	13 (19.40) / 25 (37.31)
Walking worker	2 (2.98) / 2 (2.98)
None	2 (2.98) / 1 (1.49)
Affiliation to the health system n = 103 (%)	
Subsidized	93 (90.29)
Contributory	9 (8.74)
Linked	1 (0.97)
Economic goods n = 92 (%)	
Radius	77 (83.78)
Television	72 (78.26)
DVDs	25 (27.17)
Sewing machine	8 (8.78)
Fridge	6 (6.52)
Washing machine	5 (5.43)
Stove	41 (44.57)
Computer	27 (29.35)
Heater	5 (5.43)
Bicycle	19 (20.65)
Motorcycle	28 (30.43)
Car	6 (6.52)
Truck	7 (7.61)
Phone	6 (6.52)
Cell phone	77 (83.70)
Energy	84 (91.30)

Table 2 – HAQ-DI.

Difficulty n = 70 (%)	Without any trouble	With some difficulty	With much difficulty	Can't do it
1. Dressing oneself including tying shoelaces	58 (82.86)	7 (10.00)	4 (5.71)	1 (1.43)
2. Getting in and out of bed	54 (77.14)	11 (15.71)	5 (7.14)	
3. Take to the mouth-difficulty rinsing	63 (90.00)	2 (2.86)	4 (5.71)	1 (1.43)
4. Standing up from a chair	54 (77.14)	14 (20.00)	2 (2.86)	
5. Cut the food	64 (91.43)	5 (7.14)	1 (1.43)	
6. Grab the cup or a full glass	63 (90.00)	6 (8.57)	1 (1.43)	
7. Walking on flat ground	60 (85.71)	10 (14.29)		
8. Open a bottle	57 (81.43)	8 (11.43)	4 (5.71)	1 (1.43)
9. Climb steps	57 (81.43)	10 (14.29)	3 (4.28)	
10. Wash and dry the entire body	64 (91.43)	5 (7.14)	1 (1.43)	
11. Grab and lower something over 1 kg that is above your head	59 (84.29)	6 (8.57)	4 (5.71)	1 (1.43)
12. Leaning over and picking things up off the ground	53 (75.71)	10 (14.29)	5 (7.14)	2 (2.86)
13. Grab the car door	59 (84.29)	9 (12.86)	1 (1.43)	1 (1.43)
14. Grab a jar	58 (82.86)	7 (10.00)	4 (5.71)	1 (1.43)
15. Water faucet	62 (88.57)	5 (7.14)	1 (1.43)	2 (2.86)
16. Go shopping	64 (91.43)	3 (4.29)	1 (1.43)	2 (2.86)
17. Getting in and out of the car	63 (90)	4 (5.71)	1 (1.43)	2 (2.86)
18. Housework	53 (75.71)	10 (14.29)	3 (4.29)	3 (4.29)
19. Weave or spin	58 (82.86)	6 (8.58)	3 (4.29)	3 (4.29)

– Table 1 (Continued)

Variable	Total, n = 106 (%)
Aqueduct	84 (91.30)
Sewage	14 (15.22)
Type of dwelling n = 72 (%)	
Own home	70 (97.22)
Housing for rent	2 (2.78)

Table 3 – Diagnoses reported by rheumatology (n = 106).

Diagnosis	No. (%)
Knee osteoarthritis	5 (4.72)
Hand osteoarthritis	4 (3.77)
Osteoarthritis in another joint ^a	7 (6.60)
Rheumatoid arthritis	2 (1.89)
Undifferentiated arthritis ^b	5 (4.72)
Arthralgia, unspecified ^c ++	8 (7.55)
Sjögren's syndrome	2 (1.89)
Apendicular painful regional syndrome ^d	16 (15.09)
Rheumatic disease ^e	42 (39.62)
Inflammatory rheumatic disease	9 (8.49)

^a Osteoarthritis other than knee or hand.
^b Arthritis that does not meet the full classification criteria for RA.
^c Non-inflammatory joint pain.
^d This includes shoulder tendonitis (4), rotator cuff syndrome (3), epicondylitis (5), wrist tenosynovitis (1), de Quervain's tenosynovitis (1), carpal tunnel syndrome (2).
^e Rheumatic disease, excluding non-specific musculoskeletal complaints, trauma, and those not associated with rheumatic diseases.

Validity analysis

When carrying out an analysis of the internal validity by dimensions of the COPCORD questionnaire, it was found that Cronbach's alpha ranges from 0.95 for the components of the HAQ-DI, to 0.58 for the self-reported comorbidities (Table 4).

Table 4 – COPCORD questionnaire internal consistency.

COPCORD Dimensions	Cronbach's Alpha	Items
MSK pain trajectory ^a	0.64	4
Comorbidity ^b	0.58	10
Work ^c	0.61	18
HAQ-DI functional capacity ^d	0.95	19

MSK: musculoskeletal.
^a Pain trajectory: pain in the last seven days, historical pain, historical pain intensity, current pain intensity.
^b All comorbidities (type 2 diabetes mellitus, arterial hypertension, heart disease, cardiovascular disease, anxiety, gastritis, obesity, dyslipidemia, venous insufficiency, and cancer).
^c All questions related to work and activity.
^d All the questions of the Health Assessment Questionnaire (HAQ-DI) and functional limitation.

When assessing the correlation between the pain variables and the diagnosis of a rheumatological disease using the Pearson correlation coefficient, it was found that both pain less than seven days and historical pain had a positive correlation, with an adequate significance of 0.38 ($p = 0.001$) and 0.35 ($p = 0.003$), respectively.

COPCORD screening test performance analysis

For the definition of positive COPCORD, the presence of current or historical pain in the absence of any trauma was considered. When carrying out the performance analysis of the COPCORD questionnaire using the two questions that inquire about pain in the last seven days and historical pain, comparing with the diagnosis of rheumatological disease confirmed by the rheumatologist, a sensitivity of 63.3% was obtained, a specificity 80.2%, a positive likelihood ratio (LR+) of 3.2, and an area under the curve of 0.71. The results for each rheumatic disease are described in Table 5, which also shows the comparison with the diagnostic performance

Table 5 – Performance as a screening test of the COPCORD questionnaire for the detection of rheumatic diseases.

DX	COPCORD 1						COPCORD 2					
	S%	Sp%	LR+	LR–	AUC	CI	S%	Sp%	LR+	LR–	AUC	CI
Knee osteoarthritis	100	41.58	1.71	0.00	0.70	0.65–0.75	40	68.32	1.26	0.87	0.54	0.29–0.78
Rheumatoid arthritis	100	40.38	1.67	0.00	0.70	0.65–0.74	100	69.23	3.25	0.00	0.84	0.80–0.89
Sjogren's syndrome	100	40.38	1.67	0.00	0.70	0.65–0.74	100	69.23	3.25	0.00	0.84	0.80–0.89
Undifferentiated arthritis	100	41.58	1.71	0.00	0.70	0.65–0.74	80	70.30	2.69	0.28	0.75	0.55–0.95
Unspecified arthralgia	100	42.86	1.75	0.00	0.71	0.66–0.76	25	67.35	0.76	1.11	0.46	0.29–0.62
Hand osteoarthritis	100	41.18	1.70	0.00	0.70	0.65–0.74	75	69.61	2.47	0.35	0.72	0.47–0.97
Osteoarthritis	100	42.42	1.73	0.00	0.71	0.66–0.76	57.14	69.70	1.88	0.61	0.63	0.43–0.83
Appendiceal syndromes	100	45.65	1.84	0.00	0.72	0.67–0.77	64.29	72.83	2.36	0.49	0.68	0.54–0.82
Rheumatic disease	100	55.26	2.23	0.00	0.77	0.72–0.83	63.33	80.26	3.20	0.45	0.71	0.61–0.81
Inflammatory rheumatic disease	100	42.42	1.73	0.00	0.71	0.66–0.76	85.71	71.72	3.03	0.19	0.78	0.64–0.93

COPCORD 1, Definition used in similar studies in Latin America; COPCORD 2, Definition used in this study; S% Sensitivity, Sp% Specificity; LR, likelihood ratio; AUC, Area under the curve; CI, confidence interval.

of the definition of positive COPCORD used in other validation studies: the presence of pain in the last seven days or historical pain, independently of the presence of associated trauma.

Discussion

The COPCORD misak questionnaire demonstrated an adequate capacity to detect musculoskeletal disorders and rheumatic diseases in the misak indigenous population of the Guambia reservation.

The sensitivity of the COPCORD misak questionnaire was lower than that reported in other validation studies of the COPCORD strategy in indigenous peoples, ranging between 70.8% and 100% in Latin American indigenous communities (warao, kariña, chaima [Venezuela], mixtec, Maya-Yucatec and raramuri [Mexico], qom [Argentina]),²² the saraguro of Ecuador,²³ and the wayúu of Venezuela.²⁴

The specificity of the COPCORD misak questionnaire is comparable to that reported in validation studies of the COPCORD strategy in non-indigenous communities in Ecuador²⁵ and Mexico.²⁶ On the contrary, it was higher than that reported in the studies validating such strategy in the saraguro²³ and wayúu²⁴ communities, the study of Latin American indigenous communities,²² and its validation in the non-indigenous population in Colombia¹⁵ (Annex 1).

The positive likelihood ratio of the COPCORD misak questionnaire was higher than that reported in all validation studies of the COPCORD strategy in Latin America, both in indigenous and non-indigenous populations, which varies between 1.09 and 2.73, except for Ecuador in the non-indigenous population, where an LR+ of 3.7²⁵ was reported.

The COPCORD misak questionnaire has adequate internal consistency in the dimensions evaluated, the pain trajectory dimension being comparable with the COPCORD validation studies in Ecuador in non-indigenous populations,²⁵ in the indigenous wayúu population in Venezuela,²⁴ and in the study of Latin American indigenous populations.²² The internal consistency (Cronbach's alpha) in the comorbidities dimension was higher than that reported in the

studies of the indigenous wayúu,²⁴ Saraguro,²³ and Latin American indigenous communities²² and comparable to that reported in the case of the non-indigenous population in Ecuador.²⁴ The functional capacity dimension had an excellent internal consistency, superior to that reported in the previously mentioned Latin American studies in indigenous and non-indigenous populations.

In Colombia, the COPCORD strategy was validated in the non-indigenous population in 2019.¹⁸ On that occasion, a sensitivity of 70.83%, a specificity of 35%, a positive likelihood ratio of 1.09, and an AUC of 0.53 were reported for the diagnosis of rheumatic disease. Compared to this study, the COPCORD misak questionnaire was less sensitive but showed greater specificity, positive likelihood ratio, and a greater area under the curve.

The difference in the diagnostic performance of the COPCORD misak, compared to the other validation studies of the COPCORD strategy, is mainly associated with the fact that the positive case definition used in the validation for the misak population excluded all patients with trauma related to the musculoskeletal discomfort, which favored an increase in the specificity in the detection of rheumatic diseases with lower sensitivity. Therefore, the working group established a strategy of three adequately trained and standardized filters to improve the detection capacity of the study.

Limitations

In this study, the presence of MSD in the absence of related trauma as a condition to define COPCORD positivity generated a loss of sensitivity. Considering that this is a screening test, it is suggested to eliminate the absence of associated trauma in the positive COPCORD definition in future validation studies and implementation of the strategy.

Adaptive adjustments were performed to the COPCORD instrument used for the Misak community, so some results in the socioeconomic field may not be completely comparable with similar studies in other populations. Added to this, there were difficulties in completing the questionnaires by the interviewers (despite the received training), which led to a loss of data, especially in the socioeconomic aspect.

The interview of the personal pathological history is based on what was strictly referred to by the respondents, which, following the general conception of the community about some diseases, can generate an overestimation of said entities, as is the case of gastritis. Screening for rheumatic diseases was carried out based solely on clinical diagnostic criteria.

Conclusions

This study demonstrated that the cross-cultural adaptation and its validation in the *nam trik wam* language, for the Misak indigenous group of the Guambia reservation in Colombia has adequate performance for the detection of rheumatic diseases and is easy to fill out.

The validation and adaptation of the COPCORD strategy to the *nam trik wam* promotes the recognition, promotion, protection, use, preservation, and strengthening of the languages of the ethnic groups of Colombia, as established by current legislation (Law 1381 of 2010).

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Conflict of interests

The authors declare that they have no conflict of interest in the preparation of this article.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.rcreu.2021.04.011>.

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