

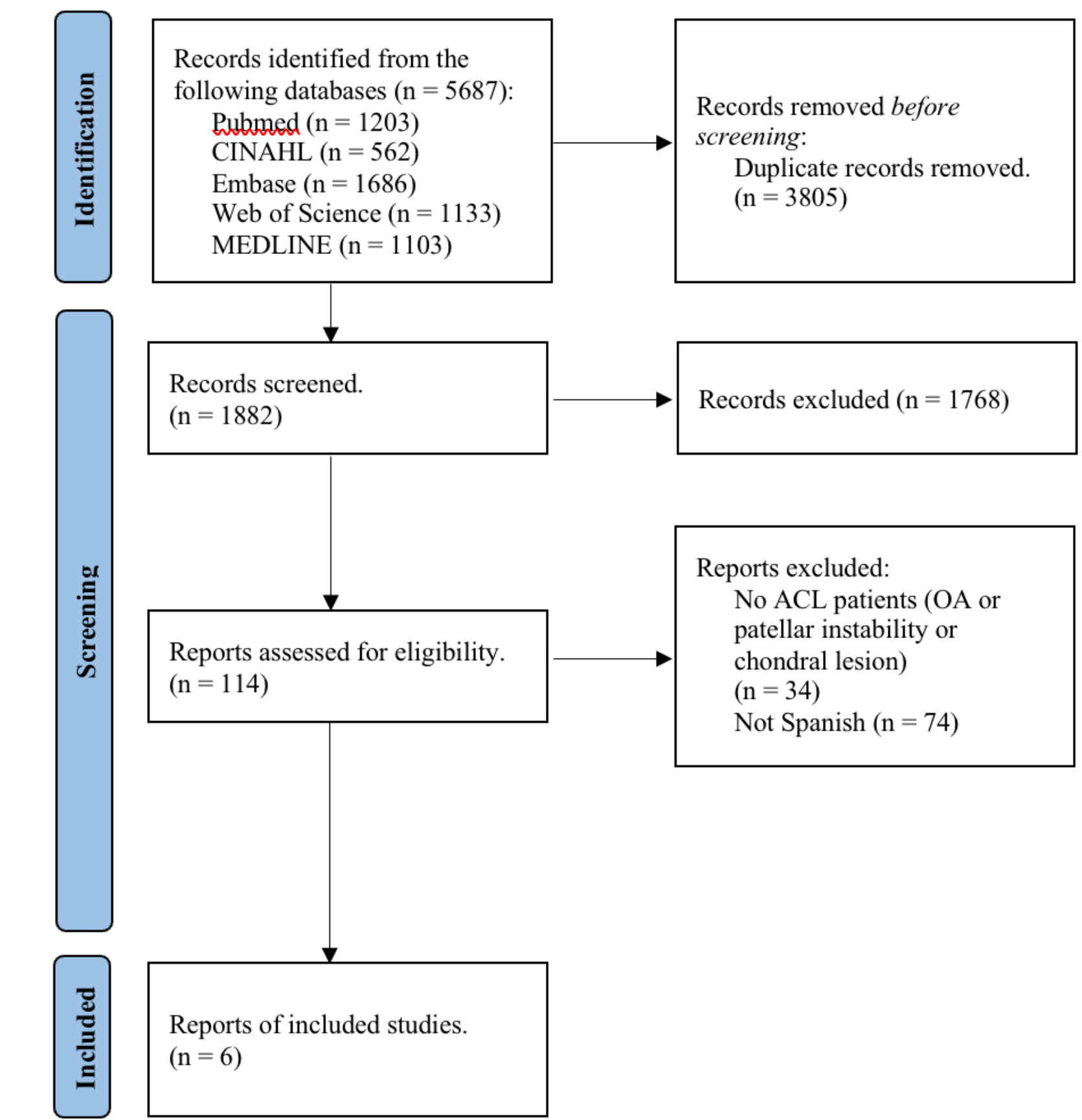
BACKGROUND

Patient reported outcome measures (PROMs) have been adopted as a way to measure patient self-rated physical function and health status for those with anterior cruciate ligament (ACL) injuries. Although multiple PROMs exist and have been translated into various languages, the cross-cultural adaptation and validity of these PROMs for Spanish-speaking patients with ACL injuries is unknown.

METHODS

We conducted a systematic review to search for studies related to adaptation quality and psychometric properties of Spanish PROMs in patients with ACL injuries.

Figure 1. PRISMA flowchart outlining literature search



Methodological Quality was evaluated using 3 checklists:

- Guidelines for the Process of Cross-Cultural Adaptation of Self-Reported Measures
- Quality Criteria for Psychometric Properties of Health Status Questionnaires
- COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) checklists.

Level of evidence for each PROM was determined based on the # of studies, methodological quality, and sample size.

DISCUSSION

The study highlights the need for improvement in PROMs for Spanish-speaking patients and the potential for mismeasurement and inappropriate application of PROM results in patients with ACL injuries.

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Are Patient-Reported Outcome Measures for Anterior Cruciate Ligament Injuries Validated for Spanish Language and Culture? A Systematic Review

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Results

- Six** articles selected for final review
- Four** PROMs – Lysholm Knee Score, Anterior cruciate ligament – return to sport after injury (ACL-RSI), lower extremity functional scale (LEFS), and lower limb functional index (LLFI)
- Three** followed all processes for cross-cultural adaptation
- None** demonstrated all 14 domains required for cross-cultural validity (**Table 3**)
- ACL-RSI** had the highest level of evidence

Table 1. Study Characteristics

Lead Author	Inclusion Criteria	Sam ple Size (n)	Age (mean +/- SD)	Sex (M (%)/F (%)	Country	PROM
Arroyo Morales, 2019	Adult patients with ACL injuries	95	21.8 ± 5.4	64 (67%) / 31 (33%)	Spain	Lysholm
Peña, 2021	Adult patients with ACL injuries	93	36 (no SD) men and 45 (no SD) women	40 (43%)/ 53 (57%)	Colombia	Lysholm
Sala-Barat, 2019	Football players with ACL injuries	114	21.8 ± 5.22	87 (85%) / 17 (15%)	Spain	ACL-RSI
Cruz-Díaz, 2006	Various diagnoses (9% lower limb)	132	27.11 ± 6.22	73 (55%) / 59 (45%)	Spain	LEFS
Dell’Era, 2016	Various diagnoses (22% lower limb)	127	43 ± 17.1	59 (47%) / 68 (54%)	Argentina	LEFS
Cuesta-Vargas, 2014	Various lower limb diagnoses (24% lower limb)	136	48 ± 19	62 (46%)/ 74 (54%)	Spain	LLFI

Table 2. Quality Assessment of the Adaptation Process and Quality Criteria for Measurement Properties

	Quality Assessment of the Adaptation Process						Quality Criteria for Measurement Properties								
Reference	Initial Translation	Synthesis of the translations	Back translation	Expert committee	Testing	Appraisal	Criterion validity	Construct Validity	Content Validity	Internal Consistency	Agreement	Reliability	Floor/ceiling	Responsiveness	Interpretability
Arroyo Morales, 2019	+	+	+	o	+	o	+	+	-	+	o	+	+	-	o
Peña, 2021	+	+	+	+	+	+	o	o	?	+	+	+	o	o	o
Sala-Barat, 2019	+	+	+	+	+	+	o	+	?	+	o	+	+	o	o
Cruz-Díaz, 2006	+	+	+	+	-	-	o	+	?	+	+	+	+	-	+
Dell’Era, 2016	+	+	+	+	+	+	o	?	?	+	o	+	o	+	?
Cuesta-Vargas, 2014	+	+	+	o	-	-	+	+	-	+	+	+	o	-	o
+ = performed; ? = indeterminate ratings; - = not performed, o = unavailable															

Abbreviations:
ACL = anterior cruciate ligament; SD= standard deviation; ACL-RSI = anterior cruciate ligament – return to sport after injury; LEFS = lower extremity functional scale; LLFI = lower limb functional index, PROM = Patient reported outcome measure



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Table 3. COSMIN Checklist for Cross-Cultural Validity

	Item #												
Reference	1	2	3	4	5	6	7	8	9	10	11	12	13
Arroyo Morales, 2019	+	+	+	+	-	o	+	o	o	+	+	+	+
Peña, 2021	-	-	+	+	+	+	+	+	+	+	-	o	-
Sala-Barat, 2019	-	-	+	+	+	+	+	+	+	+	+	+	-
Cruz-Díaz, 2006	-	-	+	+	+	+	+	+	+	-	-	+	-
Dell’Era, 2016	-	-	+	+	o	+	+	+	+	+	+	+	-
Cuesta-Vargas, 2014	+	+	+	+	+	+	+	o	o	-	-	o	-
+ = yes, - = no, o = unavailable or not clear ^1) % missing items given? 2) Handling of missing items 3) sample size 4) Language translation described 5) Expertise of translation 6) Translator independence 7) Back translation 8) Handling of conflicting translations 9) Committee review? 10) Pre-testing? 11) Pre-test sample size 12) Similar pre-test group characteristics? 13) Any flaws in design?													

Table 4. Ratings of Measurement Properties with Level of Evidence

	Lysholm	ACL-RSI	LEFS	LLFI
Criterion validity	+	NA	NA	+
Construct validity	+	+	+	+
Content validity	+	+	+	NA
Internal consistency	++	++	++	+
Agreement	+	NA	+	+
Reliability	++	++	++	+
Responsiveness	+	++	+	NA
Floor/ceiling	+	+	+	NA
Interpretability	NA	NA	+	NA
+++ or – – – Strong evidence ++ or – – Moderate evidence + or – Limited evidence + / – conflicting findings ? Poor quality NA, not available (not performed or described)				