Maintaining conceptual equivalence in linguistic validation for under-resourced languages: Challenges and practical solutions from Lao, Khmer, Tigrinya, and Kinyarwanda

E Rees, N Judge, L Cassidy, H Simpson-Finch, A Lee, H Williams

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Background and objective

Conceptual equivalence is the central objective of linguistic validation of clinical outcome assessments (COAs). Achieving it can be particularly challenging in under-resourced languages, where direct conceptual equivalents, standardised terminology, and experienced medical translators may be limited

This study aimed to:

- Characterise recurring lexical and lexicogrammatical gaps identified during the translation of patient-reported outcomes (PROs) into Lao, Khmer, Tigrinya, and Kinyarwanda
- Examine how these gaps affected the representation of PRO concepts and the interpretation of response scales
- Identify practical strategies for maintaining conceptual equivalence while ensuring cultural relevance and respondent comprehension

Methods

Data was reviewed from linguistic validation projects involving PRO measures in four languages: **Lao, Khmer, Tigrinya, and Kinyarwanda**

The linguistic validation process included:

- Concept elaboration development
- Dual forward translation and reconciliation
- Dual back translation
- Back translation review
- Cognitive debriefing
- Review and retesting of problematic items, where applicable

Issues identified through back translation review and cognitive debriefing results review were analysed using a qualitative thematic approach. The analysis focused on recurring lexical and lexicogrammatical gaps, including semantic broadening, semantic narrowing, conceptual substitution, domain shifts, and difficulties differentiating response-scale categories

Results

1. Multidimensional concepts were frequently narrowed

Concepts such as **well-being** were often interpreted more narrowly than intended. Rather than encompassing physical, mental, and emotional dimensions, the term was sometimes understood primarily as physical health or material welfare

- In **Tigrinya**, participant feedback supported the use of an expression corresponding to “full health” as the closest available equivalent
- In **Khmer**, “happiness” was considered but rejected because it represented only part of the intended concept
- In **Lao**, interpretations included food, clothing, medicine, shelter, and “eating well.” The existing wording was retained because proposed alternatives moved further from the multidimensional source concept

2. Related concepts were not always lexically differentiated

Fine distinctions between related concepts sometimes collapsed in the target language

Examples included:

- **Pain** interpreted as illness or disease in Tigrinya and Lao
- **Very nervous** interpreted primarily as fear in Khmer, reducing a broader construct that included anxiety, uneasiness, and being on edge
- **Moods** and **feelings** treated as interchangeable in Tigrinya
- **Acted nervous** interpreted as theatrical acting rather than observable behaviour, requiring reformulation as an expression corresponding to “showed nervousness”

3. Idioms and broad activity categories required descriptive adaptation

Some source concepts could not be conveyed through a concise direct equivalent

- The idiom **“down in the dumps”** was initially rendered literally in Lao and was subsequently replaced with a descriptive expression representing a very low emotional state
- **“Vigorous activities”** was narrowed in Khmer to activities causing rapid breathing. In Lao, participants relied on the accompanying examples to infer meanings such as physically demanding or strenuous activity

Results contd.

4. Response-scale concepts were especially vulnerable to conceptual drift

Distinctions between extent, frequency, duration, intensity, and quantity were not always preserved

Examples included:

- Lao equivalents for **“slightly”** and **“quite a bit”** shifted from an extent-based scale towards quantity or amount
- In Khmer **“most of the time”** was interpreted as “many times,” changing a duration or frequency judgement into a count
- In Lao **“how much of the time”** was understood as “how much of a problem,” shifting the item from frequency to impact
- **“Fair”** was interpreted as “average” or “moderate” across Lao, Khmer, Kinyarwanda, and Tigrinya, rather than conveying the intended “not good/not bad” or slightly negative evaluative position

Practical mitigation strategies

Challenge	Recommended mitigation
No direct conceptual equivalent	Develop detailed concept elaboration guidance defining the intended construct and acceptable alternatives
Semantic broadening or narrowing	Use iterative review and consensus-based adaptation involving translators, reviewers, project managers, and instrument owners
Overlap between affective or psychological states	Expand cognitive debriefing probes to test each component of the intended concept
Confusion between observable behaviour and internal state	Probe both the wording and participants’ interpretation of the intended perspective
Response-scale mismatches	Test the stem and response options together, with targeted probing of degree, frequency, duration, extent, and intensity
Meaning dependent on context	Include clear contextual examples where these are compatible with the intended construct and instrument design
Limited availability of experienced medical translators	Provide enhanced concept guidance, closer project-management support, and additional quality-control review

Conclusions

Lexical and lexicogrammatical gaps can produce systematic changes in the representation of PRO concepts, including narrowing or broadening of meaning, overlap between related mental states, and loss of distinctions between internal experience and observable behaviour

Similar challenges affect response scales, where constructs such as extent, frequency, duration, degree, and quantity may not map consistently across linguistic systems

Maintaining conceptual equivalence in under-resourced languages therefore requires more than direct translation. It depends on:

- Clear and detailed conceptual guidance
- Early identification of potentially problematic constructs
- Close collaboration with local linguistic experts and instrument owners
- Targeted cognitive debriefing probes
- Iterative, evidence-based adaptation
- Pragmatic compromise where an exact equivalent is unavailable

Source instruments may also benefit from clearer conceptual definitions and carefully selected contextual examples, particularly when respondents are likely to rely on context to understand concepts without direct lexical equivalents

Key takeaway

When no direct equivalent exists, conceptual equivalence is achieved through evidence, iteration, and collaboration, not literal translation

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