

SUPPLEMENTARY DIGITAL MATERIAL 1

The translation process was articulated into five stages, in line with the procedure laid down by Beaton, Ferraz and colleagues [1]:

- Stage 1: forward translation;
- Stage 2: synthesis of the translations;
- Stage 3: back translation;
- Stage 4: expert committee evaluation;
- Stage 5: testing of the prefinal version.

ISYQOL was translated from the source language (i.e. Italian) into the target languages (i.e. English, French, Greek, Polish, Spanish and Turkish) at stage 1. Then, in stages 2 – 5, the *equivalence* of the source and target versions was repeatedly checked.

The cross-cultural adaptation of a questionnaire is an iterative process in which equivalence between the translated and the original questionnaire is checked. Equivalence is multifaceted, including not only semantic equivalence but also, for example, idiomatic equivalence [1]. If no equivalence is found between the translation and the original version at any stage, the questionnaire translation is modified, and the equivalence-checking process is repeated. It is worth stressing that the equivalence of the translated and the original versions is a *consensus* by the researchers working on the cross-cultural questionnaire adaptation.

For the ISYQOL cross-cultural adaptation, the local research groups adopted different processes to fulfil stages 1 – 3 based on the local resources. On the contrary, stages 4 and 5 were essentially the same for the various translations.

In the following pages, stages 1 – 3 are detailed for the different countries.

Stages 1 – 3

English forward-backwards translation

ISYQOL was translated from Italian into English by a machine translator (Google translate for whole documents).

Next, this forward translation was reviewed by four researchers who were English mother tongue and consensus was reached about the translation. In addition, the local researchers contacted the ISYQOL developers to check the equivalency of the item's content between the source and English questionnaire versions.

Finally, ISYQOL was independently translated from English into Italian by two human translators who were bilingual and whose native language is Italian.

French forward-backwards translation

ISYQOL was translated from Italian into the target language by a single human translator perfectly proficient in French.

Next, the local researchers contacted the original developers of the questionnaire to check the equivalency of the item's content between the source and translated questionnaire versions. Consensus on the translated version was reached.

Finally, ISYQOL was back-translated from the target language into Italian by a human translator (bilingual and Italian mother tongue).

Greek, Polish and Turkish forward-backwards translations

Greek, Polish and Turkish researchers followed a superimposable forward-backwards translation process.

ISYQOL was translated from Italian into the target language by two human translators who worked independently, were bilingual, and whose mother tongue was the target language.

Next, the two translators and an additional researcher synthesized the results of the translations, and the local researchers contacted the ISYQOL developers to check the equivalency of the item's content between the source and target questionnaire versions.

Finally, the Greek and Polish versions of ISYQOL were back-translated into Italian by one human translator (bilingual and Italian mother tongue). Two human translators back-translated Turkish ISYQOL.

Spanish forward-backwards translation

ISYQOL was independently translated from Italian into Spanish by two human translators (bilingual and whose mother tongue was the target language).

Next, the two translators and an additional researcher synthesized the results and consensus on a single version was reached.

Finally, ISYQOL was translated from Spanish into Italian by a single human translator (bilingual and Italian mother tongue).

Stages 4 and 5

As anticipated above, stages 4 ("*expert committee evaluation*") and 5 ("*testing of the prefinal version*") were superimposable in the different nations.

In particular, each local research group defined a committee which reviewed, in the case, developed and eventually approved the prefinal version of the questionnaire for field testing. The committee comprised different professional figures, including methodologists and health professionals.

Next, the translated questionnaires were field-tested in a limited sample of respondents (at least 10) from the target setting. Respondents that took part in field testing completed the questionnaire and were interviewed by local researchers to probe about what they thought was meant by each questionnaire item

Finally, researchers decided if respondents understood the items following the meaning of the source version of the questionnaire.

References

1. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine (Phila Pa 1976)*. 2000;25:3186–91.