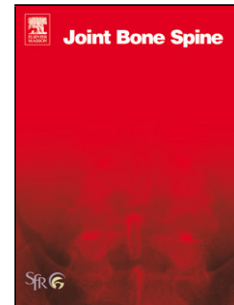


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Translation and cross-cultural adaptation of the modified Short Questionnaire to Assess Health-enhancing physical activity (mSQUASH) into French language.

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Axial spondyloarthritis (axSpA) is an inflammatory rheumatic and musculoskeletal disease that mainly affects the axial skeleton and sacroiliac joints[1]. Physical activity has demonstrated benefits on disease outcomes independent of pharmacological treatment[2,3]. For this reason, regular physical activity is recommended for all axSpA patients[4,5].

With the aim to evaluate the amount and type of daily physical activity in the general population, the Short Questionnaire to Assess Health-enhancing physical activity (SQUASH) was developed[6], which was subsequently modified to improve its validity in axSpA patients (mSQUASH)[7]. The mSQUASH evaluates four domains: commuting activities, household activities, leisure-time and sports activities, and activities at work and school[6]. This questionnaire should be translated and adapted in other languages to extend its use to SpA patients from other countries. This study reports the translation and cross-cultural adaptation of the mSQUASH into the French language among patients with SpA.

The cross-cultural adaptation study of the mSQUASH into French language was developed based on the current international recommendations[8] and followed the international standardized protocol used by the Assessment of Spondyloarthritis International Society (ASAS) group[9]. Translation and cross-cultural adaptation of the Dutch version was done using the forward-backward procedure, consisting of 5 steps: a) translation (three native speakers for French, one without medical knowledge, translated the original Dutch version of the mSQUASH into French); b) synthesis of translation; c) back translation (three bilingual native speakers for Dutch, one without medical knowledge, translated the consensual French version into the original Dutch language); d) expert committee review and e) field test with cognitive debriefing (the final version of the mSQUASH translated in French was pre-tested by ten native French SpA patients) (Figure 1)[10].

Minor discrepancies were found across translators during the Dutch - French translation and only minor discrepancies appeared in the back-translation. The final version of the translation French-Dutch was reviewed by a native French speaker (OF) with the aim to check and confirm the style and understanding of the items. During the expert review committee meeting involving the translators, back translators, and the members of the research team, some discrepancies were discussed.

Finally, the pre-final French version of the mSQUASH was tested within eight patients with axSpA and in two with psoriatic arthritis. Table 1 summarizes the demographic and clinical characteristics of the 10 participants. The mean time to complete the mSQUASH was 8.2 (5.2) minutes. In general, no single patient had difficulties in answering the questionnaire. All patients read and understood the instructions provided. Overall, participants found the items of the French version of the mSQUASH clear and understandable, without need to modify the final version (Supplementary material).

This study provides the French version of the mSQUASH questionnaire, which was translated into French in accordance with the current international guidelines for this procedure[8]. The translation and back-translation process ensured the language equivalence and cultural adaptation of this questionnaire. In addition, patients correctly understood the tool during the cognitive debriefing process, confirming the content validity. As a next step, clinical studies using this questionnaire are needed to test the psychometric properties of this new French version of the mSQUASH.

Contribution of authors: C. López-Medina: investigation, writing - original draft. S. Ramiro: conceptualization, methodology, writing - review & editing. C. van Durme: investigation, writing - review & editing. Z. Ez-Zaitouni: investigation, writing - review & editing. A. Nzeusseu Toukap: investigation, writing - review & editing. S. Arends: investigation, writing – review & editing. A. Spoorenberg: investigation, writing – review & editing. O. Fogel: investigation, writing – review & editing. A Moltó: conceptualization, investigation, writing - original draft. Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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- Anna Molto: consulting fees from AbbVie, Janssen, Lilly and Novartis.

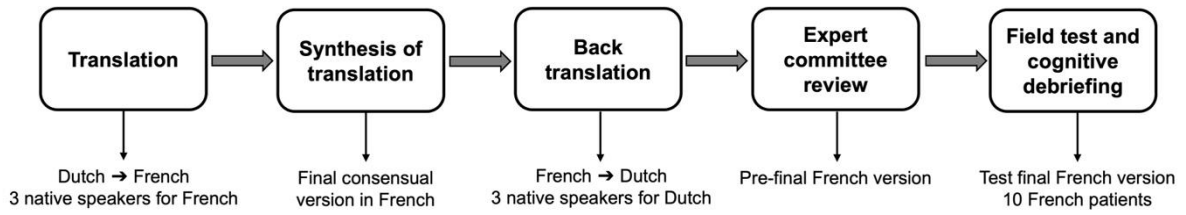
Online material. Supplementary data

Supplementary data associated with this article can be found in the online version at ...

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Figure 1. Modified Short Questionnaire to Assess Health-enhancing physical activity (mSQUASH) translation and cross-cultural adaptation workflow and procedure.



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Table 1. Individual patient characteristics.

Patient	Sex	Age	Diagnosis	Disease duration (years)	Working status	Educational status	ASDAS	Treatment
1	Female	36	axSpA	18	Full-time	University	2.5	NSAIDs
2	Male	37	axSpA	8	Full-time	University	1.3	bDMARDs
3	Male	42	PsA	13	Full-time	University	2.5	bDMARDs
4	Female	50	axSpA	16	Full-time	University	0.1	bDMARDs
5	Male	52	axSpA	35	-	High school	1.8	bDMARDs
6	Male	41	PsA	2	Full-time	University	2.6	NSAIDs
7	Male	53	axSpA	15	Full-time	University	2.9	NSAIDs
8	Male	56	axSpA	36	Full-time	University	2.8	NSAIDs
9	Male	51	axSpA	28	Full-time	University	0.7	bDMARDs
10	Female	59	axSpA	26	Full-time	High school	3.2	NSAIDs

ASDAS: Ankylosing Spondylitis Disease Activity Score; axSpA; axial Spondyloarthritis; bDMARDs: biological disease-modifying antirheumatic drugs; NSAIDs: non-steroidal anti-inflammatory drugs.

mSQUASH		Date:		
Questionnaire - Activité Physique		Nom/étude:		
		Pays:		
EXPLICATION - Veuillez lire avec attention les instructions avant de				
Considérez <u>une semaine moyenne au cours du dernier mois</u> . Veuillez indiquer:				
<ul style="list-style-type: none"> combien de jours par semaine vous avez effectué les activités ci-dessous combien de temps par jour quel était le degré d'effort lié à ces activités 				
UN EXEMPLE				
Trajet domicile-travail/école	Non applicable	Nombre de jours par semaine	Durée moyenne par jour	Degré d'effort
1. Marcher vers/du travail/école	<input type="radio"/>	5 jours	0 heure 30 min	<input checked="" type="radio"/> Lent/léger <input type="radio"/> Moyen/modéré <input type="radio"/> Rapide/intense
Explication pour le degré d'effort:				
Lent/léger: Vous ne ressentez pas d'augmentation de la fréquence cardiaque ou de la respiration				
Moyen/modéré: Vous ressentez une légère augmentation de la fréquence cardiaque et une accélération de la respiration				
Rapide/intense: Activités physiques qui vous font transpirer, augmenter votre fréquence cardiaque et vous essouffler.				
DEBUT DU QUESTIONNAIRE				
Trajet domicile-travail/école (aller et retour):	Non applicable	Nombre de jours par semaine	Durée moyenne par jour	Degré d'effort
1. Marcher vers le travail/ l'école	<input type="radio"/>	___ jours	___ heures ___ minutes	<input type="radio"/> Lent/léger <input type="radio"/> Moyen/modéré <input type="radio"/> Rapide/intense
2. Aller en vélo au travail/à l'école	<input type="radio"/>	___ jours	___ heures ___ minutes	<input type="radio"/> Lent/léger <input type="radio"/> Moyen/modéré <input type="radio"/> Rapide/intense
Autres trajets (aller et retour): (par exemple, pour aller au supermarché ou à la salle de sports)	Non applicable	Nombre de jours par semaine	Durée moyenne par jour	Degré d'effort
3. Marcher vers d'autres endroits	<input type="radio"/>	___ jours	___ heures ___ minutes	<input type="radio"/> Lent/léger <input type="radio"/> Moyen/modéré <input type="radio"/> Rapide/intense
4. Aller en vélo à d'autres endroits	<input type="radio"/>	___ jours	___ heures ___ minutes	<input type="radio"/> Lent/léger <input type="radio"/> Moyen/modéré <input type="radio"/> Rapide/intense
Travail (rémunéré ou non) ou scolaire	Non applicable			Moyenne du temps par semaine
5. Combien d'heures par semaine travaillez-vous ou suivez-vous des cours?	<input type="radio"/>			___ heures
6. Combien de ces heures représentent un travail pénible? (soulever régulièrement des objets lourds)	<input type="radio"/>			___ heures
EXPLICATION				
Considérez <u>une semaine moyenne au cours du dernier mois</u> .				
Explication pour le degré d'effort:				
Lent/léger: Vous ne ressentez pas d'augmentation de la fréquence cardiaque ou de la respiration				
Moyen/modéré: Vous ressentez une légère augmentation de la fréquence cardiaque et une accélération de la respiration				
Rapide/intense: Activités physiques qui vous font transpirer, augmenter votre fréquence cardiaque et vous essouffler.				
Travaux ménagers	Non applicable	Nombre de jours par semaine	Durée moyenne par jour	Degré d'effort
7. Travaux ménagers légers et modérément intenses (cuisine, faire la vaisselle, repasser, s'occuper des enfants, enfants, passer l'aspirateur, faire la course)	<input type="radio"/>	___ jours	___ heures ___ minutes	<input type="radio"/> Lent/léger <input type="radio"/> Moyen/modéré <input type="radio"/> Rapide/intense
8. Travaux ménagers pénibles (passer le aspirateur, battre les tapis, porter des courses lourdes)	<input type="radio"/>	___ jours	___ heures ___ minutes	<input type="radio"/> Lent/léger <input type="radio"/> Moyen/modéré <input type="radio"/> Rapide/intense
Temps libre	Non applicable	Nombre de jours par semaine	Durée moyenne par jour	Degré d'effort
9. Marche récréative	<input type="radio"/>	___ jours	___ heures ___ minutes	<input type="radio"/> Lent/léger <input type="radio"/> Moyen/modéré <input type="radio"/> Rapide/intense
10. Cyclisme récréatif (vélo normal/électrique)	<input type="radio"/>	___ jours	___ heures ___ minutes	<input type="radio"/> Lent/léger <input type="radio"/> Moyen/modéré <input type="radio"/> Rapide/intense
11. Jardiner	<input type="radio"/>	___ jours	___ heures ___ minutes	<input type="radio"/> Lent/léger <input type="radio"/> Moyen/modéré <input type="radio"/> Rapide/intense
12. Bricoler	<input type="radio"/>	___ jours	___ heures ___ minutes	<input type="radio"/> Lent/léger <input type="radio"/> Moyen/modéré <input type="radio"/> Rapide/intense
13. Faire des magasins	<input type="radio"/>	___ jours	___ heures ___ minutes	<input type="radio"/> Lent/léger <input type="radio"/> Moyen/modéré <input type="radio"/> Rapide/intense
Sports (par exemple tennis, sports de ballon, patinage, natation, danse, physio-fitness, tirage par le mouvement/exercice ou tout autre activité physique non mentionnée dans le questionnaire)	Non applicable	Nombre de jours par semaine	Durée moyenne par jour	Degré d'effort
14. _____	<input type="radio"/>	___ jours	___ heures ___ minutes	<input type="radio"/> Lent/léger <input type="radio"/> Moyen/modéré <input type="radio"/> Rapide/intense
15. _____		___ jours	___ heures ___ minutes	<input type="radio"/> Lent/léger <input type="radio"/> Moyen/modéré <input type="radio"/> Rapide/intense
16. _____		___ jours	___ heures ___ minutes	<input type="radio"/> Lent/léger <input type="radio"/> Moyen/modéré <input type="radio"/> Rapide/intense
17. _____		___ jours	___ heures ___ minutes	<input type="radio"/> Lent/léger <input type="radio"/> Moyen/modéré <input type="radio"/> Rapide/intense
Fin du questionnaire.				
Veuillez vous assurer d'avoir répondu à toutes les questions.				
Merci beaucoup pour votre participation!				