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Cross-cultural adaptation and psychometric validation of the revised Patients' Attitudes Towards Deprescribing (rPATD) questionnaire in French

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ABSTRACT

Background: The revised Patients' Attitudes Towards Deprescribing (rPATD) questionnaire allows capture of the beliefs and attitudes of older adults and caregivers towards deprescribing.
Objectives: To translate and validate the rPATD questionnaire into French.
Methods: The French rPATD was translated using forward-backward translation. Psychometric properties were evaluated in both older adults ≥65 years living in the community or in institutions and who were taking at least one chronic medication and in caregivers of older adults with similar characteristics. Participants were recruited in four French-speaking countries (Belgium, Canada, France and Switzerland). Face and content validity were assessed during the translation process. Construct validity (exploratory factor analysis (EFA)) and internal consistency (Cronbach's alpha) were investigated in questionnaires without missing data. Test-retest reliability was evaluated using intra-class correlation coefficient (ICC) in a sample of participants.
Results: In total, 320 questionnaires from older adults and 215 questionnaires from caregivers were included to evaluate construct validity and internal consistency. EFA extracted four factors in the older adults' and caregivers' versions of the questionnaire consistent with the English rPATD. The extracted factors related to the perceived burden of medication taking, the beliefs in appropriateness of medications, concerns about stopping medications and the level of involvement in making decisions and of knowledge of medications. Internal consistency was satisfactory for three factors for both versions (Cronbach's alpha >0.70), with lower internal consistency in the concerns about stopping factor. Test-retest reliability was overall good for all factors in the

Abbreviations: rPATD, revised patients' attitudes towards deprescribing; EFA, exploratory factor analysis; ICC, intra-class correlation coefficient; KMO, Kaiser-Meyer-Olkin.

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caregivers' version (ICC > 0.75) while for the older adults' version, moderate (ICC range: 0.75–0.50) to good ICC values were found.

Conclusions: The French rPATD presents globally good psychometric properties and can be used to explore attitudes towards deprescribing in French-speaking older adults and caregivers.

Introduction

Polypharmacy is common in older adults with multimorbidity[1] and may be associated with potentially inappropriate medication use and numerous negative health outcomes.[2] Deprescribing, defined as "the process of withdrawal of inappropriate medication, supervised by a health care professional with the goal of managing polypharmacy and improving outcomes",[3] may be an optimal way to tackle the harms associated with polypharmacy. Deprescribing may be also considered when a patient receives only one medication that could be potentially inappropriate.

To be successful, deprescribing interventions should be patient-centered and require the involvement of patients, caregivers, prescribers and other health care professionals.[4] However, patients' and/or family members' reluctance to stop medications has been reported by physicians as a significant barrier to deprescribing in clinical practice.[5] The main reasons of this reluctance may be, among others, belief in the appropriateness of medications with the hope for future benefits, fear of cessation, in particular fear of relapses and withdrawal symptoms, and a previous bad experience when a medication was stopped.[6]

To quantitatively capture the potential barriers and facilitators towards deprescribing, Reeve et al. developed the Patients' Attitudes Towards Deprescribing (PATD) questionnaire in Australia.[7] Published in 2012, the questionnaire explored the attitudes, beliefs and experiences of older adults about deprescribing.[7] A revised version, the revised Patients' Attitudes Towards Deprescribing (rPATD) questionnaire was developed and validated in 2016 among older adults and caregivers in Australia.[8] The rPATD includes a version for both older adults (22 items) and caregivers (19 items) and contains four main factors with four to five questions in each factor.[8] The four main factors address the perceived burden of medications, the beliefs in appropriateness of medications, the concerns about stopping medications and the level of involvement in healthcare decisions and of knowledge of medications. The rPATD displayed acceptable validity and reliability for both older adults' and caregivers' versions.[8]

Prior international studies have described attitudes of older adults and/or caregivers towards deprescribing using the PATD questionnaire or its revised version in the community,[9–15] in the hospital setting[16–19] and in residential care facilities.[20] In non-English speaking countries, the majority of studies have translated the questionnaire using forward-backward translation into Danish,[9] Malay and Mandarin[21], Amharic,[17] Italian,[19] Dutch[22] and Arabic.[23] To date, there is no French version of the rPATD questionnaire. Such a tool adapted to the French language is needed to capture the attitudes and beliefs of older people about deprescribing in French-speaking countries, which are confronted with issues of polypharmacy and potentially inappropriate medication use.[24–28] In addition, it is necessary to perform a validation of the French adapted questionnaire in order to ensure that it presents good psychometric properties for appropriate use in clinical and research practices in French-speaking countries.[29] Indeed, measuring instruments should be accurately validated during cross-cultural adaptation process as the validity of the original questionnaire may change across countries, different cultures and languages.[29] Quantifying how deprescribing is perceived by older adults and caregivers may facilitate a dialogue about deprescribing by identifying patients' specific barriers and/or facilitators to deprescribing in clinical practice while in research, it may help to target deprescribing educational programs and interventions.

Thus, this study aimed to translate the rPATD questionnaire (older adults' and caregivers' versions) into French and to evaluate psychometric properties of the French version in four French-speaking countries (Belgium, Canada, France and Switzerland).

Methods

Questionnaire

The questionnaire used for this study was the revised Australian-validated (English language) Patients' Attitudes Towards Deprescribing questionnaire (rPATD) developed by Reeve et al., in 2016.[8] The revised questionnaire includes two versions (older adults' and caregivers' versions) which can be used independently. These two versions allow exploration of attitudes, beliefs and experiences of older adults and caregivers about their medications or respectively those of their care recipients and deprescribing. The rPATD contains questions grouped into four factors: 1) Burden factor (perceived burden of medications), 2) Appropriateness factor (belief in appropriateness of medications), 3) Concerns about stopping factor (concerns about stopping medications), 4) Involvement factor (involvement in medication management and knowledge of medications). Each factor includes five or four questions. It also has two additional global questions which are not comprised in the factors, "Overall, I am satisfied with my current medicines" and "If my doctor said it was possible, I would be willing to stop one or more of my regular medicines". The older adults' and caregivers' versions contain 22 questions and 19 questions, respectively. The two versions include similar items with the exception of three items that were removed in the caregivers' version due to no equivalent questions compared to the older adults' version (inconvenience to take medications every day, concern about missing out on future benefits and good understanding of the reasons why each medicine was prescribed). Participants must answer each question using a 5-point Likert scale (1 = strongly agree, 2 = agree, 3 = unsure, 4 = disagree, and 5 = strongly disagree). An average score (between 1 and 5) is then calculated for each factor.[8] The higher the score, greater the perceived burden, concerns about stopping and participants involvement. The scoring is reversed for the appropriateness factor so that a higher score indicates a greater belief in appropriateness of their/their care recipients' medications. There is no global score for the questionnaire.

Translation and cross-cultural adaptation

The aim of the translation and cross-cultural adaptation process is to reach semantic, idiomatic, experiential and conceptual equivalence between the English rPATD questionnaire and the French version.[30] This process was conducted according to guidelines of Beaton et al.[29] and Wild et al.[31] and consisted of a forward and backward translation procedure. Consent to translate the English rPATD questionnaire into French was obtained from the primary author of the questionnaire (ER) who was also a member of the expert committee involved in the adaptation process.

In a first step, four native French-speaking translators, from each of the participating countries (Belgium, Canada, France and Switzerland) and with fluent English language skills, independently translated the English version of the rPATD (older adults' and caregivers' versions) into French (forward translation). Translators were informed of the concept of the questionnaire and each had a medical background/qualification. A multidisciplinary expert committee reviewed the four translations throughout group discussion during a 1-h videoconference in order to obtain consensus for one single translation of each of the

French versions (older adults' and caregivers' versions). This expert committee was composed of a methodologist, two clinical pharmacologists, two pharmacists, a nurse, a general practitioner, a geriatrician, an older adult, a caregiver and three of the translators who participated in the forward translation. At the end of this step, some discrepancies between some idiomatic expressions or words between countries were outlined; some examples are further presented in the results section.

In a second step, a backward translation of both French versions into English (source language) was performed by two native English-speaking translators with fluent French language skills. One translator was informed of the concept of the questionnaire and had a public health background. The other translator was uninformed and had no scientific background. The two translators were blinded regarding the English rPATD questionnaire and translated the French versions independently. Similarly to the forward translation, the same expert committee, including the main developer of the original questionnaire (ER), reviewed the back-translation during a videoconference. A comparison between the English versions of the rPATD and the retro-translated English versions was then performed and allowed for further refinement of the French versions of rPATD to correct any inconsistencies in the meaning of words when needed.

During a pre-test phase, the French rPATD was tested in a sample of older adults and caregivers recruited from three countries (France, Belgium and Switzerland) in order to evaluate face and content validity. Inclusion and exclusion criteria of these participants were similar to those described below in the section "Design and population" for the evaluation of psychometric properties. Participants recruited in this testing phase were included in the final population used to perform psychometric validation of the French questionnaire. Due to time constraints, participants from Quebec (Canada) were not involved. The questionnaire was given for self-administration to participants with a researcher present. During this pre-test phase, the face and content validity of the questionnaire was evaluated using cognitive interviews.[31,32] Face validity is defined as "the degree to which test respondents view the content of a test and its items as relevant to the context in which the test is being administrated".[33] For some authors, the face validity is an aspect of the content validity and may be defined as "the degree to which the items of a health-related patient-reported outcome instrument indeed looks as though they are adequate reflection of the construct to be measured".[34] During cognitive interviews, the understanding and clarity of items, ease to use and time required to complete it were assessed. Participants could verbalize questions that were difficult to answer and suggest alternative wording.

Following the pre-test phase, the expert committee assessed some aspects of the content validity (relevance and comprehensiveness of the questionnaire items)[34] and approved the final version of the French rPATD (older adults' and caregivers' versions).

Design and population study

A multicentre cross-sectional study was conducted from 1 July 2018 to 1 March 2019 in four French-speaking countries (Belgium, Canada, France and Switzerland) in order to assess psychometric properties. Older adults aged 65 years and older who had been taking at least one chronic medication (i.e. use $\geq$3 months) and lived in the community or in institutions (residential aged care facilities, institutions for independent elders and community organizations), excluding hospitalized patients, were eligible for inclusion in accordance with the criteria used by Reeve et al.[8] Older patients unable to complete the questionnaire (due to cognitive decline, visual impairment, *etc.*) or to speak and understand French were excluded. Similarly, caregivers caring for older adults with the same characteristics described above were included. A caregiver was defined as having any role in the management of an older person's health and/or medications; it could have been a family member, friend or any other person (excluding paid carers, such as nurses). We excluded caregivers aged <18 years and those unable to complete the questionnaire in French.

Recruitment and questionnaire administration

Older adults and caregivers were recruited through advertisements, health care professionals or directly by approved researchers in Belgium, Canada, France and Switzerland in different settings (community pharmacies, community centres, hospital outpatient clinics, general practitioner's consultations, residential aged care facilities, institutions for independent elders and community organizations) as per approved protocols in each country. Older adults and caregivers were recruited independently, that is, the older adult-caregiver pair could not be included as both "older adult" and "caregiver" participants. Participants were screened for eligibility by researchers or health care professionals in each country, who verified inclusion and exclusion criteria. Eligible participants were informed of the aims and objectives of the study and were then invited to participate. The paper versions of the older adults' and caregivers' questionnaires were administered by researchers or health care professionals. No financial incentives were provided for the recruitment and administration of the questionnaires. Participants had to self-complete the questionnaire and rated their agreement using the 5-point Likert scale. In addition to completing the self-administered questionnaire, participants were invited to provide some socio-demographic information including age, sex, living arrangement, relationship of care recipient (for caregivers), number of regular medications, medication management and level of education. Each country adapted some items of the socio-demographic data included in their questionnaires (e.g. level of education, the terminology of which differed across countries). Therefore, taking these adaptations into account, there was a questionnaire (older adults' and caregivers' version) for each French-speaking country (however, the French rPATD was consistent among the four different countries).

Sample size calculation

Sample size was determined by applying a ratio of 10:1 (10 older adults or caregivers for each questionnaire item) according to Costello and Osborne's method.[35] The resulting sample size was therefore 220 older adults for the 22-item questionnaire and 190 caregivers for the 19-item questionnaire. Taking into account a maximum percentage of missing responses of 20%, we aimed to include at least 275 older adults and 240 caregivers. The number of participants to be recruited was fairly distributed over the four French-speaking countries according to the older adults' living arrangement (in the community or in institutions) and the likely recruitment achievable in each of the settings.

Evaluation of psychometric properties

As described above, the content and face validity were respectively performed during the transcultural adaptation process by an expert committee and during the pre-test phase in a sample of individuals.

Construct validity was assessed through structural validity, an aspect of construct validity that refers to "the degree to which the scores of a health-related patient-reported outcome instrument are an adequate reflection of the dimensionality of the construct to be measured".[36] In order to assess construct validity, an exploratory factor analysis (EFA) with oblique promax rotation was conducted to examine the structure of the questionnaire and identify if new underlying factors specific to French-speaking population might emerge. Promax rotation was chosen because there are correlations between factors in the original rPATD questionnaire.[8] The assumptions required to perform an EFA were verified using the Kaiser-Meyer-Olkin (KMO) statistic (quality of intra-item correlations) and Bartlett's test of sphericity (appropriateness of data for factor analysis). Eigenvalues and scree plots were used to determine the number of extracted factors. Factors with eigenvalues >1 were considered as significant and retained in the analysis. The

combination of items most significantly associated with a factor was determined using promax rotation which permits correct visualization of the factor loading after rotation of each item on the factors. Items with a factor loading value > 0.30 for one factor were judged significant and thus regrouped within the corresponding factor. Cross-loadings were considered if an item loaded into two or more factors.

The reliability of the questionnaire was investigated through evaluation of the internal consistency and the stability (test-retest reliability). Internal consistency is defined as "the extent to which items in a questionnaire are correlated (homogeneous), thus measuring the same concept"[36] while test-retest reliability refers to "the extent to which scores for patients who have not changed are same for repeated measurement over time".[34] Internal consistency was considered satisfactory for a Cronbach's alpha value > 0.70 for each factor score.[36] Item total correlation coefficients for each specific item using Spearman correlation were also reported (correlation between a single item and the total score of each factor) to check if each item is consistent with the total score of the factor. Item-total correlations with Spearman correlation coefficient values > 0.20 were considered as satisfactory.[37,38] The test-retest reliability was measured in a sample of participants who agreed to complete the questionnaire twice at 1–3 weeks intervals. This time interval was also used in the original rPATD validation study and reported in other similar studies.[8,39] A sample of at least 20 older adults and 20 caregivers was chosen as acceptable to evaluate test-retest reliability in accordance with the methodology used in the original rPATD validation study.[8] These participants were only recruited in France for logistical reasons. Participants who returned the questionnaire after more than 3 weeks were excluded. Weighted Kappa coefficient for categorical variables (items of the questionnaire) and intra-class correlation coefficient (ICC agreement, two-way random effects model with single measurement) for quantitative variables (factor scores) were used to estimate the test-retest reliability.[40–43] Weighted Kappa coefficient and ICC were reported as the most appropriate parameters for measure test-retest reliability.[36] Agreement was considered "slight", "fair", "moderate", "substantial" and "almost perfect" for weighted Kappa coefficient values 0.00–0.20, 0.21–0.40, 0.41–0.60, 0.61–0.80 and >0.80, respectively.[44] ICC values > 0.75, 0.75–0.50 and <0.50 were considered "good", "moderate" and "poor", respectively.[45]

Evaluation of global acceptability, floor and ceiling effects

The global acceptability of the questionnaire was considered to be adequate if the percentage of missing data was <20%.[46] Floor and ceiling effects were assessed for each factor and were considered if scores of each factor reached the highest or lowest value for at least 15% of the responses of the questionnaires.[36] Asymmetry indices were also used to determine the presence of a floor or a ceiling effect for each factor score. Positively/negatively skewness values refer to a floor/-ceiling effect, respectively.[47]

Statistical analysis

Data were coded and analyzed using SAS Studio version 3.8 and R version 3.6.1 using the psy R package. Descriptive statistics were performed to describe participants' characteristics. Means with standard deviations were reported for continuous data and frequency and percentages for categorical data. The statistical significance for all analyses was set at $p < 0.05$ (two-sided). Questionnaires with at least one missing data were excluded from analyses.

Ethics

This study was approved by the Ethical review boards of the University Hospital of Limoges (no. 268/2018/24), the University Hospital of UCL Namur (NUB B039201836742) and the University of Quebec at Rimouski (CER-101-745). No ethical approval was required for Switzerland. All participants participated anonymously and voluntarily to the study. Each participant has signed a written informed consent in Belgium while in France patient consent was not required since the study was classified as a human and social study. In Quebec, the consent was considered explicit when participants completed the questionnaire. All data were anonymized.

Results

Translation and cross-cultural adaptation process

During the process of forward and backward translation, some changes considered as appropriate were made by the experts to improve readability and cultural appropriateness. Discrepancies between some idiomatic expressions or words specific to each country were addressed. For example, there was a discussion about the word "stressed" (item 13 for older adults' version and item 11 for caregivers' version). In Belgium, France and Switzerland, this word refers to a stressful situation while in Canada (province of Quebec), this word refers to a worrying situation. Consequently, we considered the two words (stressed and worried) in the questionnaire (i.e. "I get stressed/worried whenever changes are made to my medicines") to retain the original intent of the question and maximise cross-country validity.

The median age of older adults (n = 9) and caregivers (n = 9) involved in the pre-testing was 85 years (IQR: 74–88) and 61 years (IQR: 57–70), respectively, with 56% and 89% women. The participants considered the questionnaire to be easy to use with an acceptable completion time (on average, 12.7 min for older adults and 10 min for caregivers). The understanding of questions was correct for the majority of participants, but some participants needed help to complete the questionnaire, especially older adults (e.g. misunderstanding of scale use). Following this pre-test phase, feedback and researcher observations were taken into account to improve the questionnaire. For instance, the items of the 5-point Likert response scale were slightly changed to "yes, absolutely; yes in part; without opinion or undecided; no not really; no not at all". Moreover, due to the need for assistance in completing the questionnaire from some participants, in the widespread administration of the questionnaire we allowed (when necessary during the questionnaire administration) the researcher to clarify questions (particularly for older adults living in institutions) and to record this information on questionnaires.

Finally, all items were considered as relevant and comprehensiveness by the expert committee. The final French rPATD was thus approved with no further refinement (**Appendix 1**).

Characteristics of the study population

A total of 367 older adults and 255 caregivers responded to the questionnaires. Participants with incomplete responses and/or multiple responses to a single item were excluded (n = 47 older adults, n = 40 caregivers). Data analysis was therefore conducted on 320 older adults and 215 caregivers. Distribution of included participants in each country is presented in Table 1. The median age of older adults was 80 years (IQR: 71–87), 61.6% were women and 62.5% lived in the community. The median age of caregivers was 64 years (IQR: 55–72) and 74.4% were women. Caregivers were caring for older adults with a median age of 84 years (IQR: 79–90), 52.1% of whom lived in the community. Almost half of older adults (50.9%) and 70.9% of care recipients were taking at least 5 regular medications. The majority of older adults (60.9%) self-managed their medications while for one out of two care recipients (53.5%), medication management was mainly done by a paid carer, especially in older adults living in institutions (80.9%). Overall, 53.7% of older adults needed assistance to complete the questionnaire (this aspect was not recorded for caregivers).

Differences were observed between participants with incomplete responses (excluded participants) and complete responses (included

Table 1
Socio-demographic characteristics of the study population (n = 320 older adults, n = 215 caregivers).

Characteristic	Older adults		Caregivers		Care recipients of caregivers	
	N[a]	Value	N[a]	Value	N[a]	Value
Age	319		213		215	
Median (IQR)		80 (71–87)		64 (55–72)		84 (79–90)
Sex, n (%)	320		215		215	
Male		123 (38.4)		55 (25.6)		72 (33.5)
Female		197 (61.6)		160 (74.4)		143 (66.5)
Countries, n (%)						
Belgium		89 (27.8)		37 (17.2)		
Canada (province of Quebec)		83 (25.9)		61 (28.3)		
France		75 (23.5)		70 (32.6)		
Switzerland		73 (22.8)		47 (21.9)		
Living arrangement, n (%)	320		215			
Community	200 (62.5)				112 (52.1)	
Belgium		63 (31.5)				32 (28.6)
Canada (province of Quebec)		77 (38.5)				39 (34.8)
France		60 (30.0)				41 (36.6)
Switzerland		0				0
Institution[c]	120 (37.5)				103 (47.9)	
Belgium		26 (21.7)				5 (4.9)
Canada (province of Quebec)		6 (5.0)				31 (19.4)
France		15 (20.0)				20 (30.1)
Switzerland		73 (60.8)				47 (45.6)
Number of regular medications	273				151	
Median (IQR)		5 (3–6)				6.0 (4–8)
n (%)						
1-4		134 (49.1)				44 (29.1)
5-9		112 (41.0)				78 (51.7)
10-14		23 (8.4)				24 (15.9)
≥15		4 (1.5)				5 (3.3)
Relationship of care recipient, n (%)			215			
Spouse		NA		64 (29.7)		
Children		NA		82 (38.1)		
Sibling		NA		12 (5.6)		
Other relative		NA		47 (21.9)		
Other non-relative		NA		10 (4.7)		
Medication management[b], n (%)	320				215	
Self-manage		195 (60.9)				45 (20.9)
Spouse		10 (3.1)				31 (14.4)
Other relative		5 (1.6)				44 (20.5)
Paid carer		121 (37.8)				115 (53.5)
Other non-relative		0				9 (4.2)
Level of education, n (%)	318		214		213	
Primary education (elementary school)		73 (22.9)		13 (6.1)		87 (40.9)
Lower secondary education		83 (26.1)		50 (23.4)		52 (24.4)
Upper secondary education (high school)		75 (23.6)		70 (32.7)		45 (21.1)
Higher education (university)		87 (27.4)		81 (37.8)		24 (11.3)
Do not know		NA		NA		5 (2.3)
Help to complete questionnaire, n (%)	301	173 (57.5)		NA		
Community	183	60 (32.8)		NA		
Institution[c]	118	113 (95.8)		NA		
Factor scores, mean (SD)[d]	320		215			
Burden		2.4 (1.1)		2.8 (1.0)		
Appropriateness		3.7 (1.0)		3.5 (1.0)		
Concerns about stopping		2.3 (0.9)		2.8 (1.0)		
Involvement		4.1 (1.0)		4.0 (1.0)		

IQR, Interquartile range; NA, Not applicable; SD, Standard deviation.
[a] Individuals without missing data for this question.
[b] Multiple responses to this question were allowed.
[c] Residential aged care facilities, institutions for independent elders and community organizations.
[d] Factor scores range between 1 and 5. Higher scores indicate greater perceived burden of medications, belief in appropriateness of medications, concerns about stopping, and involvement in medication management.

participants) in both older adults and caregivers. Older adults who were excluded used less assistance to complete the questionnaire (25%) than those who were retained in analysis (57.5%) ($p = 0.0001$). Excluded participants were also more likely to self-manage their medications (85.1% *vs* 60.0%; $p = 0.0013$) or have a paid carer to do so (37.8% *vs* 4.3%; $p < 0.0001$) compared to included older adults. Caregivers who were excluded were more likely to be older (mean age: 70.8; SD 9.4) than those who were included (mean age: 63.2; SD 12.8) ($p < 0.0001$) and had a lower level of education (compared to higher education) (92.5% *vs* 62.2%) ($p = 0.0003$).

Construct validity

The assumptions required to conduct an EFA were confirmed for older adults' data with good sampling adequacy (KMO statistic: 0.79) and a significant Bartlett's test of sphericity ($p < 0.0001$) (items were not independent of each other). As in the validation of the English rPATD questionnaire, the EFA of the 20-item questionnaire extracted four factors with eigenvalues >1 (the two global items of the questionnaire (items 21 and 22) were not included in the EFA in the same way as the final EFA carried out in the English rPATD validation study[8]). The first, second, third and fourth factors accounted for 51%, 27%, 14%

and 10% of the total variance. The scree plot also supported the 4-factor structure of the questionnaire with a curve of eigenvalues according to the factors extracted that flattened out after the fourth factor. The results of promax rotation showed that after rotation five items loaded sufficiently onto each factor (factor loading value > 0.3) and that the grouping of items within each factor was consistent with the English rPATD questionnaire (Table 2). No items loaded with factor loading value > 0.30 onto two or more factors.

The EFA conducted on caregivers' data showed great KMO statistic (0.84) and a significant Bartlett's test of sphericity ($p < 0.0001$). Four factors with eigenvalues >1 were extracted from the 17-item questionnaire (the two global questions (items 18 and 19) were not included in the EFA) and the scree plot confirmed the 4-factor structure. The first, second and third factors accounted for 72%, 18% and 10% of the total variance while the fourth factor explained 6% of the total variance. Using promax rotation, items were grouped the same as the older adults' version and the English version with the exception of item 10 (side effects) which had a factor loading of 0.29 on the appropriateness factor in the caregivers' version (Table 2). This item was nevertheless retained in the final questionnaire since the factor loading value was almost significant, i.e. close to the value of 0.30.

Internal consistency

The Cronbach's alpha values for burden, appropriateness and involvement factors were satisfactory for both older adults' and caregivers' versions with Cronbach's alpha varying between 0.75 and 0.80 and 0.78 and 0.88, respectively (Table 2). The factor for concerns about stopping was unsatisfactory according to pre-defined criteria with values of 0.68 for older adults' and 0.60 for caregivers' questionnaires. All items showed satisfactory correlations with the total scores of each factor in both older adults' and caregivers' versions (Table 2).

Test-retest reliability

Of the 23 older adults and 30 caregivers who were asked to complete the questionnaire a second time, 21 and 23 respectively returned the completed questionnaire within 3 weeks. Older adults with incomplete responses to questionnaires (n = 2) were excluded. Similarly, caregivers with missing data (n = 5) and those who completed the second questionnaire in more than 3 weeks (n = 3) were not retained in the analysis. Overall, 19 older adults with a median age of 75 years (IQR: 71–84) and 15 caregivers with a median age of 62 years (IQR: 52–67) were included in the test-retest reliability analysis. The scores of the burden, appropriateness and involvement factors for older adults' and caregivers' versions presented globally good reliability with ICC between 0.80 to 0.84 and 0.77 to 0.91, respectively (Table 2). The concerns about stopping factor in the older adults' version showed moderate reliability (ICC value of 0.65), and good reliability in the caregivers' version (0.82). Results of the weighted Kappa coefficient of the questionnaire items varied between 0.09 and 0.82 for the older adults' version and between 0.44 and 0.90 for the caregivers' version (Table 2).

Global acceptability, floor and ceiling effect of the French version

The global acceptability was considered satisfactory for both versions of the questionnaire with 12.8% of missing data for participants (older adults' version) and 15.7% (caregivers' version). Appropriateness

Table 2
Results of psychometric properties of the French rPATD questionnaire.

	Factor loading		Internal consistency[a]		Test-retest reliability[b]	
	Older adults (N = 320)	Caregivers (N = 255)	Older adults (N = 320)	Caregivers (N = 215)	Older adults (N = 19)	Caregivers (N = 15)
			Cronbach's alpha (95% CI)		**ICC (95% CI)**	
Burden factor			**0.80 (0.75–0.83)**	**0.78 (0.72–0.82)**	**0.85 (0.64–0.95)**	**0.91 (0.82–0.96)**
Question 1 (money/expensive medicines)	0.53	0.49	0.45	0.44	0.65	0.56
Question 2 (inconvenient)	0.38	NA	0.51	NA	0.46	NA
Question 3 (large number of medicines)	0.80	0.84	0.72	0.67	0.73	0.90
Question 4 (burden)	0.49	0.33	0.58	0.49	0.76	0.63
Question 5 (too many medicines)	0.77	0.73	0.71	0.76	0.72	0.61
Appropriateness factor			**0.80 (0.76–0.83)**	**0.88 (0.68–0.80)**	**0.84 (0.52–0.95)**	**0.78 (0.44–0.91)**
Question 6 (one or more medicines that I no longer need)	0.61	0.64	0.62	0.72	0.44	0.44
Question 7 (would like to try stopping)	0.77	0.94	0.68	0.77	0.27	0.71
Question 8 (reduce the dose)	0.72	0.86	0.68	0.78	0.66	0.74
Question 9 (not working)	0.62	0.67	0.63	0.72	0.39	0.59
Question 10 (side effects)	0.35	0.29	0.42	0.55	0.70	0.40
Concerns about stopping factor			**0.68 (0.63–0.72)**	**0.60 (0.48–0.68)**	**0.66 (0.33–0.87)**	**0.83 (0.54–0.96)**
Question 11 (reluctant to stop a long-term medicine)	0.62	0.31	0.50	0.25	0.46	0.51
Question 12 (missing out on future benefits)	0.79	NA	0.47	NA	0.34	NA
Question 13 (stressed)	0.53	0.64	0.47	0.43	0.42	0.53
Question 14 (giving up)	0.41	0.54	0.39	0.43	0.09	0.66
Question 15 (previous bad experience)	0.38	0.61	0.34	0.41	0.82	0.60
Involvement factor			**0.75 (0.68–0.80)**	**0.78 (0.75–0.82)**	**0.79 (0.34–0.95)**	**0.90 (0.63–0.99)**
Question 16 (good understanding)	0.54	NA	0.33	NA	0.34	NA
Question 17 (know current medicines)	0.61	0.55	0.42	0.54	0.57	0.56
Question 18 (know as much as possible)	0.71	0.68	0.52	0.57	0.76	0.76
Question 19 (involved in decisions)	0.70	0.77	0.57	0.60	0.66	0.70
Question 20 (always ask if I don't understand)	0.51	0.75	0.41	0.61	0.64	0.59
Global questions						
Question 21 (willing to stop)	NA	NA	NA	NA	0.44	0.44
Question 22 (satisfaction)	NA	NA	NA	NA	0.47	0.89

CI, Confidence interval; ICC, Intra-class correlation coefficient; NA, Not applicable.

[a] Internal consistency was measured using Cronbach's alpha for continuous variables (factor scores) and Item-total correlation coefficients (Spearman correlation) for categorical variables (individual items).

[b] Test-retest reliability was measured using intra-class correlation coefficients for continuous variables (factor scores) and Kappa coefficients for categorical variables (individual items).

factor and involvement factors were characterized by a ceiling effect with 30.3%/42.5% of participants with the highest score in the older adults' version and 18.1%/46.0% in the caregivers' version (Table 3). Negatively skewed values were found for these factors which indicated the presence of a ceiling effect. Conversely, burden and concerns about stopping factors presented a floor effect with 27.8%/24.3% of older adults with the lower score while there was no floor effect in the caregivers' data. Positively skewed values confirmed the floor effect for these two factors.

Discussion

The French version of the rPATD questionnaire was successfully translated and cross-culturally adapted in four French-speaking countries according to international recommendations.[29,30] The French translated questionnaire demonstrated good psychometric properties (validity and reliability) comparable to those reported for the English rPATD questionnaire and displayed good acceptability by participants.

The results of the EFA indicate that the four-factor structure of the English rPATD questionnaire for both older adults' and caregivers' versions was maintained through the cross-cultural adaptation process. Similar results were found for the Arabic rPATD questionnaire[23] and the Danish rPATD including older adults with limited life expectancy.[48] These findings support the generalizability of the rPATD questionnaire among participants with a different language and culture and across settings with different healthcare organizations and medical practices. However, item 10 (side effects) showed a factor loading under the cut-off point of >0.30 in the caregivers' version (0.29) and this item had the lowest factor loading in the older adults' version (0.35). Interestingly, this question also presented a low factor loading in the Arabic rPATD questionnaire involving younger individuals (older adults' version: 0.57),[23] in the English rPATD (older adults' version: 0.43; caregivers' version: 0.52)[8] and in the Danish rPATD (older adults' version: 0.29).[48] This is an interesting finding as this question about 'side effects' relates to the potential harm of medication use, while the other four questions in the appropriateness factor relate to the likely benefit/need for the medication. This may indicate that older adults and consumers may not conceptualize 'appropriateness' of medication use in the same way that health care professionals do (as a balance between benefits and harms). Alternatively, this may just reflect that beliefs about benefits and need for medications are more tightly correlated than experience of side effects. Moreover, a low factor loading (0.38) was found for item 2 (inconvenient) in the older adults' version, which is a negative question. Similar findings were found in the Danish study where this item was ultimately excluded of the Danish rPATD as the item was found irrelevant in terms of patient population and setting.[48] These results may suggest that the incomprehension of these items could be further explored as well as other items in the French rPATD with low factor loadings (e.g. item 14, giving up).

The Cronbach alpha values in our study were comparable to those described by Reeve et al. (2016) (older adults' version: range 0.64–0.80; caregivers' version: 0.67–0.87)[8] and were satisfactory in both versions of the questionnaire for three factors suggesting good homogeneity of the items within those factors. Generally, lower Cronbach alpha values were found in the Malaysian version of the rPATD (older adults' version: >0.60)[21] while higher values were reported in the Arabic study (older adults' version: range 0.71–0.85).[23] No factor had a Cronbach's alpha value > 0.90 indicating the absence of redundancy among the items of the questionnaire in our study.[49] In addition, similarly to the original rPATD validation study, concerns about stopping factor showed unsatisfactory internal consistency in the older adults' and caregivers' versions (i.e. it was lower than the pre-specified value of 0.70). This factor had also a low Cronbach's alpha value (<0.70) in the Danish study.[48] Nevertheless, this unsatisfactory result should be tempered since similar values (0.60–0.70) were considered as acceptable in other questionnaires dealing with psychosocial constructs.[50] In the same way, item-total correlation values within the concerns about stopping factor presented low values suggesting limited correlation between individual items and the factor score. This may suggest that there is no single belief that is manifested through answering these questions. As hypothesized by Reeve et al. (2016), this factor may capture underlying beliefs about not only concerns about stopping medications but also regarding concerns about taking medications in general.[8] This aligns with the results of the Danish study where a positive correlation between the concerns about stopping factor score and the BMQ Specific-Concern score was found.[48] Alternatively, the different questions may be influenced by different beliefs as well as experiences (one of the questions specifically asks about previous experience with stopping). Thus, it seems unclear whether the items in this factor should be represented by a single factor rather than remaining individual items; this finding raises potentially areas for improving the factor structure of the questionnaire.[48] Nevertheless, the use of this factor may still be recommended based on the clear theoretical link between questions (i.e. they all represent concerns about stopping) which are in line with previous qualitative research.[51] However, factor scores from this factor should be used and interpreted with caution.

Regarding test-retest reliability, our results showed globally good reliability of scores considering the 1–3 weeks interval, with the exception of the concerns about stopping factor which presented moderate reliability in the older adults' version. These results are in agreement with those reported for the English rPATD questionnaire, except that the concerns about stopping factor showed good reliability in the caregivers' version in our study but not in the English rPATD validation study.[8] In addition, item 14 of the older adults' version (giving up, concerns about stopping factor) had the lowest kappa coefficient value (0.09). This question had an acceptable kappa coefficient in the English rPATD validation study. On examination of the changes in responses to this question, we found that the majority of participants changed responses between "no not really" and "no not at all" between the two administrations of the questionnaire. Consequently, the impact of this kappa value may be minimal since the responses to this item were in the same direction (i.e. negative responses). This observation may also raise questions about the necessity to use a 5-point Likert scale. Similarly to the rPATDcog (a modified version of the rPATD for older adults with cognitive impairment), a 3-point Likert scale could be considered for a further version of the rPATD.[52] Same challenge was reported in the Danish study where participants also experienced difficulties using the response scale.[48] Nevertheless, the insufficient internal consistency and

Table 3
Floor and ceiling effects of the older adults' and caregivers' versions of the French rPATD questionnaire.

Factors	Skewness		Floor effect (%)[a]		Ceiling effect (%)[b]	
	Older adults	Caregivers	Older adults	Caregivers	Older adults	Caregivers
Burden factor	0.51	0.24	27.8	5.1	3.8	9.8
Appropriateness factor	−0.47	−0.37	2.2	5.6	30.3	18.1
Concerns about stopping factor	0.43	0.18	24.3	7.9	1.3	6.5
Involvement factor	−1.19	−0.91	2.8	1.4	42.5	46.0

[a] Floor effect was defined by > 15% of participants with the lowest value of the factor score (value of 1).
[b] Ceiling effect was defined by > 15% of participants with the highest value of the factor score (value of 5).

the modest stability over time of the concerns about stopping factor still suggests that this factor should be interpreted with caution. In accordance with the results of Reeve et al. (2016),[8] lower kappa values were observed for the first global question (item on willing to stop) in both versions of the questionnaire. This may be explained by the fact that Kappa coefficients are sensitive to the prevalence of responses in each category.[53] A majority of participants answered "yes, absolutely" (63.2% for older adults in both administrations of the questionnaire and 66.7%/80% for caregivers at the first and second administration, respectively) which may have resulted in decreased kappa coefficients.

A ceiling effect was observed for appropriateness and involvement factors in the older adults' and caregivers' versions while a floor effect was identified for burden and concerns about stopping factors in the older adults' version. This therefore raises concerns about the discriminatory capacity and content of the questionnaire.[36] However, in our study, the threshold of 15% commonly used for defining a floor or ceiling effect[36] may be too restrictive for factor scores ranging from 1 to 5 and thus increases the risk of detecting a floor or ceiling effect. As we assessed content validity separately, concerns about this are minimized. Regarding discriminatory power, there has been limited research into the ability for the PATD/rPATD to predict actual willingness to have a medication deprescribed in practice and sensitivity to change.[54,55] These are areas for further research.

Strengths and limitations

To the best of our knowledge, this is the first study to transculturally adapt and validate a French version of the rPATD questionnaire. The cross-culturally adaptation was performed according to international guidelines including a forward and back-translation,[29,30] a review by a multidisciplinary team and an involvement of the author of the original version of the rPATD questionnaire. In addition, a rigorous method was followed to validate the translated French version including an assessment of both validity and reliability. Moreover, the present study was multicentric which permitted a large sample of individuals and sufficient power to perform adequate statistical analyses. Finally, participants were recruited in different settings (community pharmacies, hospital visits, residential aged care facilities) and involved four French-speaking countries which maximised the applicability to the wider population of older adults and caregivers as well as to all French speakers concerned by deprescribing, increasing generalizability of our results.

However, some limitations should be mentioned. First, participants responded to the questionnaire voluntarily. Participants who were more interested in deprescribing and those more involved in making decisions about their medications may have been more likely to participate in the study. This may introduce a voluntary bias. We were not able to collect information about the number of questionnaires distributed (i.e. response rate) or information about non-respondents. However, the impact of this limitation may be minimal as it has been proposed that the factor structure of a questionnaire is not impacted by selection bias.[56] Second, some differences were found between excluded and included participants due to incomplete responses. For instance, older adults who were excluded showed notably less need for assistance in completing the questionnaire compared to older adults who were included. Caregivers who were excluded were older and had a lower level of education than those who were included. However, we suppose that these differences had a low impact on the results since the four-factor structure of the questionnaire in our study is similar to the original rPATD questionnaire. Third, as some older adults needed help to complete the questionnaire, this may have influenced the responses and introduced a social desirability bias. We propose that the potential social desirability bias had a low impact on the results as the four-factor structure of the questionnaire in our study is similar to the English rPATD questionnaire which was self-administered.[8] However, this hypothesis should be verified in further research as the patient may be more inclined to be guarded in their responses especially in the case of the person who provided assistance to complete the questionnaire is the patient's physician. Fourth, criterion validity of the adapted questionnaire was not evaluated since there is no adequate gold-standard comparator in French. Finally, test-retest reliability was performed in participants only recruited in France and also who agreed to respond a second time to the questionnaire which may have overestimated the test-retest reliability (by priming these participants to remember their responses for the second administration). Moreover, the results of the test-retest reliability may have been affected by clinical changes between the two administrations of the questionnaire due to a maximum time frame of 3 weeks. However, a sufficient delay between two administrations was required to minimize recall bias in our study.

Implication for use in clinical practice and research

The French rPATD questionnaire may be a useful tool in clinical practice to facilitate conversations between patients, caregivers and prescribers about deprescribing. In particular, the use of the French rPATD can identify patient specific barriers and facilitators to deprescribing, and therefore could be used to inform what needs to be discussed during the consultation (e.g. dedicating time to discussing why the medication is inappropriate in an individual with high appropriateness factor score). In research, the French rPATD may be used to implement targeted-educational interventions and to assess the impact of deprescribing interventions, as already done in earlier studies.[57,58] It may also enhance understanding of why a deprescribing intervention was, or was not, effective by identification of prominent barriers and facilitators within subgroups of the participants.

As previously noted, we allowed for older adults to be assisted in completing the questionnaire. More than 1 in 2 older adults used help to complete the questionnaire and older adults living in institutions were more helped than those living in the community. It is therefore important for users of the French rPATD to consider the appropriateness of self-administration in their target population.

Conclusions

The French version of the rPATD questionnaire was successfully translated and cross-culturally adapted according to international recommendations. The French version presents globally good psychometric properties which were comparable with the English rPATD questionnaire. This finding corroborates the generalizability of the rPATD questionnaire across countries with different languages, culture and settings. In addition, the results support the use of the French version in clinical practice and research activities as a valid and reliable tool to capture attitudes and beliefs of older adults and caregivers towards deprescribing. Future work is required to explore whether it is a useful tool to engage older adults and caregivers in conversations about deprescribing and thus optimize medication use in the older population.

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CRediT authorship contribution statement

Barbara Roux: Conceptualization, Methodology, Software, Formal analysis, Investigation, Data curation, Writing - original draft, Writing - review & editing. **Caroline Sirois:** Conceptualization, Methodology, Investigation, Resources, Writing - review & editing. **Anne Niquille:** Conceptualization, Methodology, Investigation, Resources, Writing - review & editing. **Anne Spinewine:** Conceptualization, Methodology, Investigation, Resources, Writing - review & editing. **Nicole Ouellet:** Conceptualization, Methodology, Investigation, Resources, Writing -

review & editing. **Catherine Pétein:** Conceptualization, Methodology, Investigation, Writing - review & editing. **François-Xavier Sibille:** Conceptualization, Methodology, Investigation, Writing - review & editing. **Chantal Csajka:** Conceptualization, Methodology, Writing - review & editing. **Emily Reeve:** Conceptualization, Methodology, Writing - review & editing. **Claire Villeneuve:** Conceptualization, Methodology, Software, Formal analysis, Writing - review & editing. **Marie-Laure Laroche:** Conceptualization, Methodology, Investigation, Resources, Writing - review & editing, Supervision, Project administration.

Declaration of competing interest

Barbara Roux, Anne Niquille, Anne Spinewine, Nicole Ouellet, Catherine Pétein, François-Xavier Sibille, Chantal Csajka, Claire Villeneuve and Marie-Laure Laroche declare that they have no conflict of interest. Caroline Sirois is supported by *Fonds de recherche du Québec – Santé (Junior 1)* salary award and receives a grant from the *Centre de recherche sur les soins et les services de premières lignes de l'Université Laval*. Emily Reeve is supported by an Australian National Health and Medical Research Council (NMHRC) – Australian Research Council Dementia Research Development Fellowship (APP1105777).

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Appendix A. Supplementary data

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