**Title:** Willingness to deprescribe predictors among Portuguese older adults: a cross-sectional study

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On behalf of all authors, the corresponding author states that there is no conflict of interest.

## Title: Willingness to deprescribe predictors among Portuguese older adults: a cross-sectional study

**Abstract:**

Background: Deprescribing is a complex process requiring a patient-centred approach. One frequently expressed deprescribing barrier is patients' attitudes and beliefs toward reducing or stopping a medication. This study aims to identify the willingness to deprescribe predictors in a sample of Portuguese older patients.

Methods: Cross-sectional study with community-dwelling patients aged ≥ 65 and taking at least one regular medication. Data collection included patients' demographic and clinical characteristics and the Portuguese Revised Patients' Attitudes Towards Deprescribing (rPATD) Questionnaire. Descriptive statistics were used to present patients' characteristics and attitudes towards deprescribing. A multiple binary logistic regression analysis was performed to identify willingness to desprescribe predictors.

Results: 192 participants (median age 72 years; 65.6% female) were included. A large majority (83.33%) were willing to deprescribe if recommended by their doctor. The willingness to desprescribe predictors were age (adjusted odds ratio (aOR)= 1.136), female sex (aOR= 3.036), and the rPATD concerns about stopping (aOR= 0.391).

Conclusions: Most patients were willing to deprescribe if recommended by their doctor. Older age and female sex increase the odds of willingness to deprescribe; conversely, higher concerns about stopping medications decrease the odds. These findings suggest that addressing patients' concerns about stopping their medicines may contribute to deprescribing success.

**Keywords:** deprescribing; older adults; willingness; patients’ attitudes; clinical pharmacology.

***1-Background***

Polypharmacy is highly prevalent among older adults and a major worldwide patient safety health issue. 1 It is frequently defined as the intake of 5 or more medications per day, 2,3 and is associated with adverse outcomes such as increased fall risk, frailty, cognitive impairment, functional decline, hospitalisation, and death. 4-6. Inappropriate polypharmacy reduction was identified as a major public health goal by the World Health Organization Third Global Patient Safety Challenge: Medication Without Harm. 1

Deprescribing is a safe and efficient process to address polypharmacy in older people. 7 It refers to the withdrawal of an inappropriate medication, supervised by a health care professional to manage polypharmacy and improve outcomes. 8 Deprescribing reduces the number of potentially inappropriate medications, 9-11 and has been associated with improvements in health outcomes such as falls and mortality. 9 Nevertheless, deprescribing faces several barriers, including the patients' beliefs and attitudes toward their medications. 12 To succeed, deprescribing must be a patient-centred process in which shared decisions are essential for the patients’ involvement. 13,14 This process requires the physician to acknowledge the patients' characteristics, goals, beliefs, and attitudes toward their specific medication and provide the technical-scientific information necessary for shared decision-making.

One of the most frequently identified barriers to deprescribing is the physicians' perception of the patients' resistance or ambivalence to stop a medication. 12,15 Patients often believe in the medicines' benefit or lack of harm; however, they would still like to reduce their medications because they have the global notion that too many drugs can harm or think one or more is causing side effects. 13,15,16 A meta-analysis of 40 studies using the Patients´ Attitudes Towards Deprescribing questionnaire (PATD) and its revised version (rPATD) found that 84% of participants were willing to deprescribe. Still, most of them (67 to 93%) were satisfied with their current medicines. 17 Some characteristics have been associated with patients' willingness to deprescribe, such as age, 18-22 the number of chronic health conditions, 20,23 the number of medications, 20,22-24 self-reported health status, 23 and trust in the physician. 25 Additionally, the rPATD concerns about stopping medications 22,26-28 and the appropriateness of medicines 26,27 were both associated with patients' willingness to deprescribe.

In studies using the PATD or rPATD questionnaires, there are also some opposite findings in the associations between willingness to deprescribe and patients' characteristics. For example, age and willingness to deprescribe were found to be positively associated in four studies, 20,21,29,30 negatively associated in another four studies, 18,19,22,31 and non-significant in 15. 23-27,32-41 The number of medicines was positively associated in four studies 20,22,23,34 and non-significant in 15 studies. 21,25-27,29,30,32,33,36,37,40-44 These unclear findings support the need for more investigation on the patients’ willingness to deprescribe associated factors. Furthermore, Portugal is an aged country with one of the highest prevalences of polypharmacy in older adults (36.7%) in Europe 45, making it urgent to implement deprescribing strategies supported by research results. This study aims to add to the available scientific literature on this matter and explore the patients' characteristics and attitudes toward medicines associated with the willingness to deprescribe.

***2-Methods***

*2.1- Study design and population*

A cross-sectional study was conducted on older adults aged 65 or older and taking at least one regular medication. Participants were recruited from October to December 2021 by convenience sampling from three Portuguese outpatient clinics. The exclusion criteria were being unable to read Portuguese and having moderate or severe cognitive impairment history. A sample size of 192 older adults was considered acceptable for this study's aims.

2.1.1-Data collection

Data collection occurred during appointments in face-to-face interviews by a researcher with a medical background. The rPATD questionnaire was self-administered whenever possible, except upon participants' solicitation. Patients' demographic and clinic characteristics collected included age, sex, marital status, residence, education level, involvement in medication management,

number of medical appointments in the last 12 months, regular medications, and chronic medical conditions. Likert scales (1 to 5) were used to assess self-reported health status (bad, reasonable, good, very good, excellent) and trust in the physician (very low, low, medium, high, very high). In due course, the Charlson age-combined comorbidity index 46 was calculated based on the patient's age and medical conditions (identified by conciliating the patient's self-report and medical records).

2.1.2-rPATD questionnaire

The rPATD questionnaire's original version 47 underwent previous cross-cultural adaptation and validation to European Portuguese - Portuguese rPATD questionnaire (older adults version). 48 It includes 22 questions to assess attitudes and beliefs about medication and deprescribing and consists of two global questions and four factors with five questions in each factor. The four factors are: 1) appropriateness of medication, 2) burden of medication, 3) concerns about stopping medicines, and 4) involvement in medication management. The two global questions are "If my doctor said it was possible, I would be willing to stop one or more of my regular medicines" and "Overall, I am satisfied with my current medicines." All four factors’ questions have a 5-point Likert response scale, from strongly disagree = 1 to strongly agree= 5, except questions on the rPATD appropriateness factor that were reverse-scored to represent a greater belief in the appropriateness of their medications. There is no global score; each factor is scored separately, and the two global questions are scored independently as recommended by *Reeve et al.* 47

2.1.3 -Charlson age-combined comorbidity index

The Charlson age-combined comorbidity index combines age and comorbidity burden in a single index. 46 The Charlson comorbidity total score relates to predicting one and 10-year mortality. 49 Additionally, in the Charlson age-combined comorbidity index, the total score increases by one for each additional decade over 40. 46

*2.2- Outcomes and Statistical analysis*

The primary outcome was the characteristics and attitudes towards medicines most associated with older patients' willingness to deprescribe. The “willingness to deprescribe” was measured by one of the 2 rPATD global questions: "*If my doctor said it was possible, I would be willing to stop one or more of my regular medicines*." This question hereafter will be referred to as “*willingness to deprescribe.”* The secondary outcomes were patients' satisfaction with medicines and the scores of rPATD factors. The patients’ satisfaction was measured with the other rPATD global question, "*Overall, I am satisfied with my current medicines*."

Data were screened for normality using the Shapiro-Wilk and Kolmogorov-Smirnov tests and reported as descriptive statistics. The rPATD questionnaire factor scores were calculated as previously described. 47 The global question “willingness to deprescribe” was dichotomised into the binary outcome *agree* (strongly agree or agree) and *disagree* (unsure, disagree, or strongly disagree) to examine for associations and predictors of patients’ “*willingness to deprescribe”* and “*satisfaction with medicines.”* Bivariate analyses were performed to assess the associations of study variables (Table 1) with the “*willingness to deprescribe.”* The Chi-square (Chi2) test was used for categorical variables, and the effect size was evaluated by Cramer´s V. The Mann-Whitney U test was used for continuous and ordinal variables, and the effect size *r* was calculated (r = |Z| ⁄ ). A p-value < 0.05 was considered statistically significant.

Multiple binary logistic regression was used to verify whether patients’ characteristics and rPATD factors were predictors for the binary outcome of “*willingness to deprescribe.”* First, the patients’ demographic and clinic characteristics were examined as independent variables in simple unadjusted binary logistic regressions to assess associations with the “*willingness to deprescribe”* dichotomised global question. Then, those with p< 0.3 were included in the multiple binary logistic regression. The binary logistic regression assumptions were verified by checking for independent observations, the absence of multicollinearity between the

independent variables (all values of tolerance > 0,1 and VF < 10), and if the continuous predictors were linearly related to a transformed version of the outcome (p-value > 0,05). Afterwards, a multiple binary logistic regression was performed, with the backward stepwise likelihood ratio method (backward LR), to verify which of the patients’ characteristics were predictors of “*willingness to deprescribe”*. *P* values ≤ 0.05 were considered statistically significant. All statistical analyses were performed with IBM SPSS Version 27.0 (IBM Corp., Armonk, NY, USA). Study findings are reported according to the STROBE statement checklist. 50

*2.3-Ethics*

The study was approved by the Ethics and Deontology Council of the University of Aveiro. (Approval number: 28-CED/2021). This study was carried out following the Declaration of Helsinki (World Medical Association, 2013). Participants’ data were used solely for the purposes of this research study and kept confidential.

Free and informed consent was obtained from all participants before enrolment in the study.

The study was conducted in accordance with the Basic & Clinical Pharmacology & Toxicology policy for experimental and clinical studies.51

***3-Results***

*3.1-Patients’ Characteristics*

A total of 192 older adults were included in the study. Participants had a median age of 72 years (IQR= 69-77), were predominantly female (65.6%), and the great majority had a low education level (74.5 % had graduated from primary school or less). Polypharmacy, defined as the intake of five or more regular medicines per day, was observed in 76.9% of the patients; 90.1% of the participants self-managed their medication. In addition, 91.6 % had three or more chronic medical conditions, and the Charlson age-combined index median was 9 (IQR= 8-11). Patients’ characteristics are presented in Table 1 as results for the total study population and stratified for *“willingness to deprescribe.”*

*3.2- Patients ‘Beliefs and Attitudes Toward Deprescribing*

Answers to the rPATD global questions revealed that 83.33% of the participants agreed (38.5% agree, 44.8% strongly agree) that they were willing to stop one or more of their regular medicines if the doctor said it was possible. However, the great majority (90.62%) were satisfied with their current medicines (58.8% agree, 31.8 % strongly agree). In the rPATD factors scores, the median value was 4.4 for the *involvement factor*, 2.6 for the *burden factor*, 3.4 for the *appropriateness factor,* and 3.0 for the *concerns about stopping* factor (Table 1).In the *appropriateness of medication factor*, most patients agreed (agree or strongly agree) that they may be taking one or more medicines that they no longer needed (66.5%), and one or more of their medicines may not be working (62 %). Most participants (58.7 %) thought that their medicines might be having side effects; however, at the same time, the majority disagreed (disagree, strongly disagree, or are unsure) to try stopping one of their medicines to see how they feel without it (62 %) and disagreed that they would like the doctor to reduce the dose of one or more of their medicines (59.7%).

Among the answers to the *rPATD* *concerns about the stopping* factor's questions, it stands out that a greater proportion of participants agreed that if one of their medications were discontinued, they would be worried about losing future benefits (68.8%). Additionally, 53.6% would be reluctant to stop a medicine they had been taking for a long time. Participants’ responses to the rPATD questionnaire are presented in Figure 1. The rPATD questionnaire patients' answers frequencies and percentages are shared in Supplementary Information S1.

Patients' characteristics were stratified by “willingness to deprescribe” (agree *vs*disagree); then, a bivariate analysis of potential factors influencing willingness to deprescribe was conducted (Table 1).

*3.3 Associations between participants’ characteristics, willingness to deprescribe*

A significant association was observed between “*willingness to deprescribe”* and sex [χ2 (1) = 4.156, p=0.041], and the effect size, measured by Cramer’s V, was small (V= 0.147). The *rPATD appropriateness* scorewas significantly lower in the group “agree” (Md=3.4, n= 159) compared to the group “disagree” (Md= 4, n= 32) U = 2.17, Z =-2.137, *p*= 0.033 with a small effect size r= 0.1257. Likewise, the *rPATD* *concerns about stopping* scores were significantly lower in the group “agree” (Md=2.8, n=160) compared to the group “disagree” (Md= 3.4, n= 32) U = 2.17, z =-3.872, *p*< 0.001; with a small effect size r= 0.2794), and the *number of medical appointments in the last 12 months* was significantly lower in the “*disagree”* group (Md= 4, n=25) compared to the “agree” (Md= 5, n= 135) U=1,231, Z= -2.247, *p*= 0,025 with a small effect size (r= 0.177) on “willingness to deprescribe.”

*3.4- Predictors of “willingness to deprescribe” (Logistic Binary Regression)*

The variables included in the multiple logistic binary regression were *age* (years), *number of chronic medical conditions, rPATD burden score, rPATD concerns about stopping* score, *number of medical appointments* in the last 12 months, and *trust in the physician* as continuous variables. *Sex, marital status, number of regular medications, and self-reported health status* were also selected as categorical independent variables (Table 2). The assumptions to perform the multiple logistic binary regression were satisfied except for the variable *rPATD appropriateness* score, which violated the assumption of linearity (*p*=0.041). Therefore, this variable was not included in the multiple logistic regression model. The final model containing the independent variables *age, sex*, *rPATD burden score, rPATD* *concerns about stopping* score, and the *number of medical appointments* was significant [X2 (5) = 26,730; p<0.001], explaining 28,2% of the variance (Nagelkerke R Square) and correctly predicted 83,7 % of the results. There was a good model fit (Hosmer-Lemeshow test nonsignificant, p=0.295). The significant predictors of "willingness to deprescribe" (Table 2) were *age* (aOR= 1.134; 95% CI 1.024, 1.255), *sex* (aOR= 2.966; 95% CI 1.033, 8.519), and *the rPATD concerns about stopping* score (aOR= 0.387; 95% IC 0.201, 0.747). Although not significant, *the rPATD burden* score (aOR= 1.554; 95% CI 0.927, 2.606) and *the medical appointments in the last 12 months* (aOR= 1.155, 95% CI 0.973, 1.371) were included in the final model (Table 2).

***4- Discussion***

This study aimed to identify the predictors of willingness to deprescribe among older patients. Within the obtained results, we highlight that most participants were willing to deprescribe if recommended by their doctor, even though, at the same time, most of them were satisfied with their medications. We also highlight older age and female sex as socio-demographic characteristics increasing the odds of patients’ “*willingness to deprescribe*”; and *rPATD concerns about stopping* score as a negative predictor, i.e., the odds of willingness to deprescribe decrease with patients’ greater concerns about stopping medications.

In what refers to the first major finding, this study shows that a large proportion of participants (83.33%) were willing to deprescribe one or more of their regular medicines if their doctor recommended it. Nevertheless, at the same time, 90.62% were satisfied with their current medicines. These conjoint findings align with two systematic reviews with meta-analysis on attitudes towards deprescribing. The first meta-analysis, conducted by Weir et al. was based on the results of 36 studies published until March 2020 and concluded that 84% of participants were willing to stop one or more of their medications if their doctor said it was possible, and 67 to 93% were satisfied with their current medicines. 17  In the other meta-analysis, Chock et al., based on results from 25 articles published through April 2021, showed that 88% of patients were willing to have their medications deprescribed, and 89% were satisfied with their medication. 52 These contradictory findings between the willingness to deprescribe and satisfaction with medicines are found across studies using the rPATD questionnaire. 17 Previous studies found that older adults have conflicting beliefs towards their medications and coexisting positive and negative attitudes. 53,54 This might be explained by the fact that there are multiple and complex factors influencing patients' decisions about their medicines. 17 Moreover, the results of the two global questions should be interpreted together with the rest of therPATD questionnaire to gather broader information, facilitating the deprescribing conversation and the patient-centred approach. For example, in our study, most patients agreed they were willing to deprescribe; still, 68,8 % expressed concerns about missing out on future benefits if one of their medicines was stopped, and 53,6% referred they would be reluctant to stop a medicine they had been taking for a long time. These results may arise from the physicians' previous efforts to improve medication adherence. Another potentially explanatory reason may be the patient's need for greater health literacy, as the appropriateness of medications changes with age and changing health conditions. Acknowledging the information from the different dimensions assessed by the rPATD questionnaire will better equip the clinician to engage the patient in a deprescribing conversation. Furthermore, given the older adults’ conflicting attitudes and beliefs toward their medications, the patient-centred approach with a shared decision-making process allows patients to know more about their medications and understand the benefits of deprescribing.

Regarding the predictors of “willingness to deprescribe,” our regression model suggests that an increase in age by one year increases the odds of *“willingness to deprescribe”* by 1.134 times. Findings from previous studies are inconsistent regarding the association between age and willingness to deprescribe. For instance, two studies found that age was a significant positive predictor of willingness to deprescribe, 20, 30 and another two found positive associations. 21, 29 However, unlike our study, three studies included younger participants (≥ 18 years old): Aoki et al. found that age increases willingness to deprescribe 1.12 times per 10-year increase; 20 Lukacena et al. reported that a 10-year increase in age increases willingness to deprescribe by 2.99 times; 30 and Ul-Haq et al. found that age significantly influenced the positive attitude toward deprescribing. 29 Finally, a study by Kua et al., including older adults, reported that age was associated with willingness to deprescribe with a weak positive correlation. 21 Nevertheless, several studies found no significant association between age and willingness to deprescribe. 23,24,26-28,32-35,37-40,55-57 We can hypothesise that the time interval in studies with participants aged ≥ 65 is shorter than in studies that include younger patients, so capturing significant differences may be more challenging.

In the multiple logistic regression model, female sex was a significant predictor of "willingness to deprescribe", with the odds increasing 3-fold in female patients. To the best of our knowledge, this is the first time that sex has been reported as a predictor of "willingness to deprescribe." Previous studies found that the association between participants' sex and "willingness to deprescribe" was not significant. 20-23,26,27,30,33,35,37-39,57 Our result may be partly explained by the noteworthy differences between women and men in their medication adherence, with women being less likely to follow preventive guidance and less adherent to medicines. 58,59 Finally, a previous study found that women are more likely to initiate deprescribing conversations and have a higher awareness of harmful medications, 60, which might contribute to being more willing to a deprescribing intervention.

Two rPATD factors were in the final model of multiple binary logistic regression for “willingness to deprescribe”: the “concerns about stopping” factor, a significant predictor, and the *rPATD* burden factor, which was found not to be significant. An increase of one in the “concerns about stopping” score decreased the odds of “willingness to deprescribe” by 2.6 times. Like our results, the *rPATD* concerns about stopping factor were a negative predictor of "willingness to deprescribe" in four previous studies using the rPATD questionnaire. 22,26-28 Specifically, lower concerns about stopping medicines increase the odds of patients' willingness to deprescribe by 8 times in the Australian study, 26 1.8 times in the Croatian 27 and Nepalese studies, and 4,8 times in the French-speaking countries study 28. As for the *rPATD burden* factor, not being a predictor of “willingness to deprescribe”, this might be due to older adults’ beliefs that their medicines are necessary and therefore minimise their burden.

Additionally, the four factors rPATD scores results reveal a high involvement in medication management, high medication appropriateness, a moderate burden of medication, and moderate concerns about stopping medicines. These findings are similar to those observed in previous studies. 21,22,26-28,30

Finally, concerning the rPATD factors' predictive value, in our results, the *rPATD appropriateness* factor violated the multivariate logistic regression analysis assumption, so it was not included in the analysis. However, in bivariate analysis, lower appropriateness scores were associated with patients' *“willingness to deprescribe”,* although with a small effect size. Previous findings on the association of rPATD appropriateness and willingness to deprescribe are not consistent, two studies found no association, 28 and other two studies concluded that lower appropriateness factor scores are predictors of willingness to deprescribe. 26,27

Interestingly, in our study, trust in the physician, polypharmacy, and higher comorbidity were not associated with willingness to deprescribe. Patients' trust in the physician has been reported to influence adherence to medical recommendations, increase willingness to seek treatment, and improve shared decision-making 61; thus, it would be expected to influence patients' willingness to deprescribe as it is a patient-centred process13. Previous studies reported both positive and negative associations of trust in the physician with the willingness to deprescribing. 19,25,62 Similar to our findings, Reeve et al. found no associations. 26

Also, the number of regular medications was not associated with “*willingness to deprescribe”* in our study. These results align with most studies that explored the association between polypharmacy and *"willingness to deprescribe”* as mentioned in the *Introduction* section: 15 studies found no association*,* 21,25-27,29,30,32,33,36,37,40-44 and only four studies 20,22,23,34 reported a positive association with the number of medicines with *"willingness to deprescribe."* Although polypharmacy was highly prevalent (76.1%) in our study population, participants' beliefs about the appropriateness of medications were high, and the perceived medication burden was moderate. These attitudes may contribute to placing less value on the number of medications when asked about willingness to deprescribe.

4.1-*Strengths and limitations*

To our best knowledge, this is the first study with Portuguese older adults assessing attitudes and beliefs toward medication using the rPATD questionnaire, which allows for further international findings comparability. Additionally, participants were recruited in three different outpatient clinics in three different cities, having distinct family doctors, avoiding biases if many had the same doctor; data collection was also conducted by a researcher with a medical background but with no connection with patients´ family physicians. The rPATD questionnaire was self-administered, but some participants requested assistance to answer the questionnaire, and one must consider that a questionnaire's interview administration may introduce bias. The specific method of PROM (patient-reported outcome measures) collection may bias the results, but there is no consensus among different studies. 63 The questionnaire interview administration, when solicited by the participant, was adopted to best fit our study population, which expressed the need for some assistance in answering the questionnaire. Our study participants were older adults with age-related limitations, such as vision problems, and an expressive proportion had low education levels – these factors contributed to the need for assistance. Older patients are prone to fatigue in answering questionnaires which can be reduced by interview data collection. 64 Furthermore, a systematic review with a meta-analysis of studies using the rPATD questionnaire found no difference between administration methods (self-report vs researcher administered). [23]The participants' recruitment by convenience sampling is another limitation, and caution is needed to generalise the results. We also acknowledge that using a one-dimensional Likert scale to assess trust in the physician may be a limitation, given the multidimensional nature of trust. However, a previous study used a multidimensional scale (Wake Forest Physician Trust Scale) and obtained similar results. 26 Another possible limitation is that the rPATD questions administered in this study referred to all the patients' regular medications. Moreover, we hypothesised that the results would differ depending on whether the medicines were preventive or curative or whether we directed the research to specific medication classes.

*4.2- Implications for future practice and research*

We identified characteristics of older Portuguese patients that predict willingness to deprescribe: older age and female patients. These characteristics can be considered in clinical practice or future research in selecting patients for deprescribing interventions. The interpretation of the 4 rPATD factors and global questions helps the physician to have a broader knowledge about each patient’s attitudes and beliefs toward medication before engaging in a deprescribing conversation, helping to conduct the shared decision process by targeting the patient’s needs and concerns. In addition, our research identified the rPATD concerns about stopping factor as a negative predictor of “*willingness to deprescribe”*; paying particular attention to this specific factor might increase deprescribing interventions' success. Overall, this study's findings can contribute to developing targeted educational programs for public education to address patients' concerns related to their medications and deprescribing. Future research should focus on attitudes toward specific medication classes or diseases to deepen our knowledge and support future deprescribing interventions.

***5- Conclusions***

Most of the Portuguese ambulatory older adults were willing to deprescribe if recommended by their doctor and simultaneously were satisfied with their medicines. So, physicians must take advantage of the opportunity to engage in deprescribing conversation with their older patients. Age, gender, and the rPATD concerns about stopping factor are predictors of “willingness to deprescribe.” Specifically, older age and female gender increase the odds of patients’ “willingness to deprescribe”. Conversely, patients’ higher concerns about stopping medications decrease the odds of being willing to deprescribe. This finding highlights the need to identify and address patients’ concerns about stopping their medicines in deprescribing. Acknowledging these “willingness to deprescribe” predictors can contribute to the success of deprescribing interventions.

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**Conflict of Interest Declaration**

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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*Table 1*: Patients Characteristics and rPATD Factors Scores for the Study´s Total Population and Stratified by “*Willingness to Deprescribe.”*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Characteristic** | **Total** | **Willingness to deprescribe** | |  |
|  | value | disagree | agree | *p* value a |
| **Age (N = 192)** |  |  |  |  |
| median (IQR) | 72 (69-77) | 71,5 (68-76) | 73 (69-77,75) | *p*= 0,193 |
| **Sex** | n (%) | n (%) | n (%) |  |
| male | 66 (34,4) | 16 (50) | 50 (31,3) | ***p*=0,041b** |
| female | 126 (65,6) | 16 (50) | 110 (68,8) |
| **Marital Status (N=183)** | n (%) | n (%) | n (%) |  |
| married | 127 (66,1) | 20 (64,5) | 107 (66,9) | *p*=0,756 |
| widower | 33 (17,2) | 7 (22,6) | 26 (16,3) |
| other | 23 (12) | 4 (12,9) | 19 (11,99 |
| **Residence (N=184)** | n (%) | n (%) | n (%) |  |
| own or rented house | 177 (96,2) | 30 (96,8) | 147 (96,1) | *p*=0,802 |
| family house | 5 (2,7) | 1 (3,1) | 4 (2,6) |
| institution / nursing home | 2 (1,1) | 0 (0) | 2 (1,3) |
| **Resides with: (N=183)** | n | n (%) | n (%) |  |
| alone | 39 (21,3) | 8 (25,8) | 31 (20,4) | *p*=0,727 |
| spouse or companion | 99 (54,1) | 16 (51,6) | 83 (54,6) |
| relatives | 14 (7,7) | 1 (31,2) | 13 (8,6) |
| spouse and relatives | 29 (15,8) | 6 (19,4)) | 23 (15,1) |
| other | 2 (1,9) | 0 (0) | 2 (1,3) |
| **Level of education (N= 191)** | n (%) | n (%) | n (%) |  |
| primary school (1 to 4 years) | 143 (74,5) | 26 (81,3) | 117 (73,6) | *p*=0.660 |
| lower secondary education (5 to 9 years) | 28 (14,6) | 3 (9,4) | 25 (15,7) |
| higher secondary education (10 to 12 years) | 11(5,7) | 1 (3,1) | 10 (6,3) |
| university degree or more | 9 (4,7) | 2 (6,3) | 7 (4,4) |
| **Medication Management (N=189)** | n (%) | n (%) | n (%) |  |
| self-management | 173 (90,1) | 29 (93,5) | 144 (92,3) | *p*= 0,232 |
| self-management with the help of a family member or friend | 7 (3,6) | 1 (3,2) | 6 (3,8) |
| family member or friend | 7 (3,6) | 1 (3,2) | 6 (3,8) |
| **Number of regular medications (N=192)** | value | value | value |  |
| median (IQR) | 6 (5-9) | 5 (4-7) | 6 (4-8) | *p*= 0.589 |
|  | n (%) | n (%) | n (%) |  |
| 1 to 4 | 43 (22,4) | 8 (25,8) | 35 (22,2) | *p*= 0.447 |
| 5 to 9 | 115 (59,9) | 19 (61,3) | 96 (60,8) |
| 10 to 14 | 27 (14,1) | 2 (6,5) | 25 (15,8) |
| ≥ 15 | 4 (2,1) | 2 (6,5) | 2 (1,3) |
| **Trust in the Physician (N= 170) c** | value | value | value |  |
| median (IQR) | 4 (3-5) | 4 (3.25-5) | 4 (3-5) | *p*=0.649 |
| **Self-reported Health Status (N=171) d** | n (%) | n (%) | n (%) |  |
| bad | 20 (10,4) | 5 (17,2) | 15 (10,1) | *p*=0,390 |
| reasonable | 128 (66,7) | 18 (62,1) | 110 (73,8) |
| good, very good or excellent | 30 (15,6) | 6 (20,7) | 24 (16,1) |
| **Medical Appointments in the last 12 months (N=160)** | value | value | value |  |
| median (IQR) | 5 (3-8) | 4 (2.5-6.5) | 5 (4-8) | ***p*=0.025b** |
| **Chronic medical conditions** |  |  |  |  |
|  | n (%) | n (%) | n (%) |  |
| ≤ 3 medical conditions | 16 (8,3) | 5 (15,6) | 11 (6,9) | *p*= 0.492 |
| 4 to 5 medical conditions | 58 (30,2) | 9 (28,1) | 49 (30,6) |
| 6 to 7 medical conditions | 74 (38,5) | 12 (37,5) | 62 (38,8) |
| ≥ 8 medical conditions | 44 (22,9) | 6 (18,8) | 38 (23,8) |
| **rPATD factors scores e** |  |  |  |  |
| median (IQR) | value | value | value |  |
| Involvement | 4,4 (4,0 -4,8) | 4,4 (4,0 -4,8) | 4,2 (4,0 -4,8) | *p*= 0,400 |
| Burden | 2,6 (2,0- 3,6) | 2,4 (1,8-2,8) | 2,8 (2,0-3,6) | *p* =0,065 |
| Appropriateness | 3,4 (2,6-4,0) | 4 (2,85-4,35) | 3,4 (2,6-4,0) | ***p* =0,033b** |
| Concerns about stopping | 3,0 (2,4 -3,4) | 3,4 (3,05- 3,8) | 2,8 (2,20-3,4) | ***p* < 0,001c** |

Abbreviations: IQR, interquartile range; rPATD, revised Patients’ Attitudes Towards Deprescribing.

(a) p-value derived from Mann–Whitney U test and Chi-square test in those presented as median (IQR) and n (percentage), respectively. (b) statistically significant at 0.05 level. (c) statistically significant at < 0.001 level. (c) Trust in the physician was assessed by a Likert scale (1=very low, 2=low, 3=medium, 4=high, 5=very high). (d) Self-reported health status assessed by a Likert scale (1=bad, 2=reasonable, 3=good, 4=very good, 5=excellent) (e) rPATD scores range between 1 and 5 with higher scores indicating a higher perceived burden of medicines, belief in the appropriateness of medicines, concerns about stopping medicines, and involvement in medication management.

*Table 2:* Binary Logistic Regression Analysis of *“Willingness to Deprescribe” a*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Unadjusted binary logistic regression b | | | | Adjusted binary logistic regression c | | | |
|  |  | 95% C.I. |  |  |  | 95% C.I. | |  |
| Variable | OR | Lower | Upper | *P* value | aOR | Lower | Upper | *P* value |
| **Age** (years) | 1.050 | 0.976 | 1.128 | 0.190 | **1.134** | **1.024** | **1.255** | **0.016** |
| **Sex** (ref = male) | 2.200 | 1.019 | 4.749 | 0.045 | **2.966** | **1.033** | **8.519** | **0.043** |
| **Marital status** |  |  |  | 0.757 |  |  |  |  |
| single (ref.) |  |  |  | 0.760 |  |  |  |  |
| married | 2.293 | 0.546 | 9.623 | 0.257 |  |  |  |  |
| de facto union | 692,346,332.075 | 0.000 | . | 0.999 |  |  |  |  |
| widower | 1.592 | 0.325 | 7.800 | 0.566 |  |  |  |  |
| other | 3.429 | 0.287 | 40.946 | 0.330 |  |  |  |  |
| **Residence** |  |  |  |  |  |  |  |  |
| at home (ref.) | 0.984 |  |  |  |  |  |  |  |
| at relatives’ home | 0.999 | 0.000 | 0.000 | . |  |  |  |  |
| nursing home | 0.999 | 0.000 | 0.000 | . |  |  |  |  |
| **Education** |  |  |  |  |  |  |  |  |
| ≤ 9 years (ref.) |  |  |  | 0.727 |  |  |  |  |
| 10 t0 12 years | 2.042 | 0.252 | 16.579 | 0.504 |  |  |  |  |
| university degree or more | 0.715 | 0.141 | 3.617 | 0.685 |  |  |  |  |
| **Self-reported health status (categories)d** |  |  |  |  |  |  |  |  |
| bad (ref.) |  |  |  | 0.399 |  |  |  |  |
| reasonable | 2.037 | 0.659 | 6.294 | 0.216 |  |  |  |  |
| good, very good or excellent | 1.333 | 0.345 | 5.147 | 0.676 |  |  |  |  |
| **Trust in the physician (1 to 5) e** | 1.278 | 0.944 | 1.730 | 0.112 |  |  |  |  |
| **Number of regular medications** | 1.053 | 0.923 | 1.202 | 0.439 |  |  |  |  |
| **Number of regular medications** |  |  |  |  |  |  |  |  |
| 1 to 4 medications (ref.) |  |  |  | 0.236 |  |  |  |  |
| 5 to 9 medications | 4.375 | 0.533 | 35.909 | 0.169 |  |  |  |  |
| 10 to 14 medications | 5.053 | 0.670 | 38.119 | 0.116 |  |  |  |  |
| ≥ 15 medications | 12.500 | 1.098 | 142.306 | 0.042 |  |  |  |  |
| **Chronic medical conditions** |  |  |  |  |  |  |  |  |
| ≤ 3 medical conditions (ref.) |  |  |  | 0.447 |  |  |  |  |
| 4 a 5 medical conditions | 0.347 | 0.089 | 1.358 | 0.129 |  |  |  |  |
| 6 a 7 medical conditions | 0.860 | 0.281 | 2.625 | 0.791 |  |  |  |  |
| ≥ 8 medical conditions | 0.816 | 0.283 | 2.354 | 0.707 |  |  |  |  |
| **Charlson age-combined weighted index f** | 0.960 | 0.819 | 1.125 | 0.611 |  |  |  |  |
| **Medication management** |  |  |  |  |  |  |  |  |
| self-management (ref.) |  |  |  | 0.972 |  |  |  |  |
| self-management with help | 1.208 | 0.140 | 10.418 | 0.863 |  |  |  |  |
| family member or friend | 1.208 | 0.140 | 10.418 | 0.863 |  |  |  |  |
| **rPATD burden score** | 1.438 | 0.972 | 2.126 | 0.069 | 1.554 | 0.927 | 2.606 | 0.095 |
| **rPATD concerns about stopping score** | 0.385 | 0.228 | 0.648 | 0.000 | **0.387** | 0.201 | 0.747 | **0.005** |
| **rPATD appropriateness score** | 0.625 | 0.394 | 0.991 | 0.046 |  |  |  |  |
| **rPATD involvement score** | 0.694 | 0.319 | 1.506 | 0.355 |  |  |  |  |
| **Medical appointments in last 12 months** | 1.167 | 0.993 | 1.372 | 0.060 | 1.155 | 0.973 | 1.371 | 0.099 |

Abbreviations: OR, unadjusted odds ratio; CI, confidence interval; aOR, adjusted odds ratio; ref, reference category; rPTAD, revised patients' attitudes towards deprescribing questionnaire.

a) rPATD global question "*If my doctor said it was possible, I would be willing to stop one or more of my regular medicines*." was dichotomised to a binary outcome *agree* (strongly agree or agree) and *disagree* (unsure, disagree, or strongly disagree), designated as *“willingness to deprescribe.”*

b) The patients’ demographic and clinic characteristics were examined as independent variables in simple unadjusted binary logistic regressions. Then, the independent variables with p < 0,300 were included in the multiple binary logistic regression model. All assumptions were satisfied for the selected variables, except for the *rPATD* *appropriateness* score, which was not included in the multiple binary regression.

c) Multiple logistic binary regression with backward LR method.

d) Self-reported health status (Likert scale of 1=bad to 5= excellent) was transformed into categories based on frequencies.

e) Trust in the physician, Likert scale 1=very low to 5 = very high.

f) The Charlson age-combined comorbidity index combines age and comorbidity burden in a single index

**Figure legends**

**Fig. 1** Participants' Responses to the rPATD Questionnaire