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Article

Appropriate knowledge of the indications for medications in use among older individuals assisted in the Jornada Científica dos Acadêmicos de Farmácia-Bioquímica

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This study aimed to identify variables associated with the appropriate recall of indications and the drug classes that represented the most unmatching medications (i.e., when the individual who used it had not reported any illness that matched its indications). Community-dwelling individuals aged ≥60 years using ≥1 medication, from Santa Cruz da Esperança-SP, Brazil, were home-interviewed. Logistic regression models were used to evaluate the association between the appropriate recall of the indications for all medications in use and the following: gender, age, education, individual income, living arrangement, self-perceived health, and medication number, administration, payment, and identification. Medications whose indications were inappropriately recalled were classified as matching or unmatching. One hundred seventeen individuals used an average of 5.1 (standard deviation, 3.3) medications. Sixty-one (52.1%) appropriately recalled all indications. The appropriate recall of all indications was negatively associated with the number of medications in use (e.g., individuals taking 5–6 medications were 25 times less likely to appropriately recall all indications than those taking 1–2). Antithrombotic, acid-related disorder and psychoanaleptic classes showed greater frequencies of unmatching than matching medications. Therefore, counseling the elderly about drug indications should focus on those using ≥3 medications and/or antithrombotic, acid-related disorder, and psychoanaleptic agents.

Keywords: Aged. Patient Education as Topic. Patient Medication Knowledge. Polypharmacy. Self Report.

INTRODUCTION

Older individuals frequently have many chronic conditions, so they are exposed to complex and long-term poly-pharmacotherapy (Salive, 2013). Polypharmacy is considered the prescription of 5 or more medications (Gnjidic *et al.*, 2012). Its prevalence increased from 24% to 39% in older adults during the period of 1999 to 2012 in the United States (Kantor *et al.*, 2016). In Brazil, 93% of community-dwelling older individuals use at least 1 long-term medication, and 18.0% use at least 5 (Ramos *et al.*, 2016). The use of multiple medications by elderly patients may lead to negative clinical outcomes such as functional decline, frailty, falls, adverse drug reactions, hospitalization, and death (Gnjidic *et al.*, 2012; Fried *et al.*, 2014). The burden of multimorbidity and polypharmacy will increase, since the populations of all countries are aging. One in 5 people will be ≥60 years of age by the year 2050 worldwide (World Health Organization, 2017). In Brazil, the proportion of people over 65 years of age

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will rise from the current 8.8% up to 13.4% by the year 2030 (Instituto Brasileiro de Geografia e Estatística, 2018).

The sign, symptom, disease, or condition for which a medication is prescribed is referred to as the indication (Fitzgerald *et al.*, 2005). Knowledge of indications is necessary to ensure the correct use of medications (Delgado *et al.*, 2009; Romero-Sanchez *et al.*, 2016). Brazilian studies that investigated the medication knowledge of adult outpatients taking prescribed medication revealed that the indication was the most correctly recalled information, among other details such as name, dosage, duration of treatment, side effects, and interactions (Silva, Schenkel, Mengue, 2000; Fröhlich, Dal Pizzol, Mengue, 2010; Oenning, Oliveira, Blatt, 2011). Nevertheless, the knowledge of indications is lower in elderly individuals compared to younger ones (Hartholt *et al.*, 2011). Factors positively associated with the correct recall of indications in elderly patients are female gender (Guénette, Moisan, 2011; Bosch-Lenders *et al.*, 2016), cognition status (Guénette, Moisan, 2011), income (Guénette, Moisan, 2011), and living with a partner (Bosch-Lenders *et al.*, 2016). Negatively associated factors are advanced age (Bosch-Lenders *et al.*, 2016) and polypharmacy (Guénette, Moisan, 2011; Bosch-Lenders *et al.*, 2016). Inadequate knowledge of the indications for medications has been associated with self-reported medication non-adherence in aged individuals (Lau *et al.*, 1996; Barat, Andreasen, Damsgaard, 2001; Bazargan *et al.*, 2017). For instance, aged individuals with an appropriate knowledge about indications and dosage were 7.4 times more likely to adhere to the medication in use (Bazargan *et al.*, 2017).

The Brazilian studies about knowledge of medications failed to demonstrate its predictive factors and which medications are comparatively less known (Silva, Schenkel, Mengue, 2000; Fröhlich, Dal Pizzol, Mengue, 2010; Oenning, Oliveira, Blatt, 2011). Since these aspects are indispensable for properly designing educational interventions to improve knowledge about medications, the objectives of this work were to identify (a) the predictors of the appropriate recall of indications, and (b) the medication categories, whose indications were inappropriately recalled, that presented the most unmatching medications.

MATERIAL AND METHODS

Study design and population

This study was part of the *Jornada Científica dos Acadêmicos de Farmácia-Bioquímica* (JCAFB) of the School of Pharmaceutical Sciences of the University of Sao Paulo (FCF/USP) of the year 2014. JCAFB is an annual extramural cross-sectional service in which a group of selected undergraduates voluntarily performs laboratory testing and collects information from participants in order to promote health education interventions in Brazilian communities presenting a low human development index (Serpentino *et al.*, 2017). In the year 2014, it took place in the city of *Santa Cruz da Esperança*, located in the state of *São Paulo*, Brazil, and featured 48 undergraduates, 1 pharmacist, and 1 FCF/USP professor. Interviewers were extensively trained prior to data collection.

Community-dwelling individuals aged ≥60 years and who were using at least one medication were included by convenience from January 7th to January 23rd, 2014. Individuals who could not communicate verbally were excluded.

This study was approved by the FCF/USP Institutional Ethics Committee (CAEE 0038.0.018.000-11), and a written informed consent was obtained from all subjects prior to their inclusion.

Data collection

Individuals were interviewed face-to-face at home by means of a structured questionnaire in order to assess the following data: gender, age, educational level, personal monthly income, living arrangement, self-perceived health, self-reported illnesses, and information on medications in use.

Income was expressed in Brazilian minimum wage (MW), which was $304.70 (USD) per month in 2014 (Brasil, 2013, 2018).

The following open-ended question investigated present illnesses: Which illnesses, if any, has a doctor ever told you that you have?

Information on medications

All medications used within the 15 days preceding the interview date were registered according to self-report and categorized according to the 2nd level of the Anatomical Therapeutic Chemical (ATC) code (World Health Organization, 2018). In order to verify this information, participants were asked to hand in the packages and prescriptions of reported medicines when available. It was also determined whether participants relied on a caregiver to assist them in the correct use of medications.

Information on payment and identification was collected for every medication in use. Payment was expressed as the proportion of medications in use that were bought. Identification was denoted as the main attribute of a medication used by the participant to identify it: name or physical attributes such as package, size, shape, color, or storage container.

Medication knowledge

Medication knowledge of each participant was calculated. It was expressed as the proportion of medications in use whose indications were appropriately recalled. For instance, a participant using 5 medications and accurately reporting the indications of 3 of them had a medication knowledge of 60%.

Many medications are approved for more than one indication (e.g., hydrochlorothiazide is indicated for the treatment of both edema and hypertension). For these, the appropriate report of at least one indication was necessary to be considered as appropriately recalled medications.

The appropriate recall of indications was evaluated by the first question of an 11-question Spanish questionnaire (Delgado *et al.*, 2009) cross-culturally adapted to Brazilian Portuguese (Didone *et al.*, 2019): For what do/will you have to take/use this medication? We allowed participants to read the prescription if needed.

Answers to this question were graded as either correct, incomplete, unknown, or incorrect (Delgado, 2008; Romero-Sanchez *et al.*, 2016) according to their level of agreement with the reference information, here represented by the UpToDate database (UpToDate, 2018). Two interviewers independently graded the answers. If necessary, a third interviewer was consulted. An example of the rationale used to grade the answers is shown in Table I.

As in previous work (Bosch-Lenders *et al.*, 2016), we considered an indication recall to be appropriate when answers were either correct or incomplete, and inappropriate when answers were either unknown or incorrect.

TABLE I – System for grading the recall of indications*

Example in the case of antihypertensive use†	Classification	Explanation
"For hypertension" "To lower my pressure"	Correct	Answer mentions the purpose of the medication or the disease, sign, or symptom for which the medication is used, even if not in correct medical terminology
"For my heart"	Incomplete	Answer mentions the organ or system for which the medication is used
"I don't know" "I don't remember"	Unknown	Interviewee verbally or non-verbally indicates not knowing the answer
"For my cholesterol" "To treat diabetes"	Incorrect	Answer does not match correct or incomplete information

*According to (Delgado, 2008; Romero-Sanchez *et al.*, 2016).
†Examples of answers to the question: For what do/will you have to take/use this medication?

Correspondence to illnesses

The correspondence between the indications for each medication in use and self-reported present illnesses was checked. A medication was classified as matching when the individual reported having at least one illness that matched the indication. Medications were also classified as matching when the patient reported signs, symptoms, and/

or clinical consequences of the disease for which they were indicated. If the individual did not report having a single illness that matched the indications, the medication was considered unmatching. Reference indications were those included in the UpToDate database (UpToDate, 2018). Two interviewers independently checked each correspondence. If necessary, a third interviewer was consulted.

Statistical analyses

Statistical analyses were carried out using SPSS software, version 22.0 (IBM, USA). Categorical and numerical variables were described, respectively, as absolute and relative counts and means with standard deviations. Self-reported illnesses were evaluated by the number of individuals who reported them, and only the 13 most frequent were presented.

Eleven logistic regression models were used to predict the dependent variable: the appropriate recall of 100% of indications (as a dichotomous variable, contrasting with the appropriate recall of <100% of indications). The independent variables were: gender (male, female); age (60–69, 70–79, and ≥80 years); educational level (no education, incomplete elementary, complete elementary to university); monthly income (terciles); living arrangement (alone, with others); self-perceived health (very good or good, average, poor or very poor); medication administration (self-administration, by caregiver); number of medications in use (1–2, 3–4, 5–6, ≥7); payment for medications in use (none, some to all medications); and identification of medications (by name, by physical attributes excluding name). Variables with *P*-values <0.200 in univariate models were included in the multivariate analysis by the forced-entry method.

We compared the appropriateness of indication recall according to the 8 most frequent 2nd level ATC categories of medications. Still, we compared the correspondence between indications and self-reported present illnesses across the same 8 categories but considered only the medications inappropriately recalled. These comparisons were analyzed by Chi-square (χ^2) tests.

The level of significance was set at $\alpha = 5\%$, $P \leq 0.05$.

RESULTS

One hundred seventeen elderly individuals were included in the study (49 men and 68 women). The means (standard deviations) of age and number of medications were, respectively, 72.6 (8.1) and 5.1 (3.3). Regarding the medications in use, 22.2% of the included individuals were using 1 or 2 medications, 23.9% were using 3 or 4, 28.2% were using 5 or 6, and 25.6% were using 7 or more. The cut-off values for the terciles of income were 1.9 MW ($578.93 USD) and 2.8 MW ($853.16 USD).

The self-reported illnesses are shown in Table II. High blood pressure was the most frequent, reported by 60.7% of the individuals.

Sixty-one (52.1%) of the included individuals appropriately recalled 100% of the indications for the medications in use. The number of medications was associated negatively and significantly with the appropriate recall of 100% of indications in both univariate and multivariate analyses. Individuals who used 3 to 4, 5 to 6, and 7 or more medications had, respectively, 86%, 94%, and 96% less chance of appropriately recalling the indications of all medications in use (Table III).

Of 596 medications identified, 57.0% of the recalled indications were correct, 25.3% were incomplete, 6.7% were unknown, and 10.9% were incorrect. Thus, 82.3% and 17.6% of medication indications were appropriately and inappropriately recalled, respectively. The eight most used medication categories according to 2nd level ATC were agents acting on the renin-angiotensin system – C09 (11.7%), drugs used in diabetes – A10 (8.9%), diuretics – C03 (7.7%), antithrombotic agents – B01 (6.7%), lipid modifying agents – C10 (6.4%), beta blocking agents – C07 (5.5%), drugs for acid-related disorders – A02 (5.0%), and psychoanaleptics – N06 (5.0%).

Among these categories, the frequency of inappropriate recall of indications ranged from 9.1% (beta blocking agents) to 33.3% (psychoanaleptics). Although not statistically different, it is worth mentioning that 1 out of 3 psychoanaleptics were inappropriately recalled (Table IV).

Considering only medications whose indications were inappropriately recalled, the following categories showed higher frequencies of unmatching self-reported illnesses than matching ones: antithrombotic agents, drugs for acid-related disorders, and psychoanaleptics (Table V).

TABLE II – Thirteen most frequent self-reported illnesses (N = 117)

Disease	n (%)
High blood pressure	71 (60.7)
Diabetes mellitus	34 (29.1)
High blood cholesterol	28 (23.9)
Heart disease	18 (15.4)
Depression	11 (9.4)
Labyrinthitis	8 (6.8)
Thyroid disease	7 (6.0)
Stroke	6 (5.1)
Prostate disease	5 (4.3)
Cancer	4 (3.4)
Diverticulitis	4 (3.4)
Vertebral column disease	4 (3.4)
Peripheral vascular disease	4 (3.4)

TABLE III – Simple and multiple logistic regression models predicting the appropriate recall of 100% of indications (N = 117)

Model	Independent variable	Appropriate recall of indications, n (%)		OR (95% CI)	*P*
		<100%	100%		
Simple					
1	**Gender**				
	Male	21 (37.5)	28 (45.9)	1.00	
	Female	35 (62.5)	33 (54.1)	0.71 (0.34–1.48)	0.358
2	**Age, years**				
	60–69	19 (33.9)	27 (44.3)	1.00	
	70–79	24 (42.9)	24 (39.3)	0.70 (0.31–1.59)	0.398
	≥80	13 (23.2)	10 (16.4)	0.54 (0.20–1.49)	0.235

(continuing)

TABLE III – Simple and multiple logistic regression models predicting the appropriate recall of 100% of indications (N = 117)

Model	Independent variable	Appropriate recall of indications, n (%)		OR (95% CI)	*P*
Simple		<100%	100%		
3	**Educational level**				
	No education	28 (50.0)	29 (47.5)	1.00	
	Incomplete elementary	17 (30.4)	23 (37.7)	1.31 (0.58–2.95)	0.520
	Complete elementary to university	11 (19.6)	9 (14.8)	0.79 (0.28–2.20)	0.651
4*	**Terciles of income, MW‡**				
	1st (≤1.9)	23 (45.1)	13 (23.2)	1.00	
	2nd (2.0–2.8)	15 (29.4)	24 (42.9)	2.83 (1.11–7.23)	0.030
	3rd (>2.8)	13 (25.5)	19 (33.9)	2.59 (0.97–6.89)	0.057
5	**Living arrangement**				
	Alone	8 (14.3)	7 (11.5)	1.00	
	With others	48 (85.7)	54 (88.5)	1.29 (0.43–3.81)	0.650
6	**Self-perception of health**				
	Very good or good	26 (46.4)	36 (59.0)	1.00	
	Average	27 (48.2)	23 (37.7)	0.62 (0.29–1.30)	0.205
	Poor or very poor	3 (5.4)	2 (3.3)	0.48 (0.08–3.09)	0.441
7	**Medication administration**				
	Self-administration	42 (75.0)	53 (86.9)	1.00	
	By caregiver	14 (25.0)	8 (13.1)	0.45 (0.17–1.18)	0.105
8	**Number of medications**				
	1–2	2 (3.6)	24 (39.3)	1.00	
	3–4	11 (19.6)	17 (27.9)	0.13 (0.03–0.66)	0.014
	5–6	22 (39.3)	11 (18.0)	0.04 (0.01–0.21)	<0.001
	≥7	21 (37.5)	9 (14.8)	0.04 (0.01–0.18)	<0.001
9	**Payment for medication in use**				
	None (0%)	38 (67.9)	36 (59.0)	1.00	
	Some to all medications	18 (32.1)	25 (41.0)	1.47 (0.69–3.13)	0.323

(continuing)

TABLE III – Simple and multiple logistic regression models predicting the appropriate recall of 100% of indications (N = 117)

Model	Independent variable	Appropriate recall of indications, n (%)		OR (95% CI)	*P*
		<100%	100%		
Simple					
10*	**Identification of medications**				
	By name	29 (51.8)	28 (49.1)	1.00	
	By physical attributes (excluding name)	27 (48.2)	29 (50.9)	1.11 (0.53–2.33)	0.777
	Multiple				
11*†	**Terciles of income, MW‡**				
	1st (≤1.9)			1.00	
	2nd (2.0–2.8)			2.53 (0.85–7.57)	0.096
	3rd (>2.8)			3.02 (0.99–9.26)	0.053
	Medication administration				
	Self-administration			1.00	
	By caregiver			0.50 (0.15–1.65)	0.254
	Number of medications				
	1–2			1.00	
	3–4			0.14 (0.03–0.75)	0.022
	5–6			0.06 (0.01–0.34)	0.001
	≥7			0.04 (0.01–0.21)	<0.001

*Models 4 and 11 had 10 missing values, and model 10 had 4 missing values.
†Hosmer–Lemeshow goodness-of-fit statistic: $\chi^2 = 5.62$ ($P = 0.690$); $R^2 = 0.347$ (Nagelkerke).
‡304.7 USD per month (Brasil 2013, 2018).
CI, confidence interval; MW, minimum wage; OR, odds ratio.

TABLE IV – Appropriateness of recall of indications across the eight most frequent 2nd level ATC categories of medications (N = 340)

ATC code (2nd level)		Recall of indications, n (%)		P
		Appropriate	Inappropriate	
C09	Agents acting on the renin-angiotensin system	62 (88.6)	8 (11.4)	0.119
A10	Drugs used in diabetes	47 (88.7)	6 (11.3)	
C03	Diuretics	39 (84.8)	7 (15.2)	

(continuing)

TABLE IV – Appropriateness of recall of indications across the eight most frequent 2nd level ATC categories of medications (N = 340)

ATC code (2nd level)		Recall of indications, n (%)		P
		Appropriate	Inappropriate	
B01	Antithrombotic agents	35 (87.5)	5 (12.5)	
C10	Lipid modifying agents	31 (81.6)	7 (18.4)	
C07	Beta blocking agents	30 (90.9)	3 (9.1)	
A02	Drugs for acid-related disorders	27 (90.0)	3 (10.0)	
N06	Psychoanaleptics	20 (66.7)	10 (33.3)	

ATC, anatomical therapeutic chemical.

TABLE V – Correspondence between indications and self-reported present illnesses across the eight most frequent 2nd level ATC categories of medications whose indications were inappropriately recalled (N = 49)

ATC code (2nd level)		Correspondence to illnesses, n (%)		P
		Matching	Unmatching	
C09	Agents acting on the renin-angiotensin system	7 (87.5)	1 (12.5)	0.002
A10	Drugs used in diabetes	6 (100)	0	
C03	Diuretics	5 (71.4)	2 (28.6)	
B01	Antithrombotic agents	2 (40.0)	3 (60.0)	
C10	Lipid modifying agents	5 (71.4)	2 (28.6)	
C07	Beta blocking agents	3 (100)	0	
A02	Drugs for acid-related disorders	0	3 (100)	
N06	Psychoanaleptics	3 (30.0)	7 (70.0)	

ATC, anatomical therapeutic chemical.

DISCUSSION

The main findings revealed that the higher the number of medications in use, the lower the chance of appropriately recalling their indications. In addition, among the inappropriately recalled medications, antithrombotic agents, drugs for acid-related disorders, and psychoanaleptics were the categories with the highest percentages of unmatching medications.

The frequencies of appropriate recall of indications varied from 66.3% to 97.6% of patients in Brazilian studies (Silva, Schenkel, Mengue, 2000; Fröhlich, Dal Pizzol,

Mengue, 2010; Oenning, Oliveira, Blatt, 2011; Dresch, Amador, Heineck, 2016). Our findings are in agreement with those studies, even though they evaluated only one medication, had no constraints of age, and interviewed the patient right after having received medication counseling.

The knowledge of a drug indication is indispensable for promoting the rational use of medicines, since the correspondence between the indication and treating the disease is key to identifying medications that are used inappropriately (Salmasian *et al.*, 2015). Despite this, the influence of medication knowledge on adherence is scarcely investigated. A cross-sectional study conducted with 348 elderly patients showed that those who correctly recalled the indications of ≥75% of their medications were 3.7 times more likely to follow the prescribed regimen and 1.8 times more likely to follow the prescribed daily dose (Barat, Andreasen, Damsgaard, 2001).

Our finding that poly-medicated individuals presented lower odds of appropriately recalling drug indications was presented by a few other cross-sectional studies. Community-dwelling older individuals using ≥6 medications had lower odds of appropriately recalling the indications of all medications compared to those using ≤5 (Guénette, Moisan, 2011; Bosch-Lenders *et al.*, 2016). In Singapore, crude associations revealed that cancer outpatients aged ≥65 years using ≥4 medications were less knowledgeable of their indications than those using ≤3 medications (Si *et al.*, 2012). In the Netherlands, crude associations also showed that the higher the number of medications used, the lower the knowledge about drug indications in aged outpatients (Hartholt *et al.*, 2011). Our study showed that not only did the individuals using at least 4 or 6 medications have less knowledge about their indications, but also the individuals using 3 or more. Although polypharmacy is generally considered the daily use of 5 or more medications (Masnoon *et al.*, 2017), some authors consider the use of 3 or more to be so (Frazier, 2005).

The comparison between indications and self-reported illnesses revealed that when patients did not have the knowledge of the indications for antithrombotic agents, drugs for acid-related disorders, and psychoanaleptics, they also did not have the knowledge of the diseases they were treating. This exposes the patients' "double ignorance" of their clinical conditions, related not only to the unknowing why a medication is being used, but also to the complete unawareness of having a medical illness. Factors such as the patients' unwillingness to disclose their diseases and memory problems, and physicians' over-prescribing of unnecessary medications, may partially explain these issues. Nonetheless, we believe the main determinant of this is the lack of health professional-led patient counseling on present medical conditions and medication knowledge.

We believe the low knowledge of antithrombotics is due to the patients not understanding that they are used to prevent a disease rather than to treat an existing one, and also due to a lack of adequate counseling. These reasons were revealed in a community- and health facility-based survey performed with 4633 individuals in King County, United States. The study showed that 38.3% and 18.3% of the individuals with atherosclerotic disease did not mention lowering the risk of a heart attack or stroke, respectively, as the purpose of routine aspirin use. These patients also reported never having a discussion with a health professional about the risks and benefits of aspirin in preventing heart attack and stroke (Roth *et al.*, 2014).

With respect to drugs for acid-related disorders, evidence suggests that the prescription and use of proton pump inhibitors (PPIs) follow an inconsistent pattern, which might contribute to the lack of patient knowledge on these medications. A Swedish cross-sectional study found that 37.8% of community-dwelling aged individuals on long-term treatment with a PPI presented no underlying acid-related disease or drug-related reason to justify its use, such as esophagitis or long-term use of COX inhibitors (Wallerstedt *et al.*, 2017). Further, a qualitative English study revealed that physicians felt internally pressured to prescribe PPIs due to their effectiveness in alleviating symptoms, and patients were uncomfortable asking direct questions during a medical consultation (Grime, Pollock, Blenkinsopp, 2001).

The vast majority of psychoanaleptics used by the studied population were antidepressants. Depression in aged patients is commonly undetected and inadequately treated since they fail to voluntarily report depressive symptoms, generally attribute symptoms of depression to a physical illness, and may perceive depression as a moral weakness or character flaw rather than a disease (Ell, 2012). These elderly traits help us to understand reasons why the patients' awareness of depression and knowledge of antidepressants were low in our study. In addition, the prescription of antidepressants to geriatric patients is not only explained by the physician's technical knowledge of antidepressant pharmacotherapy, but more so by their beliefs and experiences regarding this type of treatment (Arean *et al.*, 2003). As a result, the prescription process becomes less rational, and in turn, it might

suppress physician-patient communication in order to avoid unreasonable justifications.

To the best of our knowledge, this is the first Brazilian publication that identified predictors of medication knowledge, and it is the first one to analyze data gathered in the JCAFB. This study is of great importance since it reflects a goal of the University of São Paulo—to offer the community extramural services that integrate teaching and research activities (Universidade de São Paulo, 1988).

Selection bias may have arisen due to the non-random inclusion of individuals and the exclusion of the ones with atypical clinical conditions (e.g., having no disease and using no medication, being debilitated and not able to communicate). The sample is not representative of the older inhabitants of the city of *Santa Cruz da Esperança*, and the results cannot be extrapolated to the general Brazilian population. Nevertheless, the clinical implications of this work can apply to other populations presenting similar conditions, such as the health system and individuals using multiple medications.

Counseling the elderly about the indications for medications should focus on those using 3 or more medications and those taking antithrombotic agents, drugs for acid-related disorders, and/or psychoanaleptics. One of the pharmacists' competencies is to provide medication counseling to patients in order to promote the rational, safe, and correct use of medications (American Society of Health-System Pharmacists, 1997), and Brazilian pharmacists are obligated by law to perform this activity (Brasil, 2014). We recommend that JCAFB develop this competency with their undergraduates and offer this activity to patients in its upcoming editions. Also, we suggest that the findings of this paper be made available to *Santa Cruz da Esperança* health professionals by the JCAFB staff.

More studies of this kind should be performed, since they integrate teaching, research, and extramural activities. There is a need for studies that investigate determinants of the knowledge of not only the indication, but also other information on medication. Still, it is of the greatest importance to conduct studies to demonstrate the effectiveness of educational interventions on patient medication knowledge.

CONCLUSION

The higher the number of medications in use, the lower the odds of appropriate recall of their indications. Also, the categories of antithrombotic agents, drugs for acid-related disorders, and psychoanaleptics that were inappropriately recalled showed a greater percentage of unmatching than matching medications.

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CONFLICTS OF INTEREST

No conflicts of interest are declared.

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