

Influence of pharmacists' opinions on their dispensing medicines without requirement of a doctor's prescription

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Abstract

Objective: To assess the influence of pharmacists' opinions on their dispensing medicines with a «medical prescription only» label without requiring a doctor's prescription.

Methods: We performed a cross-sectional study of 166 community pharmacies in northwest Spain. The opinions of pharmacists on the following were collected as independent variables through personal interview: a) physicians' prescribing practices; b) the pharmacist's qualifications to prescribe; c) the responsibility of the pharmacist regarding the dispensed drugs; d) the customer's qualifications for self-medication; and e) the pharmacist's perception of his or her own work. The dependent variable was the pharmacist's demand for a medical prescription for 5 drugs, which in Spain require a prescription. Multiple linear regression models were constructed.

Results: The response rate was 98.8%. A total of 65.9% of pharmacists reported dispensing antibiotics without a prescription. This percentage was 83.5% for nonsteroidal anti-inflammatory drugs, 46.3% for angiotensin-converting enzyme inhibitors, 13.4% for benzodiazepines, and 84.8% for oral contraceptives. Further results showed that pharmacists with a heavier workload and those who underestimated the physicians' qualifications to prescribe but overestimated their own qualifications to prescribe less frequently demanded medical prescriptions. In contrast, pharmacists who stressed the importance of their duty in rationalizing the consumption of drugs more frequently demanded medical prescriptions.

Conclusion: Our results suggest that to increase the quality of dispensing: a) the importance of the pharmacist's duty in controlling drug consumption should be stressed; b) pharmacies' workload should be optimized; and c) perceptions of physicians' prescribing practices among pharmacists should be improved.

Key words: Prescription requirement. Cross-sectional study. Community pharmacist.

Resumen

Objetivo: Evaluar la influencia de las opiniones de los farmacéuticos que no solicitan receta médica para dispensar fármacos que la requieren para su venta.

Métodos: Se ha llevado a cabo un estudio transversal sobre una muestra de 166 farmacéuticos de oficina de farmacia en la provincia de A Coruña. Las opiniones de los farmacéuticos, variables e independientes, fueron medidas mediante entrevista personal. Se valoraron las opiniones siguientes: a) prácticas prescriptoras de los médicos; b) cualificación de los farmacéuticos para prescribir; c) la responsabilidad de los farmacéuticos sobre los medicamentos dispensados; d) la cualificación de los clientes para automedicarse, y e) la percepción de los farmacéuticos sobre su trabajo. La exigencia de receta por parte del farmacéutico para 5 fármacos, que en España deben dispensarse con receta, fue la variable dependiente que se tuvo en cuenta. Se construyeron modelos de regresión múltiple.

Resultados: La participación fue del 98,8%. Un total del 65,9% de los farmacéuticos afirmaron dispensar antibióticos sin receta. Este porcentaje fue del 83,5% para los antiinflamatorios no esteroideos, 46,3% para los inhibidores de la enzima de conversión de la angiotensina, 13,4% para las benzodiazepinas y 84,8% para los anticonceptivos orales.

Además, los resultados muestran que los farmacéuticos con mayor carga de trabajo y los que califican peor la prescripción de los médicos, y que en mayor medida consideran que ellos mismos están capacitados para prescribir, exigen menos recetas médicas. Por el contrario, los farmacéuticos que otorgan mayor importancia a la racionalización en el consumo de fármacos exigen receta más frecuentemente.

Conclusión: Nuestros resultados indican que para el incremento en la calidad de la dispensación el sistema debería lograr: a) incrementar la importancia que los farmacéuticos otorgan al control y la racionalización del consumo de fármacos; b) adecuar la carga de trabajo de las farmacias, y c) mejorar la percepción que los farmacéuticos tienen de las pautas prescriptoras de los médicos.

Palabras clave: Exigencia de receta. Estudio transversal. Farmacéutico.

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Introduction

The professional activity of the community pharmacist has changed dramatically in the last decades. With the increase of ready-to-use drugs, the activity in a pharmacist's laboratory experienced a sharp decrease¹. Today, the main health-related activity of a pharmacist is to assure quality of dispensing^{2,3}.

Several studies associated quality of dispensing with factors such as pharmacist's age, educational background and social and demographic factors of the practice⁴⁻⁶. The pharmacists' opinions about their activity have been proposed as potential determinants of the quality of dispensing^{7,8}. However, these factors have been analyzed individually and so far, no comprehensive theoretical model has been proposed to explain their effect.

According to previous studies^{2,7-12}, we propose a model to investigate the opinions of the pharmacist that are associated with dispensing. Following this model, dispensing by the pharmacists is determined by their opinions about the prescription practice of the physicians, about their own competence to prescribe and about the pharmacists' responsibility in the control of consumption of medicines. The model also considers that the dispensing practice is subject to changes that are due to the workload of the pharmacist and to the socio-economic and socio-cultural characteristics of the customers.

The aim of this study is to assess the validity of the model proposed and to measure the effect on the quality of dispensing (measured as the requirement of a medical prescription to dispense) exerted by each opinion.

Methods

Design, population, sample

We carried out a cross-sectional study of the population of community pharmacists in Northwest Spain (n = 875, who work in 490 pharmacies). We used multistage cluster sampling (pharmacies are clusters and pharmacist are the population). Pharmacies were used as sampling units in the first stage (n = 150), and pharmacists were sampled at random within pharmacies. All pharmacists present during the interviewer's visit were selected (n = 166). The schedule of the visit to the pharmacy was selected at random during the opening hours.

Data collection

We collected data collection by means of a personal interview (February and March, 2002) with a closed

questionnaire, a method that can maximize participation¹³.

The interviews were carried out by a trained qualified interviewer (pharmacist). The questionnaire included four blocks of questions: a) socio-demographic variables and variables of the formation of the pharmacist; b) practice in relation to requirement of prescription to dispense different drugs; c) level of agreement with 24 items about prescription practice of the doctors, pharmacist's qualification to prescribe, responsibility of the pharmacist about dispensed drugs, clients' qualification for self-medication, and pharmacists' perception of their work, and d) services offered in the pharmacy and characteristics of its socio-cultural and socio-economic surroundings.

Independent variables

Pharmacists were asked about whether they had specialty training. In Spain, pharmacists may work either with or without specialty degrees. The three-year special training is officially regulated and takes place in pharmacies of the National Health Service. During the three year special training, the pharmacists work in a hospital pharmacy and they study clinical pharmacology, pharmacoepidemiology and clinical epidemiology. So, specialty is a dichotomous variable: yes or no.

Pharmacists were asked about their work status. Two situations were considered: a pharmacist who is the owner or responsible for the pharmacy and a pharmacist who is under contract. So, work status is a dichotomous variable: owner or responsible (yes or no).

The models also included two variables that measure the work environment of the pharmacist: number of pharmacists in the pharmacy: number of pharmacist who work in the pharmacy (this variable is used as a proxy of the customers per day of the pharmacy) and the socio-economic level of the population attended. The socio-economic level of the population was valued through the perceptions of the pharmacists in charge, by means of a 5-point Likert-like response scale ranging from «very low» to «very high».

The opinions were measured by asking the pharmacists about their level of agreement with 16 items (from 0 = completely in disagreement, to 10 = completely in agreement). The items were grouped in 5 topics: prescription practice of the doctors (3 items); pharmacist's qualification to prescribe (3 items); responsibility of the pharmacist about dispensed drugs (5 items); clients' qualification for self-medication (2 items), and pharmacists' perception of their work (3 items).

Dependent variable

Requirement. We gathered information on the requirement of a prescription to dispense 5 drugs (no requirement = 0; requirement = 1), which in Spain have to be dispensed with a prescription (drugs with «medical prescription only» label). These drugs included an oral contraceptive (Diane 35[®]), an angiotensin-converting enzyme (ACE) inhibitor (Capoten[®]), an antibiotic (Clamoxyl[®]), a benzodiazepine (Lexatin[®]), and a nonsteroidal anti-inflammatory drug (Voltaren[®]). Prescription requirement was considered for 5 drugs and two types of client: well-known customers (habitual customers) and unknown customers. So, the variable ranges from 0 (the pharmacist does not demand any prescription for any of the 5 drugs, either for well-known or unknown customers) to 10 (the pharmacist demands a prescription for the 5 drugs for all customers).

Statistical analysis

We measured the effect that each of the opinions exerts on the variable *requirement* through linear regression. We adjusted the multiple linear regression models for the variables: age of the pharmacist, work status, specialty, number of pharmacists in the pharmacy and perception of socio-economic level of the population. These variables were associated with the quality of dispensing in previous studies⁶.

Other candidates for potential confounders included sex, number of years of work, former work experience, additional degree of studies, and urban/rural environment. These covariates were introduced in the final model if their inclusion changed the coefficient of the main independent variable by more than 10%. SPSS package was used to analyze the data.

Results

Of the 150 pharmacies sampled, 4 were excluded (due to vacation closing). Out of the 146 remaining pharmacies, 123 participated (84.2%). Of the 166 pharmacists, 164 participated in the study (98.8%). Table 1 shows the characteristics of the participants. The mean age of the pharmacists was 40.2 years and their average work experience was 12.3 years. Our sample showed a proportion of 72% of women and a proportion of pharmacists with a specialist degree obtained through the National Health Service of 3.1%.

Table 2 shows the proportion of pharmacists that demanded a prescription for dispensing the five drugs considered, according to the type of client. Table 3 shows the variables in the multivariate model for the dependent variable *requirement*.

Table 1. Main characteristics of the study population

		95%CI
Age (mean)	40.2	38.5-41.9
Years of work in pharmacy (mean)	12.3	10.8-13.8
Proportion of women (%)	72.0	64.0-80.0
Proportion of specialist degree obtained through residency in National Health Service (%)	3.10	1.90-5.71
Proportion of owner or responsible of the pharmacy (%)	75.0	0.65-0.85
Number of pharmacist per pharmacy (mean)	1.35	1.15-1.50

Table 2. Requirement of medical prescription according to the type of drug and customer

	Percentage of pharmacists who require a prescription			
	Well-known customers		Unknown customers	
	%	95%CI	%	95%CI
Antibiotic (Clamoxyl [®])	34.1	26.9-41.1	59.1	51.6-66.7
Non-steroidal anti-inflammatory (Voltaren [®])	16.5	10.8-22.1	32.3	25.2-39.5
ACE inhibitor (Capoten [®]) ^a	53.7	46.0-61.1	68.3	61.2-75.4
Benzodiazepine (Lexatin [®])	86.6	81.4-91.8	98.2	94.7-99.6
Oral contraceptive (Diane [®])	15.2	9.7-20.7	26.2	19.5-33.0

^aAngiotensin-converting enzyme

Table 3. Regression coefficients (β) of the effect of the characteristics of the pharmacists on the variable requirement

	Univariate analysis		Multivariate analysis	
	β	p	β^*	p
Age of pharmacist	0.084	0.000	0.083	0.000
Owner or responsible ^a	-0.813	0.069	-0.949	0.032
Specialty ^a	1.751	0.121	2.220	0.028
Pharmacist per pharmacy	-0.644	0.004	-0.425	0.045
Perception of socio-economic level of the population ^b	-0.671	0.021	-0.586	0.016

*adjusted for the other independent variables included in this table.

^aYes = 1; no = 0.

^bMeasurements on Likert-like scale (0 = very low, to 5 = very high).

dent variable *requirement*. Age of the pharmacist, work status, specialty, number of pharmacists in the pharmacy, and perception of socio-economic level of the population, were associated to the quality of dispensing.

Table 4 presents the influence of the pharmacist's opinions on the variable *requirement*, the agreement with item (mean), the regression coefficients (β), the p-value and the proportion of multivariate explained variance (r^2). Pharmacists who have a heavier workload and who un-

Table 4. Influence of pharmacists' opinions on variable *requirement*. Agreement with item (mean), regression coefficients (β), p-value and proportion of multivariate explained variance (r^2)

Opinions	Mean ^a (95%CI)	Analysis				
		Univariate		Multivariate		
		β	p	r^2	β^b	p
<i>Prescription practice of the physicians</i>						
It1. Physicians prescribe too many drugs to pensioners	5.70 (5.38-6.02)	-0.851	< 0.001	0.32	-0.691	< 0.001
It2. Physicians prescribe too many drugs to workers	4.74 (4.44-5.02)	-0.508	0.017	0.27	-0.468	0.016
It3. Physicians do not stop enough to explain to their patients	6.32 (5.98-6.68)	-0.431	0.014		-0.154	0.352
<i>Pharmacist's qualification to prescribe</i>						
It4. In minor pathologies, the pharmacist is as prepared as a doctor to prescribe	5.62 (5.40-5.84)	-0.299	0.263	0.26	-0.421	0.048
It5. Pharmacists know the circumstances of patients better than doctors	5.16 (4.78-5.54)	-0.124	0.434		-0.146	0.311
It6. Patients ask a pharmacist more questions than a doctor	6.16 (5.82-6.50)	-0.360	0.039		-0.207	0.193
<i>Responsibility of pharmacist on dispensed drugs</i>						
It7. Never dispenses a drug with a «medical prescription only» label without a medical prescription	5.24 (5.04-5.46)	1.005	< 0.001	0.27	0.637	0.015
It8. The pharmacist must ask the customer what the drug is for if he/she does not have a prescription	5.94 (5.72-6.16)	0.580	0.027	0.28	0.651	0.006
It9. I check that the medicines taken by patients are compatible	6.38 (6.24-6.52)	0.371	0.378		0.685	0.079
It10. The pharmacist must ask what a drug has been prescribed for	4.61 (4.40-4.81)	0.240	0.309		0.200	0.270
It11. The pharmacist must be a health educator	6.38 (6.22-6.54)	0.064	0.860		0.249	0.444
<i>Clients' qualification for self-medication</i>						
It12. A drug prospectus can be understood by patients	4.08 (3.78-4.38)	-0.060	0.764		-0.029	0.870
It13. The population makes a rational use of medicines	3.46 (3.28-3.86)	-0.059	0.776		-0.160	0.386
<i>Pharmacists perception of their work</i>						
It14. I put up with an excessive workload	4.80 (4.60-5.02)	-0.443	0.127	0.26	-0.530	0.045
It15. I carry out my work correctly	6.06 (5.88-6.24)	-0.639	0.066		-0.557	0.079
It16. Professionally, I am very satisfied	5.64 (5.38-5.90)	-0.157	0.503		-0.107	0.626

^aDegree of agreement with the item: 0, completely in disagreement... 10, completely in agreement.

^bAdjusted for: age of pharmacist, work status, specialty, pharmacist per pharmacy and perception of socio-economic level of the population (not adjusted for other items included in the table).

derestimate the physicians' qualification to prescribe but overestimate their own qualification to prescribe required medical prescriptions less often. Those pharmacists who stress the importance of their duty in rationalizing the consumption of drugs demanded medical prescriptions more often.

Discussion

According to our model, the dispensing practice of the pharmacists is associated with their opinions on the prescription practice of the physicians, on the qualification of the pharmacist to prescribe, and on the perception of the pharmacist's responsibility toward the rational use of drugs.

Prescription practice of the doctors. The association between pharmacists' perception of the quality of the medical prescription and prescription requirement (table 4, items 1 and 2) reflects the doubts that pharmacists raise on the adequacy of the diagnosis and prescription by the physician. The pharmacist who is not con-

vinced by the adequacy of the physician's diagnosis will be more flexible towards the mandatory character of the prescription demand. These results are consistent with those found in Nepal in a study of excessive prescription and quality of dispensing⁹. The similarity of the results of these studies that were carried out in very different cultural environment and with different methodologies suggests that the relation between those variables is causal¹⁴.

Furthermore, the high degree of agreement of the pharmacists with the third affirmation «doctors do not stop enough to give explanations to their patients», (mean, 6.32; 95%CI, 5.98-6.68) and the negative correlation with the variable *requirement* show that the lower confidence in the clinical practice is associated with a higher independence in the behavior of the pharmacist.

Pharmacists' qualification to prescribe. We analyzed this determinant of the quality of dispensing by means of 3 items. The first and very explicit affirmation, «in minor pathologies, the pharmacist is as prepared as a doctor to prescribe» is negatively correlated with a lower demand of a medical prescription ($p = 0.048$). The items 5 and 6, in which the level of knowledge of the patient

is assessed, are also negatively associated with the variable *requirement*, although this association is not statistically significant.

These results show that the opinions of the pharmacists about their qualification to prescribe translate into dispensing practice⁶. This practice is facilitated by their large autonomy and the scarce control that exists over dispensing in Spain¹⁵. To improve the quality of dispensing, it is necessary to implement a stricter administrative control over dispensing. Pharmacist's prescription could be accepted only for over-the-counter drugs and continuation of treatments initially prescribed by a physician¹⁶.

Responsibility on dispensed drugs. The higher degree of agreement with affirmation 7 and 8 «never dispense a drug with a «medical prescription only» label without a medical prescription» and «the pharmacist must ask the client what the drug is for if he/she does not have a prescription» is significantly related to a higher demand of the medical prescription ($p = 0.015$ and $p = 0.006$, respectively). Those pharmacists who perceive as important their role in the rationalization of the consumption of drugs dispense in a stricter manner and demand every legal control^{15,17}. The higher degree of agreement with the remaining items (9, 10 and 11) is correlated positively but not statistically significantly with the variable *requirement*.

According to the proposed model, the interaction of the pharmacists with their environment will modify their dispensing practice. Our study measured two aspects: pharmacists' perception of their work and opinion on the qualification of the customer for self-medication.

The pharmacist's perception of the customers' qualification for self-medication is not significantly associated with prescription requirement. However, both items 1 and 2 show a negative correlation with the prescription requirement: those pharmacists who consider that «a drug prospectus can be understood by patients» and that «the population makes a rational use of medicines» tend to require the medical prescription less often. In addition, if we take into account that the model is adjusted for the pharmacists' perception of the socio-economical level of the population ($p = 0.016$), and that this level and the qualification for self-medication are highly correlated¹⁷, we cannot rule out the possibility that the lack of statistical significance is due to over-adjustment.

In relation to pharmacists' perception of their work, previous studies associated a large number of customers with less pharmaceutical advice^{10,11}. Other studies demonstrated the existence of a relation between large dispensing loads and the number of dispensing mistakes¹². Our results confirm those results, as item 14 «the pharmacist puts up with an excessive workload» shows a negative correlation with the variable *re-*

quirement, which is statistically significant ($p = 0.045$). This could be explained by the fact that those pharmacies with excessive workload function in a more commercial way, reducing the time a pharmacist spends with each customer and exerting less control over prescriptions⁶.

Previous studies found that a low degree of pharmaceutical advice is related to a high cultural degree of the population attended^{11,18}; a similar relation exists between medical prescriptions and the level of autonomy of the patient¹⁹⁻²¹.

Four possible limitations to this study have to be considered. First, since the current analysis is based on cross-sectional data, the validity of the conclusions could be limited by the difficulty in differentiating between cause and effect. However, in our study, those factors that are associated with quality dispensing are variables that are unlikely to change during the period of time in which the dependent variable is measured. A cross-sectional analysis provides then results that are close to those of a longitudinal one¹⁴. Second, the questionnaire has not been validated. Third, the measure of the prescription requirement of the pharmacist could be biased by the pharmacist's tendency to provide answers that are legally acceptable. The indicators are then probably too optimistic as far as it concerns the evaluation of the quality of dispensing. Finally, the quality of dispensing is assessed only by the prescription requirement. There are probably other indicators the measure of which was not feasible in our study²². In conclusion, our results suggest that, in order to increase the quality of dispensing, it is necessary: *a)* to stress the importance of the duty of the pharmacists in controlling the consumption of medicines; *b)* to optimize the pharmacies workload, and *c)* to improve the perception of the prescription practice of the physicians among pharmacists. It is also necessary to restrict drug prescription by the pharmacist to over-the-counter drugs and to continuation of treatments initially prescribed by a physician.

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