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Understanding antibiotics dispensed without medical prescription behaviour: a qualitative study on Spanish pharmacists

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1 *Understanding antibiotics dispensed without medical prescription*
2 *behaviour: a qualitative study on Spanish pharmacists.*

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ABSTRACT

Objective: To investigate community pharmacists' knowledge, attitudes, perceptions and habits with respect to antibiotic dispensing without medical prescription in Spain.

Methods: A qualitative research using focus groups method (FG) in Galicia (north-west Spain). FG sessions were conducted using a moderator. A topic guide was developed to lead the discussions, which were audio-recorded to facilitate data interpretation, and transcription. Proceedings were transcribed and interpreted by an independent researcher.

Setting: Community pharmacies in Galicia, region Norwest of Spain.

Participants: Thirty pharmacists agreed to participate in the study, and a total of 5 FG sessions were conducted with 2-11 pharmacists. We sought to ensure a high degree of heterogeneity in the composition of the groups to improve our study's external validity. Pharmacists' participation was made subject to no gender or age restrictions, and an effort was made to form FGs with pharmacists who were both owners and non-owners, provided in all cases that they were OCP-registered community pharmacists. For the purpose of conducting FG discussions, the basic methodological principle of allowing groups to attain their "own structural identity" was applied.

Main outcome measurements: Community pharmacists' habits and knowledge with regard to antibiotics, and identify the attitudes and/or factors that influence their being dispensed without medical prescription.

Results: Pharmacists attributed the problem of antibiotics dispensed without medical prescription and its relationship with antibiotic resistance to the following attitudes: external responsibility (doctors, dentists and the national health system); complacency; indifference; and lack of continuing education.

Conclusions: Despite being a problem, antibiotic dispensing without a medical prescription is still a common practice in community pharmacies in Galicia, Spain. This practice is attributed to complacency, indifference and lack of continuing education. The

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3 70 problem of resistance was ascribed to external responsibility, including that of patients,
4 71 physicians, dentists and the national health system.
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7 72
8 73 **Keywords:** Community pharmacy; Antibiotic dispensed; Public health; Infectious
9 74 diseases, qualitative research.
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12 76 **Strengths and limitations:**

- 13 77 1.- Results could also be compromised due to the intrinsic characteristics of the
14 78 pharmaceutical system in Spain.
15 79 2.- Focus group technique seeks the interaction of all the members of the group and
16 80 ensures identifies all dimensions of the problem investigated while simultaneously
17 81 increasing the subjective validity of each identified idea.
18 82 3.- Proceedings were transcribed and interpreted by an independent researcher. Any
19 83 points of disagreement were discussed and resolved by consensus.
20 84 4.- Possible lack of transferability of findings to health systems in other countries.
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85 INTRODUCTION

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87 Antibiotic resistance poses a major threat to clinical efficacy and an important problem for
88 global public health. Resistance is an inescapable consequence of antibiotic use [1] but
89 increases drastically with misuse and abuse. [2,3] It is thus imperative to improve
90 antibiotic use,[4] particularly in outpatient settings where 90% of consumption occurs.[5]

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92 One of the chief loopholes requiring attention is the dispensing of antibiotics without a
93 prescription, a major problem in some countries.[6] Whereas outpatient use of antibiotics
94 is restricted to prescription-based consumption in northern Europe, the USA and Canada,
95 access to antibiotics dispensed without medical prescription is nevertheless
96 commonplace in the rest of the world.[6,7,8] In Spain, dispensing antibiotics legally is done
97 only through prescriptions and the National Health System (NHS) covers the expenses of
98 almost the entire population.[9] Population density in Galicia is 92.6 inhab/km², similar to
99 the European average. Population density decreases as one moves inland from Atlantic
100 fringe. Consequently, distances to a given population's designated health centre tend to
101 increase. In this way, community pharmacists are the first point of contact for patients as
102 part of the health care team. Even so, up to one third of all outpatient antibiotics dispensed
103 are not prescribed by physicians.[2,10] Despite the fact that the EU encourages Member
104 States to restrict the use of systemic antibiotics and recommends that such drugs be
105 exclusively consumed under medical prescription, the dispensing of antibiotics without
106 prescription is still a common practice.[11]

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108 Accordingly, this study sought to conduct a qualitative analysis of community pharmacists'
109 knowledge, attitudes, perceptions and habits vis-à-vis antibiotic dispensing in Galicia,
110 Spain.

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112 METHODS

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114 *Study design*

115 We used the focus group (FG) method to ascertain pharmacists' attitudes, knowledge and
116 views concerning the dispensing and use of antibiotics in Galicia, Spain. The focus-group
117 (FG) method was used to explore community pharmacists' habits and knowledge with
118 regard to antibiotics, and identify the attitudes and/or factors that influence their being
119 dispensed. We decided to use the focus-group technique because the interaction of group
120 members tends to ensure that all the dimensions of the problem assessed are brought to

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3 121 light, information is simultaneously obtained on the subjective validity of various
4 122 members of the group, and in addition, it is a fast technique for generating such
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6 123 information.^[12] A theoretical model based on a previous systematic review was
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8 124 constructed for the purpose of drawing up an agenda, which was to be followed during the
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10 125 group sessions to facilitate the identification of attitudes and/or factors.
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127 The program for conducting meetings in the various FGs was designed with a dual
13 128 purpose, namely, to address: (i) the dispensing of antibiotics without a prescription; and
14 129 (ii) individual points of view regarding antibiotic-dispensing practices among pharmacists.
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16 130 Basing our study on a previous one undertaken on a population of physicians ^[13] and
17 131 adapting it to the specific characteristics of pharmacists, we defined the script in attempt
18 132 to cover the following factors/attitudes: complacency; indifference; external
19 133 responsibilities and lack of continuing education. For the purposes of clarity and ease of
20 134 comprehension, the four attitudes were defined in table 1.
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26 136 *Study population and settings*

27 137 In Spain, many drugs, including antibiotics, may only be dispensed under medical
28 138 prescription. The dispensing of drugs takes place in community pharmacies, which must
29 139 be owned by a registered pharmacist.
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34 141 The study population comprised community pharmacists in Galicia. Galicia is a region in
35 142 north-west Spain, with a population of around 2,779,000; almost 100% of these people
36 143 have access to health care delivery and 31% are pensioners. Population density in Galicia
37 144 is 92.6 inhab/km², similar to the European average. Population density decreases as one
38 145 moves inland from Atlantic fringe. Consequently, distances to a given population's
39 146 designated health centre tend to increase. It's in this way that pharmacists become the
40 147 first patient contact with the health system to consult their health problems.
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46 149 *Holding of focal group sessions*

47 150 With the aid of the Official Colleges of Pharmacists (OCP), project information was
48 151 distributed to all community pharmacists with a goal of encouraging participation in the
49 152 FGs. FG sessions were designed to be held with pre-established number of participants
50 153 between 5 to 10 pharmacists in attendance in Galicia.
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56 155 We sought to ensure a high degree of heterogeneity in the composition of the groups to
57 156 improve our study's external validity. Pharmacists' participation was made subject to no
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3 157 gender or age restrictions, and an effort was made to form FGs with pharmacists who
4 158 were both owners and non-owners, provided in all cases that they were OCP-registered
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6 159 community pharmacists. Sessions were chaired by a moderator who was a specialist in the
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8 160 field, following a script to ensure comparability among groups.
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11 162 For the purpose of conducting FG discussions, the basic methodological principle of
12 163 allowing groups to attain their "own structural identity" was applied.^[14] This afforded an
13 164 opportunity to discuss individual experiences and then start the group discussion. Only in
14 165 the latter stages of the FG sessions did the moderator introduce discussion topics
15 166 (following the guide) which had not been discussed.
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20 168 FG sessions took place at OCP meeting rooms. All FG sessions were recorded and lasted for
21 169 45-70 minutes. The sessions ended when the information being provided by the
22 170 participants yielded no new ideas. To prevent any possible interpretation biases, the
23 171 proceedings were transcribed by an independent researcher (MTT).
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26 173 *Ethical considerations*

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28 174 This study was approved by the Galician Clinical Research Ethics Committee. All the
29 175 pharmacists were informed that the FG sessions were to be recorded and transcribed, and
30 176 that no-one attending would be personally identified in the study results.
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33 178 *Analysis*

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35 179 Analysis of the transcripts was an iterative process undertaken by two independent
36 180 researchers (CGG and JVL). The researchers carefully read the transcriptions to structure
37 181 the data properly. This allowed for greater in-depth study and familiarisation with the
38 182 data, and decreased the likelihood of researcher bias. Thematic and discursive analysis
39 183 was used to examine the data, identifying different ideas and sentences that were obtained
40 184 from the different FGs and organisation of topics, with text excerpts serving as units of
41 185 analysis. The next step was the association between the groups' ideas and the pre-
42 186 established variables. The researchers then compared thematic analyses and analysed
43 187 emerging issues. Any points of disagreement were discussed and resolved by consensus. A
44 188 computerised format was not necessary used to process the results because was not
45 189 involved a large number of interviews.
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48 191 **RESULTS**

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3 193 Five FGs were formed. A total of 30 pharmacists -56.7% women, 43.3% men- participated
4 194 in the FGs. Our qualitative approach indicated that the influence of the following 4
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6 195 variables was considered relevant when it came to dispensing antibiotics over the counter.
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9 197 *External responsibility*

10 198 According to the conclusions of all the groups, one of the most influential variables at play
11 199 when a pharmacist dispensed an antibiotic without a prescription was external
12 200 responsibility, something that was seen to rest with two types of health professionals,
13 201 namely, physicians and dentists.
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17 203 "*I think that doctors also give them [antibiotics] out very easily.*" (FG5; W1). The external
18 204 responsibility of physicians was viewed by 100% of the FGs as being one of the most
19 205 influential variables behind the inappropriate dispensing of antibiotics (Table 2).
20 206 Likewise, another important variable was dentists' responsibility. All the FGs agreed that
21 207 the latter were in the habit of issuing a large number of prescriptions by telephone, i.e.,
22 208 "*Patients come in saying, I just talked to my dentist and he told me to take an antibiotic for 5*
23 209 *days, and that I must pass by his surgery.*" (FG3; M2). The groups also saw dentists as a
24 210 source of unnecessary antibiotic prescriptions, i.e., "*When dentists are going to remove a*
25 211 *tooth, they'll prescribe amoxicillin-clavulanate just like they prescribe ibuprofen.*" (FG1; M1)
26 212 (Table 2).
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29 214 The NHS was rated as being one of the main culprits. Pharmacists said that poor access
30 215 (space-time) to physicians was an influential factor when antibiotics were dispensed
31 216 without medical prescription, i.e., "*Another problem is all the time it takes to see a doctor:*
32 217 *accessibility is always faster at a pharmacy.*" (FG2; M2) (Table 2).
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35 219 Another important variable was the number of prescriptions prescribed in private
36 220 insurance versus the NHS, with most FGs reporting i.e., "*Ten times more antibiotics are*
37 221 *given in private insurance than in the NHS*" (FG2; M1).
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40 223 *Lack of continuing education*

41 224 Lack of continuing education was considered a relevant factor by 80% of the FGs (4/5) in
42 225 any case where a pharmacist dispensed antibiotics without a prescription (Table 2). As
43 226 shown above, lack of continuing education can be viewed from different standpoints, e.g.,
44 227 "*In specific diseases, there is a range of antibiotics and you start with the oldest.*" (FG3; W3).
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3 229 Age might be a confounding factor when analysing this variable, in that, "*Older pharmacists*
4 230 *give out antibiotics much more readily.*" (FG2, M1), and, "*Young people give out fewer*
5 231 *antibiotics.*" (FG3; W3).
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10 233 Lack of knowledge could also may be associated with the occurrence of antimicrobial
11 234 resistance. "*I think that issue of resistance has recently begun, not so long ago...*" (FG1, W2).
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14 236 *Complacency*

15 237 In the five FGs (100%), complacency was seen as an important variable (Table 2), i.e.,
16 238 "*Many people give them to retain patients.*" (FG4; W1). A contributory factor was the
17 239 different treatment accorded to regular and non-regular customers, i.e., "*Sometimes, I give*
18 240 *them to regular patients.*" (FG1; M1).
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23 242 In essence, complacency is yielding to pressure when a given patient wants an antibiotic:
24 243 "*When you know the customer, you try to convince him, but in the end, if he keeps on*
25 244 *insisting, you give it to him.*" (FG2; W1); and, "*If they come to get amoxicilin and then start*
26 245 *insisting, you give it to them.*" (FG5; W1). Indeed, 60% of the FGs regarded patient pressure
27 246 as an important factor when it came to dispensing antibiotics without a prescription. From
28 247 the viewpoint of pharmacists, the current percentage ranges from 5% to 20%.
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34 249 *Indifference*

35 250 Participants in two FGs laid emphasis on the lack of communication between community
36 251 pharmacists and other health-care professionals, chiefly physicians. The lack of
37 252 communication was indirectly associated with indifference, i.e., "*I give you amoxicillin-*
38 253 *clavulanate... but you go to your doctor and bring me the prescription. That way I feel I'm*
39 254 *blameless.*" (FG5; W2). Approaches such as this show mutual consent and indifference
40 255 among professionals, along with inappropriate attitudes to prescribing and dispensing
41 256 antibiotics.
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48 258 In a third FG, the following statements were made: "*The two professions are hardly involved*
49 259 *with each other, there are no close ties, so that we criticise our mistakes but don't value our*
50 260 *successes*"; and, "*Sometimes I dispense an inappropriate antibiotic because I don't have the*
51 261 *time to contact the patient's physician.*" (FG2; W1) (Table 1). Although a lack of
52 262 communication was identified, no suggestions for improvement were made.
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3 264 Indifference is other possible way to contribute to develop microbial resistances. "It is
4 265 *difficult to understand (patients) why resistance is generated, I mean, surely you speak to a*
5 266 *person of resistance and it sounds; Now, trying to explain how the resistance is generated,*
6 267 *you know, I mean, an effective way to make them understand that, if the antibiotic is taken*
7 268 *after and are not going to take effect"* (FG1, W2).
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12 270 There was a very important variable among pharmacists, namely, "*In addition to being*
13 271 *health-care professionals, we are also businessmen.*" (FG2; M2). Businessman status is an
14 272 extremely important factor when analysing the community-pharmacist profession in
15 273 Spain. This statement reflects it: "*Take it home. If you get better, don't take it, just bring it*
16 274 *back to me! ...and most people bring it back.*" (FG2; W1), a variable that could be defined as
17 275 "delayed dispensing". Delayed prescriptions are those that are written but are only used if
18 276 the symptoms do not improve.^[15] Delayed dispensing of antibiotics can thus be defined as
19 277 the dispensing of antibiotics for a patient, on the condition that they are not to be used
20 278 immediately but only in the event that the symptoms fail to improve.
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28 280 **DISCUSSION**

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30 282 This is the first qualitative study to be conducted in Spain that explores pharmacists'
31 283 knowledge of and attitudes to antibiotic use and its relationship with microbial resistance.
32 284 Our study shows that antibiotics dispensed without medical prescription was attributed to
33 285 complacency, indifference and lack of continuing education. The problem of resistance
34 286 was ascribed to lack of continuing education, indifference and external responsibility,
35 287 including patients, physicians, dentists and the NHS.
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43 289 We chose a qualitative design to perform this study because it helped us to better
44 290 understand the processes and realities of the problems currently confronting public
45 291 health.^[16] We were interested in a full, detailed description as well as concept analysis and
46 292 theory generation. Since there was a theory that we could corroborate and it was hoped
47 293 that a theory might arise from systematically collected data, grounded theory offered the
48 294 most appropriate method.^[17] The use of the focus group in the sphere of health is
49 295 indicated and validated where the aim is to investigate what participants think and why
50 296 they think like this, enabling data to be generated which could not be attained by other
51 297 techniques. ^[18, 19]
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3 299 Antibiotics dispensed without medical prescription is a problem in Spain. The statements
4 300 made by the different FGs corroborate what previous studies have concluded, namely, that
5 301 antibiotic dispensing without a prescription is a phenomenon that exists in Spain.^[20,21]
6 302 This conclusion was reached by all the FGs, notwithstanding the fact that there were small
7 303 variations among them in terms of pharmacists' opinions regarding the attitudes
8 304 responsible for this practice. Evidence has been put forward to show that the dispensing of
9 305 antibiotics without medical prescription rises to 30% in Spain.^[11] Our study reveal that,
10 306 from the viewpoint of pharmacists, the current percentage ranges from 5% to 20%,
11 307 although they thought that this percentage may have been underestimated.
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19 309 Our findings have been reinforced by studies conducted elsewhere. As in our case, in these
20 310 other settings a prescription is required to obtain an antibiotic, and a high percentage of
21 311 self-medication and antibiotics dispensed without medical prescription at community
22 312 pharmacies was likewise detected.^[22] Nevertheless, the estimates of the pharmacists who
23 313 participated in our FGs were lower than those of other studies conducted in the same
24 314 environment. The latter studies put the percentage of antibiotics dispensed without
25 315 prescription at 65.9%.^[23] These results were only to be expected, however, since the
26 316 pharmacists that we questioned about inappropriate dispensing were the very ones
27 317 responsible for doing this.
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34 319 Analysis of *lack of continuing education* showed a difference between professionals of
35 320 different ages. This situation may possibly be due to: (1) increased training of new
36 321 professionals in the antibiotics field, since it has been in the last ten years when the
37 322 problem of resistance has had major social, scientific and clinical repercussions; (2) the
38 323 fact that younger people are usually not pharmacy owners, which means that sales levels
39 324 have no direct impact on their salaries and that any request to dispense antibiotics
40 325 without a prescription will therefore be met with a firm refusal; and, (3) the fear factor,
41 326 possibly linked to the major fear felt by young pharmacists on dispensing antibiotics, even
42 327 though none of the FGs mentioned this variable.
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49 329 Studies conducted in other settings using the same methodology have reached similar
50 330 conclusions regarding the variables influencing the time taken to dispense an antibiotic, as
51 331 being the external responsibility of physicians and patients; however, they also attach
52 332 great importance to other variables, such as economic interest. ^[24] Economic interest is
53 333 strongly linked to variables such as patient loyalty, e.g., in our environment, the dispensing
54 334 of non-prescription antibiotics was found to increase in cases where patients were
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3 335 known.[22] A study conducted in our setting concluded that there was an association
4 336 between the pharmacist' age, the fact of owning a pharmacy, the patient's age and sex, and
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6 337 the workload in terms of higher or lower drug-dispensing levels. While these results
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8 338 cannot be directly extrapolated to our study because they would have to be restricted to
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10 339 antibiotic dispensing, they nonetheless show the variables which have an influence when a
11 340 drug is dispensed, and these have proved relevant in our study. [25] The fact that here in
12 341 Spain some community pharmacists are also business owners is a factor that has not been
13 342 taken into account in studies conducted on this population. This variable emerged directly
14 343 in one focus group and indirectly in others.
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18 345 *The difficulty of spatiotemporal access* to physicians was another variable that emerged in
19 346 the FGs. There is evidence in the literature to confirm that the proximity of a pharmacy
20 347 decreases the demand for primary care. [26] Lack of communication with other health
21 348 professionals, particularly physicians, due different variables such as the attitudes and
22 349 perceptions of different professionals, is something that has already been studied in our
23 350 setting. [27] Our study reinforces the idea of the need to improve pharmacist training
24 351 programmes and the relationships among health professionals.
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31 353 *Complacency* is a factor that has been studied by other research groups. The ease with
32 354 which an antibiotic is dispensed to a patient is a variable that other studies have
33 355 confirmed.[28] Our results are comparable with those yielded by other professionals in the
34 356 same setting. Conclusions reached about physicians show that the determinant factors of
35 357 antibiotic prescribing are fear, complacency, lack of continuing education and external
36 358 responsibility.[12] Factors such as lack of continuing education and external responsibility
37 359 show great influence in both studies, when it comes to prescribing and dispensing
38 360 antibiotics. Both studies report the external responsibility of other professionals as being
39 361 one of the main sources of malpractice, i.e., the notion of other professionals being
40 362 perceived as the main culprits. Indeed, external responsibility is a common variable
41 363 among health professionals, especially those who state that they have no time to give
42 364 explanations, and this is the reason for their malpractice. [29]
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51 366 Our results are also comparable to those of a recent qualitative study undertaken in
52 367 Portugal. This latter paper concludes that attitudes related to the problem of resistance
53 368 were attributed to the external responsibility of patients, physicians, other pharmacies
54 369 and veterinary use.[30] In our study, external responsibility was attributed to physicians,
55 370 dentists and the NHS. These results are extremely interesting because these attitudes,
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3 371 which were identified in two different countries, could open the way to designing specific
4 372 interventions at a Euro-regional Galicia-Northern Portugal level.
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8 374 *Strengths and weaknesses*

9 375 One limitation is the low number and the source of the participants (community
10 376 pharmacists from a specific area of Spain, who are not necessarily representative of all
11 377 community pharmacists working in Spain), something that restricts the study's
12 378 generalisation to other areas or countries. The generalisation of the results could also be
13 379 compromised due to the intrinsic characteristics of the pharmaceutical system in Spain,
14 380 governed by laws that may differ with respect to other countries. However, the study
15 381 conducted in Portugal yielded similar results.[29] Another possible study limitation is that
16 382 one of the FGs failed to attain the pre-established minimum number of participants.
17 383 Nevertheless, the conclusions drawn from this FG did not differ significantly from those of
18 384 the other groups. Among the study's advantages is the fact that interaction among FG
19 385 members generated ideas about antibiotics and resistances, which would otherwise have
20 386 been difficult to obtain.¹⁶ There are several previous studies which corroborate our
21 387 findings both in our and other settings, thereby increasing the reproducibility and validity
22 388 of our study.[^{12,21,25,28}]
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33 390 **CONCLUSIONS**

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35 392 Once attitudes/knowledge associated with inappropriate dispensing have been identified,
36 393 interventions can be designed to focus on these shortcomings, so as to improve antibiotic
37 394 use and contribute to minimising resistance.^[31] Pharmacotherapy-based interventions on
38 395 community pharmacists must be undertaken to prevent errors due to lack of knowledge.
39 396 This also implies the need to bear in mind the specific functions of pharmacists as health
40 397 professionals. Not only are publicity campaigns to reduce antibiotic use necessary, but
41 398 they need to be more direct if they are to have a major impact on health professionals and
42 399 the general population alike.
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49 401 **LIST OF ABBREVIATIONS**

- 50 402 1.- FG: focus groups
51 403 2.- M: Man
52 404 3.- NHS: National Health System
53 405 4.- OCP: Official Colleges of Pharmacists
54 406 5.- W:Woman
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3 409 **Contributorship statement:**

4 410 All authors have contributed:

5
6 411 - to the conception or design of the work; or the acquisition, analysis, or interpretation of
7
8 412 data for the work,

9 413 - drafting the work or revising it critically for important intellectual content;

10 414 - to final approval of the version to be published;

11 415 - and agreement to be accountable for all aspects of the work in ensuring that questions
12 416 related to the accuracy or integrity of any part of the work are appropriately investigated
13 417 and resolved.

14 418 Authors specific contribution:

15 419 1.- Vazquez-Lago JM: Conception and desing of the study. Desing and conduct focus
16 420 groups. Contribution to peer review of the transcription data. Analysis and interpretation
17 421 data. Write the different versions of the manuscript. Review final approval of the work.

18 422 2.- Gonzalez-Gonzalez C: Desing and conduct focus groups. Analysis and interpretation
19 423 data. Review final approval of the work.

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35 439 All published and unpublished study data are a set of everything you need and want to
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Table 1. Definition of studied attitudes.

External responsibility: the responsibility of another professional or the NHS for the sale of antibiotics without a medical prescription.

Complacency: the ease with which antibiotics are dispensed to customers. This is associated with better customer loyalty. Part of such complacency is due to patient pressure, which comes in the form of different reasons given by a patient in order to obtain antibiotics without a prescription.

Indifference: a lack of interest in terms of the patient's illness, dispensing procedures or helping resolve patient doubts.

Lack of knowledge upgrade: lack of knowledge of pharmacists.

Lack of knowledge can be seen from three different perspectives: 1) from a legal standpoint (ignorance of the legal consequences of dispensing antibiotics without a prescription); 2) from a public health standpoint (ignorance of the consequences of dispensing antibiotics without a prescription, whether for the individual (individual point of view) or for the community (ecological point of view), in terms of resistance, etc.); or , 3) from a pharmacological standpoint (pharmacists' ignorance of the pharmacotherapeutic issues of antibiotics).

review only

Table 2. Results of the focus groups

			FG I	FG II	FG III	FG IV	FG V
Factors influencing dispensing of non-prescription antibiotics	External Responsibility	Dentist	X	X	X	X	X
		Doctor	X	X	X	X	X
		NHS		X	X	X	X
	Complacency		X	X	X	X	X
	Lack of knowledge upgrade		X	X	X		X
Indifference					X	X	
Percentage of non-prescription antibiotics			15	5	5	20	10

FG = focus group

NHS = National Health System

DASH OF FOCUS GROUPS

Qualitative approach to the attitudes and knowledge of community pharmacists that condition inadequate prescription of antibiotics

CONTENT STRUCTURE OF PHARMACEUTICAL GROUPS

What do you think about the last campaigns on proper use of ATB carried out from the Ministry of Health?

Do you consider that there are still pharmacists who do not use ATB without prescription?

And 5 years ago? Was done? *Mention references that support this.*

What do you think could be the causes?

If you do not go out mention:

- *Difficulty of access to medical / health services*
- *By patient pressure. Sometimes aggressive attitudes, others because they can not stop going to work, because they are going to travel ...*
- *For customer loyalty.*
- *To advance time, "you already know what you are going to prescribe"*
- *And the pharmaceutical industry, has something to do?*
- *Any other reason?*

The use of ATB is now improving, the latest studies show that in Spain the consumption figures stabilize. What do you think may be the causes?

What do you think may be the% of pharmacies dispensed without prescription ATB?

BMJ Open

Knowledge, attitudes, perceptions and habits towards antibiotics dispensed without medical prescription: a qualitative study on Spanish pharmacists

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7 3 *Spanish pharmacists.*
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ABSTRACT

Objective: To investigate community pharmacists' knowledge, attitudes, perceptions and habits with respect to antibiotic dispensing without medical prescription in Spain.

Methods: A qualitative research using focus groups method (FG) in Galicia (north-west Spain). FG sessions were conducted using a moderator. A topic guide was developed to lead the discussions, which were audio-recorded to facilitate data interpretation, and transcription. Proceedings were transcribed and interpreted by an independent researcher used the Grounded Theory approach.

Setting: Community pharmacies in Galicia, region Norwest of Spain.

Participants: Thirty pharmacists agreed to participate in the study, and a total of 5 FG sessions were conducted with 2-11 pharmacists. We sought to ensure a high degree of heterogeneity in the composition of the groups to improve our study's external validity. Pharmacists' participation was made subject to no gender or age restrictions, and an effort was made to form FGs with pharmacists who were both owners and non-owners, provided in all cases that they were OCP-registered community pharmacists. For the purpose of conducting FG discussions, the basic methodological principle of allowing groups to attain their "own structural identity" was applied.

Main outcome measurements: Community pharmacists' habits and knowledge with regard to antibiotics, and identify the attitudes and/or factors that influence their being dispensed without medical prescription.

Results: Pharmacists attributed the problem of antibiotics dispensed without medical prescription and its relationship with antibiotic resistance to the following attitudes: external responsibility (doctors, dentists and the national health system); complacency; indifference; and lack of continuing education.

Conclusions: Despite being a problem, antibiotic dispensing without a medical prescription is still a common practice in community pharmacies in Galicia, Spain. This practice is attributed to complacency, indifference and lack of continuing education. The

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3 70 problem of resistance was ascribed to external responsibility, including that of patients,
4 71 physicians, dentists and the national health system.
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7 73 **Keywords:** Community pharmacy; Antibiotic dispensed; Public health; Infectious
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9 74 diseases, qualitative research.
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12 76 **Strengths and limitations:**

13
14 77 1.- The generalization of the results could also be compromised due to the intrinsic
15 78 characteristics of the pharmaceutical system in Spain. E.g. In the system of
16
17 79 pharmaceutical provision in Spain, antibiotics necessarily require a prior prescription by
18 80 the physician, all drugs must always be dispensed in pharmacies, and cannot be
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20 81 purchased in other types of establishments.
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22 82 2.- Focus group technique seeks the interaction of all the members of the group and
23 83 ensures identifies all dimensions of the problem investigated while simultaneously
24 84 increasing the subjective validity of each identified idea.
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27 85 3.- Proceedings were transcribed and interpreted by an independent researcher. Any
28 86 points of disagreement were discussed and resolved by consensus.
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30 87 4.- Possible lack of transferability of findings to health systems in other countries.
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88 INTRODUCTION

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90 Antibiotic resistance poses a major threat to clinical efficacy and an important problem for
91 global public health. Resistance is an inescapable consequence of antibiotic use ^[1] but
92 increases drastically with misuse and abuse. ^[2,3] It is thus imperative to improve antibiotic
93 use, ^[4] particularly in outpatient settings where 90% of consumption occurs. ^[5]

94
95 One of the chief loopholes requiring attention is the dispensing of antibiotics without a
96 prescription, a major problem in some countries.^[6] Whereas outpatient use of antibiotics
97 is restricted to prescription-based consumption in northern Europe, the USA and Canada,
98 access to antibiotics dispensed without medical prescription is nevertheless
99 commonplace in the rest of the world.^[6,7,8] In Spain, dispensing antibiotics legally is done
100 only through prescriptions and the National Health System (NHS) covers the expenses of
101 almost the entire population.^[9] Due to population density characteristics at our territory,
102 community pharmacists are the first point of contact for patients as part of the health care
103 team. Therefore, up to one third of all outpatient antibiotics dispensed are not prescribed
104 by physicians.^[3,10] Despite the fact that the EU encourages Member States to restrict the
105 use of systemic antibiotics and recommends that such drugs be exclusively consumed
106 under medical prescription, the dispensing of antibiotics without prescription is still a
107 common practice.^[11]

108
109 Accordingly, this study sought to conduct a qualitative analysis of community pharmacists'
110 knowledge, attitudes, perceptions and habits vis-à-vis antibiotic dispensing in Galicia,
111 Spain.

113 METHODS

115 *Study design*

116 We used the focus group (FG) method to ascertain pharmacists' attitudes, knowledge and
117 views concerning the dispensing and use of antibiotics in Galicia, Spain. The focus-group
118 (FG) method was used to explore community pharmacists' habits and knowledge with
119 regard to antibiotics, and identify the attitudes and/or factors that influence their being
120 dispensed. We decided to use the focus-group technique because the interaction of group
121 members tends to ensure that all the dimensions of the problem assessed are brought to
122 light, information is simultaneously obtained on the subjective validity of various
123 members of the group, and in addition, it is a fast technique for generating such

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3 124 information.^[12] A theoretical model based on a previous systematic review was
4 125 constructed for the purpose of drawing up an agenda and a dash of FG, ^[13] which was to be
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6 126 followed during the group sessions to facilitate the identification of attitudes and/or
7
8 127 factors.

9 128
10 129 The program for conducting meetings in the various FGs was designed with a dual
11 130 purpose, namely, to address: (i) the dispensing of antibiotics without a prescription; and
12 131 (ii) individual points of view regarding antibiotic-dispensing practices among pharmacists.
13 132 Basing our study on a previous one undertaken on a population of physicians ^[14] and
14 133 adapting it to the specific characteristics of pharmacists, we defined the script in attempt
15 134 to cover the following factors/attitudes: complacency; indifference; external
16 135 responsibilities and lack of continuing education. For the purposes of clarity and ease of
17 136 comprehension, the four attitudes were defined in table 1.

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24 138 **Table 1. Definition of studied attitudes.**

External responsibility: the responsibility of another professional or the NHS for the sale of antibiotics without a medical prescription.

Complacency: the ease with which antibiotics are dispensed to customers. This is associated with better customer loyalty. Part of such complacency is due to patient pressure, which comes in the form of different reasons given by a patient in order to obtain antibiotics without a prescription.

Indifference: a lack of interest in terms of the patient's illness, dispensing procedures or helping resolve patients doubts.

Lack of continuing education: Lack of knowledge of pharmacist due to a bad continuing education and bad knowledge upgrade.

Lack of continuing education can be seen from three different perspectives: 1) from a legal standpoint (ignorance of the legal consequences of dispensing antibiotics without prescription); 2) from a public health standpoint (ignorance of the consequences of dispensing antibiotics without a prescription, whether for the individual –individual point of view- or the community –ecological point of view- in terms of resistances...); or 3) from a pharmacological standpoint (pharmacists' ignorance of the pharmacotherapeutic issues of antibiotics).

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45 141 *Study population and settings*

46 142 In Spain, many drugs, including antibiotics, may only be dispensed under medical
47 143 prescription. The dispensing of drugs takes place in community pharmacies, which must
48 144 be owned by a registered pharmacist.

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52 146 The study population comprised community pharmacists in Galicia. Galicia is a region in
53 147 north-west Spain, with a population of around 2,779,000; almost 100% of these people
54 148 have access to health care delivery and 31% are pensioners. Population density in Galicia
55 149 is 92.6 inhab/km², similar to the European average. Population density decreases as one

1
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3 150 moves inland from Atlantic fringe. Consequently, distances to a given population's
4 151 designated health centre tend to increase. It's in this way that pharmacists become the
5
6 152 first patient contact with the health system to consult their health problems.
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9 154 *Holding of focal group sessions*

10 155 In order to work in a community pharmacy in Spain, it is compulsory to be collegiate at
11 156 Official Colleges of Pharmacists (OCP). Using the "snowball method", the OCP send project
12 157 information in the normal manner to all community pharmacists. Community pharmacists
13 158 who were interested in FGs participation, had to send a mail to researcher team. FGs
14 159 sessions were designed to be held with pre-established number of participants between 5
15 160 to 10 pharmacists in attendance in Galicia.
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21 162 We sought to ensure a high degree of heterogeneity in the composition of the groups to
22 163 improve our study's external validity. Pharmacists' participation was made subject to no
23 164 gender or age restrictions, and an effort was made to form FGs with pharmacists who
24 165 were both owners and non-owners, provided in all cases that they were OCP-registered
25 166 community pharmacists. Sessions were chaired by a moderator who was a specialist in the
26 167 field, following a script to ensure comparability among groups.
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32 169 For the purpose of conducting FG discussions, the basic methodological principle of
33 170 allowing groups to attain their "own structural identity" was applied.^[15] This afforded an
34 171 opportunity to discuss individual experiences and then start the group discussion. Only in
35 172 the latter stages of the FG sessions did the moderator introduce discussion topics
36 173 (following the guide) which had not been discussed.
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40 174
41 175 FG were conducted by principal research (JVL). This researcher has specific training for
42 176 development research with qualitative methodology. FG sessions took place at OCP
43 177 meeting rooms. Only the investigator/moderator and the participants were present in the
44 178 development of the FG. All FG sessions were audio-recorded and lasted for 45-70 minutes.
45 179 The investigator/moderator also collected field notes in relation to the
46 180 attitudes/factors/knowledges explored. The sessions ended when the information being
47 181 provided by the participants yielded no new ideas. To prevent any possible interpretation
48 182 biases, the proceedings were transcribed by an independent researcher (MTT).
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55 184 *Ethical considerations*
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185 This study was approved by the Galician Clinical Research Ethics Committee. All the
 186 pharmacists were informed that the FG sessions were to be recorded and transcribed, and
 187 that no-one attending would be personally identified in the study results.

188

189 *Analysis*

190 We used the Grounded Theory Approach.^[16] Analysis of the transcripts was an iterative
 191 process undertaken by two independent researchers (CGG and JVL). The researchers
 192 carefully read the transcriptions to structure the data properly. This allowed for greater
 193 in-depth study and familiarisation with the data, and decreased the likelihood of
 194 researcher bias. Thematic and discursive analysis was used to examine the data,
 195 identifying different ideas and sentences that were obtained from the different FGs and
 196 organisation of topics, with text excerpts serving as units of analysis. The next step was the
 197 association between the groups' ideas and the pre-established variables. The researchers
 198 then compared thematic analyses and analysed emerging issues. Any points of
 199 disagreement were discussed and resolved by consensus. Not was used an informatics
 200 software during analysis process because a large number of focus groups were not
 201 performed.

202

203 **RESULTS**

204

205 Five FGs were formed. 30 pharmacists -56.7% women, 43.3% men- contacted the
 206 research team and all of them were invited to participate in focal groups. Other
 207 characteristics of the FG can be seen in Table 2.

208

209 **Table 2. Characteristics of focus group composition.**

Focus group (n)	Sex Number (%)		Age Range	Practice Status Owner Number (%)	
	Women (W)	Men (M)			
I (9)	7 (77,8)	2 (22,2)	27-32 years	0 (0)	210 213
II (7)	2 (28,6)	5 (71,4)	42-58 years	3 (42,9)	214
III (7)	4 (57,1)	3 (42,9)	38-50 years	2 (28,6)	215
IV (5)	2 (40,0)	3 (60,0)	45-60 years	1 (20)	216
V (2)	2 (100)	0 (0)	42-43 years	0 (0)	217

218

219

220 Our qualitative approach indicated that the influence of the following 4 variables was
 221 considered relevant when it came to dispensing antibiotics over the counter. (View table
 222 3).

223

224 **Table 3. Factors that influence antibiotic dispensing.**

Indifference	due lack of communication with patient's physicians
	due to lack of patient follow-up
	due it is prioritized to sell the antibiotic
External responsibility	of patient (inappropriate use)
	of physicians (prescriptions without indication)
	of health care system (private insurances)
	of other professionals (mainly dentists)
Complacency	pressure exerted by customers to have the symptoms speedily resolved to prevent regular customers consulting another pharmacy
Lack of continuing education	dispensing habit

225

226

227 *External responsibility*

228 According to the conclusions of all the groups, one of the most influential variables at play
 229 when a pharmacist dispensed an antibiotic without a prescription was external
 230 responsibility, something that was seen to rest with two types of health professionals,
 231 namely, physicians and dentists.

232

233 *"I think that doctors also give them [antibiotics] out very easily."* (FG5, W1). The external
 234 responsibility of physicians was viewed by 100% of the FGs as being one of the most
 235 influential variables behind the inappropriate dispensing of antibiotics.

236 Likewise, another important variable was dentists' responsibility. All the FGs agreed that
 237 the latter were in the habit of issuing a large number of prescriptions by telephone, i.e.,

238 *"Patients come in saying, I just talked to my dentist and he told me to take an antibiotic for 5*
 239 *days, and that I must pass by his surgery."* (FG3; M2). The groups also saw dentists as a
 240 source of unnecessary antibiotic prescriptions, i.e., *"When dentists are going to remove a*
 241 *tooth, they'll prescribe amoxicillin-clavulanate just like they prescribe ibuprofen."* (FG1; M1).

242

243 The NHS was rated as being one of the main culprits. Pharmacists said that poor access
 244 (space-time) to physicians was an influential factor when antibiotics were dispensed
 245 without medical prescription, i.e., *"Another problem is all the time it takes to see a doctor:*
 246 *accessibility is always faster at a pharmacy."* (FG2; M2).

247

248 Another important variable was the number of prescriptions prescribed in private
249 insurance versus the NHS, with most FGs reporting i.e., "Ten times more antibiotics are
250 given in private insurance than in the NHS" (FG2; M1).

251

252 *Lack of continuing education*

253 *Lack of continuing education was considered a relevant factor by 80% of the FGs (4/5) in*
254 *any case where a pharmacist dispensed antibiotics without a prescription. As shown above,*
255 *lack of continuing education can be viewed from different standpoints, e.g., "In specific*
256 *diseases, there is a range of antibiotics and you start with the oldest." (FG3; W3). In this case,*
257 *it shows the lack of knowledge about what to start with the first-line antibiotic, that is not*
258 *always the oldest.*

259

260 *Age is also referred to as a key variable to explain the existence of lack of continuing*
261 *education, being older pharmacists which exhibit this deficit. "Older pharmacists give out*
262 *antibiotics much more readily." (FG2, M1), and, "Young people give out fewer antibiotics."*
263 *(FG3; W3).*

264

265 *Another aspect mentioned and related to lack of continuing education is the consideration of*
266 *the problem of resistance as a recent phenomenon. "I think that issue of resistance has*
267 *recently begun, not so long ago..." (FG1, W2).*

268

269 *Complacency*

270 In the five FGs (100%), complacency was seen as an important variable, i.e., "Many people
271 give them to retain patients." (FG4; W1). A contributory factor was the different treatment
272 accorded to regular and non-regular customers, i.e., "Sometimes, I give them to regular
273 patients." (FG1; M1).

274

275 In essence, complacency is yielding to pressure when a given patient wants an antibiotic:
276 "When you know the customer, you try to convince him, but in the end, if he keeps on
277 insisting, you give it to him." (FG2; W1); and, "If they come to get amoxicilin and then start
278 insisting, you give it to them." (FG5; W1). Indeed, 60% of the FGs regarded patient pressure
279 as an important factor when it came to dispensing antibiotics without a prescription. From
280 the viewpoint of pharmacists, the current percentage ranges from 5% to 20%.

281

282 *Indifference*

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3 283 *Participants indicate the existence of indifference and mutual consent between community*
4 284 *pharmacists and other health-care professionals, chiefly physicians, along with*
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6 285 *inappropriate attitudes to prescribing and dispensing antibiotics; noting the lack of*
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8 286 *communication as indirectly associated with indifference, i.e., "I give you amoxicillin-*
9 287 *clavulanate... but you go to your doctor and bring me the prescription. That way I feel I'm*
10 288 *blameless." (FG5; W2).*
11

12 289
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14 290 *In a third FG, the following statements were made: "The two professions are hardly involved*
15 291 *with each other, there are no close ties, so that we criticise our mistakes but don't value our*
16 292 *successes"; and, "Sometimes I dispense an inappropriate antibiotic because I don't have the*
17 293 *time to contact the patient's physician." (FG2; W1) (Table 1). In this case they identify*
18 294 *communication difficulties as the cause of inadequate dispensation but show indifference*
19 295 *when solving the problem.*
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23 297 *We also appreciate the existence of Indifference when they must transmit adequate*
24 298 *information about the problems of resistances to customers who go to the pharmacy to buy*
25 299 *antibiotics, well, Indifference is other possible way to contribute to develop microbial*
26 300 *resistances. "Ok, I see, but this is about that it is difficult for them (people) to understand, I*
27 301 *mean, surely if you talk to somebody about resistance it will sound familiar to him, but trying*
28 302 *to explain him how resistances are generated..., you know what I mean, an effective way to*
29 303 *make them understand that if they take that, or those, antibiotic without needing it, it's not*
30 304 *going to take effect later on" (FG1, W2).*
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32 305
33
34 306 *Finally, another aspect that is framed within the Indifference is the fact that in Spain the*
35 307 *pharmacist is also a businessman. "In addition to being health-care professionals, we are also*
36 308 *businessmen." (FG2; M2), so it is concerned, in addition to the health of the individual, by the*
37 309 *profitability of the business. This statement reflects it: "Take it home. If you get better, don't*
38 310 *take it, just bring it back to me! ...and most people bring it back." (FG2; W1). This sentence*
39 311 *also refers to what we call "delayed dispensing" which is related to the delayed prescriptions.*
40 312 *Delayed prescriptions are those that are written but are only used if the symptoms do not*
41 313 *improve.^[17] Delayed dispensing of antibiotics can thus be defined as the dispensing of*
42 314 *antibiotics for a patient, on the condition that they are not to be used immediately but only*
43 315 *in the event that the symptoms fail to improve.*
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46 317 **DISCUSSION**

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3 319 This is the first qualitative study to be conducted in Spain that explores pharmacists'
4 320 knowledge of and attitudes to antibiotic use and its relationship with microbial resistance.
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6 321 Our study shows that antibiotics dispensed without medical prescription was attributed to
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8 322 complacency, indifference and lack of continuing education. The problem of resistance
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10 323 was ascribed to lack of continuing education, indifference and external responsibility,
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12 324 including patients, physicians, dentists and the NHS.

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14 325
15 326 We chose a qualitative design to perform this study because it helped us to better
16 327 understand the processes and realities of the problems currently confronting public
17 328 health.^[18] We were interested in a full, detailed description as well as concept analysis and
18 329 theory generation. Since there was a theory that we could corroborate and it was hoped
19 330 that a theory might arise from systematically collected data, grounded theory offered the
20 331 most appropriate method.^[19] The use of the focus group in the sphere of health is
21 332 indicated and validated where the aim is to investigate what participants think and why
22 333 they think like this, enabling data to be generated which could not be attained by other
23 334 techniques.^[20,21]

24
25 335
26 336 Antibiotics dispensed without medical prescription is a problem in Spain. The statements
27 337 made by the different FGs corroborate what previous studies have concluded, namely, that
28 338 antibiotic dispensing without a prescription is a phenomenon that exists in Spain.^[22,23]
29 339 This conclusion was reached by all the FGs, notwithstanding the fact that there were small
30 340 variations among them in terms of pharmacists' opinions regarding the attitudes
31 341 responsible for this practice. Evidence has been put forward to show that the dispensing of
32 342 antibiotics without medical prescription rises to 30% in Spain.^[13] Our study reveal that,
33 343 from the viewpoint of pharmacists, the current percentage ranges from 5% to 20%,
34 344 although they thought that this percentage may have been underestimated.

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36 345
37 346 Our findings have been reinforced by studies conducted elsewhere. As in our case, in these
38 347 other settings a prescription is required to obtain an antibiotic, and a high percentage of
39 348 self-medication and antibiotics dispensed without medical prescription at community
40 349 pharmacies was likewise detected.^[24] Nevertheless, the estimates of the pharmacists who
41 350 participated in our FGs were lower than those of other studies conducted in the same
42 351 environment. The latter studies put the percentage of antibiotics dispensed without
43 352 prescription at 65.9%.^[25] These results were only to be expected, however, since the
44 353 pharmacists that we questioned about inappropriate dispensing were the very ones
45 354 responsible for doing this.

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4 356 Analysis of *lack of continuing education* showed a difference between professionals of
5
6 357 different ages. This situation may possibly be due to: (1) increased training of new
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8 358 professionals in the antibiotics field, since it has been in the last ten years when the
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10 359 problem of resistance has had major social, scientific and clinical repercussions; (2) the
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12 360 fact that younger people are usually not pharmacy owners, which means that sales levels
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14 361 have no direct impact on their salaries and that any request to dispense antibiotics
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16 362 without a prescription will therefore be met with a firm refusal; and, (3) the fear factor.
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18 363 This factor are possibly linked to the major fear felt by young pharmacists on dispensing
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20 364 antibiotics, just as it was found in a study about physicians performed in our environment
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22 365 [14]. Even though none of the FGs mentioned this variable, so it is necessary to interpret
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24 366 this very cautiously.

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28 368 Studies conducted in other settings using the same methodology have reached similar
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30 369 conclusions regarding the variables influencing the time taken to dispense an antibiotic, as
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32 370 being the external responsibility of physicians and patients; however, they also attach
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34 371 great importance to other variables, such as economic interest. [26] Economic interest is
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36 372 strongly linked to variables such as patient loyalty, e.g., in our environment, the dispensing
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38 373 of non-prescription antibiotics was found to increase in cases where patients were
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40 374 known. [23] A study conducted in our setting concluded that there was an association
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42 375 between the pharmacist' age, the fact of owning a pharmacy, the patient's age and sex, and
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44 376 the workload in terms of higher or lower drug-dispensing levels. While these results
45
46 377 cannot be directly extrapolated to our study because they would have to be restricted to
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48 378 antibiotic dispensing, they nonetheless show the variables which have an influence when a
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50 379 drug is dispensed, and these have proved relevant in our study. [27] The fact that here in
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52 380 Spain some community pharmacists are also business owners is a factor that has not been
53
54 381 taken into account in studies conducted on this population. This variable emerged directly
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56 382 in one focus group and indirectly in others.

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60 384 The *difficulty of spatiotemporal access* to physicians was another variable that emerged in
61
62 385 the FGs. There is evidence in the literature to confirm that the proximity of a pharmacy
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64 386 decreases the demand for primary care. [28] Lack of communication with other health
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66 387 professionals, particularly physicians, due different variables such as the attitudes and
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68 388 perceptions of different professionals, is something that has already been studied in our
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70 389 setting. [29] Our study reinforces the idea of the need to improve pharmacist training
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72 390 programmes and the relationships among health professionals.

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4 392 *Complacency* is a factor that has been studied by other research groups. The ease with
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6 393 which an antibiotic is dispensed to a patient is a variable that other studies have
7
8 394 confirmed.^[30] Our results are comparable with those yielded by other professionals in the
9
10 395 same setting. Conclusions reached about physicians show that the determinant factors of
11
12 396 antibiotic prescribing are fear, complacency, lack of continuing education and external
13
14 397 responsibility.^[13] Factors such as lack of continuing education and external responsibility
15
16 398 show great influence in both studies, when it comes to prescribing and dispensing
17
18 399 antibiotics. Both studies report the external responsibility of other professionals as being
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20 400 one of the main sources of malpractice, i.e., the notion of other professionals being
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22 401 perceived as the main culprits. Indeed, external responsibility is a common variable
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24 402 among health professionals, especially those who state that they have no time to give
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26 403 explanations, and this is the reason for their malpractice. ^[13]

27 404
28 405 Our results are also comparable to those of a recent qualitative study undertaken in
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30 406 Portugal. This latter paper concludes that attitudes related to the problem of resistance
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32 407 were attributed to the external responsibility of patients, physicians, other pharmacies
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34 408 and veterinary use.^[31] In our study, external responsibility was attributed to physicians,
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36 409 dentists and the NHS. These results are extremely interesting because these attitudes,
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38 410 which were identified in two different countries, could open the way to designing specific
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40 411 interventions at a Euro-regional Galicia-Northern Portugal level.

412 413 *Strengths and weaknesses*

414 One limitation is the low number and the source of the participants (community
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416 pharmacists from a specific area of Spain, who are not necessarily representative of all
417
418 community pharmacists working in Spain), something that restricts the study's
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420 generalisation to other areas or countries. The generalisation of the results could also be
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422 compromised due to the intrinsic characteristics of the pharmaceutical system in Spain,
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424 governed by laws that may differ with respect to other countries. However, the study
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426 conducted in Portugal yielded similar results.^[31] Anyway, qualitative methods can seek to
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428 obtain a range of views, generalisability of findings is not usually an expected attribute of
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430 this type of research. Similarly, the nature of qualitative data is that it is jointly constructed
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432 by the researcher and participants and cannot be viewed as objective accounts.^[16,20]
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434 Another possible study limitation is that one of the FGs failed to attain the pre-established
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436 minimum number of participants. Nevertheless, the conclusions drawn from this FG did
437
438 not differ significantly from those of the other groups. Among the study's advantages is the

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3 427 fact that interaction among FG members generated ideas about antibiotics and resistances,
4 428 which would otherwise have been difficult to obtain.^[16] There are several previous studies
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6 429 which corroborate our findings both in our and other settings, thereby increasing the
7
8 430 reproducibility and validity of our study.^[13,22,26,29]
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431

432 **CONCLUSIONS**

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434 Once attitudes/knowledge associated with inappropriate dispensing have been identified,
435 interventions can be designed to focus on these shortcomings, so as to improve antibiotic
436 use and contribute to minimising resistance.^[32] Pharmacotherapy-based interventions on
437 community pharmacists must be undertaken to prevent errors due to lack of knowledge.
438 This also implies the need to bear in mind the specific functions of pharmacists as health
439 professionals. Not only are publicity campaigns to reduce antibiotic use necessary, but
440 they need to be more direct if they are to have a major impact on health professionals and
441 the general population alike.

442

443 **LIST OF ABBREVIATIONS**

- 444 1.- FG: focus groups
445 2.- M: Man
446 3.- NHS: National Health System
447 4.- OCP: Official Colleges of Pharmacists
448 5.- W:Woman
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451 ***Contributorship statement:***

452 All authors meet the ICMJE criteria and all authors have contributed:
453 - to the conception or design of the work; or the acquisition, analysis, or interpretation of
454 data for the work,
455 - drafting the work or revising it critically for important intellectual content;
456 - to final approval of the version to be published;
457 - and agreement to be accountable for all aspects of the work in ensuring that questions
458 related to the accuracy or integrity of any part of the work are appropriately investigated
459 and resolved.

460 Authors specific contribution:

- 461 - Vazquez-Lago JM: Conception and design of the study. Design and conduct focus
462 groups. Contribution to peer review of the transcription data. Analysis and
463 interpretation data. Write the different versions of the manuscript. Review final
464 approval of the work.

- 1
2
3 465 - Gonzalez C: Design and conduct focus groups. Analysis and interpretation data.
4 466 Review final approval of the work.
5
6 467 - Zapata-Cachafeiro M: Write the different versions of the manuscript. Review final
7 468 approval of the work.
8
9 469 - Lopez-Vazquez P: Analysis and interpretation data. Contribution to peer review of
10 470 the transcription data.
11
12 471 - Taracido M: Transcription of audio data.
13
14 472 - Lopez A: Conception and design of the study. Design the focus groups. Contribution
15 473 to peer review of the transcription data.
16
17 474 - Figueiras A: Drafting the work and revising it critically for important intellectual
18 475 content. Final approval of the version to be published.
19
20 476

21
22 477 ***Competing interest:***

23 478 All Authors of this paper declares no conflicts of interest.
24
25 479

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27
28 481 There has been no public or private funding for the conduct and publication of this study.
29
30 482

31 483 ***Data sharing statement:***

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33 484 All published and unpublished study data are a set of everything you need and want to
34 485 check or reproduce our research in a different field than ours.
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For peer review only

DASH OF FOCUS GROUPS

Qualitative approach to the attitudes and knowledge of community pharmacists that condition inadequate prescription of antibiotics

CONTENT STRUCTURE OF PHARMACEUTICAL GROUPS

What do you think about the last campaigns on proper use of ATB carried out from the Ministry of Health?

Do you consider that there are still pharmacists who do not use ATB without prescription?

And 5 years ago? Was done? *Mention references that support this.*

What do you think could be the causes?

If you do not go out mention:

- *Difficulty of access to medical / health services*
- *By patient pressure. Sometimes aggressive attitudes, others because they can not stop going to work, because they are going to travel ...*
- *For customer loyalty.*
- *To advance time, "you already know what you are going to prescribe"*
- *And the pharmaceutical industry, has something to do?*
- *Any other reason?*

The use of ATB is now improving, the latest studies show that in Spain the consumption figures stabilize. What do you think may be the causes?

What do you think may be the% of pharmacies dispensed without prescription ATB?

Manuscript: Knowledge, attitudes, perceptions and habits towards antibiotics dispensed without medical prescription: a qualitative study on Spanish pharmacists.

Juan M Vazquez-Lago (M.D.) (M.S.), Cristian Gonzalez-Gonzalez (M.S.), Maruxa Zapata-Cachafeiro (M.S.), Paula Lopez-Vazquez (Ph.D.), Margarita Taracido (Ph.D.), Ana López (Ph.D.), Adolfo Figueiras (Ph.D.)

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

Developed from:

Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

No. Item	Guide questions/description	Reported on Page #
Domain 1: Research team and reflexivity		Page 1
<i>Personal Characteristics</i>		
1. Inter viewer/facilitator	Which author/s conducted the inter view or focus group?	Juan M. Vazquez-Lago Page 1
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	Page 1
3. Occupation	What was their occupation at the time of the study?	Doctor in Medicine. Specialist in preventive medicine and public health. PhD student Page 1
4. Gender	Was the researcher male or female?	Male Page 1
5. Experience and training	What experience or training did the researcher have?	The researcher published an article with similar methodology (Vazquez-Lago JM, Lopez-Vazquez P, López-Durán A, Taracido-Trunk M, Figueiras A. Attitudes of primary care physicians to the prescribing of

		antibiotics and antimicrobial resistance: a qualitative study from Spain. <i>Fam Pract.</i> 2012; 29: 352-60.). The researcher studied masters in public health where the qualitative methodology forms part of the teaching program. Conducted continuous training courses in qualitative methodology. Page 5 and 16
	<i>Relationship with participants</i>	
	6. Relationship established	Was a relationship established prior to study commencement? Page 5-6
	7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research Page 5
	8. Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic Page 4-5-6

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Domain 2: study design		
<i>Theoretical framework</i>		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Page 7
<i>Participant selection</i>		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Page 5-6
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Page 6
12. Sample size	How many participants were in the study?	Page 7
13. Non-participation	How many people refused to participate or dropped out? Reasons?	Page 7 and 13
<i>Setting</i>		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Page 6
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	Page 6
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Page 6-7
<i>Data collection</i>		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Page 5
18. Repeat interviews	Were repeat inter views carried out? If yes, how many?	Page 7
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	Page 6

20. Field notes	Were field notes made during and/or after the interview or focus group?	Page 6
21. Duration	What was the duration of the inter views or focus group?	Page 6
22. Data saturation	Was data saturation discussed?	Page 6
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	N/A
Domain 3: analysis and findings		
<i>Data analysis</i>		
24. Number of data coders	How many data coders coded the data?	N/A
25. Description of the coding tree	Did authors provide a description of the coding tree?	N/A
26. Derivation of themes	Were themes identified in advance or derived from the data?	Page 5
27. Software	What software, if applicable, was used to manage the data?	Page 7
28. Participant checking	Did participants provide feedback on the findings?	Page 6
<i>Reporting</i>		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Page 7 to 10
30. Data and findings consistent	Was there consistency between the data presented and the findings?	Yes, there was. From page 10 to 14
31. Clarity of major themes	Were major themes clearly presented in the findings?	Yes. they were. From page 7 to 10
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Discussion of major and minor themes From page 10 to 14

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Knowledge, attitudes, perceptions and habits towards antibiotics dispensed without medical prescription: a qualitative study of Spanish pharmacists.

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1 *Knowledge, attitudes, perceptions and habits towards antibiotics*
2 *dispensed without medical prescription: a qualitative study of*
3 *Spanish pharmacists.*

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3 364
5 37 **ABSTRACT**6
7 38 **Objective:** To investigate community pharmacists' knowledge, attitudes, perceptions and
8
9 39 habits with regard to antibiotic dispensing without medical prescription in Spain.

10 40

11 41 **Methods:** A qualitative research using focus-group method (FG) in Galicia (north-west
12 42 Spain). FG sessions were conducted in the presence of a moderator. A topic script was
13 43 developed to lead the discussions, which were audio-recorded to facilitate data
14 44 interpretation and transcription. Proceedings were transcribed by an independent
15 45 researcher and interpreted by two researchers working independently. We used the
16 46 Grounded Theory approach.

17 47

18 48 **Setting:** Community pharmacies in Galicia, region Norwest of Spain.

19 49

20 50 **Participants:** Thirty pharmacists agreed to participate in the study, and a total of 5 FG
21 51 sessions were conducted with 2-11 pharmacists. We sought to ensure a high degree of
22 52 heterogeneity in the composition of the groups to improve our study's external validity.
23 53 Pharmacists' participation had no gender or age restrictions, and an effort was made to
24 54 form FGs with pharmacists who were both owners and non-owners, provided in all cases
25 55 that they were OCP-registered community pharmacists. For the purpose of conducting FG
26 56 discussions, the basic methodological principle of allowing groups to attain their "own
27 57 structural identity" was applied.

28 58

29 59 **Main outcome measurements:** Community pharmacists' habits and knowledge with
30 60 regard to antibiotics, and identification of the attitudes and/or factors that influence
31 61 antibiotic dispensing without medical prescription.

32 62

33 63 **Results:** Pharmacists attributed the problem of antibiotics dispensed without medical
34 64 prescription and its relationship to antibiotic resistance to the following attitudes:
35 65 external responsibility (doctors, dentists and the NHS); acquiescence; indifference; and
36 66 lack of continuing education.

37 67

38 68 **Conclusions:** Despite being a problem, antibiotic dispensing without a medical
39 69 prescription is still a common practice in community pharmacies in Galicia, Spain. This
40 70 practice is attributed to acquiescence, indifference and lack of continuing education. The41
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3 71 problem of resistance was ascribed to external responsibility, including that of patients,
4 72 physicians, dentists and the NHS.
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8 74 **Keywords:** Community pharmacy; Antibiotic dispensing; Public health; Infectious
9 75 diseases, qualitative research.
10
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12 77 **Strengths and limitations:**

13
14 78 1.- The generalization of the results could also be compromised due to the intrinsic
15 79 characteristics of the pharmaceutical system in Spain. In the system of pharmaceutical
16 80 provision in Spain, antibiotics necessarily require a prior prescription by the physician,
17 81 and all drugs must always be dispensed by pharmacies and cannot be purchased in other
18 82 types of establishments.
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22 83 2.- The focus-group technique seeks the interaction of all the members of the group and
23 84 ensures the identification of all the dimensions of the problem investigated while
24 85 simultaneously increasing the subjective validity of each identified idea.
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27 86 3.- Proceedings were transcribed and interpreted by an independent researcher. Any
28 87 points of disagreement were discussed and resolved by consensus.
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31 88 4.- Possible lack of generalization of findings to health systems in other countries.
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3 894 90 **INTRODUCTION**

5 91

6 92 Antibiotic resistance poses a major threat to clinical efficacy and is an important problem
7 93 for global public health. Resistance is an inescapable consequence of antibiotic use ^[1] but it
8 94 increases drastically with misuse and abuse. ^[2,3] It is thus imperative to improve antibiotic
9 95 use, ^[4] particularly in outpatient settings where 90% of the consumption occurs. ^[5]

10 96

11 97 One of the chief loopholes requiring attention is the dispensing of antibiotics without a
12 98 prescription, a major problem in some countries.^[6] Whereas outpatient use of antibiotics
13 99 is restricted to prescription-based consumption in northern Europe, the USA and Canada,
14 100 access to antibiotics dispensed without medical prescription is nevertheless
15 101 commonplace in the rest of the world.^[6,7,8] In Spain, dispensing antibiotics legally is done
16 102 only through prescriptions, and the National Health System (NHS) covers the expenses of
17 103 almost the entire population.^[9] Due to population density characteristics in our territory,
18 104 community pharmacists are the first point of contact for patients, as part of the health care
19 105 team. Therefore, up to one third of all outpatient antibiotics dispensed are not prescribed
20 106 by physicians.^[3,10] Despite the fact that the EU encourages Member States to restrict the
21 107 use of systemic antibiotics and recommends that such drugs be exclusively consumed
22 108 under medical prescription, the dispensing of antibiotics without prescription is still a
23 109 common practice.^[11]

24 110

25 111 Accordingly, this study sought to conduct a qualitative analysis of community pharmacists'
26 112 knowledge, attitudes, perceptions and habits with regard to antibiotic dispensing in
27 113 Galicia, Spain.

28 114

29 115 **METHODS**

30 116

31 117 *Study design*

32 118 We used the focus-group (FG) method to ascertain pharmacists' attitudes, knowledge and
33 119 views concerning the dispensing and use of antibiotics in Galicia, Spain. The focus-group
34 120 (FG) method was used to explore community pharmacists' habits and knowledge with
35 121 regard to antibiotics, and to identify the attitudes and/or factors that influence their being
36 122 dispensed. We decided to use the focus-group technique because the interaction of group
37 123 members tends to ensure that all the dimensions of the problem assessed are brought to
38 124 light, information is simultaneously obtained on the subjective validity of various

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3 125 members of the group, and in addition, it is a rapid technique for generating such
4 126 information.^[12] A theoretical model based on a previous systematic review was
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6 127 constructed for the purpose of drawing up an agenda and a script for FG, ^[13] which was to
7
8 128 be followed during the group sessions to facilitate the identification of attitudes and/or
9
10 129 factors.

11 130
12 131 The program for conducting meetings in the various FGs was designed with a dual
13 132 purpose, namely, to address: (i) the dispensing of antibiotics without a prescription; and
14 133 (ii) individual points of view regarding antibiotic-dispensing practices among pharmacists.
15 134 Basing our study on a previous one undertaken in a population of physicians ^[14] and
16 135 adapting it to the specific characteristics of pharmacists, we defined the script in attempt
17 136 to cover the following factors/attitudes: acquiescence; indifference; external
18 137 responsibilities and lack of continuing education. For the purposes of clarity and ease of
19 138 comprehension, the four attitudes are defined in Table 1.

20 139
21 140 **Table 1. Definition of studied attitudes.**

External responsibility: the responsibility of another professional or the NHS for the sale of antibiotics without a medical prescription

Acquiescence: the ease with which antibiotics are dispensed to customers. This is associated with better customer loyalty. Part of such complacency is due to patient pressure, which comes in the form of different reasons given by a patient in order to obtain antibiotics without a prescription.

Indifference: a lack of interest in terms of the patient's illness, dispensing procedures or helping resolve patients doubts.

Lack of continuing education: Lack of knowledge of pharmacist due to a bad continuing education and bad knowledge upgrade from the point of view of quantity and quality.

Lack of continuing education can be seen from three different perspectives: 1) from a legal standpoint (ignorance of the legal consequences of dispensing antibiotics without prescription); 2) from a public health standpoint (ignorance of the consequences of dispensing antibiotics without a prescription, whether for the individual - individual point of view- or the community -ecological point of view- in terms of resistances, etc); or 3) from a pharmacological standpoint (pharmacists' ignorance of the pharmacotherapeutic issues of antibiotics).

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41 142 *Study population and settings*
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43 143 In Spain, many drugs, including antibiotics, may only be dispensed under medical
44 144 prescription. The dispensing of drugs takes place in community pharmacies, which must
45 145 be owned by a registered pharmacist.

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47 146
48 147 The study population comprised community pharmacists in Galicia. Galicia is a region in
49 148 north-west Spain, with a population of around 2,779,000; almost 100% of these people
50 149 have access to health care delivery and 31% are pensioners. Population density in Galicia
51 150 is 92.6 inhab/km², similar to the European average. Population density decreases as one
52 151 moves inland from the Atlantic fringe. Consequently, distances to a given population's

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3 152 designated health centre tend to increase. This is how pharmacists become patients' first
4 153 contact with the health system to consult their health problems.
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8 155 *Holding of focal group sessions*

9 156 In order to work in a community pharmacy in Spain, it is compulsory to be a member of
10 157 the Official Colleges of Pharmacists (OCP). Using the "snowball method", the OCP sent
11 158 project information in the usual way to all community pharmacists. Community
12 159 pharmacists who were interested in FG participation had to send a reply to the research
13 160 team. FG sessions were designed to be held with a pre-established number of participants,
14 161 between 5 and 10 pharmacists in attendance in Galicia.
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19 163 We sought to ensure a high degree of heterogeneity in the composition of the groups to
20 164 improve our study's external validity. Pharmacists' participation had no gender or age
21 165 restrictions, and an effort was made to form FGs with pharmacists who were both owners
22 166 and non-owners, provided in all cases that they were OCP-registered community
23 167 pharmacists. Sessions were chaired by a moderator who was a specialist in the field,
24 168 following a script to ensure comparability among groups.
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30 170 For the purpose of conducting FG-discussions, the basic methodological principle of
31 171 allowing groups to attain their "own structural identity" was applied.^[15] This afforded an
32 172 opportunity to discuss individual experiences and then start the group discussion. Only in
33 173 the latter stages of the FG-sessions did the moderator introduce discussion topics
34 174 (following the script) which had not been mentioned.
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40 176 FGs were conducted by the principal researcher (JVL). This researcher is specifically
41 177 trained to develop research using qualitative methodology. FG-sessions took place in OCP
42 178 meeting rooms. Only the investigator/moderator and the participants were present during
43 179 the FG-sessions. All FG-sessions were audio-recorded and lasted 45-70 minutes. The
44 180 investigator/moderator also took field notes in relation to the
45 181 attitudes/factors/knowledge explored. The sessions ended when the information being
46 182 provided by the participants yielded no new ideas. To prevent any possible interpretation
47 183 biases, the proceedings were transcribed by an independent researcher (MTT).
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53 185 *Ethical considerations*

54 186 This study was approved by the Galician Clinical Research Ethics Committee. All the
55 187 pharmacists were informed of the purpose of the study, of what their involvement
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188 entailed, of the objectives, as well as of the fact that the FG sessions would be recorded and
 189 transcribed, and that no participant would be personally identified in the study results. All
 190 of them agreed to participate by signing informed consent.

191

192 *Analysis*

193 We used the Grounded Theory Approach. [16] Analysis of the transcripts was an iterative
 194 process undertaken by two researchers working independently (CGG and JVL). The
 195 researchers carefully read the transcriptions to structure the data adequately. This
 196 allowed for greater in-depth study and familiarisation with the data, and decreased the
 197 likelihood of researcher bias. Thematic and discursive analysis was used to examine the
 198 data, identifying different ideas and sentences that were obtained from the different FGs
 199 and organising the topics, with text excerpts serving as units of analysis. The next step was
 200 to establish the association between the groups' ideas and the pre-established variables.
 201 The researchers then compared the thematic analyses and analysed emerging issues. Any
 202 points of disagreement were discussed and resolved by consensus. No computer software
 203 was used to analyze the process because the number of FGs was performed was not large.

204

205 **RESULTS**

206

207 Five FGs were formed. Thirty pharmacists -56.7% women, 43.3% men- contacted the
 208 research team and all of them were invited to participate in the FGs. Other characteristics
 209 of the FG can be seen in Table 2.

210

211

Table 2. Characteristics of focus group composition.

Focus group (n)	Sex Number (%)		Age Range	Practice Status Owner Number (%)	
	Women (W)	Men (M)			
I (9)	7 (77,8)	2 (22,2)	27-32 years	0 (0)	212
II (7)	2 (28,6)	5 (71,4)	42-58 years	3 (42,9)	213
III (7)	4 (57,1)	3 (42,9)	38-50 years	2 (28,6)	214
IV (5)	2 (40,0)	3 (60,0)	45-60 years	1 (20)	215
V (2)	2 (100)	0 (0)	42-43 years	0 (0)	216

219

220 Our qualitative approach indicated that the influence of the following 4 variables was
 221 considered relevant when it came to dispensing antibiotics over the counter (see Table 3).

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224

225 **Table 3. Factors that influence antibiotic dispensing.**

	due lack of communication with patient's physicians
Indifference	due to lack of patient follow-up
	due it is prioritized to sell the antibiotic
	of patient (inappropriate use)
External responsibility	of physicians (prescriptions without indication)
	of health care system (private insurances)
	of other professionals (mainly dentists)
Acquiescence	pressure exerted by customers to have the symptoms speedily resolved
	to prevent regular customers consulting another pharmacy
Lack of continuing education	dispensing habit

226

227 *External responsibility*

228 According to the conclusions of all the groups, one of the most influential variables at play
229 when a pharmacist dispenses an antibiotic without a prescription was external
230 responsibility, an aspect that was considered to lie with two types of health professionals,
231 namely, physicians and dentists.

232

233 *"I think that doctors also give them [antibiotics] out very easily."* (FG5, W1). The external
234 responsibility of physicians was viewed by 100% of the FGs as being one of the most
235 influential variables underlying the inappropriate dispensing of antibiotics.

236 Likewise, another important variable was dentists' responsibility. All the FGs agreed that
237 the latter were in the habit of issuing a large number of prescriptions by telephone, i.e.,

238 *"Patients come in saying, I just talked to my dentist and he told me to take an antibiotic for 5*
239 *days, and that I must go to his surgery."* (FG3; M2). The groups also saw dentists as a source
240 of unnecessary antibiotic prescriptions, i.e., *"When dentists are going to remove a tooth,*
241 *they'll prescribe amoxicillin-clavulanate, just like they prescribe ibuprofen."* (FG1; M1).

242

243 The NHS was rated as being one of the main culprits. Pharmacists said that poor access
244 (space-time) to physicians was an influential factor when antibiotics were dispensed
245 without medical prescription, i.e., *"Another problem is all the time it takes to see a doctor:*
246 *access is always faster at a pharmacy."* (FG2; M2).

247

248 Another important variable was the number of prescriptions prescribed in private
249 insurance versus the NHS, with most FGs reporting i.e., *"Ten times more antibiotics are*
250 *given in private insurance than in the NHS"* (FG2; M1).

251

252 *Lack of continuing education*

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3 253 Lack of continuing education was considered a relevant factor by 80% of the FGs (4/5) in
4 254 any case where a pharmacist dispensed antibiotics without a prescription. As shown
5
6 255 above, lack of continuing education can be viewed from different standpoints, e.g., "*In*
7 256 *specific diseases, there is a range of antibiotics, and you start with the oldest.*" (FG3; W3). In
8
9 257 this case, it shows the lack of knowledge about starting with the first-line antibiotic, which
10 258 is not always the oldest.
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12 259
13 260 Age is also referred to as a key variable to explain the existence of lack of continuing
14 261 education, with older pharmacists being those who exhibit this deficit. "*Older pharmacists*
15 262 *give out antibiotics much more readily.*" (FG2, M1), and, "*Young people give out fewer*
16 263 *antibiotics.*" (FG3; W3).
17

18 264
19 265 Another aspect mentioned and related to lack of continuing education is the consideration
20 266 of the problem of resistance as a recent phenomenon. "*I think that the issue of resistance*
21 267 *has begun recently, not so long ago...*" (FG1, W2).
22 268

23 269 *Acquiescence*
24 270 In the five FGs (100%), acquiescence was seen as an important variable, i.e., "*Many people*
25 271 *give antibiotics to retain patients.*" (FG4; W1). A contributory factor was the different
26 272 treatment accorded to regular and non-regular customers, i.e., "*Sometimes, I give them to*
27 273 *regular patients.*" (FG1; M1).
28 274

29 275 In essence, acquiescence is yielding to pressure when a certain patient wants an antibiotic:
30 276 "*When you know the customer, you try to convince him, but in the end, if he keeps on*
31 277 *insisting, you give it to him.*" (FG2; W1); and, "*If they come to get amoxicillin and then start*
32 278 *insisting, you give it to them.*" (FG5; W1). Indeed, 60% of the FGs regarded patient pressure
33 279 as an important factor when it came to dispensing antibiotics without a prescription. From
34 280 the pharmacists' viewpoint, the current percentage ranges from 5% to 20%.
35 281

36 282 *Indifference*
37 283 Participants indicate the existence of indifference and mutual consent between
38 284 community pharmacists and other health-care professionals, chiefly physicians, along with
39 285 inappropriate attitudes to prescribing and dispensing antibiotics, noting the lack of
40 286 communication as indirectly associated with indifference, i.e., "*I will give you amoxicillin-*
41 287 *clavulanate... but you go to your doctor and bring me the prescription. That way, I feel I'm*
42 288 *blameless.*" (FG5; W2).
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4 290 In a third FG, the following statements were made: *"The two professions are hardly involved*
5 *with each other, there are no close ties, so that we criticise our mistakes but don't value our*
6 *successes"; and, "Sometimes I dispense an inappropriate antibiotic because I don't have the*
7 *time to contact the patient's physician." (FG2; W1) (Table 1). In this case, they identify*
8 *communication difficulties as the cause of inadequate dispensation but show indifference*
9 *about solving the problem.*

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12 296
13 297 We also observed the existence of Indifference about transmitting adequate information
14 298 about the problems of resistances to customers who go to the pharmacy to buy antibiotics,
15 299 as Indifference is another possible way to contribute to developing microbial resistances.
16 300 *"Ok, I see, but this is about their (people's) difficulty to understand, I mean, surely, if you talk*
17 *to somebody about resistance, it will sound familiar to them, but trying to explain to them*
18 *how resistances are generated..., you know what I mean, an effective way to make them*
19 *understand that, if they take this or that antibiotic without needing it, it's not going to have*
20 *any effect later on" (FG1, W2).*

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26 306 Finally, another aspect that is framed within Indifference is the fact that, in Spain, the
27 307 pharmacist is also a businessman. *"In addition to being health-care professionals, we are*
28 *also businessmen." (FG2; M2), so, in addition to the individual's health, they are concerned*
29 308 about the profitability of the business. This statement reflects this attitude: *"Take it with*
30 309 *you. If you get better, don't take it, just bring it back to me! ...and most people bring it back."*
31 310 *(FG2; W1). This sentence also refers to what we call "delayed dispensing" which is related*
32 311 *to delayed prescriptions. Delayed prescriptions are those that are written but are only*
33 312 *used if the symptoms do not improve.^[17] Delayed dispensing of antibiotics can thus be*
34 313 *defined as the dispensing of antibiotics for a patient, on the condition that they are not to*
35 314 *be used immediately but only in the event that the symptoms fail to improve.*

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317 **DISCUSSION**

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319 This is the first qualitative study to be conducted in Spain that explores pharmacists'
320 knowledge of and attitudes toward antibiotic use and its relationship with microbial
321 resistance. Our study shows that antibiotics dispensed without medical prescription was
322 attributed to acquiescence, indifference and lack of continuing education. The problem of
323 resistance was ascribed to lack of continuing education, indifference and external
324 responsibility, including patients, physicians, dentists and the NHS.

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4 326 We chose a qualitative design to perform this study because it helped us to better
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6 327 understand the processes and realities of the problems currently confronting public
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8 328 health.^[18] We were interested in a full, detailed description as well as conceptual analysis
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10 329 and theory generation. As there was a theory that we could corroborate and it was hoped
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12 330 that a theory might arise from systematically collected data, the grounded theory offered
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14 331 the most appropriate method.^[19] The use of the FG in the sphere of health is indicated and
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16 332 validated in works where the aim is to investigate what participants think and why,
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18 333 enabling data to be generated which could not be attained by other techniques.^[20,21]

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19 335 Antibiotics dispensed without medical prescription is a problem in Spain. The statements
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21 336 made in the different FGs corroborate the conclusions of previous studies, namely, that
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23 337 antibiotic dispensing without a prescription is a phenomenon that exists in Spain.^[22,23]
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25 338 This conclusion was reached by all the FGs, notwithstanding the fact that there were small
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27 339 variations among them in terms of pharmacists' opinions regarding the attitudes
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29 340 responsible for this practice. Evidence has been provided to show that the dispensing of
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31 341 antibiotics without medical prescription reaches 30% in Spain.^[13] Our study reveals that,
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33 342 from the pharmacists' viewpoint, the current percentage ranges from 5% to 20%,
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35 343 although they thought that this percentage may have been underestimated.

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34 345 Our findings are reinforced by studies conducted elsewhere. As in our case, in these other
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36 346 settings, a prescription is required to obtain an antibiotic, and a high percentage of self-
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38 347 medication and antibiotics dispensed without medical prescription at community
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40 348 pharmacies was likewise detected.^[24] Nevertheless, the estimates of the pharmacists who
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42 349 participated in our FGs were lower than those of other studies conducted in the same
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44 350 environment. The latter studies placed the percentage of antibiotics dispensed without
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46 351 prescription at 65.9%.^[25] These results were only to be expected, however, as the
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48 352 pharmacists that we questioned about inappropriate dispensing were the very ones
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50 353 responsible for doing this.

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50 355 Analysis of *lack of continuing education* showed a difference between professionals of
51
52 356 different ages. This situation may be due to: (1) increased training of new professionals in
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54 357 the antibiotics field, as it is in the last ten years when the problem of resistance has had
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56 358 major social, scientific and clinical repercussions; (2) the fact that younger people are
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58 359 usually not pharmacy owners, which means that sales levels have no direct impact on their
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60 360 salaries and that any request to dispense antibiotics without a prescription will therefore

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3 361 be met with a firm refusal; and, (3) the fear factor. This factor is possibly linked to the
4 362 major fear felt by young pharmacists about dispensing antibiotics, as found in a study of
5 363 physicians performed in our area ^[14]. However, none of the FGs mentioned this variable, so
6 364 it is necessary to interpret it very cautiously.
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9 365
10 366 Studies conducted in other settings using the same methodology have reached similar
11 367 conclusions regarding the variables influencing the time taken to dispense an antibiotic,
12 368 and the external responsibility of physicians and patients. However, they also attach great
13 369 importance to other variables, such as economic interest. ^[26] Economic interest is strongly
14 370 linked to variables such as patient loyalty, e.g., in our environment, the dispensing of non-
15 371 prescription antibiotics was found to increase in cases where patients were known. ^[23] A
16 372 study conducted in our setting concluded that there was an association between the
17 373 pharmacist' age, the fact of owning a pharmacy, the patient's age and sex, and the
18 374 workload in terms of higher or lower drug-dispensing levels. While these results cannot be
19 375 directly extrapolated to our study because they would have to be restricted to antibiotic
20 376 dispensing, they nonetheless show the variables that have an impact when a drug is
21 377 dispensed, and these have proved to be relevant in our study. ^[27] The fact that, in Spain,
22 378 some community pharmacists are also business owners is a factor that has not been taken
23 379 into account in studies conducted in this population. This variable emerged directly in one
24 380 FG and indirectly in others.
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27 381
28 382 *The difficulty of spatiotemporal access* to physicians was another variable that emerged in
29 383 the FGs. There is evidence in the literature to confirm that the proximity of a pharmacy
30 384 decreases the demand for primary care. ^[28] Lack of communication with other health
31 385 professionals, particularly physicians, due to different variables such as the attitudes and
32 386 perceptions of different professionals is an aspect that has already been studied in our
33 387 setting. ^[29] Our study reinforces the idea of the need to improve pharmacist training
34 388 programmes and the relationships among health professionals.
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37 389
38 390 *Acquiescence* is a factor that has been studied by other research groups. The ease with
39 391 which an antibiotic is dispensed to a patient is a variable that other studies have
40 392 confirmed. ^[30] Our results are comparable with those yielded by other professionals in the
41 393 same setting. Conclusions reached about physicians show that the determinant factors of
42 394 antibiotic prescribing are fear, acquiescence, lack of continuing education and external
43 395 responsibility. ^[13] Factors such as lack of continuing education and external responsibility
44 396 show great influence in both studies, when it comes to prescribing and dispensing
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3 397 antibiotics [13,30]. Both studies report the external responsibility of other professionals as
4 398 being one of the main sources of malpractice, i.e., the notion of other professionals being
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6 399 perceived as the main culprits. Indeed, external responsibility is a common variable
7
8 400 among health professionals, especially those who state that they have no time to give
9 401 explanations, and this is the reason for their malpractice. [13,30]

10 402

11 403 Our results are also comparable to those of a recent qualitative study undertaken in
12 404 Portugal. This paper concludes that attitudes related to the problem of resistance were
13 405 attributed to the external responsibility of patients, physicians, other pharmacists and
14 406 veterinarians.^[31] In our study, external responsibility was attributed to physicians,
15 407 dentists and the NHS. These results are extremely interesting because these attitudes,
16 408 which were identified in two different countries, could clear the way to designing specific
17 409 interventions at a Euro-regional Galicia-Northern Portugal level.

18 410

19 411 *Strengths and weaknesses*

20 412 One limitation is the low number and the source of the participants (community
21 413 pharmacists from a specific area of Spain, who are not necessarily representative of all
22 414 community pharmacists working in Spain), an aspect that restricts the study's
23 415 generalization to other areas or countries. The generalization of the results could also be
24 416 compromised due to the intrinsic characteristics of the pharmaceutical system in Spain,
25 417 governed by laws that may differ with respect to other countries. However, the study
26 418 conducted in Portugal yielded similar results.^[31] In any case, qualitative methods can seek
27 419 to obtain a range of views, and generalizability of findings is not usually an expected
28 420 attribute of this type of research. Similarly, the nature of qualitative data is that it is jointly
29 421 constructed by the researcher and the participants and cannot be viewed as objective
30 422 accounts.^[16,20] Another possible study limitation is that one of the FGs failed to attain the
31 423 pre-established minimum number of participants. Nevertheless, the conclusions drawn
32 424 from this FG did not differ significantly from those of the other groups. Among the study's
33 425 advantages is the fact that interaction among FG members generated ideas about
34 426 antibiotics and resistances, which would otherwise have been difficult to obtain. [16] There
35 427 are several previous studies that corroborate our findings both in our own and in other
36 428 settings, thereby increasing the reproducibility and validity of our study.^[13,22,26,29]

37 429

38 430 **CONCLUSIONS**

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3 432 Once attitudes/knowledge associated with inappropriate dispensing have been identified,
4 433 interventions can be designed to focus on these shortcomings, so as to improve antibiotic
5 434 use and contribute to minimising resistance.^[32] Pharmacotherapy-based interventions
6 435 with community pharmacists must be undertaken to prevent errors due to lack of
7 436 knowledge. This also implies the need to bear in mind the specific functions of
8 437 pharmacists as health professionals. Not only are publicity campaigns to reduce antibiotic
9 438 use necessary, but they need to be more direct if they are to have a major impact on health
10 439 professionals and the general population alike.
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17 441 **LIST OF ABBREVIATIONS**

- 18 442 1.- FG: focus groups
19 443 2.- M: Man
20 444 3.- NHS: National Health System
21 445 4.- OCP: Official Colleges of Pharmacists
22 446 5.- W: Woman
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27 449 ***Contributorship statement:***

28 450 All authors meet the ICMJE criteria and all authors have contributed:
29 451 - to the conception or design of the work; or the acquisition, analysis, or interpretation of
30 452 data for the work,
31 453 - drafting the work or revising it critically for important intellectual content;
32 454 - to final approval of the version to be published;
33 455 - and agreement to be accountable for all aspects of the work in ensuring that questions
34 456 related to the accuracy or integrity of any part of the work are appropriately investigated
35 457 and resolved.

36 458 Author's specific contribution:

- 37 459 1.- Vazquez-Lago JM: Conception and design of the study. Design and conduct focus
38 460 groups. Contribution to peer review of the transcription data. Analysis and interpretation
39 461 data. Write the different versions of the manuscript. Review final approval of the work.
40 462 2.- Gonzalez-Gonzalez C: Design and conduct focus groups. Analysis and interpretation
41 463 data. Review final approval of the work.
42 464 3.- Zapata-Cachafeiro M: Write the different versions of the manuscript. Review final
43 465 approval of the work.
44 466 4.- Lopez-Vazquez P: Analysis and interpretation data. Contribution to peer review of the
45 467 transcription data.
46 468 5.- Taracido M: Transcription of audio data.
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4 470 peer review of the transcription data.

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6 471 7.- Figueiras A: Drafting the work and revising it critically for important intellectual
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22 481 ***Data sharing statement:***

23 482 All published and unpublished study data are a set of all you need, should you want to
24 483 confirm or reproduce our research in a different field than ours.

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SCRIPT OF FOCUS GROUPS

Qualitative approach to the attitudes and knowledge of community pharmacists that condition inadequate prescription of antibiotics

CONTENT STRUCTURE OF PHARMACEUTICAL GROUPS

What do you think about the last campaigns on proper use of ATB carried out from the Ministry of Health?

Do you consider that there are still pharmacists who do not use ATB without prescription?

And 5 years ago? Was done? *Mention references that support this.*

What do you think could be the causes?

If you do not go out mention:

- *Difficulty of access to medical / health services*
- *By patient pressure. Sometimes aggressive attitudes, others because they can not stop going to work, because they are going to travel ...*
- *For customer loyalty.*
- *To advance time, "you already know what you are going to prescribe"*
- *And the pharmaceutical industry, has something to do?*
- *Any other reason?*

The use of ATB is now improving, the latest studies show that in Spain the consumption figures stabilize. What do you think may be the causes?

What do you think may be the% of pharmacies dispensed without prescription ATB?

Manuscript: Knowledge, attitudes, perceptions and habits towards antibiotics dispensed without medical prescription: a qualitative study of Spanish pharmacists.

Juan M Vazquez-Lago (M.D.) (M.S.), Cristian Gonzalez-Gonzalez (M.S.), Maruxa Zapata-Cachafeiro (M.S.), Paula Lopez-Vazquez (Ph.D.), Margarita Taracido (Ph.D.), Ana López (Ph.D.), Adolfo Figueiras (Ph.D.)

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

Developed from:

Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

No. Item	Guide questions/description	Reported on Page #
Domain 1: Research team and reflexivity		
<i>Personal Characteristics</i>		
1. Inter viewer/facilitator	Which author/s conducted the inter view or focus group?	Juan M. Vazquez-Lago Page 6. "FG were conducted by principal research (JVL)"
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	Page 1. "Juan M Vazquez-Lago (M.D.) (M.S.)"
3. Occupation	What was their occupation at the time of the study?	Doctor in Medicine. Specialist in preventive medicine and public health. MD and PhD student Page 1. "Department of Preventive Medicine and Public Health, Clinic Hospital of Santiago de Compostela"
4. Gender	Was the researcher male or female?	Male Page 1
5. Experience and training	What experience or training did the researcher have?	The researcher published an article

		<p>with similar methodology (Vazquez-Lago JM, Lopez-Vazquez P, López-Durán A, Taracido-Trunk M, Figueiras A. Attitudes of primary care physicians to the prescribing of antibiotics and antimicrobial resistance: a qualitative study from Spain. <i>Fam Pract.</i> 2012; 29: 352-60.). The researcher studied masters in public health where the qualitative methodology forms part of the teaching program. Conducted continuous training courses in qualitative methodology. Page 6. “<i>This researcher has specific training for development research with qualitative methodology</i>” and page 15. “<i>Vazquez-Lago JM, Lopez-Vazquez P, López-Durán A, Taracido-Trunk M, Figueiras A. Attitudes of primary care physicians to the prescribing of antibiotics and antimicrobial resistance: a qualitative study from Spain. Fam Pract. 2012; 29: 352-60.</i>”</p>
<p><i>Relationship with participants</i></p>		
<p>6. Relationship established</p>	<p>Was a relationship established prior to study commencement?</p>	<p>Page 5. “<i>In order to work in a community pharmacy in Spain, it is compulsory to be collegiate at Official Colleges of</i></p>

For peer review only

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		<p><i>Pharmacists (OCP). Using the “snowball method”, the OCP send project information in the normal manner to all community pharmacists. Community pharmacists who were interested in FGs participation, had to send a mail to researcher team.”</i></p> <p>Page 6. <i>“FG sessions took place at OCP meeting rooms.”</i></p>
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	<p>Page 6. <i>“All pharmacists were informed of the purpose of the study, of what implied their implication, of the objectives, as well as that the FG sessions were to be recorded and transcribed, and that no-one attending would be personally identified in the study results. All agreed to participate by signing informed consent.”</i></p>
8. Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	Page 4-5-6-7

Domain 2: study design		
<i>Theoretical framework</i>		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Page 6
<i>Participant selection</i>		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Page 5-6
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Page 5
12. Sample size	How many participants were in the study?	Page 7
13. Non-participation	How many people refused to participate or dropped out? Reasons?	Page 7 and 12
<i>Setting</i>		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Page 6
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	Page 6
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Page 6-7
<i>Data collection</i>		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Page 5
18. Repeat interviews	Were repeat inter views carried out? If yes, how many?	Page 7
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	Page 6

20. Field notes	Were field notes made during and/or after the inter view or focus group?	Page 6
21. Duration	What was the duration of the inter views or focus group?	Page 6
22. Data saturation	Was data saturation discussed?	Page 6
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	N/A
Domain 3: analysis and findings		
<i>Data analysis</i>		
24. Number of data coders	How many data coders coded the data?	N/A
25. Description of the coding tree	Did authors provide a description of the coding tree?	N/A
26. Derivation of themes	Were themes identified in advance or derived from the data?	Page 5
27. Software	What software, if applicable, was used to manage the data?	Page 7
28. Participant checking	Did participants provide feedback on the findings?	Page 6
<i>Reporting</i>		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Page 6-7-8-9
30. Data and findings consistent	Was there consistency between the data presented and the findings?	Yes, there was. From page 7 to 12
31. Clarity of major themes	Were major themes clearly presented in the findings?	Yes. they were. From page 7 to 12
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Discussion of major and minor themes From page 7 to 22

BMJ Open

Knowledge, attitudes, perceptions and habits towards antibiotics dispensed without medical prescription: a qualitative study of Spanish pharmacists.

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3 1 *Knowledge, attitudes, perceptions and habits towards antibiotics*
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5 2 *dispensed without medical prescription: a qualitative study of*
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7 3 *Spanish pharmacists.*
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53 32 **Word count:**

54 33 Abstract: 300

55 34 Text: 4437
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6 37 **ABSTRACT**7 **Objective:** To investigate community pharmacists' knowledge, attitudes, perceptions and
8 habits with regard to antibiotic dispensing without medical prescription in Spain.
910
1112 **Methods:** A qualitative research using focus-group method (FG) in Galicia (north-west
13 Spain). FG sessions were conducted in the presence of a moderator. A topic script was
14 developed to lead the discussions, which were audio-recorded to facilitate data
15 interpretation and transcription. Proceedings were transcribed by an independent
16 researcher and interpreted by two researchers working independently. We used the
17 Grounded Theory approach.
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2324 **Setting:** Community pharmacies in Galicia, region Norwest of Spain.
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2728 **Participants:** Thirty pharmacists agreed to participate in the study, and a total of 5 FG
29 sessions were conducted with 2-11 pharmacists. We sought to ensure a high degree of
30 heterogeneity in the composition of the groups to improve our study's external validity.
31 Pharmacists' participation had no gender or age restrictions, and an effort was made to
32 form FGs with pharmacists who were both owners and non-owners, provided in all cases
33 that they were OCP-registered community pharmacists. For the purpose of conducting FG
34 discussions, the basic methodological principle of allowing groups to attain their "own
35 structural identity" was applied.
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4041 **Main outcome measurements:** Community pharmacists' habits and knowledge with
42 regard to antibiotics, and identification of the attitudes and/or factors that influence
43 antibiotic dispensing without medical prescription.
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4546
4748 **Results:** Pharmacists attributed the problem of antibiotics dispensed without medical
49 prescription and its relationship to antibiotic resistance to the following attitudes:
50 external responsibility (doctors, dentists and the NHS); acquiescence; indifference; and
51 lack of continuing education.
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5556 **Conclusions:** Despite being a problem, antibiotic dispensing without a medical
57 prescription is still a common practice in community pharmacies in Galicia, Spain. This
58 practice is attributed to acquiescence, indifference and lack of continuing education. The
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3 71 problem of resistance was ascribed to external responsibility, including that of patients,
4 72 physicians, dentists and the NHS.
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74 **Keywords:** Community pharmacy; Antibiotic dispensing; Public health; Infectious
75 diseases, qualitative research.
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78 **Strengths and limitations:**

79 1.- The generalization of the results could also be compromised due to the intrinsic
80 characteristics of the pharmaceutical system in Spain. In the system of pharmaceutical
81 provision in Spain, antibiotics necessarily require a prior prescription by the physician,
82 and all drugs must always be dispensed by pharmacies and cannot be purchased in other
83 types of establishments.

84 2.- The focus-group technique seeks the interaction of all the members of the group and
85 ensures the identification of all the dimensions of the problem investigated while
86 simultaneously increasing the subjective validity of each identified idea.

87 3.- Proceedings were transcribed and interpreted by an independent researcher. Any
88 points of disagreement were discussed and resolved by consensus.

89 4.- Possible lack of generalization of findings to health systems in other countries.
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89 INTRODUCTION

90
91 Antibiotic resistance poses a major threat to clinical efficacy and is an important problem
92 for global public health. Resistance is an inescapable consequence of antibiotic use ^[1] but it
93 increases drastically with misuse and abuse. ^[2,3] It is thus imperative to improve antibiotic
94 use, ^[4] particularly in outpatient settings where 90% of the consumption occurs. ^[5]

95
96 One of the chief loopholes requiring attention is the dispensing of antibiotics without a
97 prescription, a major problem in some countries.^[6] Whereas outpatient use of antibiotics
98 is restricted to prescription-based consumption in northern Europe, the USA and Canada,
99 access to antibiotics dispensed without medical prescription is nevertheless
100 commonplace in the rest of the world.^[6,7,8] In Spain, dispensing antibiotics legally is done
101 only through prescriptions, and the National Health System (NHS) covers the expenses of
102 almost the entire population.^[9] Due to population density characteristics in our territory,
103 community pharmacists are the first point of contact for patients, as part of the health care
104 team. Therefore, up to one third of all outpatient antibiotics dispensed are not prescribed
105 by physicians.^[3,10] Despite the fact that the EU encourages Member States to restrict the
106 use of systemic antibiotics and recommends that such drugs be exclusively consumed
107 under medical prescription, the dispensing of antibiotics without prescription is still a
108 common practice.^[11]

109
110 Accordingly, this study sought to conduct a qualitative analysis of community pharmacists'
111 knowledge, attitudes, perceptions and habits with regard to antibiotic dispensing in
112 Galicia, Spain.

114 METHODS

116 *Study design*

117 We used the focus-group (FG) method to ascertain pharmacists' attitudes, knowledge and
118 views concerning the dispensing and use of antibiotics in Galicia, Spain. The focus-group
119 (FG) method was used to explore community pharmacists' habits and knowledge with
120 regard to antibiotics, and to identify the attitudes and/or factors that influence their being
121 dispensed. We decided to use the focus-group technique because the interaction of group
122 members tends to ensure that all the dimensions of the problem assessed are brought to
123 light, information is simultaneously obtained on the subjective validity of various
124 members of the group, and in addition, it is a rapid technique for generating such

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3 125 information.^[12] A theoretical model based on a previous systematic review was
4 126 constructed for the purpose of drawing up an agenda and a script for FG, ^[13] which was to
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6 127 be followed during the group sessions to facilitate the identification of attitudes and/or
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8 128 factors.

9 129
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11 130 The program for conducting meetings in the various FGs was designed with a dual
12 131 purpose, namely, to address: (i) the dispensing of antibiotics without a prescription; and
13 132 (ii) individual points of view regarding antibiotic-dispensing practices among pharmacists.
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15 133 Basing our study on a previous one undertaken in a population of physicians ^[14] and
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17 134 adapting it to the specific characteristics of pharmacists, we defined the script in attempt
18 135 to cover the following factors/attitudes: acquiescence; indifference; external
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20 136 responsibilities and lack of continuing education. For the purposes of clarity and ease of
21
22 137 comprehension, the four attitudes are defined in Table 1.

23 138
24 139 **Table 1. Definition of studied attitudes.**

External responsibility: the responsibility of another professional or the NHS for the sale of antibiotics without a medical prescription

Acquiescence: the ease with which antibiotics are dispensed to customers. This is associated with better customer loyalty. Part of such complacency is due to patient pressure, which comes in the form of different reasons given by a patient in order to obtain antibiotics without a prescription.

Indifference: a lack of interest in terms of the patient's illness, dispensing procedures or helping resolve patients doubts.

Lack of continuing education: Lack of knowledge of pharmacist due to a bad continuing education and bad knowledge upgrade from the point of view of quantity and quality.

Lack of continuing education can be seen from three different perspectives: 1) from a legal standpoint (ignorance of the legal consequences of dispensing antibiotics without prescription); 2) from a public health standpoint (ignorance of the consequences of dispensing antibiotics without a prescription, whether for the individual - individual point of view- or the community -ecological point of view- in terms of resistances, etc); or 3) from a pharmacological standpoint (pharmacists' ignorance of the pharmacotherapeutic issues of antibiotics).

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39 141 *Study population and settings*

40 142 In Spain, many drugs, including antibiotics, may only be dispensed under medical
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42 143 prescription. The dispensing of drugs takes place in community pharmacies, which must
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44 144 be owned by a registered pharmacist.

45 145

46
47 146 The study population comprised community pharmacists in Galicia. Galicia is a region in
48 147 north-west Spain, with a population of around 2,779,000; almost 100% of these people
49 148 have access to health care delivery and 31% are pensioners. Population density in Galicia
50 149 is 92.6 inhab/km², similar to the European average. Population density decreases as one
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52 150 moves inland from the Atlantic fringe. Consequently, distances to a given population's
53
54 151 designated health centre tend to increase. This is how pharmacists become patients' first
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56 152 contact with the health system to consult their health problems.

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3 1534 154 *Holding of focal group sessions*

5 155 In order to work in a community pharmacy in Spain, it is compulsory to be a member of
6 156 the Official Colleges of Pharmacists (OCP). Using the "snowball method", the OCP sent
7 157 project information in the usual way to all community pharmacists. Community
8 158 pharmacists who were interested in FG participation had to send a reply to the research
9 159 team. FG sessions were designed to be held with a pre-established number of participants,
10 160 between 5 and 10 pharmacists in attendance in Galicia.

11 161

12 162 We sought to ensure a high degree of heterogeneity in the composition of the groups to
13 163 improve our study's external validity. Pharmacists' participation had no gender or age
14 164 restrictions, and an effort was made to form FGs with pharmacists who were both owners
15 165 and non-owners, provided in all cases that they were OCP-registered community
16 166 pharmacists. Sessions were chaired by a moderator who was a specialist in the field,
17 167 following a script to ensure comparability among groups.

18 168

19 169 For the purpose of conducting FG-discussions, the basic methodological principle of
20 170 allowing groups to attain their "own structural identity" was applied.^[15] This afforded an
21 171 opportunity to discuss individual experiences and then start the group discussion. Only in
22 172 the latter stages of the FG-sessions did the moderator introduce discussion topics
23 173 (following the script) which had not been mentioned.

24 174

25 175 FGs were conducted by the principal researcher (JVL). This researcher is specifically
26 176 trained to develop research using qualitative methodology. FG-sessions took place in OCP
27 177 meeting rooms. Only the investigator/moderator and the participants were present during
28 178 the FG-sessions. All FG-sessions were audio-recorded and lasted 45-70 minutes. The
29 179 investigator/moderator also took field notes in relation to the
30 180 attitudes/factors/knowledge explored. The sessions ended when the information being
31 181 provided by the participants yielded no new ideas. To prevent any possible interpretation
32 182 biases, the proceedings were transcribed by an independent researcher (MTT).

33 183

34 184 *Ethical considerations*

35 185 This study was approved by the Galician Clinical Research Ethics Committee. All the
36 186 pharmacists were informed of the purpose of the study, of what their involvement
37 187 entailed, of the objectives, as well as of the fact that the FG sessions would be recorded and

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188 transcribed, and that no participant would be personally identified in the study results. All
 189 of them agreed to participate by signing informed consent.

190

191 *Analysis*

192 We used the Grounded Theory Approach.^[16] Analysis of the transcripts was an iterative
 193 process undertaken by two researchers working independently (CGG and JVL). The
 194 researchers carefully read the transcriptions to structure the data adequately. This
 195 allowed for greater in-depth study and familiarisation with the data, and decreased the
 196 likelihood of researcher bias. Thematic and discursive analysis was used to examine the
 197 data, identifying different ideas and sentences that were obtained from the different FGs
 198 and organising the topics, with text excerpts serving as units of analysis. The next step was
 199 to establish the association between the groups' ideas and the pre-established variables.
 200 The researchers then compared the thematic analyses and analysed emerging issues. Any
 201 points of disagreement were discussed and resolved by consensus. No computer software
 202 was used to analyze the process because the number of FGs was performed was not large.

203

204 **RESULTS**

205

206 Five FGs were formed. Thirty pharmacists -56.7% women, 43.3% men- contacted the
 207 research team and all of them were invited to participate in the FGs. Other characteristics
 208 of the FG can be seen in Table 2.

209

210

Table 2. Characteristics of focus group composition.

Focus group (n)	Sex Number (%)		Age Range	Practice Status Owner Number (%)	
	Women (W)	Men (M)			
I (9)	7 (77,8)	2 (22,2)	27-32 years	0 (0)	211
II (7)	2 (28,6)	5 (71,4)	42-58 years	3 (42,9)	212
III (7)	4 (57,1)	3 (42,9)	38-50 years	2 (28,6)	213
IV (5)	2 (40,0)	3 (60,0)	45-60 years	1 (20)	214
V (2)	2 (100)	0 (0)	42-43 years	0 (0)	215
					216
					217

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219

220 Our qualitative approach indicated that the influence of the following 4 variables was
 221 considered relevant when it came to dispensing antibiotics over the counter (see Table 3).

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224

225 **Table 3. Factors that influence antibiotic dispensing.**

	due lack of communication with patient's physicians
Indifference	due to lack of patient follow-up
	due it is prioritized to sell the antibiotic
	of patient (inappropriate use)
External responsibility	of physicians (prescriptions without indication)
	of health care system (private insurances)
	of other professionals (mainly dentists)
Acquiescence	pressure exerted by customers to have the symptoms speedily resolved
	to prevent regular customers consulting another pharmacy
Lack of continuing education	dispensing habit

226

227 *External responsibility*

228 According to the conclusions of all the groups, one of the most influential variables at play
 229 when a pharmacist dispenses an antibiotic without a prescription was external
 230 responsibility, an aspect that was considered to lie with two types of health professionals,
 231 namely, physicians and dentists.

232

233 *"I think that doctors also give them [antibiotics] out very easily."* (FG5, W1). The external
 234 responsibility of physicians was viewed by 100% of the FGs as being one of the most
 235 influential variables underlying the inappropriate dispensing of antibiotics.

236 Likewise, another important variable was dentists' responsibility. All the FGs agreed that

237 the latter were in the habit of issuing a large number of prescriptions by telephone, i.e.,

238 *"Patients come in saying, I just talked to my dentist and he told me to take an antibiotic for 5*
 239 *days, and that I must go to his surgery."* (FG3; M2). The groups also saw dentists as a source
 240 of unnecessary antibiotic prescriptions, i.e., *"When dentists are going to remove a tooth,*
 241 *they'll prescribe amoxicillin-clavulanate, just like they prescribe ibuprofen."* (FG1; M1).

242

243 The NHS was rated as being one of the main culprits. Pharmacists said that poor access

244 (space-time) to physicians was an influential factor when antibiotics were dispensed

245 without medical prescription, i.e., *"Another problem is all the time it takes to see a doctor:*

246 *access is always faster at a pharmacy."* (FG2; M2).

247

248 Another important variable was the number of prescriptions prescribed in private

249 insurance versus the NHS, with most FGs reporting i.e., *"Ten times more antibiotics are*

250 *given in private insurance than in the NHS"* (FG2; M1).

251

252 *Lack of continuing education*

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3 253 Lack of continuing education was considered a relevant factor by 80% of the FGs (4/5) in
4 254 any case where a pharmacist dispensed antibiotics without a prescription. As shown
5
6 255 above, lack of continuing education can be viewed from different standpoints, e.g., "*In*
7 256 *specific diseases, there is a range of antibiotics, and you start with the oldest.*" (FG3; W3). In
8
9 257 this case, it shows the lack of knowledge about starting with the first-line antibiotic, which
10 258 is not always the oldest.

11
12 259
13 260 Age is also referred to as a key variable to explain the existence of lack of continuing
14 261 education, with older pharmacists being those who exhibit this deficit. "*Older pharmacists*
15 262 *give out antibiotics much more readily.*" (FG2, M1), and, "*Young people give out fewer*
16 263 *antibiotics.*" (FG3; W3).

17 264
18 265 Another aspect mentioned and related to lack of continuing education is the consideration
19 266 of the problem of resistance as a recent phenomenon. "*I think that the issue of resistance*
20 267 *has begun recently, not so long ago...*" (FG1, W2).

21 268
22 269 *Acquiescence*
23 270 In the five FGs (100%), acquiescence was seen as an important variable, i.e., "*Many people*
24 271 *give antibiotics to retain patients.*" (FG4; W1). A contributory factor was the different
25 272 treatment accorded to regular and non-regular customers, i.e., "*Sometimes, I give them to*
26 273 *regular patients.*" (FG1; M1).

27 274
28 275 In essence, acquiescence is yielding to pressure when a certain patient wants an antibiotic:
29 276 "*When you know the customer, you try to convince him, but in the end, if he keeps on*
30 277 *insisting, you give it to him.*" (FG2; W1); and, "*If they come to get amoxicillin and then start*
31 278 *insisting, you give it to them.*" (FG5; W1). Indeed, 60% of the FGs regarded patient pressure
32 279 as an important factor when it came to dispensing antibiotics without a prescription. From
33 280 the pharmacists' viewpoint, the current percentage ranges from 5% to 20%.

34 281
35 282 *Indifference*
36 283 Participants indicate the existence of indifference and mutual consent between
37 284 community pharmacists and other health-care professionals, chiefly physicians, along with
38 285 inappropriate attitudes to prescribing and dispensing antibiotics, noting the lack of
39 286 communication as indirectly associated with indifference, i.e., "*I will give you amoxicillin-*
40 287 *clavulanate... but you go to your doctor and bring me the prescription. That way, I feel I'm*
41 288 *blameless.*" (FG5; W2).

289
290 In a third FG, the following statements were made: *"The two professions are hardly involved*
291 *with each other, there are no close ties, so that we criticise our mistakes but don't value our*
292 *successes"; and, "Sometimes I dispense an inappropriate antibiotic because I don't have the*
293 *time to contact the patient's physician." (FG2; W1) (Table 1). In this case, they identify*
294 *communication difficulties as the cause of inadequate dispensation but show indifference*
295 *about solving the problem.*

296
297 We also observed the existence of Indifference about transmitting adequate information
298 about the problems of resistances to customers who go to the pharmacy to buy antibiotics,
299 as Indifference is another possible way to contribute to developing microbial resistances.
300 *"Ok, I see, but this is about their (people's) difficulty to understand, I mean, surely, if you talk*
301 *to somebody about resistance, it will sound familiar to them, but trying to explain to them*
302 *how resistances are generated..., you know what I mean, an effective way to make them*
303 *understand that, if they take this or that antibiotic without needing it, it's not going to have*
304 *any effect later on" (FG1, W2).*

305
306 Finally, another aspect that is framed within Indifference is the fact that, in Spain, the
307 pharmacist is also a businessman. *"In addition to being health-care professionals, we are*
308 *also businessmen." (FG2; M2), so, in addition to the individual's health, they are concerned*
309 *about the profitability of the business. This statement reflects this attitude: "Take it with*
310 *you. If you get better, don't take it, just bring it back to me! ...and most people bring it back."*
311 *(FG2; W1). This sentence also refers to what we call "delayed dispensing" which is related*
312 *to delayed prescriptions. Delayed prescriptions are those that are written but are only*
313 *used if the symptoms do not improve.^[17] Delayed dispensing of antibiotics can thus be*
314 *defined as the dispensing of antibiotics for a patient, on the condition that they are not to*
315 *be used immediately but only in the event that the symptoms fail to improve.*

316

317 **DISCUSSION**

318

319 This is the first qualitative study to be conducted in Spain that explores pharmacists'
320 knowledge of and attitudes toward antibiotic use and its relationship with microbial
321 resistance. Our study shows that antibiotics dispensed without medical prescription was
322 attributed to acquiescence, indifference and lack of continuing education. The problem of
323 resistance was ascribed to lack of continuing education, indifference and external
324 responsibility, including patients, physicians, dentists and the NHS.

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4 326 We chose a qualitative design to perform this study because it helped us to better
5
6 327 understand the processes and realities of the problems currently confronting public
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8 328 health.^[18] We were interested in a full, detailed description as well as conceptual analysis
9
10 329 and theory generation. As there was a theory that we could corroborate and it was hoped
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12 330 that a theory might arise from systematically collected data, the grounded theory offered
13
14 331 the most appropriate method.^[19] The use of the FG in the sphere of health is indicated and
15
16 332 validated in works where the aim is to investigate what participants think and why,
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18 333 enabling data to be generated which could not be attained by other techniques.^[20,21]

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19 335 Antibiotics dispensed without medical prescription is a problem in Spain. The statements
20
21 336 made in the different FGs corroborate the conclusions of previous studies, namely, that
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23 337 antibiotic dispensing without a prescription is a phenomenon that exists in Spain.^[22,23]
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25 338 This conclusion was reached by all the FGs, notwithstanding the fact that there were small
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27 339 variations among them in terms of pharmacists' opinions regarding the attitudes
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29 340 responsible for this practice. Evidence has been provided to show that the dispensing of
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31 341 antibiotics without medical prescription reaches 30% in Spain.^[13] Our study reveals that,
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33 342 from the pharmacists' viewpoint, the current percentage ranges from 5% to 20%,
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35 343 although they thought that this percentage may have been underestimated.

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34 345 Our findings are reinforced by studies conducted elsewhere. As in our case, in these other
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36 346 settings, a prescription is required to obtain an antibiotic, and a high percentage of self-
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38 347 medication and antibiotics dispensed without medical prescription at community
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40 348 pharmacies was likewise detected.^[24] Nevertheless, the estimates of the pharmacists who
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42 349 participated in our FGs were lower than those of other studies conducted in the same
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44 350 environment. The latter studies placed the percentage of antibiotics dispensed without
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46 351 prescription at 65.9%.^[25] These results were only to be expected, however, as the
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48 352 pharmacists that we questioned about inappropriate dispensing were the very ones
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50 353 responsible for doing this.

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50 355 Analysis of *lack of continuing education* showed a difference between professionals of
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52 356 different ages. This situation may be due to: (1) increased training of new professionals in
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54 357 the antibiotics field, as it is in the last ten years when the problem of resistance has had
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56 358 major social, scientific and clinical repercussions; (2) the fact that younger people are
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58 359 usually not pharmacy owners, which means that sales levels have no direct impact on their
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60 360 salaries and that any request to dispense antibiotics without a prescription will therefore

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3 361 be met with a firm refusal; and, (3) the fear factor. This factor is possibly linked to the
4 362 major fear felt by young pharmacists about dispensing antibiotics, as found in a study of
5 363 physicians performed in our area ^[14]. However, none of the FGs mentioned this variable, so
6 364 it is necessary to interpret it very cautiously.
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11 366 Studies conducted in other settings using the same methodology have reached similar
12 367 conclusions regarding the variables influencing the time taken to dispense an antibiotic,
13 368 and the external responsibility of physicians and patients. However, they also attach great
14 369 importance to other variables, such as economic interest. ^[26] Economic interest is strongly
15 370 linked to variables such as patient loyalty, e.g., in our environment, the dispensing of non-
16 371 prescription antibiotics was found to increase in cases where patients were known. ^[23] A
17 372 study conducted in our setting concluded that there was an association between the
18 373 pharmacist' age, the fact of owning a pharmacy, the patient's age and sex, and the
19 374 workload in terms of higher or lower drug-dispensing levels. While these results cannot be
20 375 directly extrapolated to our study because they would have to be restricted to antibiotic
21 376 dispensing, they nonetheless show the variables that have an impact when a drug is
22 377 dispensed, and these have proved to be relevant in our study. ^[27] The fact that, in Spain,
23 378 some community pharmacists are also business owners is a factor that has not been taken
24 379 into account in studies conducted in this population. This variable emerged directly in one
25 380 FG and indirectly in others.
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36 382 *The difficulty of spatiotemporal access* to physicians was another variable that emerged in
37 383 the FGs. There is evidence in the literature to confirm that the proximity of a pharmacy
38 384 decreases the demand for primary care. ^[28] Lack of communication with other health
39 385 professionals, particularly physicians, due to different variables such as the attitudes and
40 386 perceptions of different professionals is an aspect that has already been studied in our
41 387 setting. ^[29] Our study reinforces the idea of the need to improve pharmacist training
42 388 programmes and the relationships among health professionals.
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49 390 *Acquiescence* is a factor that has been studied by other research groups. The ease with
50 391 which an antibiotic is dispensed to a patient is a variable that other studies have
51 392 confirmed. ^[30] Our results are comparable with those yielded by other professionals in the
52 393 same setting. Conclusions reached about physicians show that the determinant factors of
53 394 antibiotic prescribing are fear, acquiescence, lack of continuing education and external
54 395 responsibility. ^[13] Factors such as lack of continuing education and external responsibility
55 396 show great influence in both studies, when it comes to prescribing and dispensing
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3 397 antibiotics [13,30]. Both studies report the external responsibility of other professionals as
4 398 being one of the main sources of malpractice, i.e., the notion of other professionals being
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6 399 perceived as the main culprits. Indeed, external responsibility is a common variable
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8 400 among health professionals, especially those who state that they have no time to give
9 401 explanations, and this is the reason for their malpractice. [13,30]

10 402
11
12 403 Our results are also comparable to those of a recent qualitative study undertaken in
13 404 Portugal. This paper concludes that attitudes related to the problem of resistance were
14 405 attributed to the external responsibility of patients, physicians, other pharmacists and
15 406 veterinarians.^[31] In our study, external responsibility was attributed to physicians,
16 407 dentists and the NHS. These results are extremely interesting because these attitudes,
17 408 which were identified in two different countries, could clear the way to designing specific
18 409 interventions at a Euro-regional Galicia-Northern Portugal level.

19 410 20 411 *Strengths and weaknesses*

21 412 One limitation is the low number and the source of the participants (community
22 413 pharmacists from a specific area of Spain, who are not necessarily representative of all
23 414 community pharmacists working in Spain), an aspect that restricts the study's
24 415 generalization to other areas or countries. The generalization of the results could also be
25 416 compromised due to the intrinsic characteristics of the pharmaceutical system in Spain,
26 417 governed by laws that may differ with respect to other countries. However, the study
27 418 conducted in Portugal yielded similar results.^[31] In any case, qualitative methods can seek
28 419 to obtain a range of views, and generalizability of findings is not usually an expected
29 420 attribute of this type of research. Similarly, the nature of qualitative data is that it is jointly
30 421 constructed by the researcher and the participants and cannot be viewed as objective
31 422 accounts.^[16,20] Another possible study limitation is that one of the FGs failed to attain the
32 423 pre-established minimum number of participants. Nevertheless, the conclusions drawn
33 424 from this FG did not differ significantly from those of the other groups. Among the study's
34 425 advantages is the fact that interaction among FG members generated ideas about
35 426 antibiotics and resistances, which would otherwise have been difficult to obtain. [16] There
36 427 are several previous studies that corroborate our findings both in our own and in other
37 428 settings, thereby increasing the reproducibility and validity of our study.^[13,22,26,29]

38 429 39 430 **CONCLUSIONS**

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3 432 Once attitudes/knowledge associated with inappropriate dispensing have been identified,
4 433 interventions can be designed to focus on these shortcomings, so as to improve antibiotic
5 434 use and contribute to minimising resistance.^[32] Pharmacotherapy-based interventions
6 435 with community pharmacists must be undertaken to prevent errors due to lack of
7 436 knowledge. This also implies the need to bear in mind the specific functions of
8 437 pharmacists as health professionals. Not only are publicity campaigns to reduce antibiotic
9 438 use necessary, but they need to be more direct if they are to have a major impact on health
10 439 professionals and the general population alike.
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441 **LIST OF ABBREVIATIONS**

- 442 1.- FG: focus groups
443 2.- M: Man
444 3.- NHS: National Health System
445 4.- OCP: Official Colleges of Pharmacists
446 5.- W:Woman
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FOOTNOTES.**Contributorship statement:**

All authors meet the ICMJE criteria and all authors have contributed:

- to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work,
- drafting the work or revising it critically for important intellectual content;
- to final approval of the version to be published;
- and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Author's specific contribution:

- 1.- Vazquez-Lago JM: Conception and design of the study. Design and conduct focus groups. Contribution to peer review of the transcription data. Analysis and interpretation data. Write the different versions of the manuscript. Review final approval of the work.
- 2.- Gonzalez-Gonzalez C: Design and conduct focus groups. Analysis and interpretation data. Review final approval of the work.
- 3.- Zapata-Cachafeiro M: Write the different versions of the manuscript. Review final approval of the work.
- 4.- Lopez-Vazquez P: Analysis and interpretation data. Contribution to peer review of the transcription data.
- 5.- Taracido M: Transcription of audio data.
- 6.- Lopez A: Conception and design of the study. Design the focus groups. Contribution to peer review of the transcription data.
- 7.- Figueiras A: Drafting the work and revising it critically for important intellectual content. Final approval of the version to be published.

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All Authors of this paper declare no conflicts of interest.

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Data sharing statement:

Unpublished data from the study can be availed upon request from Juan M. Vázquez Lago.

SCRIPT OF FOCUS GROUPS

Qualitative approach to the attitudes and knowledge of community pharmacists that condition inadequate prescription of antibiotics

CONTENT STRUCTURE OF PHARMACEUTICAL GROUPS

What do you think about the last campaigns on proper use of ATB carried out from the Ministry of Health?

Do you consider that there are still pharmacists who do not use ATB without prescription?

And 5 years ago? Was done? *Mention references that support this.*

What do you think could be the causes?

If you do not go out mention:

- *Difficulty of access to medical / health services*
- *By patient pressure. Sometimes aggressive attitudes, others because they can not stop going to work, because they are going to travel ...*
- *For customer loyalty.*
- *To advance time, "you already know what you are going to prescribe"*
- *And the pharmaceutical industry, has something to do?*
- *Any other reason?*

The use of ATB is now improving, the latest studies show that in Spain the consumption figures stabilize. What do you think may be the causes?

What do you think may be the% of pharmacies dispensed without prescription ATB?

Manuscript: Knowledge, attitudes, perceptions and habits towards antibiotics dispensed without medical prescription: a qualitative study of Spanish pharmacists.

Juan M Vazquez-Lago (M.D.) (M.S.), Cristian Gonzalez-Gonzalez (M.S.), Maruxa Zapata-Cachafeiro (M.S.), Paula Lopez-Vazquez (Ph.D.), Margarita Taracido (Ph.D.), Ana López (Ph.D.), Adolfo Figueiras (Ph.D.)

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

Developed from:

Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

No. Item	Guide questions/description	Reported on Page #
Domain 1: Research team and reflexivity		
<i>Personal Characteristics</i>		
1. Inter viewer/facilitator	Which author/s conducted the inter view or focus group?	Juan M. Vazquez-Lago Page 6. "FG were conducted by principal research (JVL)"
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	Page 1. "Juan M Vazquez-Lago (M.D.) (M.S.)"
3. Occupation	What was their occupation at the time of the study?	Doctor in Medicine. Specialist in preventive medicine and public health. MD and PhD student Page 1. "Department of Preventive Medicine and Public Health, Clinic Hospital of Santiago de Compostela"
4. Gender	Was the researcher male or female?	Male Page 1
5. Experience and training	What experience or training did the researcher have?	The researcher published an article

		<p>with similar methodology (Vazquez-Lago JM, Lopez-Vazquez P, López-Durán A, Taracido-Trunk M, Figueiras A. Attitudes of primary care physicians to the prescribing of antibiotics and antimicrobial resistance: a qualitative study from Spain. <i>Fam Pract.</i> 2012; 29: 352-60.). The researcher studied masters in public health where the qualitative methodology forms part of the teaching program. Conducted continuous training courses in qualitative methodology. Page 6. "This researcher has specific training for development research with qualitative methodology" and page 15. "Vazquez-Lago JM, Lopez-Vazquez P, López-Durán A, Taracido-Trunk M, Figueiras A. Attitudes of primary care physicians to the prescribing of antibiotics and antimicrobial resistance: a qualitative study from Spain. <i>Fam Pract.</i> 2012; 29: 352-60."</p>
<p><i>Relationship with participants</i></p>		
<p>6. Relationship established</p>	<p>Was a relationship established prior to study commencement?</p>	<p>Page 5. "In order to work in a community pharmacy in Spain, it is compulsory to be collegiate at Official Colleges of</p>

For peer review only

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		<p><i>Pharmacists (OCP). Using the “snowball method”, the OCP send project information in the normal manner to all community pharmacists. Community pharmacists who were interested in FGs participation, had to send a mail to researcher team.”</i></p> <p>Page 6. <i>“FG sessions took place at OCP meeting rooms.”</i></p>
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	<p>Page 6. <i>“All pharmacists were informed of the purpose of the study, of what implied their implication, of the objectives, as well as that the FG sessions were to be recorded and transcribed, and that no-one attending would be personally identified in the study results. All agreed to participate by signing informed consent.”</i></p>
8. Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	Page 4-5-6-7

Domain 2: study design		
<i>Theoretical framework</i>		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Page 6
<i>Participant selection</i>		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Page 5-6
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Page 5
12. Sample size	How many participants were in the study?	Page 7
13. Non-participation	How many people refused to participate or dropped out? Reasons?	Page 7 and 12
<i>Setting</i>		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Page 6
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	Page 6
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Page 6-7
<i>Data collection</i>		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Page 5
18. Repeat interviews	Were repeat inter views carried out? If yes, how many?	Page 7
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	Page 6

20. Field notes	Were field notes made during and/or after the inter view or focus group?	Page 6
21. Duration	What was the duration of the inter views or focus group?	Page 6
22. Data saturation	Was data saturation discussed?	Page 6
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	N/A
Domain 3: analysis and findings		
<i>Data analysis</i>		
24. Number of data coders	How many data coders coded the data?	N/A
25. Description of the coding tree	Did authors provide a description of the coding tree?	N/A
26. Derivation of themes	Were themes identified in advance or derived from the data?	Page 5
27. Software	What software, if applicable, was used to manage the data?	Page 7
28. Participant checking	Did participants provide feedback on the findings?	Page 6
<i>Reporting</i>		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Page 6-7-8-9
30. Data and findings consistent	Was there consistency between the data presented and the findings?	Yes, there was. From page 7 to 12
31. Clarity of major themes	Were major themes clearly presented in the findings?	Yes. they were. From page 7 to 12
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Discussion of major and minor themes From page 7 to 22