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### Medicines and medication literacy

*social practices and use of information*

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## Article

# Medicines and Medication Literacy: Social Practices and Use of Information

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**Abstract:** This article discusses results from a sociological study on (i) the sources and use of information on medicines and/or supplements and (ii) the self-assessment of how informed participants were about the last medicine or supplement they purchased. It seeks to demonstrate the plurality of information sources (expert and lay) that individuals call upon—with which they build up their medication literacy—and their perception of the information they have. While these social components of literacy are scarcely visible in available studies, the need to produce knowledge on them is a requisite for a more laypeople-centred approach in public policies seeking to promote medication literacy. A questionnaire was applied in-person (n = 1107) in urban pharmacies in Lisbon and Porto (Portugal). Results show expert information (medical and pharmaceutical) as the dominant reference, followed by lay sources (family/friends/colleagues), while digital sources were less valued than interpersonal ones. This interpersonal dimension was a relevant factor in the building of trust in information. The self-assessment of the information on medication was higher in functional literacy and lower in comprehensive literacy. Studies on medication literacy are particularly relevant in the current context of the expansion and diversification of medicines' use and of individuals' growing autonomy in their consumption habits.

**Keywords:** medication literacy; information sources; informational plurality; pharmaceuticals; dietary supplements; sociological analysis



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## 1. Introduction

Medication literacy is a relatively recent conceptual category, which is broadly defined as individuals' competences or skills in the safe and effective use of medicines (Raynor 2009; Saucedo et al. 2012). The emergence of this category is inextricably linked to the current social changes in the use of medicines. Originally limited to the management of health and illness, the use of medicines has progressively expanded to other purposes in performance management, such as aesthetic, cognitive and relational enhancement (Lopes and Rodrigues 2015; Coveney et al. 2019). This pattern of change is classified in sociological theory as a pharmaceuticalisation process (Williams et al. 2008; Fox and Ward 2008; Abraham 2010; Lopes et al. 2015). Defined as "the transformation of human conditions, capacities or capabilities into pharmaceutical matters of treatment or enhancement" (Williams et al. 2008, p. 851), the concept of pharmaceuticalisation marks a set of changes in people's relationships with medicines<sup>1</sup>. In turn, these new uses of medicines, as well as the increased availability of over-the-counter medicines, have diluted the centrality of a doctor's prescription in access to a growing segment of these resources. In this scenario, sources of information on medicines, health and performance have been

multiplying and diversifying, giving way to the constitution of what the literature has defined as informational landscapes (Nettleton 2004; Clamote 2010), in which expert and non-expert sources of information coexist and expand. This plurality of information sources and uses of medicines has given rise to a broader lay autonomy that takes on new configurations in terms of individuals' consumption choices in medicines; something that is particularly visible in the field of performance investments (Fox et al. 2005; Ruppel and Rains 2012; Clamote 2015; Pegado 2016).

The current social reality of medicines—the expansion of consumption, diversification of uses and leeway of lay autonomy in choosing how to use them—has drawn attention to the question of literacy in this field. This has resulted in a significant academic investment in the production of instruments evaluating medication literacy, as attested to by recent literature review papers (Liang et al. 2018; Pantuzza et al. 2021; Plaza-Zamora et al. 2020). The conceptual range of part of these instruments—generally in the form of questionnaires—is restricted to what has been defined as *functional literacy*, i.e., individuals' ability to understand prescribed instructions and to act accordingly (Sauceda et al. 2012; Plaza-Zamora et al. 2020). This conception of medication literacy has prompted criticism within and outside pharmaceutical studies (Papen 2009; Peerson and Saunders 2009; Cordina et al. 2018; Pouliot et al. 2018; Samerski 2019). It has been targeted as a restricted view of the information resources individuals resort to in the use of medicines, which go beyond a mere understanding of prescribed instructions. More recent advances in the conceptualisation of the notion of medication literacy have been focusing on the broadening of the information resources individuals use and their margins of autonomy. This conceptual reframing has been anchored in the notion of *informed decision*, around which the current definition of medication literacy has stabilised: “Medication literacy is the degree to which individuals can obtain, comprehend, communicate, calculate and process patient-specific information about their medications to make informed medication and health decisions in order to safely and effectively use their medications (...)” (Pouliot et al. 2018, p. 797).

In the field of social sciences, studies on health and/or medication literacy, or literacy in general, have highlighted the importance of taking into account the social contextuality of the processes governing the production and incorporation of literacy competences, considering it a requisite to be able to build knowledge and intervene in this field (Ávila 2008; Papen 2009; Chinn 2011; Gee 2015; Samerski 2019). Within this framework, literacy is conceptualized in the form of “social situated events” (Chinn 2011; Samerski 2019), in that it constitutes a resource that is shared and assimilated in the context of social relations. This means that literacy is not reducible to strictly individual competences, as these incorporate social and cultural resources from the wider context in which literacy practices take place (Papen 2009; Samerski 2019). In the same vein, Gee (2015) holds that “(...) literacy should be studied in an integrated way in its full range of contexts and practices, not just cognitive, but social, cultural, historical, and institutional, as well” (p. 35). The social contextuality of literacy, and specifically medication literacy, emphasises the need not just to measure instrumental competences but also to take into account the choices that individuals make and the information resources they lean on in the different circumstances and purposes for which they use medicines. It is important to consider how the use of information resources takes on a composite configuration, by including different sources of information and using different validity criteria, where scientific criteria (professional recommendations) and lay and empirical criteria (resulting from personal circumstances and experience) often coexist and are called upon, in a more or less eclectic fashion, to manage the use of medicines (Lopes 2009; Clamote 2010; Raposo 2016).

As another feature of the social contextuality of medication literacy, in tandem with the focus on trajectories of information use, this approach also encompasses users' perception of the information they access. Concerning this aspect, there are few medication literacy studies exploring how users assess the technical and professional information they receive and its usefulness and how they use it. This approach has been argued for in some research, defining it as a *laypeople-centred approach* (Papen 2009; Lee et al. 2018). In this case, it means

shifting the focus from an ethno-professional perspective—i.e., restricted to measuring the competencies individuals have to comply with professional guidelines on the use of medication—which has been dominant in the construction of tools to assess medication literacy, in order to add indicators able to assess how laypeople evaluate the usefulness and applicability of the information they have. The goal is not to replace one perspective with the other but to produce specific knowledge on the second one as a social requisite for optimising the design of professional responses and public policies devoted to improving people's medication literacy.

Another critical viewpoint on medication literacy studies relates to their narrow focus on pharmaceuticals, to the exclusion of other resources that may be used interchangeably with them. In fact, in association with the phenomenon of pharmaceuticalisation, another segment of consumption practices for therapeutic and/or performance purposes has been growing and spreading. This is the case of expanding recourse to dietary supplements and of the frequently interchangeable use of these resources with pharmaceuticals in consumption practices (Lopes et al. 2012, 2015; Rodrigues et al. 2019). That is an expression of how, in addition to the increasing use of pharmaceuticals, pharmaceuticalisation has also been expanding through the growth of a “natural industry” in the form of natural medicines and dietary supplements. This contributes to the alternating use of pharmaceuticals and natural products, for the same purposes, depending on factors such as the greater or lesser urgency of the desired results and perceptions of risks associated with different medications (Raposo 2016; Rodrigues et al. 2019). The scarcity of comparative studies on literacy in these interchanging consumption practices, between the pharmaceutical and the natural, keeps it practically invisible.

This article discusses results from a sociological study<sup>2</sup> on the sources and uses of information on the consumption of medicines and/or supplements and the self-assessment by the participants of how informed they were about the medication they use, more specifically on the last one they had acquired. The research on this topic aims to contribute to the discussion of the dimensions of social contextuality in medication literacy—which is addressed here through information sources—and how that contextuality informs the literacy practices in everyday life. For this purpose, we adopted a focus on the users' perspective—a laypeople-centred approach—which was operationalised and explored along two analytic lines: (i) the information sources individuals access to manage their uses of medicines and/or supplements and (ii) the self-assessment on the adequacy of the information individuals have on the medication they use. With this objective in mind, we do not argue that the social contextuality of medication literacy is tied solely to the issue of information sources and that it can dispense with other analytical components pertaining to functional literacy. It does, nonetheless, constitute a structural requisite for the design of more efficacious instruments in improving medication literacy.

## 2. Materials and Methods

### 2.1. The Questionnaire

The questionnaire used in this study was tailor-made, drawing on elements from existing literature on the subject, contributions from interviews with pharmacy directors (n = 7) and new indicators built by the sociology, pharmacy and statistics experts that made up the multidisciplinary project team. The questionnaire was pre-tested on a sample of 44 respondents in May 2021. It is divided into two main subject sections dealing with the components of medication literacy that are associated with a laypeople-centred approach.

The first section was devoted to indicators on the sources individuals use to get information on medicines, distinguishing between medicines and supplements. Covering a number of possible sources of information, the questionnaire also incorporated specific indicators on the role of the internet as a source of information and a means of purchasing these products, as well as on the assessment of the trust individuals place in the information provided by medication leaflets.

In the second section, the indicators related to the degree and type of information individuals considered they had on a medicine or supplement, referring to the last one they had purchased for themselves at the pharmacy at the time they answered the questionnaire. The questions in this section generally made two distinctions that proved to have substantial explanatory potential: first, a distinction between prescribed medicines, over-the-counter medicines and supplements and, second, a distinction between first-time use of these products and situations where they had been used before.

## 2.2. Data Collection

The survey was conducted by project team researchers at 10 urban pharmacies in the Lisbon and Porto areas, the two main cities in Portugal, between June and October 2021. Pharmacy customers who agreed to answer the questionnaire filled it out directly on a tablet. If they had trouble using the device, the researcher recorded their answers for them. If customers were not able to answer the questionnaire at the time, a link to the online questionnaire was emailed to them, asking for it to be filled out within 3 days, after which the link would expire. Thirty-four percent of the questionnaires were filled out in this way. Regardless of whether the questionnaire was filled out in person or online, the participants' anonymity was guaranteed.

The involvement of the Associação Nacional de Farmácias (National Pharmacy Association) was decisive in access to the pharmacies, providing contacts for pharmacies in both areas and, in some cases, brokering direct contact with their directors. For this study, preference was given to pharmacies located in large public spaces—such as shopping centres or transportation terminals—as opposed to neighbourhood pharmacies. The main reason for this choice, given the COVID-19 pandemic during this phase of the project, was the impossibility of having a researcher wait in small-sized pharmacies. We also hoped that larger venues would increase the probability of reaching a more diverse population, who would be buying a wider range of products for a greater variety of purposes.

The questionnaire and the data collection strategy were approved by the Ethics Committee of Iscte-University Institute of Lisbon (protocol code 72/2021, approved on the 9 June 2021).

## 2.3. Data Analysis

The survey data were analysed statistically using SPSS (Statistical Package for Social Sciences, Version 27). In addition to univariate and bivariate analyses (and their statistical testing when adequate), new variables were built to combine some of the initial indicators and measures. These composite variables underwent reliability tests (Cronbach's alpha) and were shown to be of high or very high reliability.

## 2.4. Participants and Sociodemographic Characteristics

The survey yielded a total of 1107 completed and validated questionnaires. However, during the data treatment, 186 (17%) were found to have been answered by health professionals, from such areas as medicine, nursing and pharmacy. Given that the subject of the questionnaire was medication literacy, including these questionnaires could have resulted in a bias in the overall analysis, so they were put aside as a separate sample to be analysed at a later date.

As a result, the final, non-probabilistic sample totalled 921 respondents. Throughout the process of applying the questionnaire, the participants' sociodemographic attributes were monitored in order to cover the diversity of profiles, although it was not possible to achieve their distribution in proportional terms. The sociodemographic structure of the sample is described in Table 1. In terms of gender, there was an overrepresentation of women, something that had happened in other surveys of pharmacy customers (Brito Reis et al. 2012). In terms of age, the sample included individuals between 18 and 75 years old and was fairly balanced in terms of age groupings. With respect to education, the proportion of respondents with higher education was above that of those with secondary

education, which does not reflect the reality in Portugal. This bias can be attributed to the fact that the questionnaire was conducted in large stores and the participants were asked to use a tablet to answer, which may have introduced an invisible selectivity. However, given that this is a large sample, that discrepancy does not invalidate statistical comparisons between education categories.

**Table 1.** Sample: sociodemographic characteristics (n = 921).

	%
<b>Gender</b>	
Female	73.5
Male	26.5
<b>Age</b>	
Up to 34 years	38.7
35 to 49 years	39.0
50 years or more	22.4
<b>Education level</b>	
Secondary education (12 years) or less	37.9
Bachelor's degree	41.4
Master's/PhD	20.6

### 3. Results

The indicators selected for this presentation of results correspond to the three analytical dimensions addressed in this article and covered in this section. The first is information sources for medicines and supplements. The second addresses patient information leaflets and the respondents' reading practices, assessment of the information in the leaflets and degree of trust in this information. The third deals with indicators linked to medication literacy, referring mostly to a self-assessment of the level of information individuals have—covering different items—about the last medicine and/or supplement they purchased. We conduct a systematic comparison between medicines and supplements throughout the presentation of these results. Whenever relevant, crosstabulations with sociodemographic variables are also introduced, particularly with regard to age and education levels.

#### 3.1. Sources of Information

Regarding the sources of information on medicines and supplements, it is possible to see that the search for information covers a plurality of sources, both institutional ones and others associated with lay referral (Table 2).

In spite of this plurality, traditional expert sources (doctors and pharmacists) are the ones most frequently used, both for medicines (averages of 3.91 and 3.32, respectively) and supplements (averages of 3.11 and 2.76), even though this preponderance is lower for the latter. It is also particularly worth noting that the average for expert sources is much higher for those with interpersonal contacts, which are sought out much more than impersonal ones like institutional websites (Infarmed, pharmacies or health food stores).

For medicines and supplements alike, the internet (not counting institutional websites) is a relevant source, with search averages (2.89 and 2.66, respectively, for medicines and supplements) that are slightly higher than those for informal sources (2.46 and 2.41, respectively). This role of the internet as a source of information is not, however, reflected in its use as a favoured means of acquiring medicines or supplements. About a quarter of the respondents (26.2%), mostly with higher education and aged under 50, had already acquired a product online, mostly supplements (86.3%). A lack of trust in medicines or supplements sold online (35%) and the absence of a professional to answer questions (32.7%) were the main reasons mentioned for not buying online.

**Table 2.** Regularity with which one seeks information on medicines and supplements in the following ways.

	Average Medicines	Average Supplements	Paired Samples <i>t</i> -Test ( <i>p</i> -Value)
Asking a pharmacist	3.32	2.76	0.000 *
On the Infarmed website	2.02	—	—
On pharmacy websites	1.92	1.92	0.874
At health food stores	—	2.34	—
At health food stores/brand websites	—	2.22	—
At doctor's appointments/from a doctor	3.91	3.11	0.000 *
In blogs or online forums	1.86	1.86	0.964
From relatives or friends/colleagues	2.46	2.41	0.122
From other experts (therapists, nutritionists, etc.)	2.63	2.69	0.112
On the internet (Google, etc.)	2.89	2.66	0.000 *
From other information sources	1.38	1.32	0.007 *

Scale from 1 "Never sought" to 5 "Always seek"; midpoint 3. \*  $p < 0.050$ ; paired samples *t*-Test.

Age constitutes a differentiating factor in terms of the regularity with which information is sought. In general terms, two differences stand out if we split the sample into three age groups (under 34; 35 to 49; over 50). First, older respondents are less likely to seek information from any sources, except from a doctor in the case of medicines and a pharmacist or health food store in the case of supplements. Second, the internet is the favourite source of information for younger respondents, for both products, particularly searches on non-institutional websites, such as Google (averaging 3.02, 2.73 and 2.37, respectively, from the youngest to the oldest age group, in the case of medicines and 2.81, 2.62 and 2.47 in the case of supplements) and blogs or online forums (1.96, 1.68 and 1.57 for medicines; 2.02, 1.82 and 1.63 for supplements).

Regarding education levels (after dividing the variable between the categories "up to upper secondary education" and "higher education"), a pattern emerges where those with higher education prevail in the search for information from the majority of sources. Expert sources constitute an exception to this, as those with upper secondary education resort more often to a pharmacist in the case of medicines and more often to a doctor in the case of supplements.

Results on whether respondents sought advice from a doctor or pharmacist on the last medicine or supplement they had bought for themselves attest to the importance of the interpersonal dimension of the relationship with expert sources. However, the proportion of those who requested expert advice varies depending on the category of the product in question (Table 3). For prescribed medicines, a great percentage requested advice from a doctor, while a pharmacist was asked for advice in fewer than 20% of cases. Requests for a doctor's advice on over-the-counter medicines fall to nearly half, while for pharmacists, the percentage remains the same, which may be associated with greater familiarity with the use of these medicines. There seems to be a greater need for advice, from both doctors and pharmacists (around 40%), on supplements, as respondents are probably less knowledgeable about them.

Age does not seem to make a significant difference in these requests for advice. As for education levels, there were statistically significant differences in seeking advice from a doctor on prescribed medicines ( $p = 0.036$ ), which was requested by more respondents with higher education, and for supplements ( $p = 0.010$ ), for which more respondents with a lower level of education sought advice. The difference between education levels is more accentuated for advice from a pharmacist on over-the-counter medicines ( $p = 0.000$ ), for which there were more requests for advice from respondents with a lower education level.

**Table 3.** Asking the doctor and/or the pharmacist for advice about a medicine and/or supplement (the last one purchased at the pharmacy).

		Doctor	Pharmacist
Prescribed medicines	Yes	69.7%	19.1%
	No	30.3%	80.9%
	Total	100.0% (n = 806)	100.0% (n = 806)
Over-the-counter medicines	Yes	33.3%	19.3%
	No	66.7%	80.7%
	Total	100.0% (n = 430)	100.0% (n = 403)
Supplements	Yes	43.4%	40.8%
	No	56.6%	59.2%
	Total	100.0% (n = 196)	100.0% (n = 196)

### 3.2. Medicine and Supplement Information Leaflets

Respondents' assessment of the quality of the information provided by medicine and supplement leaflets was generally positive but did vary on the basis of the type of product and the nature of the information in question (Table 4). All aspects of the information offered by leaflets for medicines received a relatively favourable assessment, except for the fact that it was considered too technical. Assessments of supplements were not so positive for almost all items, with the exception of overly technical information, which on average was less of a problem compared to medicines.

**Table 4.** Assessment of information in medicine and supplement information leaflets.

	Average Medicines	Average Supplements	Paired Samples <i>t</i> -Test ( <i>p</i> -Value)
Not very clear	2.12	2.44	0.000 *
Too technical	2.60	2.19	0.000 *
Incomplete	1.91	2.47	0.000 *
Helpful	3.26	2.95	0.000 *
Quite useful	3.56	3.13	0.000 *
Global assessment index	3.06	2.82	0.000 *

Scale from 1 "Disagree" to 4 "Agree"; midpoint 2.5. \*  $p < 0.050$ ; paired samples *t*-Test.

For comparative purposes, we constructed two indexes on the assessment of information leaflets, one for medicines (3.06) and the other for supplements (2.82), using the averages of the different information characteristics and after inverting the scale of the negative assessments. Looking at these indexes by education level, they show significant differences, which also vary, in opposite directions, for different types of products. Those with higher education were the ones who overall had a more positive opinion of the information provided by medicine leaflets (3.14) and less positive of that provided by supplement leaflets (2.75), while the opposite was the case for those with a lower education level (3.06 and 2.90, respectively). This may speak to the greater familiarity of those with higher education with the type of language used in medicine leaflets, which may also make them more demanding in regard to the information in supplement leaflets.

The results on the degree of trust in the information offered by medication leaflets also show differences between medicines and supplements. On average, on a scale of 1 "no trust" to 6 "total trust", medicine leaflets received a level of trust of 4.93, while those for supplements had a lower score of 4.21.

Focusing on indicators for reading the leaflet accompanying the last medicine or supplement purchased by respondents at the pharmacy for themselves, it was found to be quite widespread, which confirms the value attributed to expert sources and the positive assessment of the information they provide. There are notable differences to be found,



nonetheless, depending on whether the product is being used for the first time or has been used before (Table 5). In the first case, unfamiliarity was a factor that encouraged the respondents to read the leaflets for prescribed and over-the-counter medicines and supplements alike (respectively, 63.9%, 62% and 57.1% of respondents said they would read the leaflets). However, the percentage of those who do not read them or who say they might read them is not negligible for the three types of products. When the product has been used before, these percentages fall in the case of prescribed (48.5%) and over-the-counter (38.3%) medicines, while remaining high for supplements (61.7%).

**Table 5.** Reading of information leaflets for medicines and supplements (*has read or intends to read for the last product purchased at the pharmacy*).

		First Time Use	Been Using/Used before	Total
Prescribed medicines (*)	Yes	63.9%	48.5%	54.5%
	No/maybe	36.1%	51.5%	45.5%
	Total	100.0% (n = 277)	100.0% (n = 439)	100.0% (n = 716)
Over-the-counter medicines (*)	Yes	62.0%	38.3%	42.6%
	No/maybe	38.0%	61.7%	57.4%
	Total	100.0% (n = 71)	100.0% (n = 326)	100.0% (n = 397)
Supplements	Yes	57.1%	61.7%	60.0%
	No/maybe	42.9%	38.3%	40.0%
	Total	100.0% (n = 70)	100.0% (n = 115)	100.0% (n = 185)

\*  $p < 0.050$ ; chi-square test.

### 3.3. Self-Assessment of Information and Medication Literacy

In general, the overall self-assessed level of information respondents felt they had about the last medicine or supplement they had purchased was relatively high (Table 6). This level is higher for indicators related to “functional information” (what the medication is used for, how to use it, for how long)—information that is more instrumental and directly applicable to consumption—than for “comprehensive information” (side effects, interactions, contraindications and composition). This difference is higher for medicines than supplements.

**Table 6.** Self-assessment of information on a medicine or supplement (*last one purchased at the pharmacy*): averages per item.

	Prescribed Medicine	Over-the-Counter Medicine	Supplement
Purposes of the medicine or supplement	3.41	3.39	3.32
How to use it	3.53	3.51	3.40
How long to use it	3.43	3.41	3.15
Side effects	2.93	2.90	2.86
Interactions with other medicines or supplements	2.78	2.76	2.83
Interactions with food	2.66	2.64	2.88
Contraindications (when its use is not recommended)	2.89	2.88	2.86
Composition of the medicine or supplement	2.76	2.70	3.09

Scale from 1 “no information” to 4 “plenty information”; midpoint 2.5.

For the purpose of this analysis, three composite variables (aggregate averages) were built from the different information items, distinguishing the type of information they referred to. “Functional information” includes the first three items in Table 6, and “comprehensive information” includes the next five items. “Global information” includes all items. These new variables are of good or very good internal consistency, as shown by the Cronbach’s alfa values (Table 7).

**Table 7.** Self-assessment of information on a medicine or supplement (*last one purchased at the pharmacy*): aggregate averages and Cronbach's alpha ( $\alpha$ ).

	Prescribed Medicine	Over-the-Counter Medicine	Supplement
Functional information	3.46 ( $\alpha = 0.844$ )	3.37 ( $\alpha = 0.900$ )	3.29 ( $\alpha = 0.838$ )
Comprehensive information	2.80 ( $\alpha = 0.908$ )	2.83 ( $\alpha = 0.937$ )	2.91 ( $\alpha = 0.925$ )
Global information	3.05 ( $\alpha = 0.877$ )	3.03 ( $\alpha = 0.914$ )	3.05 ( $\alpha = 0.922$ )

Scale from 1 "no information" to 4 "plenty information"; midpoint 2.5.

Comparing averages for the new variables, the differences between the type of information and the type of product become clearer. The self-assessed levels of information are consistently higher for "functional information" in all product categories, and their distance from the levels of "comprehensive information" is wider for medicines than supplements.

The self-assessment indexes vary in accordance with the respondents' education level, habit of reading medicine or supplement leaflets and experience of using the product, but that depends on the type of information and the type of product in question (Table 8).

**Table 8.** Self-assessment of information on medicine or supplement, by education level, leaflet reading and experience of using the product: averages.

	Type of Information	Prescribed Medicine	Over-the-Counter Medicine	Supplement
<b>Education level</b>				
Secondary education or less	Functional	3.42	3.29 *	3.36
	Comprehensive	2.84	2.79	3.05 *
	Global	3.06	2.98	3.16 *
Higher education	Functional	3.48	3.42 *	3.25
	Comprehensive	2.78	2.85	2.83 *
	Global	3.04	3.07	2.99 *
<b>Leaflet reading</b>				
Yes	Functional	3.48 *	3.41 *	3.27
	Comprehensive	2.80 *	2.94 *	2.89
	Global	3.05 *	3.11 *	3.03
No/maybe	Functional	3.38 *	3.30 *	3.34
	Comprehensive	2.68 *	2.69 *	2.71
	Global	2.94 *	2.92 *	2.95
<b>Experience using</b>				
First time using	Functional	3.38	3.11 *	3.10 *
	Comprehensive	2.52	2.44 *	2.64 *
	Global	2.84	2.69 *	2.81 *
Used before	Functional	3.50	3.43 *	3.40 *
	Comprehensive	2.95	2.91 *	3.05 *
	Global	3.16	3.10 *	3.18 *

Scale from 1 "no information" to 4 "plenty information"; midpoint 2.5. \*  $p < 0.050$ ; independent samples *t*-test.

The relationship of education levels with the self-assessment of information is significant for over-the-counter medicines and supplements, which are subject to less expert control. The self-assessment of functional information on a product is higher among those with higher education for over-the-counter medicines, whereas, for supplements, those with lower education felt they had more comprehensive information. This distribution matches up with our previous findings on respondents' evaluation of information in supplement leaflets, which was less positive among those with higher education.

Regardless of the type of information in question, reading leaflets is significantly associated with the respondents' self-assessment of the information they have on prescribed or over-the-counter medicines. Specifically, the self-assessed levels of information are always higher for the respondents who said they had read the leaflet or planned to. However, this is not the case for supplements, which again confirms that leaflets are considered a less important source of information for these products.

Having experience of using a product is also a relevant factor in the self-assessed levels of information, particularly in the case of non-prescribed products, like over-the-counter medicines and supplements. For these, respondents who had already used the product felt that they were more informed, regardless of the type of information in question, as all types show a significant statistical relationship with this variable. Although the average levels of self-assessed information for prescribed medicines are also higher when the medicine has been used before, this relationship is not statistically significant.

#### 4. Discussion

Given these results, we can identify a set of trends that will permit some advances in the production of specific knowledge on medication literacy. As it is a relatively recent category, there are few studies specifically focused on the population's skills in dealing with medicines and supplements. This stands in the way of comparisons with results from other research and of diachronic analysis. Nevertheless, in this section, we seek to summarise some results that may relate more or less directly to those produced in this study.

This approach favours a conception of medication literacy that takes its social contextuality into account. The results therefore not only measure skills but also address how literacy is built, from which sources of information (and how they are valued) and how individuals self-assess the knowledge they have.

Although the search for information on medicines and supplements/natural products encompasses multiple sources, expert sources stand out (particularly doctors and pharmacists). This tallies with results from previous research in Portugal, which found these sources to be the most highly valued (Clamote 2010). While the internet has been gaining some relevance as a source of information about medications, the data suggest that it is not a direct trigger for consumption but rather a way to initially access information that is later validated with expert interpersonal sources (Egreja et al. 2023). The fact that people prefer direct contact with experts, as opposed to impersonal institutional channels, attests to the continuing importance of an interpersonal dimension in the construction of trust in information about medications (Rodrigues 2021).

This does not invalidate the fact that there is a relevant presence of non-expert information sources—either through non-institutional internet contents or through the social networks of individuals (relatives or friends/colleagues)—which attest to the growing margins of autonomy in the search for and management of information on medications. This autonomy has also been fuelled by the expansion of pharmaceuticalisation, both through the use of medication beyond the frontiers of disease and prevention (Lopes and Rodrigues 2015; Coveney et al. 2019) and through the growing use of supplements (Lopes et al. 2012).

This dimension can also be found in indicators on how those same sources are used for advice about the last medicine or supplement the respondents have purchased for themselves. Calls for advice on prescribed medicines are quite widespread and are primarily made to a doctor, as is to be expected. The number is lower for over-the-counter medicines, however, perhaps because of greater familiarity with them and their use and a perception of a lesser need to confirm information on them. On the other hand, less familiarity with supplements seems to boost the need for advice on their use.

Of all sources of information on medicines, leaflets are the focal point in studies to assess medication literacy. Their contents undergo readability tests given to small groups of users, preferably with lower general literacy levels (Pires et al. 2015). For this study, the results show that the respondents shared a generally positive evaluation of this information, though it was considered too technical. Their degree of trust in the

information was also quite high. Other extensive studies have also recorded high levels of satisfaction with written information on medicines. They have, however, also highlighted some shortcomings, particularly their length and the language used, which is considered to be overly technical (Grime et al. 2007). In comparison, supplement leaflets have not only been less favourably evaluated, but the levels of trust in the information are also considerably lower, an issue that is bound to be entangled with the matter of the social credibility of these resources.

The habit of reading leaflets for the last product purchased for personal use was shown here to be widespread, on a par with results from research in other countries (see Raynor et al. 2007, in the United Kingdom; Nathan et al. 2007, in the USA) and in Portugal: a survey of a sample of 233 pharmacy customers in the Lisbon area found that 43.5% said that they read leaflets “very often”, 15.9% “often” and 20.3% “sometimes” (Brito Reis et al. 2012). The inclusion in this study of a variable distinguishing between respondents who were using a product for the first time and those who had used it before proved to be fruitful, as it showed that more respondents read the leaflet when they were using the product for the first time. In the case of prescribed medicines, the same pattern was found in a systematic review of research from several European Union countries, where “most participants (range of 60–95%) said that they had read written information accompanying the medicine at least once (...) usually when the medicine was first prescribed” (Grime et al. 2007, p. 290). In the case of supplements, the percentage of those reading leaflets remains high even when they have used them before. This may have to do with less familiarity with the product and the scarcity of other institutional information sources for them. This requires further empirical and analytical investigation.

However, the percentage of individuals who do not read or who say that perhaps they will read the leaflets is not negligible. This is particularly important when considering medication that is being used for the first time, given the implications of the non-reading of leaflets on the information that individuals may have about the medications they take. This result raises the need to understand not only the patterns and reasons for reading the leaflets but also to explore the reasons for not reading them.

In this study, the indicators pertaining to medication literacy were geared towards the self-assessment of the level of information respondents had on the last medicine or supplement they had purchased, rather than focusing on validating and measuring their knowledge. The correspondence between those two types of measurement was tested in a study conducted by Brito Reis et al. (2012) and proven to be strong, i.e., the average of correct answers on a medicine and respondents’ self-assessment of their own knowledge (measured by a single question, where they classified their knowledge on a scale from insufficient to entirely sufficient) was quite close. The closeness in this study makes it possible to consider the self-assessment of information as an indirect measure of medication literacy, in addition to highlighting the importance of the self-perception of knowledge on how individuals relate to sources of information and medication.

Overall, the respondents’ self-assessed level of information was relatively high but varied according to the type of information. It was higher for “functional information” (purposes, how to use, for how long) than “comprehensive information” (composition, interactions and contraindication). This gap is larger for medicines than for supplements. While the items assessed are not directly comparable, another study conducted in Portugal (Brito Reis et al. 2012) that measured respondents’ effective knowledge of medicines got higher percentages of correct answers for functional information. These results show how different types of information on medicines and supplements hold different values for individuals, depending on how it can be used in the management of actual consumption.

The reading of leaflets and experience using the last medicine or supplement purchased are variables that, in general, show a relationship (often statistically significant) with the respondents’ self-assessment of their degree of information on a product. In medicines, knowledgeability was always considered higher by respondents who had read the leaflet or intended to, while the same did not hold true for supplements. This appears to confirm that

leaflets as a source of information on these products are less important. The experience of use also had a relevant effect on the self-assessed degrees of familiarity, particularly in non-prescribed products, like over-the-counter medicines and supplements, where previous use entailed a higher self-assessed knowledgeability for all types of information.

Some differences between age groups and levels of education were explored in sociodemographic variations. While differences between age groups were found not to be significant in most cases, the same was not the case with the level of education, which introduced significant variations in some of the dimensions explored here. First, in the self-assessed level of information on over-the-counter medicines and supplements, those with higher education felt that they had a higher level of “functional” information for over-the-counter medicines but also admitted to a lower level of “comprehensive” information for supplements. Other studies have shown that knowledge about medicines tends to be greater the higher the level of education (Brito Reis et al. 2012) and argued that this is one of the determinants of health literacy (Arriaga et al. 2022). However, these results complexify this relationship and show that there is a need to explore it further, especially for products that are subject to less expert control and accounting for different types of information. One of the explanatory factors for this may be that individuals with higher education levels have a higher opinion of the information in medicine leaflets than that in supplement leaflets. The opposite is the case for those with lower education levels. This seems to speak to the greater proximity and familiarity of the former with the language of medicine leaflets, which may also lead them to expect more from the information provided for supplements. In turn, for those with lower education levels, the need for more, and more exhaustive, information on supplements seems to be less pressing, which may have to do with perceptions of lower risk associated with them (Raposo 2016).

Finally, the questionnaire included indicators on supplements, and the results show that they involve certain specificities when compared to medicines. These need to be explored moving forward, particularly due to the spread of these products as therapeutic resources used for an increasingly diverse array of purposes (Lopes et al. 2012, 2015; Rodrigues et al. 2019). Regarding their main specificities, in the search for information on supplements in general, expert sources (doctor and pharmacist) are not as preponderant as for medicines. More supplements are purchased online and do not appear to be subject to the same validation and trust-building mechanisms as medicines. Nonetheless, when it comes to concrete use, they prompt a greater demand for further advice from doctors and pharmacists. The information in supplement leaflets is assessed less positively and also inspires less trust.

## 5. Conclusions

In the current social reality of the expansion and diversification of the use of medicines and supplements, the issue of medication literacy is of particular relevance as a requisite for public health. As such, this is an issue that warrants not only further conceptual and analytical investment but greater interdisciplinary work as well, in order to articulate and go deeper into the technical and social aspects of this field, as already pointed out by other authors (Coca et al. 2022). This article sought to offer evidence on the importance of articulating the discussion of this issue with its social contextuality. It focused on identifying the plurality of information and its uses in the sphere of medicines and supplements and discussed how these pluralities translate into a growing lay autonomy in the everyday management of medication choices and uses. This new contextuality, in turn, accentuates the importance of an also shifting focus towards individuals’ self-assessment of the information they have about the medications and information sources they use. Labelled as a *laypeople-centred approach*, the results derived from this focus, for which this study produced specific indicators, under tight theoretical and methodological control, proved to be critical in identifying continuities and discontinuities between users’ perceptions and the goals set out by institutional and professional safety directives on the use of medicines and supplements.

The pursuit of a focus on users requires, in turn, the adoption of methodologies that are not restricted to the exclusive use of quantitative and extensive techniques, as is the case of survey questionnaires. The need to identify the social rationales underlying medication literacy practices, which individuals enact in different decision contexts for different purposes, calls for the complementary use of qualitative techniques, such as interviews and focus groups, following a mixed-methods strategy. In this sense, the results presented here also contribute to highlighting the need to deepen the topic under analysis through further research and methodological diversity. Within the framework of these methodological options and interdisciplinary approaches, medication literacy studies can help to both define public policies in this area and produce support materials for health professionals as favoured agents of medication literacy for the general population.

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## Notes

- <sup>1</sup> An additional note on pharmaceuticalisation is that its genesis is indissociable from medicalisation, a concept originally formulated by Zola (1972) and further developed by Conrad (2007). Medicalisation is understood as the transformation of human conditions into medical problems, which are then treated as diseases or disorders. Thus, the expansion of the use of medicines has become directly related to the expansion of medicalisation. However, this expansion also created new forms of interdependence between pharmaceuticalisation and medicalisation. This occurs through new conditions whose medicalisation is induced by the processes of pharmaceuticalisation, such as therapeutic innovation and new medically approved “off-label” uses of medicines (Conrad 2007; Abraham 2010).
- <sup>2</sup> The results presented in this article are part of a wider research project on “Medicines and dietary supplements in performance consumptions: social practices, contexts and literacy”, funded by the Portuguese Foundation for Science and Technology (FCT), and hosted by the CIES-Iscte research centre, in partnership with the Instituto Universitário Egas Moniz (IUEM) and the Instituto de Sociologia da Universidade do Porto (IS-UP). The project had the cooperation of Infarmed [National Authority of Medicines and Health Products] and ANF [National Pharmacy Association].

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