

RESEARCH ARTICLE

Online pharmacy: customer profiling

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Introduction: Nearly three out of four European citizens purchase goods online. The main advantages of using an online pharmacy are lower prices and convenience. In addition, patients appreciate a higher degree of privacy and access to a wider selection of health products. Study shows that the number of online users is on the rise in major countries like the USA, EU member states or India. **Methods:** The study is based on data collected in April 2020 at the country level (Romania) from a sample of 789 adults over the age of 18, using CATI. A simple random sampling procedure was applied, with a confidence interval of 3.5% and a confidence level of 95%. **Results:** About 17.7% of Romanians have purchased healthcare products through online pharmacies or drugstores, of those 60% are women, between 30 - 64 years old (84 %), have a monthly income of more than 2700 lei (90%), and a university degree (76%). The most common reasons for choosing an online pharmacy are the ability to compare prices, shop quickly, and have prompt access to items and information, together with a wider range of products. **Conclusions:** Respondents' motivation to use online pharmacies appears to be more related to the benefits of the online media, rather than to some unmet needs in brick-and-mortar pharmacies. Search capabilities, access to more information, price comparison, as well as a larger range of products and availability 24/7 are some reasons why patients utilise online pharmacies to purchase medicines.

Keywords: online pharmacy, patients behavior, pharmacists, influencing decision, medicine, pharmaceuticals, healthcare products, digital marketing

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Introduction

Nearly three out of every four European citizens made transactions online according to a study published in 2020 [1]. The latest Covid19 pandemic has only intensified the growth of digital platforms, with major retail players recently announcing their presence in the pharmacy market [2]. Despite having a negative EBITDA, an online pharmacy company operating in three countries in Central Eastern Europe was floated on the Czech stock exchange at the end of 2020, with a market capitalization of approximately 54 million Euro, indicating an increased interest from financial investors in this sector [3–5].

For several years, online pharmacies have been haunted by security and counterfeit medication claims. The key drawbacks of online pharmacies have been linked to difficulties in determining if the medicine purchased is legitimate or fraudulent, a lack of direct communication between the pharmacist and the consumer, questions about the quality of medicine purchased online, and issues with the promotion of self-medication [6, 7]. The old days are gone, and recent research shows that online buyers are growing in major markets like the United States, Europe, and India, with millions of people trusting this channel [8, 9]. Nonetheless, there are certain security concerns about the confidentiality of medical and personal data, authorization of the online pharmacy to dispense out certain medicines (such as prescription pharmaceuticals), technical IT matters related to the websites, or financial risks associated with purchases via the online channels [10, 11].

Early in the 2000s, the online channel was primarily praised for offering patients the options to address embarrassing or sensitive medical conditions to pharmacists from behind the Internet confidentially wall [12]. Now, the main advantages of online pharmacies are lower prices, the possibility to compare prices between various vendors, and convenience (24/7 opening hours). On top of these, patients appreciate a certain level of privacy, access to a more extensive range of healthcare products, and free access to information easily managed digitally [6, 13]. A study published in 2020 in India concluded that the essential factors in choosing an online pharmacy were quick service, doorstep delivery, and reduced cost of medicine, while privacy, accessible payment mode, and decreased error rate were also mentioned [14]. Knowledge, age, income, attitude toward the online media, residence, and other factors influence the level of adoption of this pharmacy channel [15, 16].

The acceptance of online channels by patients moves fast. For example, in Romania, a study published in 2015 showed that 8.3% of respondents already ordered medicine via the Internet, and another 7.1% intended to do that in the near future. The typical Internet user is between 18 and 34 years old, with above-average educational background [17].

A study from 2018 on Hungarian patients revealed that despite 82.65% of them being aware of the online channel availability, only 4.17% of the subjects indicated they used the Internet for ordering medicine, mostly the young and educated [18]. In 2017, Germany and the United Kingdom were considered the most mature markets for Internet pharmacies at the European level, with 10% of non-prescription medicine delivered through this channel [9].

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While communication between pharmacist and patient is the new hallmark of the profession of pharmacist, the focus on efficiency of communication is being analyzed in various studies, and online channels proved to empower the patient by providing access to medical information about new products, side effects and health conditions in general [7, 19].

Pharmacies are also considering opportunities given by the online media due to easy access to advertising activities towards lucrative segments of the population, the ability to convey customized messages using web-based tools, and a way to capitalize on competitive operational advantages, such as low prices or quick delivery [6, 7, 16].

Trust is the most important concept associated with the online pharmacy phenomenon, and it is related not only to financial transactions, or technical IT-related matters. Still, it is very much about the perceived trust with which strong regulation equips online pharmacies [20, 21].

Material and methods

The analysis is based on data obtained in April 2020 for a large-scale market research study. The data was collected using CATI (Computer Assisted Telephone Interviewing) by *Institutul Român pentru Evaluare și Strategie* (IRES). A sample of 789 respondents over 18 years old, from cities and towns with over 10,000 inhabitants, was selected using simple random sampling (3.5% confidence interval, 95% confidence level).

The questionnaire included several questions evaluating various pharmacy services and patient-pharmacy interaction, with a sub-section addressing online pharmacies related issues and patient's access to pharmacy websites on the Internet. In addition, demographic profiles have been compiled in their entirety.

Collected data have were analyzed using Stata 16 [22]. We used descriptive statistics for describing attitudes and behaviors regarding the choice and use of online pharmacies. Having one or more expected values less than 5, we tested the level of association between various items using the two-sided Fisher's exact test, using a p-value of less than 0.05 to reject the null hypothesis.

Results

When participants were asked how important it is for them to have online purchasing alternatives when choosing a pharmacy (Figure 1), 36.78 percent said it is very important (N=274). In comparison, 42.27 percent of respondents believed this is not at all important.

Women (56 percent, N= 153.5), 18-49 years old (61 percent, N=165.8), monthly income above 2700 Lei (55 percent, N=142), and education high school or higher (76 percent, N=208.5) make up the profile of those considering as "Important" or "Very important" for a pharmacy to have an online purchase option. At the time of data collection, 2700 Lei was equivalent to 560 Euro while the net average wage for the 1st semester of 2020 was 3300 lei.

The lack of online pharmacy options, on the other hand, was cited by 48.69 percent (N=376) of respondents as a cause to shift to another pharmacy. Women (59 percent, N=221), 30-64 years old (70 percent, N=261), monthly salary of over 2700 Lei (64 percent, N=225), and university studies (48 percent, N=179) are the demographics of those who responded like this.

In terms of online pharmacy utilization, 17.7% of respondents (N=140) said that they had purchased health-care products from online pharmacies or online drug stores thus far. Women (60 percent, N=84), 30-64 years old (84 percent, N=106), monthly income of over 2700 Lei (90 percent, N=122), and university studies (76 percent, N=106) are the characteristics of those who buy from an online pharmacy (Table I).

The participants were asked to evaluate the advantages of the online pharmacy against traditional pharmacy ("Classic"). The opportunity to compare costs, shop quickly, have rapid access to products and information, and have a large selection of products were all cited (Figure 2). On the other hand, better pricing (27.9%) and access to alternative solutions (54.3 percent) were the least mentioned.

We also questioned which criteria are the most significant when choosing an online pharmacy, and the most commonly answered factors were related to the general, technical advantages of Internet commerce: range of products, search capability, and payment choices (Figure 3).

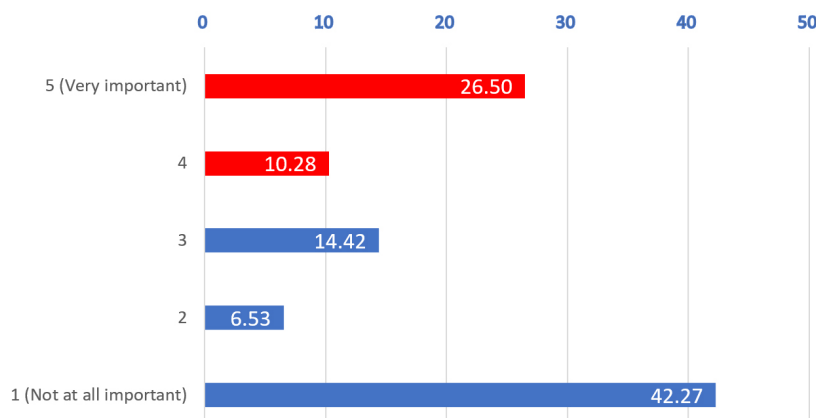


Fig. 1. On a scale of 1-5 (5 being "Very important" and 1 being "Not important at all") please evaluate the importance of the possibility to buy online when choosing a pharmacy (%)

Table I. Profile of respondents who purchased from online sites (online pharmacy or online drug stores)

Variable	Frequency	Percent
Gender		
Women	84	60%
Men	56	40%
Total	140	100%
Age		
18-29 years	11.0	8%
30-49 years	79.0	56%
50-64 years	36.0	26%
≥ 65 years	14.0	10%
Total	140.0	100%
Monthly income		
≤ 1500 lei	3.0	2%
1501-2700 lei	11.0	8%
2701-4500 lei	47.0	35%
> 4500 lei	74.0	55%
Total	135.0	100%
Education		
Elementary school/primary school	1.0	1%
High-school and vocational	33.0	24%
University or post-university	106.0	76%
Total	140.0	100%

From the websites accessed by the respondents, *Farmacia Tei* received the most references, with over 70% of respondents being aware of it. *Catena* and *Farmacia la pret mic* are owned by the same company, and 40 percent of respondents cited them simultaneously. *Farmacia Ardealul*, *Medimfarm*, and *Minifarm* are examples of regional pharmacy chains featured in this list (Figure 4).

We assessed the relation between the items describing the interaction with the pharmacist and the pharmacy with the variable indicating whether the respondent purchased pharmaceuticals or similar products online (q101) using Fisher's exact test (results in Table II).

The test revealed no significant relationship between satisfaction, convenience, trust in pharmacy or pharmacists solicitude, and online shopping behavior.

A comparable test of the independence of the variable pertaining to the possession/use of fidelity cards versus the variable indicating where respondents purchased drugs online revealed no dependent relationship as well (Table III).

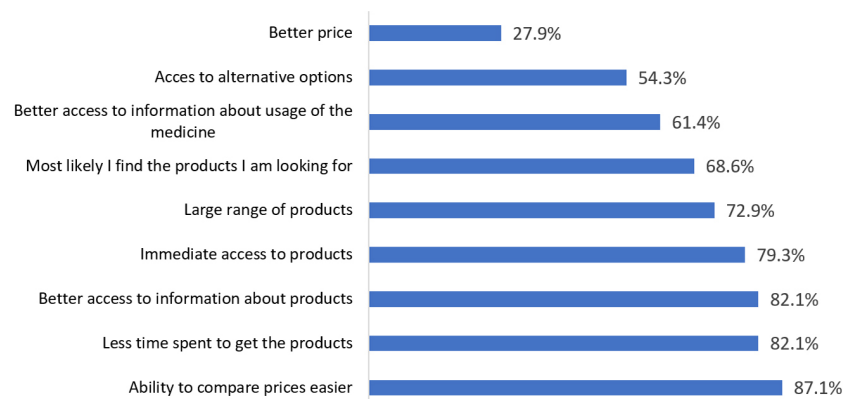
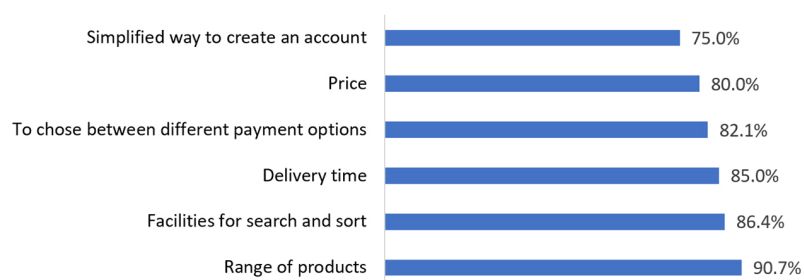
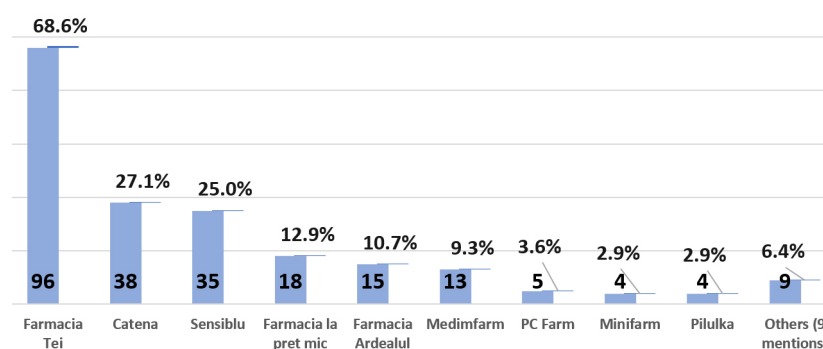
**Fig. 2. Advantages of online pharmacies vs classic pharmacies (% mentions, multiple answers) (N=140)****Fig. 3. How important are the following factors when choosing a particular online pharmacy? (% of mentions, multiple answers) (N=140)****Fig. 4. Previously, did you purchase from the following websites? (% of mentions Yes) (N=140)**

Table II. Fisher's exact - association tests between various questions for respondents that bought online medicine or healthcare products (Q2, Q3, Q22, and Q25 vs Q101)

Question	Fisher's exact score	Answers
Q2. How satisfied are you with the pharmacy you buy most often from?	0.207	- I am not satisfied(34) - Indifferent (90) - Satisfied (665)
Q3. How convenient is the pharmacy from which you are used to getting your medicines in terms of distance and time?	0.199	- Convenient (738) - Not convenient (40) - Indifferent (11)
Q22. How much do you trust pharmacists in general?	0.304	- Much trust (682) - Little trust (100)
Q25. Would you like the pharmacist to talk to you more?	0.820	- Yes (391) - No (386)

Table III. Fisher's exact - association tests between answers regarding owning a fidelity card and online pharmacies respondents are buying from (Q10 and Q102)

Question	Fisher's exact score	Answers
Q10. Do you own and use loyalty cards from pharmacies?	0.121	- I own and use one (582) - I own, but not use it (60) - I do not own one (135)

Discussion

One-third of the respondents believe that a pharmacy should provide an online purchasing option to its customers ("very important", and "important" choices), which contrasts with the responses to the next question, which shows that nearly a half of the respondents are considering switching pharmacies due to the lack of an online option. In sociological studies, such contradictions used to show up when respondents were asked hypothetical questions and their responses reflected that [23].

The profile of persons who regard online options as substantial and critical is consistent with the premise that education and a high income tend to be the primary drivers of early adoption of digital solutions.

The percentage of the population who have used the Internet to buy medicine and healthcare items is double that it was ten years ago (17.7% vs. 8.3%), but it is still much

behind the percentage of those shopping online for various other goods in Romania, which is 29% [1, 17]. People who buy medications online have a profile that matches the profile of positive respondents to the previous questions: they are active, have a high level of education, and have disposable income. We need to keep in mind that Romania has a much lower proportion of people who use the Internet than the rest of Europe [1].

When we dig deeper into the reasons for using an online pharmacy, we find that respondents emphasize the importance of various advantages of this channel – the ability to compare prices, the capacity to shortly select products, the amount of available information before the computer, and the range of products. The majority of these factors have been stated in cited works, but the priority ranking gives us a unique perspective on how specific regional factors influence such issues [6, 7, 10].

When a consumer chooses an online pharmacy, the choice of products (obviously larger than in a *brick-and-mortar* pharmacy) and the ability to search and filter on the online shop are the most important criteria. However, all of the other characteristics mentioned received a high degree of reference (>75%), underlining that the electronic medium generates a new way of thinking about pharmaceutical purchases in the consumer's mind.

Farmacia Tei has been developing and promoting its online franchise for many years and has developed a certain level of notoriety, as evidenced by the fact that almost 70% of respondents identified them as a well-known online pharmacy in our survey. National chains of pharmacies have established online pharmacies, as well, and their awareness follows the main brand, as evidenced by the success of *Catena* (with two brands) or *Sensiblu* - Romania's leading pharmacy chain. In addition, respondents suggested names like *Farmacia Ardealul*, *Medimfarm*, or *Minifarm* well outside their physical location, indicating that Internet marketing efforts for smaller and regional pharmacies paid off. These results are proof that online development allows pharmacies to grow.

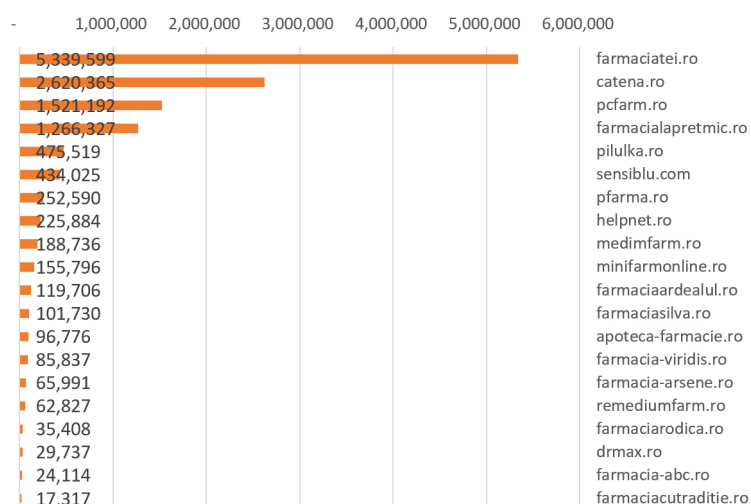


Fig. 5. Traffic for April 2020 (visits); source: SemRush.com (Traffic Analytics)

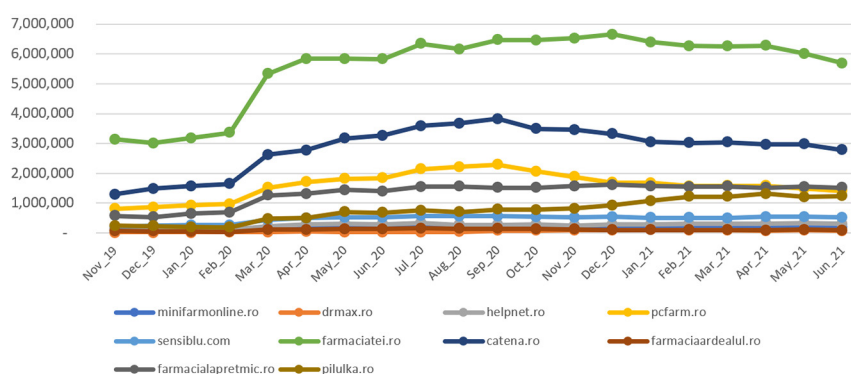


Fig. 6. Evolution of traffic (visits per month); source: SemRush.com (Traffic Analytics)

For comparative reasons we acquired data for April 2020 (the same month we conducted our research) from the SaaS website *semrush* (www.semrush.com) in order to better understand how the public's view on a website reflects real data regarding visits to that website? As seen in Figure 5, genuine data backs up our findings and the ranking suggested by our research. The only exceptions are *pilulka.ro* and *helpnet.ro*, both of which have far more real traffic than the sites included in our study.

According to statistics from *semrush.com* (Figure 6), we noticed a significant increase in traffic around February 2020, which we may ascribe to the Covid-19 epidemic and lock-out measures imposed immediately after the pandemic outbreak. *Farmacia Tei* has the biggest traffic ranking (more than twice that of any other online pharmacy website), and *pilulka.ro* was expected to witness a large increase in traffic in the fall of 2020. We should also highlight that the law governing online pharmacies comes into effect at the end of 2019, and most online pharmacies began online advertising and digital marketing activities after receiving the necessary license, thus these two events had a big impact on the outcome, including traffic. According with the legislation, online pharmacies are allowed to dispense out OTC medicine, food supplements, vitamins, medical devices and other healthcare products with the exception of prescription medicines (Rx) [24].

We tested using Fisher's exact several other aspects, including general satisfaction, convenience, trust in pharmacist, willingness to talk with a pharmacist, or possession of a loyalty card. The reasons for respondents using online pharmacy appear to be related more likely to the merits of the online medium, and not to some unmet needs of the "classic" *brick-and-mortar* pharmacies. The technological advantages of e-commerce, such as search capabilities, access 24/7, capacity to compare prices, access to a greater selection of products, and access to information, are major reasons for choosing to utilize the online channel.

Conclusions

Although e-commerce penetration in Romania is lower than in other nations, the trend is favorable, and the recent Covid-19 outbreak has expedited acceptance of this channel. Online pharmacies follow the same pattern, with

almost 20% of respondents using an online pharmacy to purchase medications. In the coming years, we may expect further investments in digital marketing communication as well as improvements to the user experience to attract even more users.

Online pharmacies benefit from technological advantages such as search capabilities, access to more information, price comparison, as well as a larger range of products and availability 24/7, and by better utilizing digital marketing tools in utilizing user profiles in segmentation, this channel will play a more important role in the future.

The major pharmacy chains are already well-positioned in the market, and new major companies are entering the fray. However, an online business model is still accessible for smaller or regional pharmacies that want to expand their national presence.

Author's contribution

CMC: Conceptualization, Methodology, Validation, Visualization, Writing – original draft, Writing – review & editing

PCO: Conceptualization, Formal Analysis, Methodology, Software, Validation, Visualization, Writing – review & editing

Conflict of interest

None to declare.

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