

# SOCIO-DEMOGRAPHIC PROFILE OF THE ROMANIAN PATIENT REGARDING THE FACTORS INFLUENCING THE CHOICE OF A PHARMACY USING LOGISTIC REGRESSION AND FACTOR ANALYSIS

MARIUS CĂLIN CHERECHEȘ<sup>1\*</sup>, CRISTIAN POPA<sup>2</sup>, CORNELIU FLORIN BUICU<sup>3</sup>

<sup>1</sup>University of Medicine, Pharmacy, Sciences and Technology "George Emil Palade", 38 Gheorghe Marinescu Street, Târgu Mureș, Romania

<sup>2</sup>Faculty of European Studies, Babeș-Bolyai University, 1 Emmanuel de Martonne Street, Cluj-Napoca, Romania

\*corresponding author: [mariuscalinchereches@mac.com](mailto:mariuscalinchereches@mac.com)

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## Abstract

Segmentation and targeting are very important steps in the marketing activity to create the pharmacy's best positioning. Knowing more about the composition and interests of patients' segments will help pharmacies properly design the mix of services and the marketing approach. The current study is based on a quantitative market research performed in 2012 with a transversal design from 1478 valid questionnaires for a representative sample of the Romanian adult population. We used logistic regression to check the association and the direction of the association for each variable regarding the reasons for choosing a pharmacy (price, availability of products, attitude of the pharmacist and proximity), with the socio-demographic variables. We also conducted an exploratory factor analysis (EFA) on those variables and identified three behavioural groups: i) Pharmacy driven, ii) Pharmacist driven, and iii) Pragmatic driven people. Pharmacy driven group are interested in the pharmacy itself and its characteristics (recommended by a doctor, part of a retail chain, with good availability of medicines, generous opening hours and offering certain commercial effects such as discounts or promotions). Pharmacist driven consist of patients interested in a specific the pharmacist due to her/his professionalism and interaction with the patients. The pragmatic group was influenced by the prices and the proximity of the pharmacy to their domicile.

## Rezumat

Segmentarea și alegerea pieței țintă sunt pași foarte importanți în activitatea de marketing cu scopul de a crea cea mai bună poziționare pentru farmacie. Știind mai multe despre compoziția și interesele segmentelor de pacienți putem ajuta farmaciile să proiecteze corect mixul de marketing și abordarea de marketing. Studiul actual se bazează pe date cantitative de cercetare de piață realizate în 2012 cu un design transversal din 1478 de chestionare valabile pentru un eșantion reprezentativ al populației adulte din România. Am folosit regresia logistică pentru a verifica asocierea și direcția de asociere pentru fiecare variabilă legată de motivele pentru alegerea unei farmacii (preț, disponibilitatea produselor, atitudinea farmacistului și proximitatea), cu variabilele socio-demografice. De asemenea, am efectuat analiza exploratorie de tip factor (EFA) pe acele variabile și am identificat 3 grupuri comportamentale: i) interesați de farmacie, ii) interesați de farmacist și iii) pacienți pragmatici. Grupul interesat de farmacie este preocupat de caracteristicile farmaciei în sine (recomandată de un medic, parte a unui lanț de farmacii, cu o bună disponibilitate a medicamentelor, orar generos și care oferă reduceri sau promoții). Grupul interesat de farmacist este format din pacienți preocupați de profesionalismul farmacistului și interacțiunea acestuia cu clienții. Grupul pragmatic este influențat de prețuri și de proximitatea farmaciei de domiciliul acestora.

**Keywords:** segmentation, factor analysis, logistic regression, pharmacy

## Introduction

The pharmacy is meant to deliver quality services to its patients, therefore and evaluating patient/client satisfaction towards pharmacy services has proven to be a crucial part of the health services [1, 2].

Worley and Schommer created a pharmacy-specific model describing the factors that affect the patient - pharmacist relationship. According to the initial model, pharmacist's expertise and contact intensity predicted the relationship quality. Also, they found that a minimum relationship between the patient and pharmacist is

required for the patient to commit to communicate with the pharmacist [3]. A variety of factors may be considered when referring to patient satisfaction: demographics and educational level, patient's expectation [4-6]. If the perceived expectations are met, the patient will be registering a higher satisfaction level. Satisfaction is based on the evaluation of a service that requires emotional reaction [7]. A judgment is made by an individual that results in pleasure if satisfaction occurs or displeasure if dissatisfaction occurs [8].

Previous researches indicated four main factors influencing the choice of a particular pharmacy by

the patient: (i) perception, reputation and competence of the pharmacist, (ii) quality of services provided by the pharmacy, (iii) price and (iv) proximity. Similar results are reported in a comparative study between Poland and UK. As defined by a percentage of responders, the most frequently reported factors were in Poland: (1) location; (2) professional and high-quality of service; (3) good price of medicines; (4) promotions on medicines. In the UK, the most commonly reported factors were: (1) professional and high quality of service; (2) location; (3) good advice received from the pharmacist; and (4) option of discussing and consulting all health issues in a consultation room [9]. A recent study made in Greece indicated three clusters of patients: (i) “convenience customers” (mostly young consumers, (ii) “loyal customers” (mainly retired) and (iii) “convenience and price-sensitive customers” (retired or unemployed with low or moderate education and low personal income [10].

Segmentation and targeting are very important steps in the marketing activity to create the pharmacy's best positioning [11]. The positioning has the ultimate aim to create a particular image of the pharmacy in the consumer's mind (patient), and this should be distinctive enough to attract and retain the respective patient for a long period. A pharmacy will employ a differentiation strategy that might target various segments. The company should be aware of the needs and sources of satisfaction of consumers' particular segments [12]. During the last few years, with the online environment emerging, customers' segmentation is much more refined [13]. Still, the community pharmacy is likely to remain the most important gate for patient access to medicines, particularly prescription drugs. Therefore, a customer's decision process will not be soon scalable or the segmentation mechanism [14]. More detailed information

about the patients' profile is also required to better design internship programs for students as their knowledge about the patient is more and more important in day-to-day work [15]. The online pharmacies will use more sophisticated tools for segmentation and targeting, but this mostly refers to food supplements, cosmetics, medical devices and OTC medicine [16-20].

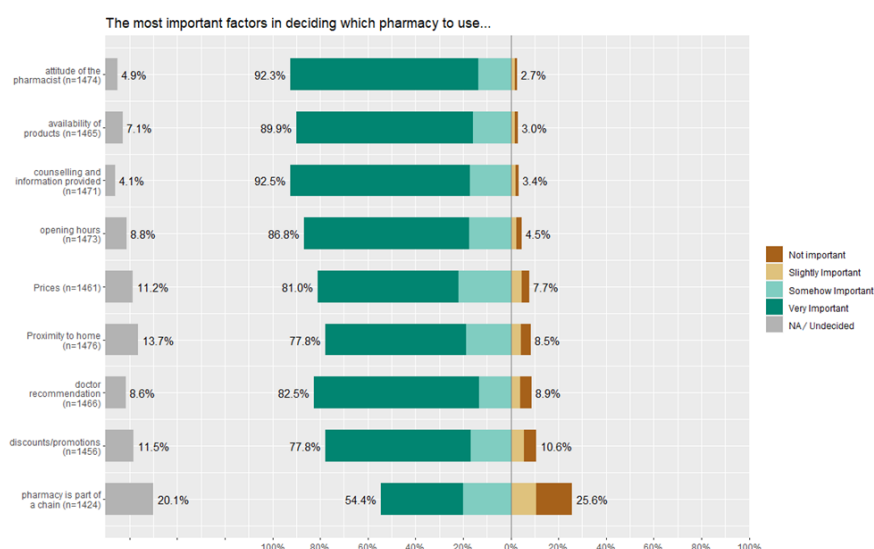
### Materials and Methods

The initial hypothesis was that Romanian patients are not fundamentally different from patients in the United Kingdom or Poland in viewing the important factors to choose a pharmacy.

The study's objective is to outline the profile of different customer segments for pharmacies based on behaviours towards choosing a pharmacy.

The current study is based on quantitative market research performed in 2012 with a transversal design. Data were collected using Computer Assisted Telephone Interview (CATI) from 1478 valid questionnaires. The research was performed by IRES (Cluj-Napoca, Romania). The sample consisted of above 18 years old subjects, multi-layer, probabilistic, and representative for Romania's adult population.

The subject was asked about which is the most important factor in deciding which pharmacy to use as an open question. Then, subjects were asked how they rate some pre-set factors as important (on a 1 to 5 scale) about choosing a pharmacy. These factors (Figure 1) were: (i) proximity, (ii) prices, (iii) pharmacy to be part of a pharmacy chain, (iv) attitude of the pharmacist, (v) counselling and information provided by the pharmacist, (vi) doctor recommendation, (vii) availability of products, (viii) opening hours and (ix) discounts/promotions.



**Figure 1.** The most important factors influencing the decision of the patient in choosing a pharmacy (sorted descending by “Very important” frequency)

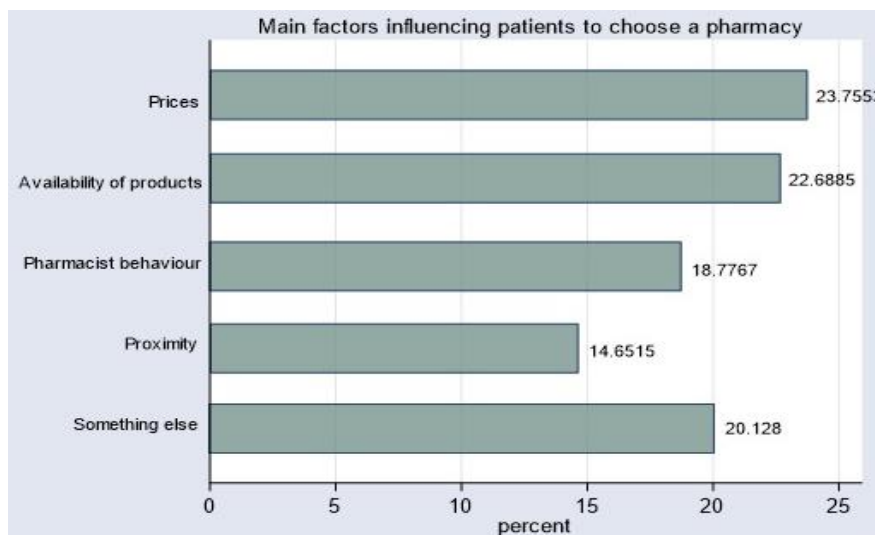
We analysed age, sex, education level, ethnicity, residency, family income, marital status, family size, and chronic illness presence as socio-demographic denominators.

We used descriptive statistics to show the main factors considered by patients when choosing a pharmacy and for further analyses. To identify socio-demographic and behavioural characteristics of various segments of the population, we also used cross-tabulation. Statistical analyses used were Chi-square contingency tables, logistic regression analysis and factor analysis.

The software used for statistical analyses was Stata software with the polychoric package and FACTOR software for backup [21, 22]. For factor selection, the method of choice was Parallel Analysis (median simulated eigenvalues, aka PA) using the fapara package in Stata.

**Results and Discussion**

The study revealed the top four factors influencing patients to choose a pharmacy, in an open question, as presented in Figure 2:



**Figure 2.**

Main factors influencing patients to choose a pharmacy (% of answers)

“No answer” and “I don’t know” respondents were excluded.

Our study proved that Romanian patients are not fundamentally different from other patients considering the factors influencing the way they are choosing a pharmacy. Our study showed that prices and the availability of products in the pharmacy are the most important ones. At the same time, the pharmacist and proximity come afterwards.

Prices and availability of medicines are specifically important for Romanian patients due to the objective conditions and recent history. Pharmacies in Romania are allowed to practice various prices and discount, rendering this factor a marketing message conveyed heavily to all categories of patients.

Due to various reasons (pharmacy reimbursement budgets, parallel trade), the Romanian patient experienced a poor availability of medicine and got used to visiting several pharmacies in order to get the needed prescription filled. This situation justifies their interest in this factor.

Like other countries, the pharmacist's professionalism and proximity are common factors when choosing a pharmacy.

We used logistic regression to check the association and direction of the association for each answer with

the socio-demographic variable, reporting Odds Ratio (OR), with a statistical significance threshold  $p < 0.05$  with a confidence level of 95%.

Regarding the answer “Prices”, the results with statistical relevance were depicted in Table I.

**Table I**

Association of determinant Price with socio-demographic variables (Multinomial Logistic Regression)

	OR	95% CI	p val
<b>Sex</b>			
<b>Women</b>	1.67	1.30 - 2.15	0.000
<b>Age category</b>			
<b>50 - 64 years</b>	1.53	0.98 - 2.37	0.060
<b>65+ years</b>	0.60	0.37 - 0.97	0.038
<b>Monthly income</b>			
<b>No income</b>	2.52	1.21 - 5.23	0.013
<b>Bellow 1000 Lei</b>	2.22	1.15 - 4.29	0.017
<b>1001 - 2000 Lei</b>	2.33	1.19 - 4.55	0.014
<b>Occupation</b>			
<b>Retired</b>	0.54	0.38 - 0.76	0.001

Statistical significance ( $p < 0.05$ ) was obtained for certain categories of population influenced by Prices when choosing a pharmacy positively e.g. Women, 50 - 64 years, low income while Retired, 65+ years

seem to disregard Prices when choosing a pharmacy. This attitude of the retired and over 65 years old persons is surprising. However, the statistics proved relevant for additional tests and explanations to relate with the generous reimbursement for medicine used by this category, making them less interested in prices,

but in factors such as the pharmacist availability of medicine or proximity.

Applying the same analyses for “Availability of product/ Good purchasing,” we got the results presented in Table II.

**Table II**

Association of determinant Availability of products/Good Purchasing with socio-demographic variables (Multinomial Logistic Regression)

	<i>OR</i>	<i>95% CI</i>	<i>p val</i>
<b>Sex</b>			
<b>Women</b>	0.72	0.56 - 0.93	0.011
<b>Age category</b>			
<b>65+ years</b>	1.57	0.98 - 2.52	0.060
<b>Ethnicity</b>			
<b>Hungarian</b>	2.08	1.25 - 3.47	0.005
<b>Region</b>			
<b>Bucharest + South + Dobrogea</b>	0.69	0.52 - 0.93	0.013
<b>Monthly income</b>			
<b>No income</b>	0.35	0.18 - 0.68	0.002
<b>Bellow 1000 Lei</b>	0.61	0.37 - 1.00	0.051
<b>Occupation</b>			
<b>Retired</b>	2.08	1.36 - 3.19	0.001
<b>Worker</b>	1.67	0.99 - 2.79	0.052
<b>Specialist university studies</b>	2.37	1.38 - 4.10	0.002
<b>Not declared</b>	4.61	2.27 - 9.38	0.000

The availability of products is an important factor in choosing a pharmacy for categories where results are statistically significant ( $p < 0.05$ ) in a positive way (they praise this) for the following socio-demographic categories: 65+ years, Hungarian (although, we had few respondents in this segment), Retired, Worker, Specialists with university studies and those with no

declared occupation. Also, we can say Women, people from Bucharest + South + Dobrogea and low income are less likely to be influenced by the availability of products when choosing a pharmacy.

We applied logistical regression for the answer “Kindness/Attitude/Pharmacist behaviour” and the results are presented in Table III.

**Table III**

Association of determinant Kindness/Attitude/Pharmacist behaviour with socio-demographic variables (Multinomial Logistic Regression)

	<i>OR</i>	<i>95% CI</i>	<i>p val</i>
<b>Education</b>			
<b>University and above</b>	0.48	0.23 - 1.03	0.059
<b>Region</b>			
<b>Bucharest + South + Dobrogea</b>	0.67	0.49 - 0.90	0.009
<b>Occupation</b>			
<b>Freelance or management</b>	3.62	1.79 - 7.33	0.000
<b>Marital status</b>			
<b>Not declared</b>	2.31	1.02 - 5.23	0.045

The pharmacist's performance is a factor that most likely is of interest for respondents being freelancers/managers and those with marital status not declared. Respondents with university education and living in the South part of Romania seem less likely to be interested in this factor.

In the case of proximity, we noticed that several categories are less likely to be interested in it, such as people between the age between 30 - 49 and 50 - 65 years and those being married/in partnership (Table IV). This is not exactly surprising given the inflation of pharmacies in Romania and the easy finding of one or more pharmacy almost everywhere in the urban area.

**Table IV**

Association of determinant Proximity with socio-demographic variables (Multinomial Logistic Regression)

	<i>OR</i>	<i>95% CI</i>	<i>p</i>
<b>Age category</b>			
<b>30 - 49 years</b>	0.29	0.17 - 0.50	0.000
<b>50 - 64 years</b>	0.44	0.28 - 0.71	0.001
<b>Marital status</b>			
<b>Married/Partnership</b>	0.42	0.28 - 0.63	0.000

The above profiles are useful for pharmacies to consider when planning their marketing approach.

Providing the information about the public they are serving is detailed and accurate.

Respondents were asked to evaluate the importance they grant to nine pre-defined options regarding a customer's bent for a particular pharmacy, a *Likert* scale with five levels, where 1 was “of less importance” and 5 “of great importance”.

We conducted exploratory factor analysis (EFA) on those variables using a polychoric correlation matrix, a generalised method suitable for dichotomous or ordinal data.

We identified three factors: Factor 1. Patients interested in the pharmacy itself and characteristics (recommended by a doctor, part of a retail chain, with good availability of medicines, generous opening hours and offering certain commercial approaches such as discounts or promotions). Factor 2. Patients interested in a good interaction with the pharmacist (they appreciate the professionalism and the advice they get from the pharmacist). Factor 3. “The pragmatic segment” of those influenced more likely by the prices and the proximity of the pharmacy to their domicile.

This is very important because the patient's behaviour is a criterion of segmentation highly valuable for the marketer. The patient is unveiling his/her profile easy and targeting various segments is more efficient.

These segments' socio-demographic profile is also extremely important for segmentation and targeting to reach the best positioning.

This kind of analysis allows us to group the attitudes regarding the choice of a pharmacy. Analysing the three factors, we would be able to name them based on the attitudes that are grouped.

We generated three new variables consisting of the 3-factor scores using the predict function EFA pass and each was considered as the dependent variable in a linear regression against all of the defining socio-demographic variables used as predictors.

For Factor 1 (“Pharmacy driven”), we got statistical relevant results in women, 65+ years old persons, ethnics others than Romanian, Hungarian or Rroma, people with not declared occupation and divorced/widow persons (Table V). We already noticed that old people (65+ years) expressed strong interest in the availability of medicines consistent with our finding. From the practical experience, this is expected given that patients of these segments are influenced by doctor’s recommendation and targets for marketing campaigns of various pharmaceutical chains. Persons of Rroma ethnicity, people with income above 2000 lei monthly, “specialised personnel” (including those with university studies), managers or freelancers most likely are not to be part of this group.

**Table V**

Correlations with Factor 1 (Pharmacy driven)

O1	coefficient	std. err.	p >  t
<b>Women (gender)</b>	0.17	0.046	0.000
<b>Over 65 years (age)</b>	0.26	0.12	0.027
<b>Rroma (ethnicity)</b>	-1.17	0.41	0.004
<b>Other (ethnicity)</b>	0.55	0.25	0.030
<b>&gt; 2000 lei (monthly income)</b>	-0.35	0.13	0.007
<b>Specialized personnel (occupation)</b>	0.30	0.12	0.009
<b>Specialized with university studies (occupation)</b>	0.33	0.12	0.008
<b>Management/freelance (occupation)</b>	0.33	0.14	0.019
<b>Not declared (occupation)</b>	0.51	0.26	0.048
<b>Divorced/widow (marital status)</b>	0.24	0.10	0.018

For Factor 2 (“Pharmacist driven”), the pharmacy should consider targeting women, married/in partnership and divorced/widow persons with messages that value professionalism and pharmaceutical counselling (Table V). Pharmacist's appearance and the activity are very

important factors of decision for these segments as well to retain them as patients. Equally, we can say that people with medium and high income are less likely to be responsive to such an approach.

**Table VI**

Correlations with Factor 2 (Pharmacist driven)

O2	coefficient	std. err.	p >  t
<b>Women (gender)</b>	0.20	0.04	0.000
<b>1001 - 2000 lei (monthly income)</b>	-0.22	0.09	0.020
<b>&gt; 2000 lei (monthly income)</b>	-0.45	0.11	0.000
<b>Married/partnership (marital status)</b>	0.15	0.07	0.023
<b>Divorced/widow (marital status)</b>	0.18	0.08	0.028

In the case of Factor 3 “Pragmatism driven”, we recorded statistical relevance for Women (gender), inhabitants of region Bucharest + South + Dobrogea

(region) and respondents Married/in Partnership (marital status) or Divorced/Widow (marital status), which are likely to fall into this category (Table VII).

Respondents with income above 2000 lei (monthly income), specialised personnel (occupation) and those who don't declare their marital status are most probably not part of this category. The pragmatic segment is interested in the prices and proximity of the pharmacy. These are people with responsibilities related to the family budget, busy and willing to get the best deal from a pharmacy visit. Women are more involved in acquiring medicines and have more complex needs.

People living in Bucharest, the capital of Romania, suite best to this factor.

People having a family are also interested in simplifying their lives as they also have other responsibilities and interests. We can also say that people with a high income are less likely part of the pragmatic segment, and this is also natural as they are looking for a different way to be satisfied with pharmaceutical services.

**Table VII**

Correlations with Factor 3 (Pragmatism driven)

O3	coefficient	std. err.	p >  t
Women (gender)	0.23	0.04	0.000
Bucharest-South-Dobrogea (region)	0.12	0.05	0.011
> 2000 lei (monthly income)	-0.40	0.12	0.001
Specialised personnel (occupation)	-0.23	0.11	0.030
Married/partnership (marital status)	0.20	0.07	0.008
Divorced/widow (marital status)	0.23	0.09	0.014
Not declared (marital status)	-0.55	0.27	0.044

Following the results of the quantitative research on a representative sample of Romania's adult population, we noticed that the association between the socio-demographic variables with the main reasons to choose a pharmacy showed statistical relevant results.

We used logistic regression to determine how likely is for a certain socio-demographic segment to choose a pharmacy due to certain factor (price, availability of products, attitude of the pharmacist and proximity). Women, 50 - 64 years old and low-income persons are likely to consider price as the most important factor to choose a pharmacy, while people aged above 65 years and retired seems to be likely, not interested in this factor. This segment is rather interested in considering the availability of the products first when choosing a pharmacy. The pharmacist's performance is likely to be responsible for choosing a pharmacy for people working as managers or freelancers. Given the generous availability of pharmacies in Romania, we noticed some segments (30 - 64 years old, married/in partnership) unlikely to choose a pharmacy due to its proximity. The factor analysis revealed an interesting segmentation, namely behavioural one. We identified three main segments-pharmacy-driven, pharmacist-driven, and pragmatic-driven persons when choosing and evaluating a pharmacy. This is very useful for making the market research work more practical and easier to find a business approach.

The pharmacy driven persons are interested in the pharmacy itself, in the availability of products, the opening hours, being or not part of a chain, discounts or promotions or the pharmacy recommended by a doctor. The pharmacist driven persons rely on their decisions based on the perceptions about the professionalism and attitude of pharmaceutical personnel. The pragmatic, driven segment make their decisions based on information about the pharmacy and prices' location.

## Conclusions

The main factors influencing the pharmacy's choice are similar to those identified in other countries, and their ranking is driven by particularities of a specific segment of the population such as age, occupation, education or income.

Logistical regression is a method used to explore how various market segments are behaving concerning a particular factor. We notice for example, a different attitude towards the price or the pharmacist by retired persons or subjects over 65 years old.

A more subtle method to emphasise market segments is the factor analysis because it is based on the behavioural segments. Following such an analysis, we identified three main segments on the market: people looking for the pharmacist (as a professional specialist), people being impressed by the pharmacy (as healthcare unit) and the pragmatic segment, very much oriented towards satisfying their need efficiently. Further research would be useful to identify how such segmentation methods capture the evolution of population's behaviour in time and how other factors might be included.

## Conflict of interest

The authors declare no conflict of interest.

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