https://doi.org/10.31925/farmacia.2026.4.24 **ORIGINAL ARTICLE**

COMMUNITY PHARMACY USERS' PERCEPTIONS OF ACCESSIBILITY, PHARMACIST COMMUNICATION AND SELF-MEDICATION: A QUESTIONNAIRE-BASED STUDY

RAMONA GURILA [1#], RAMONA AMINA POPOVICI [2#], DORIN ANTAL [1], FLAVIU BOB [3], ANDRA TIBERIA PĂCURAR [1,4,5], IASMINA-ALEXANDRA PREDESCU [1,4,5], IOAN SMULTEA [1,4,5], SERGIO LIGA [4], MONICA MARIA ȘUȘAN [6,7]*, ALINA ANTON [4,5], SILVIU BRAD [8]

[1]Doctoral School, "Victor Babeş" University of Medicine and Pharmacy Timişoara, 2 Eftimie Murgu Square, 300041, Timişoara, Romania
[2]Department I-Management and Communication, Faculty of Dental Medicine, "Victor Babeş" University of Medicine and Pharmacy Timişoara, 2 Eftimie Murgu Square, 300041, Timişoara, Romania
[3]Department of Internal Medicine II-Nephrology University Clinic, "Victor Babeş" University of Medicine and Pharmacy Timişoara, 2 Eftimie Murgu Square, 300041, Timişoara, Romania
[4]University Clinic of Toxicology, Drug Industry, Management and Legislation, Faculty of Pharmacy, "Victor Babeş" University of Medicine and Pharmacy Timişoara, 2 Eftimie Murgu Square, 300041, Timişoara, Romania
[5]Research Center for Pharmaco-Toxicological Evaluation, "Victor Babeş" University of Medicine and Pharmacy Timişoara, 2 Eftimie Murgu Square, 300041, Timişoara, Romania
[6]Department of Internal Medicine, Discipline of Medical Semiology I, "Victor Babeş" University of Medicine and Pharmacy Timişoara, 2 Eftimie Murgu Square, 300041, Timişoara, Romania
[7]Centre for Preventive Medicine, "Victor Babeş" University of Medicine and Pharmacy Timişoara, 2 Eftimie Murgu Square, 300041, Timişoara, Romania
[8]Department of Radiology, "Victor Babeş" University of Medicine and Pharmacy Timişoara, 2 Eftimie Murgu Square, 300041, Timişoara, Romania

**corresponding author: susan.monica@umft.ro*
[#]Authors with equal contribution.

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Abstract

This observational, cross-sectional questionnaire study assessed community pharmacy users' perceptions of accessibility, medicine availability, pharmacist communication and self-medication in Timiș County, Romania. Questionnaires were distributed through community pharmacies between 1 and 30 April 2023; 162 were returned and 146 analysed. Content validity was high (S-CVI/Ave = 0.96). Easy pharmacy access was reported by 82.9%, and 78.8% lived within 3 km of a pharmacy, with no urban-rural differences. Evening or weekend access differed significantly by residence (urban 52.0% *versus* rural 0%; $p < 0.001$), as did the perceived need for additional pharmacies (0% *versus* 70.8%; $p < 0.001$). Medicine unavailability was reported by 19.9%. Pharmacist recommendations were considered helpful by 89.0%, 60.3% reported sufficient counselling time, and 50.7% understood their medicines and administration. Self-treatment without medical recommendation was reported by 61.0%. Urban-rural disparities primarily concerned temporal rather than geographical accessibility.

Rezumat

Acest studiu observațional transversal, bazat pe chestionar, a evaluat, în județul Timiș, România, percepțiile utilizatorilor farmaciilor comunitare privind accesibilitatea și disponibilitatea medicamentelor, comunicarea cu farmacistul și automedicația. Chestionarele au fost distribuite între 1 și 30 aprilie 2023; 162 au fost returnate, iar 146 au fost analizate. Validitatea de conținut a fost ridicată (S-CVI/Ave = 0,96). Accesul facil la farmacie a fost raportat de 82,9%, iar 78,8% locuiau la maximum 3 km, fără diferențe între urban și rural. Accesul seara sau în weekend a diferit semnificativ în funcție de domiciliu (urban 52,0% *versus* rural 0%; $p < 0,001$), precum și de necesitatea percepută a unor farmacii suplimentare (0% *versus* 70,8%; $p < 0,001$). Indisponibilitatea medicamentelor a fost raportată la 19,9%. Recomandările farmaciștilor au fost utile pentru 89,0%; 60,3% au raportat că au avut timp suficient pentru consiliere, iar 50,7% au înțeles modul de administrare a medicamentelor. Automedicația fără recomandare medicală a fost raportată de 61,0%. Disparitățile urban-rurale au vizat accesibilitatea temporală, nu cea geografică.

Keywords: community pharmacy, health services accessibility, pharmacist-patient communication, self-medication

Introduction

Community pharmacies are accessible healthcare settings that provide medicines, counselling and other patient-centred pharmaceutical services (1, 2). Patient satisfaction with community pharmacy services is influenced by several dimensions, including pharmacy

accessibility, medication availability and interaction with pharmaceutical staff (2). Their activities increasingly include patient-centred pharmaceutical services in addition to traditional dispensing of medicines (3). Effective pharmacist-patient communication supports patients' understanding of medication use (4). Satisfaction with pharmacy services and trust in the information provided by pharmacists are related but distinct concepts, influenced by factors such as the pharmacist's attitude, attention, counselling time and medication availability (5). Recent evidence indicates that OTC consultations in community pharmacies often focus on product details and recommendations. At the same time, the patient's symptoms, current medication, health conditions, and suitability for self-care are addressed less consistently (6). Recent Romanian research conducted among community pharmacy staff identified medicine dispensing, patient counselling, patient safety, medication management and pharmacy management as important dimensions of pharmaceutical service quality, with respondents generally reporting favourable performance across these areas (7). The quality of dispensing and counselling practices may also be associated with professional and organisational characteristics, including pharmacists' education, experience, pharmacy type, and job satisfaction (8). Pharmacists also recognise the importance of patient-centred communication, although several aspects of their communication practice could still be improved (3). Healthcare professionals have also highlighted the perceived importance of effective communication with patients and the potential contribution of clinical pharmacists to treatment adherence, pharmacological decision-making and medication safety (9). Self-medication is common across Europe and may be influenced by healthcare accessibility, previous experience, the perceived severity of symptoms, and the availability of non-prescription medicines. Although responsible self-medication may provide convenient relief for minor conditions, inappropriate medicine use can delay diagnosis and increase the risk of adverse reactions or drug interactions (10). Because community pharmacy practice brings together accessibility, medicine availability, patient counselling, and self-medication, participants' perceptions of these dimensions may help identify both strengths and areas requiring further attention (1, 4, 9).

The present study aimed to assess participants' perceptions of community pharmacy accessibility, medicine availability, pharmacist communication, and self-medication practices.

Materials and Methods

Study design and setting

This was an observational, cross-sectional, single-time-point, questionnaire-based study, reported in accordance with the STROBE statement for the reporting of observational studies. Data were collected between 1 and 30 April 2023 among adult users of community pharmacies in Timiș County, in the western part of Romania, a county that combines the large urban centre of Timișoara, Romania, with an extensive network of rural localities.

Study population, eligibility and sampling

The target population consisted of adults who frequent community pharmacies and are residents of Timiș County. A self-selected, non-probabilistic sampling approach was used, as the questionnaires were made available on-site and completion depended on the individual's voluntary decision. This approach was chosen because there is no registry of community pharmacy users in Romania from which a probabilistic sample could be drawn and because the study was exploratory in its objectives.

Eligibility criteria were as follows: age over 18 years, having resided in Timiș County for at least one year before participation, voluntarily agreeing to participate, and submitting a fully completed questionnaire. The one-year residence requirement was applied to ensure that respondents had sufficient exposure to the local pharmacy network to form the perceptions assessed by the questionnaire, particularly regarding operating hours and drug availability in the previous year. Individuals were excluded if they were under 18 years of age, had resided in Timiș County for less than one year, or submitted an incomplete questionnaire.

During the one-month collection period, 162 questionnaires were completed and returned. Sixteen questionnaires were excluded: six were completed by participants under 18 years of age, five by participants residing in the county for less than one year, and five were not fully completed. Therefore, the final analytical sample consisted of 146 participants.

Ethical considerations

The study was approved by the Ethics Committee of "Victor Babeș" University of Medicine and Pharmacy Timișoara, Romania (Approval no. 106/2023, revised on 31 July 2026). It was conducted in accordance with the principles of the Declaration of Helsinki. Participation was voluntary, anonymous, and based on informed consent obtained before completing the questionnaire. The questionnaire did not collect names, contact details or other direct personal identifiers. Completion and submission of the questionnaire were considered to indicate informed consent to participate.

Questionnaire development and content

Data were collected using a study-specific questionnaire developed in Romanian for the present study. The instrument contained 22 items organised into five sections: (i) sociodemographic and eligibility information (four items); (ii) perceived geographical accessibility to community pharmacies (four items); (iii) accessibility related to pharmacy opening hours,

medicine availability and the perceived usefulness of pharmacist recommendations (six items, including one conditional follow-up question); (iv) pharmacist-patient communication and counselling (four items); and (v) self-medication and pharmacy-use patterns (four items).

Age was recorded in completed years. Gender, residential environment and duration of residence in Timiș County were recorded using predefined response categories. The remaining items used dichotomous Yes/No responses, three-category responses such as Yes/No/Not always or Yes/No/Sometimes, predefined frequency categories and other categorical response options. The principal variables represented participants' self-reported perceptions and behaviours. Easy access was operationalised as an affirmative response to the question asking whether the participant considered access to a pharmacy easy. Access in the evenings or on weekends was assessed by asking whether the participant considered it easy to reach a pharmacy when medication was needed during these periods. The presence of a pharmacy within approximately 3 km of the participant's home or workplace was based on the participant's own estimate and was not objectively measured.

Sufficient counselling time referred to the participant's perception of whether the pharmacist allocated enough time to understand the problem presented. Knowledge of purchased medicines referred to the participant's self-reported knowledge of which medicines had been obtained and how they should be administered. For the main self-medication item, self-medication was operationalised as usually treating oneself without medical recommendation, with Yes, No and Sometimes as response options. The questions concerning the inability to obtain necessary medicines and the frequency of pharmacy visits to purchase medicines without a prescription were based on the previous year.

Questionnaire validation

Content validation. A group of experts was involved in validating the content of the item set, following the procedure described by Lynn and the recommendations of Polit and Beck (11-13). The group consisted of five experts, three of whom were community pharmacists working in open-circuit community pharmacies, and two were clinical pharmacists working in hospital settings. In terms of experience, the community pharmacists had 15, 10, and 6 years, while the specialist pharmacists had 8 and 5 years. The selection of experts was based exclusively on their professional profiles, and none of them is a co-author of this article.

Each expert independently rated each item on a 1 - 4 relevance scale (1 = not relevant, 2 = somewhat relevant, 3 = relevant but needs minor revision, 4 = very relevant) and on a 4-point parallel clarity scale. Ratings of 3 or 4 were dichotomised as agreement. Content validity was assessed in two stages. In June 2023, all twenty-two items were rated by the panel. In December 2023, three items (easy access to a pharmacy, easy access in the evening or on weekends, and sufficient time for counselling) were re-rated by the same panel. The values from the second rating are reported for these three items, and the values from the first rating for the remaining nineteen.

The item-level content validity index (I-CVI) was calculated as the proportion of experts who rated an item as 3 or 4. Given that the panel consisted of five experts, the a priori acceptance threshold was universal agreement, *i.e.* I-CVI = 1.00, according to Lynn. Scale-level indices were calculated both as the mean of the item indices (S-CVI/Ave, acceptance threshold 0.90) and as the proportion of items that reached universal agreement (S-CVI/UA, acceptance threshold 0.80). Because I-CVI does not take into account chance agreement, a modified kappa value was additionally calculated for each item, as follows: k* = (I-CVI - Pc)/(1 - Pc), where Pc = [N!/(A!(N - A)!)] x 0.5^N, N is the number of experts and A the number of experts rating the item 3 or 4; k* values were interpreted as excellent (≥ 0.74), good (0.60 - 0.73) or fair (0.40 - 0.59).

Content validity was assessed for all twenty-two items of the instrument used. Two of these items were not subsequently analysable because no responses were recorded in the database; therefore, the analysis of participants' responses covers 20 items.

Content validation was performed after data collection, in April 2023, but before publication of the results, and the administered version of the questionnaire was not modified based on the expert evaluation. Items that did not meet the acceptance threshold were retained in the analysis, reported in the Results section of the article, and addressed in the Limitations section.

Construct validity and internal consistency. The instrument was designed as a set of independent items to assess distinct aspects of pharmacy accessibility, medication availability, specialist-patient communication, and self-medication behaviour, and was not intended to form unidimensional scales. Thus, exploratory factor analysis and internal consistency coefficients (*e.g.*, Cronbach's alpha, KR-20) are not applicable to this instrument, and their absence reflects the questionnaire design rather than an omission.

Reliability over time was not evaluated using a test-retest methodology, as the questionnaire was administered anonymously and participants could not be re-contacted. Furthermore, face validity was not established through cognitive pre-testing with lay respondents or *via* a pilot study. These omissions are acknowledged as limitations of the current research.

Data collection procedure

Data were collected between 1 and 30 April 2023 using a paper-based Romanian-language questionnaire

completed on the premises of the participating community pharmacies. Participation was voluntary. Before completing the questionnaire, participants were informed about the purpose of the study and the anonymous nature of data collection. The questionnaire did not request names, contact details or other direct personal identifiers. After collection, questionnaires submitted by participants younger than 18 years, those who had lived in Timiș County for less than one year, and those who had not completed the questionnaire in full were excluded. Responses from the eligible and complete questionnaires were entered into a database created in Microsoft Excel 365.

Participating pharmacies acted as passive distribution centres. Questionnaires were printed in Romanian and distributed in a designated area of the pharmacy, along with brief written information about the purpose of the study and the anonymous nature of participation. Questionnaires were completed at the pharmacy and returned to the pharmacy. To ensure the anonymity of both respondents and participating pharmacies, questionnaires were not coded by pharmacy identifier. Therefore, the number of questionnaires returned from each pharmacy could not be determined, and the 146 questionnaires analysed represent opportunistic responses within participating centres, rather than a known distribution *per* centre.

Variables and data handling

The 22 questionnaire prompts were represented in the database by 28 analytical variables, excluding the participant identification number. Questions allowing more than one response were entered as separate binary variables for each response category. Two of these 28 variables, corresponding to the prompts on whether the opening hours of the pharmacies usually attended were convenient and whether the medicines needed were usually available at the nearest pharmacy, contained no recorded responses from any participant and were therefore excluded from the analysis. The analyses reported here are accordingly based on 26 variables derived from 20 of the 22 prompts.

Age was recorded as the participant's exact number of completed years and was treated as a continuous variable. Gender was recorded as a nominal variable and coded as 1 for male and 2 for female. Residential environment was self-declared by participants, rather than assigned according to an external administrative classification, and was coded as 1 for urban and 2 for rural. Residence in Timiș County for at least one year was treated as an eligibility variable and coded as 1 for Yes and 0 for No.

Dichotomous questionnaire items were treated as nominal variables and coded as 1 for Yes and 0 for No. Items with three response categories were coded as 1 for "Yes", 2 for "No", and 3 for "Not always" or "Sometimes", depending on the wording of the individual item. These numerical codes were used solely for data entry and did not represent calculated scores or equal numerical intervals between response categories.

The reported frequency of purchasing medicines without a prescription during the previous year was treated as an ordinal categorical variable and coded as follows: 0, Never; 1, 1 - 3 times; 2, 3 - 5 times; 3, 5 - 10 times; 4, more than 10 times; and 5, Do not know. The types of medicines or health products used were recorded as separate multiple-response binary variables, coded as 1 when a category was selected and 0 when it was not selected.

Preferred pharmacy type was treated as a nominal categorical variable and coded as follows: 1, nearest pharmacy; 2, a pharmacy the participant liked; 3, a pharmacy where the participant held a loyalty card; and 4, online pharmacy. The follow-up question regarding the type of medicine that could not be obtained was represented by separate binary variables for thyroid medicines, diabetes medicines and other medicines.

Before analysis, questionnaires were screened for eligibility and completeness. Five incompletely completed questionnaires were excluded in their entirety, so no partially completed questionnaire was retained. Among the 146 included participants, no item-level missing data occurred for any of the 26 analysed variables, and every reported percentage is therefore based on the complete set of valid responses for the item concerned. Apart from the two variables described above, which contained no data at all, no imputation was required or performed. For the conditional follow-up question about the types of medicines that could not be obtained, the denominator was the 29 participants who reported such a difficulty during the previous year; all 29 reported at least one category, and no participant who had not reported a difficulty did so. Percentages for multiple-response medicine and health-product categories were calculated using the full analytical sample as the denominator and were not expected to sum to 100%.

Statistical analysis

All data management and statistical analyses were performed in Microsoft Excel 365. Age was treated as a continuous variable; because its distribution was approximately symmetrical, it is summarised as the mean and standard deviation, with the median, interquartile range and range also reported. Categorical variables are summarised as absolute frequencies and percentages, and every percentage is accompanied by its absolute frequency and its denominator. Two-sided 95% confidence intervals for proportions were calculated by the Wilson score method, implemented as an explicit spreadsheet formula; this method was preferred over the normal approximation because several proportions lay close to the boundaries of the 0 - 1 interval. Two of the twenty-two questionnaire prompts contained no recorded

observations and were excluded from the analysis, leaving twenty items for analysis. The denominator was the full analytical sample (n = 146) for all items except the conditional item on the type of medicine that could not be obtained, for which the denominator was the twenty-nine participants who reported such a difficulty. Group comparisons were organised into two pre-specified families to limit the risk of false-positive findings. The primary family comprised the six accessibility and medicine-availability items compared by area of residence, corresponding to the principal research question; these comparisons are reported without correction for multiple testing. All remaining comparisons, by area of residence, sex, and age group, were treated as exploratory; for this family of 51 comparisons, the Benjamini-Hochberg procedure was applied with a false discovery rate of 0.05, and both nominal and adjusted p-values are reported. Age was categorised as 18 - 34, 35 - 49 and 50 years or older for comparative analyses only. Associations between categorical variables were tested with the chi-square test of association, with Yates' continuity correction applied to 2 × 2 tables. Expected cell counts were computed for every contingency table and were at least 8.2 in all six primary comparisons, so the chi-square approximation was applicable throughout. Where a table larger than 2 × 2 contained expected counts below five, the result is reported but interpreted with caution. The significance threshold was 0.05 for two-sided tests.

Questionnaire items were analysed individually. No total scores, domain scores, or other composite measures were calculated, consistent with the instrument's design as a set of independent single items. For items permitting more than one response, each category was analysed separately, and the resulting percentages were not expected to sum to 100%.

Results and Discussion

Content validity of the questionnaire

In the first round of evaluation, all twenty-two items achieved universal agreement among the five experts on both the relevance and the clarity scale (I-CVI = 1.00). In the second assessment of the three items involving subjective judgements of access and counselling time, agreement was lower: the relevance I-CVI was 0.80 for easy access to a pharmacy, 0.80 for easy access in the evening or at weekends and 0.60 for the sufficiency of counselling time, with corresponding clarity indices of 0.80, 0.80 and 0.60. The modified kappa was 0.76 for the first two items, still within the excellent range, and 0.42 for the item on counselling time, which corresponds to fair agreement only. Across all items, the I-CVI ranged from 0.60 to 1.00; the S-CVI/Ave was 0.964 for relevance and 0.964 for clarity; and the S-CVI/UA was 0.864, with 19 of the 22 items achieving universal agreement. The mean modified kappa was 0.952, with twenty-one items classified as excellent and one as fair.

Thus, the instrument met both acceptance thresholds at the scale level, while three items did not meet the universal concordance threshold required for a panel of five members. All three items that did not reach the concordance threshold refer to judgments of adequacy against an unspecified standard, and, in addition, all three were retained in the analysis because data collection had already been completed. For this reason, the findings derived from these items, especially the proportion of participants who reported that the pharmacist allocated sufficient time, should be interpreted with caution. Item-level results are presented in Table I.

Table I

Content validity indices for the twenty-two questionnaire items (five-member expert panel)

Item	Content	Assessment reported	I-CVI relevance	k*	k* interpretation	I-CVI clarity	Threshold
Q1	Age	Round 1	1.00	1.00	Excellent	1.00	Met
Q2	Sex	Round 1	1.00	1.00	Excellent	1.00	Met
Q3	Area of residence	Round 1	1.00	1.00	Excellent	1.00	Met
Q4	Duration of residence in the county	Round 1	1.00	1.00	Excellent	1.00	Met
Q5	Perceived easy access to a pharmacy	Round 2	0.80	0.76	Excellent	0.80	Not met
Q6	Pharmacy within approximately 3 km	Round 1	1.00	1.00	Excellent	1.00	Met
Q7	Difficulty obtaining medicines despite a nearby pharmacy	Round 1	1.00	1.00	Excellent	1.00	Met
Q8	More pharmacies in the locality considered useful	Round 1	1.00	1.00	Excellent	1.00	Met
Q9	Pharmacy opening hours considered convenient (not analysable)	Round 1	1.00	1.00	Excellent	1.00	Met
Q10	Easy access in the evening or at weekends	Round 2	0.80	0.76	Excellent	0.80	Not met
Q11	Medicines usually available at the nearest pharmacy (not analysable)	Round 1	1.00	1.00	Excellent	1.00	Met
Q12	Pharmacist recommendations helpful when no physician had been consulted	Round 1	1.00	1.00	Excellent	1.00	Met
Q13	Unable to obtain a necessary medicine in the previous year	Round 1	1.00	1.00	Excellent	1.00	Met

Item	Content	Assessment reported	I-CVI relevance	k*	k* interpretation	I-CVI clarity	Threshold
Q14	Type of medicine that could not be obtained (conditional)	Round 1	1.00	1.00	Excellent	1.00	Met
Q15	The pharmacist understood the participant's request	Round 1	1.00	1.00	Excellent	1.00	Met
Q16	Pharmacist-recommended treatment perceived as effective	Round 1	1.00	1.00	Excellent	1.00	Met
Q17	The pharmacist allocated sufficient time	Round 2	0.60	0.42	Fair	0.60	Not met
Q18	Knowledge of medicines obtained and their administration	Round 1	1.00	1.00	Excellent	1.00	Met
Q19	Usual self-treatment without medical recommendation	Round 1	1.00	1.00	Excellent	1.00	Met
Q20	Frequency of purchasing medicines without a prescription	Round 1	1.00	1.00	Excellent	1.00	Met
Q21	Types of medicines and health products used	Round 1	1.00	1.00	Excellent	1.00	Met
Q22	Preferred source of purchase	Round 1	1.00	1.00	Excellent	1.00	Met

I-CVI: item-level content validity index; k*: modified kappa. With a five-member panel, the a priori acceptance threshold was universal agreement (I-CVI = 1.00). Round 1 was conducted in June 2023 and covered all items; round 2 was conducted in December 2023 and covered three items. S-CVI/Ave = 0.964 (relevance) and 0.964 (clarity); S-CVI/UA = 0.864; mean k* = 0.952. Items Q9 and Q11 were part of the validated item pool but were not analysable, as no responses were recorded for them

Sociodemographic characteristics

The final sample of the study was 146 participants. The mean age was 41.72 ± 12.6 years, ranging from 18 to 82 years, while the median age was 41.5 years (interquartile range: 33 - 51 years). The sample included 79 women (54.1%) and 67 men (45.9%). Ninety-eight participants (67.1%) reported living in an urban area, while 48 (32.9%) reported living in a rural area. All included participants met the eligibility requirement of having lived in Timiș County for at least 1 year before participation. Education level, employment status, the presence of chronic disease, and health insurance status were not collected in the questionnaire and therefore could not be described; this is acknowledged as a limitation. Their sociodemographic characteristics are presented in Table II.

Table II

Sociodemographic characteristics of the study participants (n = 146)

Characteristic	Category	Value	95% CI
Age, years	Mean ± standard deviation	41.72 ± 12.63	—
	Median (interquartile range)	41.5 (33-51)	—
	Minimum-maximum	18 - 82	—
Age group, n (%)	18 - 34 years	43 (29.5)	22.7-37.3
	35 - 49 years	59 (40.4)	32.8-48.5
	50 years or older	44 (30.1)	23.3-38.0
Sex, n (%)	Male	67 (45.9)	38.0-54.0
	Female	79 (54.1)	46.0-62.0
Place of residence, n (%)	Urban	98 (67.1)	59.1-74.2
	Rural	48 (32.9)	25.8-40.9
Residence in Timiș County for at least one year, n (%)	Yes	146 (100.0)	97.4-100.0

Geographical and temporal accessibility of community pharmacy services

Participants' perceptions of accessibility and the availability of medicine are presented in Figure 1.

Easy access to a community pharmacy was reported by 121 of 146 participants (82.9%; 95% CI 75.9-88.1), and 115 of 146 participants (78.8%; 95% CI 71.4-84.6) reported having a pharmacy within approximately 3 km of their home or workplace. Neither perception differed between urban and rural residents: easy access was reported by 80 of 98 urban (81.6%) and 41 of 48 rural participants (85.4%; p = 0.74), and a pharmacy within 3 km by 77.6% and 81.2% respectively (p = 0.77).

Perceptions of access outside regular opening hours were markedly different. Only 51 participants (34.9%; 95% CI 27.7-43.0) considered access to a pharmacy easy when medication was needed in the evening or at the weekend, and this proportion differed sharply by area of residence: 51 of 98 urban participants (52.0%; 95% CI 42.2-61.5) as against none of the 48 rural participants (0%; 95% CI 0-7.4; p < 0.001). Consistently, no urban participant considered additional pharmacies in their locality useful, whereas 34 of 48 rural participants did so (70.8%; 95% CI 56.8-81.7; p < 0.001). A further 34 participants (23.3%) reported difficulty obtaining medicines despite having a pharmacy nearby, with no difference by residence (p = 0.78). Their distribution by area of residence is presented in Figure 2.

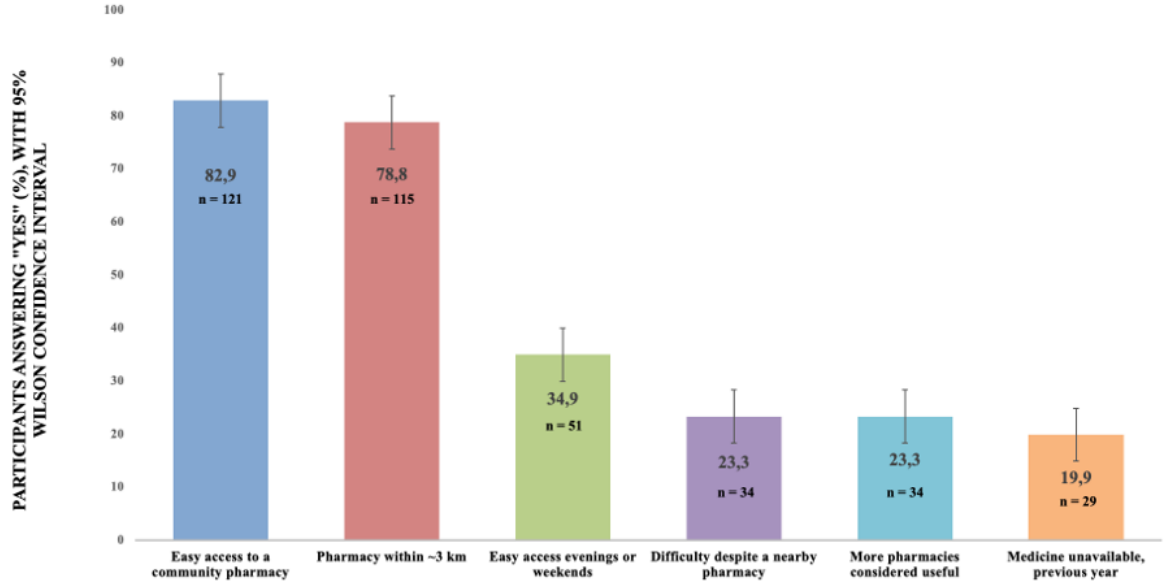

Figure 1.

Perceived accessibility of community pharmacy services and medicine availability. Bars show the proportion of participants answering "Yes" to each item, with 95% Wilson confidence intervals; absolute frequencies are given in parentheses. The denominator was the full analytical sample (n = 146). Because the questionnaire contained both positively and negatively worded items, a higher proportion of affirmative answers does not uniformly indicate more favourable accessibility

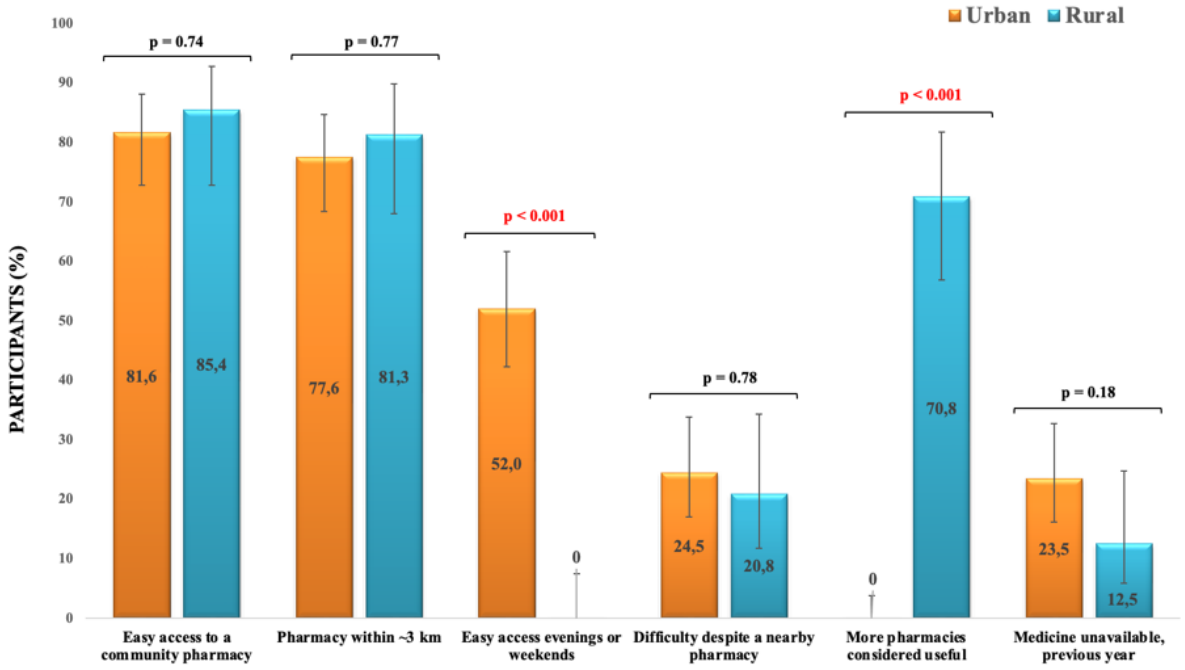

Figure 2.

Perceived accessibility and medicine availability by area of residence. Bars show the proportion answering "Yes" among urban (n = 98) and rural (n = 48) participants, with 95% Wilson confidence intervals and absolute frequencies in parentheses; p values are from the chi-square test of association with Yates' continuity correction; these six comparisons constituted the a priori primary family and were not corrected for multiple testing

Taken together, these findings indicate that the urban-rural disparity observed in this sample concerned temporal rather than geographical accessibility. What differed was not the presence of a pharmacy but the hours during which it could be used, and the absence of an out-of-hours or on-call service in rural localities. The item on the perceived need for additional pharmacies should probably be read in the same light: rural respondents may have been expressing a need for availability in time rather than in space, since the two items behaved identically.

The distinction between geographical and temporal accessibility is supported by a spatiotemporal analysis conducted in Lisbon, which showed that access to community pharmacies varied with opening hours, time of day, and available transport modes (14). Our findings nevertheless diverge from part of the international literature. Roubin *et al*., applying an enhanced two-step floating catchment area method in Vermont, USA, found rural disadvantage across virtually all temporal segments, that is, in spatial as well as temporal accessibility (15), and nationwide geospatial analyses in the United States have consistently documented poorer geographical access in rural areas (1). Evidence from England and Wales also indicates that geographical accessibility may vary substantially between types of localities. Clark and Newing calculated a spatial accessibility index for 2022 and 2024 and found that suburban and rural neighbourhoods generally had poorer access than urban areas (16). Two considerations may reconcile this divergence. First, the rural pharmacy network of Timiș County is comparatively dense, unlike the sparsely populated rural areas of North America. Second, our outcome was a self-reported perception rather than a measured drive time; perceptions are calibrated to local expectations, so the same distance may be judged as easy by a rural resident and difficult by an urban resident. The absence of a geographical gradient in our data may therefore reflect measurement and sampling as much as provision.

For community pharmacy practice in Romania, these findings support consideration of opening hours and out-of-hours arrangements alongside the geographical distribution of pharmacy outlets. Tele-pharmacy may represent a complementary option, although evidence from other healthcare systems should be applied with caution. In a US study comparing three rural tele-pharmacies with three supporting traditional pharmacies, no significant adjusted differences were observed in adherence to non-insulin diabetes medicines, renin-angiotensin system antagonists or statins, or in the use of high-risk medicines among older adults (17). In a separate survey of 178 participants recruited from two local pharmacies in Germany, 37% expressed general interest in tele-pharmacy consultations, while 71% considered tele-pharmacy a useful addition to on-site counselling (18). These findings suggest that remote consultations may be more acceptable as a complementary service than as a replacement for face-to-face pharmaceutical care.

Availability of medicines

Twenty-nine participants (19.9%; 95% CI 14.2-27.1) reported having been unable to obtain a necessary medicine during the previous year. Among these 29 participants, 12 (41.4%) referred to medicines other than those listed, 9 (31.0%) to thyroid medicines, and 8 (27.6%) to diabetes medicines. The proportion reporting such a difficulty did not differ between urban and rural residents (23.5% *versus* 12.5%; p = 0.180).

This finding should be interpreted as a patient-reported experience of unavailability and does not allow identification of the underlying cause, its duration or its geographical extent. A multinational study covering European and Western Asian countries identified considerable variation in the definition, notification and management of medicine shortages, as well as in the availability of information to healthcare professionals and the public (19). More recent real-world evidence indicates that reported shortages may also be followed by measurable changes in medicine utilisation. A multinational network cohort study, using data from 52 databases across 18 European countries and the United States, examined 16 medicines with reported shortages and 41 potential alternatives (20). Following shortage announcements, reductions of at least 33% were observed in the incidence of use of eight medicines and in the prevalence of use of nine medicines, together with changes in treatment indication, duration or prescribed dose for selected products. However, the clinical impact of a shortage cannot be inferred from utilisation changes or product characteristics alone. Postma *et al*. assessed a representative sample of 324 medicine shortages in the Netherlands based on the availability of alternatives, the underlying disease, patient susceptibility, costs, and the number of patients affected (21). Shortages classified as having a high impact could not be reliably identified solely from the characteristics of the unavailable medicines, indicating that their consequences should be assessed in relation to the clinical and organisational context of each episode.

The absence of an urban-rural difference is nevertheless informative: a difficulty arising from local distribution would be expected to produce a gradient, whereas a national supply disruption would not. The categories most frequently named are consistent with the latter interpretation, since medicines for thyroid disorders and diabetes are chronic therapies with limited scope for substitution, for which supply interruptions have been reported at national level.

In practice, these are precisely the therapeutic areas in which an interruption is clinically consequential and in which the pharmacist's role in identifying alternatives, contacting the prescriber and documenting the substitution is most valuable. Prospective risk assessment may contribute to the management of shortages. In a survey of healthcare experts from Europe and Israel, only 29.4% reported that risk assessment was integrated into shortage-mitigation protocols, although 85.3% considered it a useful strategy (22). The authors identified limited use of systematically organised tools, insufficient legal provisions and inadequate supporting data as barriers to systematic risk assessment.

Pharmacist-patient communication and counselling

Pharmacists' recommendations were considered helpful by 130 of 146 participants (89.0%; 95% CI, 82.9-93.1) who had not consulted a physician. One hundred and fifteen participants (78.8%; 95% CI, 71.4-84.6) reported that the pharmacist understood what they were trying to communicate, 21 (14.4%) selected "not always", and 10 (6.8%) answered negatively. Pharmacist-recommended treatment was perceived as effective by 110 participants (75.3%; 95% CI 67.8-81.6). By contrast, only 88 participants (60.3%; 95% CI 52.2-67.8) considered that the pharmacist allocated sufficient time to understand their problem, with 36 (24.7%) answering negatively, and only 74 participants (50.7%; 95% CI 42.7-58.7) reported knowing which medicines they had obtained and how they should be administered, with 48 (32.9%) answering negatively. Participants' perceptions of communication and counselling are presented in Figure 3.

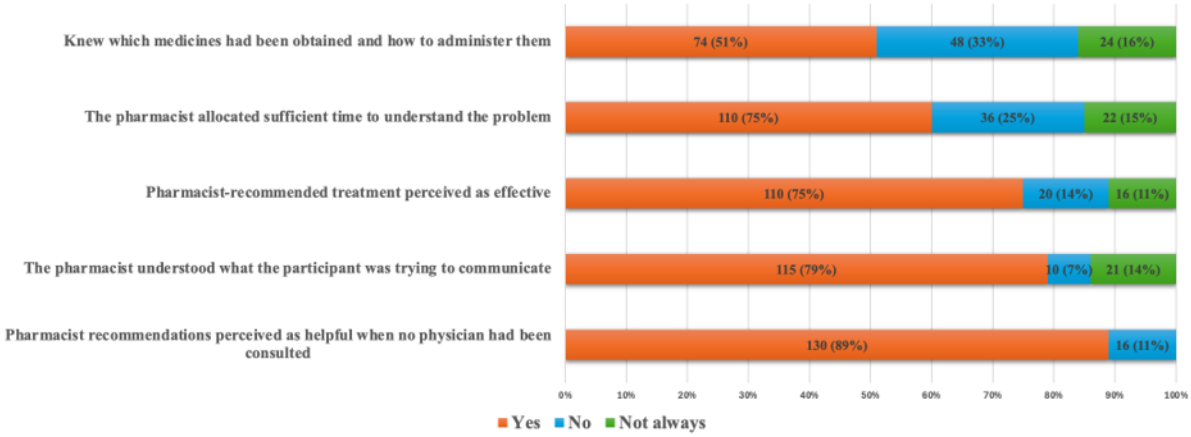

Figure 3.

Participants' perceptions of pharmacist communication and counselling. Horizontal 100% stacked bars show the distribution of responses for each item, with percentages and absolute frequencies. The denominator was the full analytical sample (n = 146). The first item offered only a dichotomous Yes/No response format, whereas the remaining four items offered a third category ("Not always"); this difference reflects the questionnaire as administered

The gradient across these five items is the substantive finding. Global judgements of the pharmacist's helpfulness and understanding were consistently favourable. In contrast, the two items that require the encounter to have transferred usable information, namely the time allocated and the participant's resulting knowledge, were rated considerably less favourably. A recommendation may therefore be experienced as helpful even when the patient does not retain the information needed to use the medicine appropriately. Favourable overall evaluations of pharmacy encounters have also been reported in a study of structured self-medication consultations, in which 93% of patients contacted after the consultation reported improvement, and the mean satisfaction score was 4.7 out of 5 (23). However, the authors cautioned that the improvement could not be causally attributed to the consultation, because minor health problems may resolve favourably irrespective of the intervention.

Two comparisons with the literature are instructive, and both diverge from our results. First, a survey of community pharmacy staff in Romania reported generally favourable self-assessment of performance across dispensing, counselling and patient safety (7). Our patient-side data are less favourable on the counselling dimension, with a quarter of participants stating explicitly that insufficient time was allocated. A discrepancy between provider self-assessment and patient experience is a recurrent pattern in health service quality research (24, 25), and it argues against relying on staff-reported indicators alone when evaluating pharmaceutical service quality. Second, Showande and Laniyan, who observed counselling encounters directly rather than relying on self-report, found that information on how to use the medicine was provided in 83.3% of first prescriptions and on the dosage form in 71.4%, but on the duration of treatment in only 42.9% (26). Our figure of 50.7% is well below their proportion for use instructions yet close to their proportion for treatment duration. Part of the difference is attributable to our item, which asked simultaneously about which medicines had been obtained and how they should be administered, so that uncertainty about either component produced a non-affirmative answer; and part to the distinction between information being provided at the counter and information being retained after leaving. Read together, the comparison suggests that the deficit lies less in whether counselling occurs than in whether it is complete and remembered. The quality and completeness of counselling are shaped by factors related to the patient, pharmacy personnel and the practice environment. Cassie *et al*. identified privacy, communication, and decision-making skills, staff training,

access to relevant patient information, and patients' awareness of pharmacy personnel's roles as important influences on information gathering during OTC consultations (27). In 275 encounters observed across seven Norwegian community pharmacies, full compliance with the national OTC counselling standard was identified in only 14.6% of cases. In contrast, approximately 40% of product enquiries did not meet the applicable requirements (28). Needs assessment generally focused on previous use, the intended user and presenting symptoms, with less attention paid to patient-specific factors such as contraindications and potential interactions. Information provision was predominantly practical, particularly regarding use and dosage, whereas effects and adverse reactions were more often discussed when prompted by the customer. From the pharmacists' perspective, evidence-based counselling on self-medication requires rapid access to information on dosage, effectiveness, safety and the circumstances in which referral to a physician is indicated (29). The practical implications of our findings are the systematic use of teach-back, the provision of written administration instructions, and explicit attention to treatment duration, which appears to be the least consistently communicated element.

Self-medication behaviour and community pharmacy preferences

Eighty-nine participants (61.0%; 95% CI 52.9-68.5) reported usually treating themselves without a medical recommendation, 31 (21.2%) answered "sometimes", and 26 (17.8%) answered negatively. The three categories were analysed separately and were not combined into a single prevalence estimate. Regarding the frequency of purchasing medicines without a prescription during the previous year, the most frequently selected category was three to five purchases, reported by 42 participants (28.8%), followed by one to three purchases (24.0%) and five to ten purchases (19.2%); 26 participants (17.8%) reported never having done so and 9 (6.2%) did not know.

The proportion reporting habitual self-treatment is considerably higher than the European average. Yeamans *et al*., analysing the third wave of the European Health Interview Survey among 255,758 respondents, estimated the prevalence of self-medication in the European Union at 34.3% (95% CI 34.1-34.5) (10). Three factors are likely to account for most of this difference, and none of them requires the assumption that self-medication is twice as frequent in this population. The wording of the two measures differs fundamentally: the European survey asks about the use of non-prescribed medicines within a defined recent recall period, whereas our item asked whether the respondent habitually treats themselves without medical advice, a dispositional question without a recall window, which systematically yields higher affirmative responses. The sampling frames also differ: our participants were recruited inside community pharmacies, that is, among people actively obtaining medicines, whereas the European estimate is population-based. Finally, the same authors identified health system factors as the strongest correlates of self-medication, including waiting lists (adjusted OR 1.38) and inability to afford medical examination or treatment (adjusted OR 1.27); both are relevant in the Romanian context and are consistent with our own observation that only about a third of participants considered out-of-hours access to a pharmacy easy.

Our findings are convergent with Romanian evidence. Research conducted in a rural area of north-eastern Romania found that participants frequently preferred to request medicines from a pharmacist rather than consult a physician, a choice the authors related to the greater accessibility and time efficiency of community pharmacies (30). A multicentre survey of Romanian pharmacists similarly reported that requests for self-medication predominantly concern common, apparently minor conditions, with pharmacists emphasising the need for patient education and referral when self-treatment is inappropriate (31). Behavioural mechanisms may also contribute to self-medication. Druică *et al*. found that self-medication practices among Romanian respondents were strongly associated with non-cognitive factors, particularly established habits and the perceived similarity of current symptoms to previous episodes (32). By contrast, knowledge of medications and awareness of potential risks were not significantly associated with the behaviours examined. These findings suggest that information provision alone may be insufficient to modify the self-medication practices and that habitual decision-making should also be considered.

Two cautions apply to the interpretation of these data. Purchases without a prescription should not be equated with self-medication in the absence of professional advice, because the questionnaire did not distinguish medicines selected independently by the participant from those recommended by the pharmacist. And the 21.2% who answered "sometimes" are arguably the group of greatest practical interest, since their behaviour appears situational and therefore most amenable to pharmacist-led triage, while the 17.8% who reported never purchasing medicines without a prescription show that the behaviour is by no means universal in this population. Self-treatment without medical recommendation and the frequency of purchasing medicines without a prescription are presented in Figure 4.

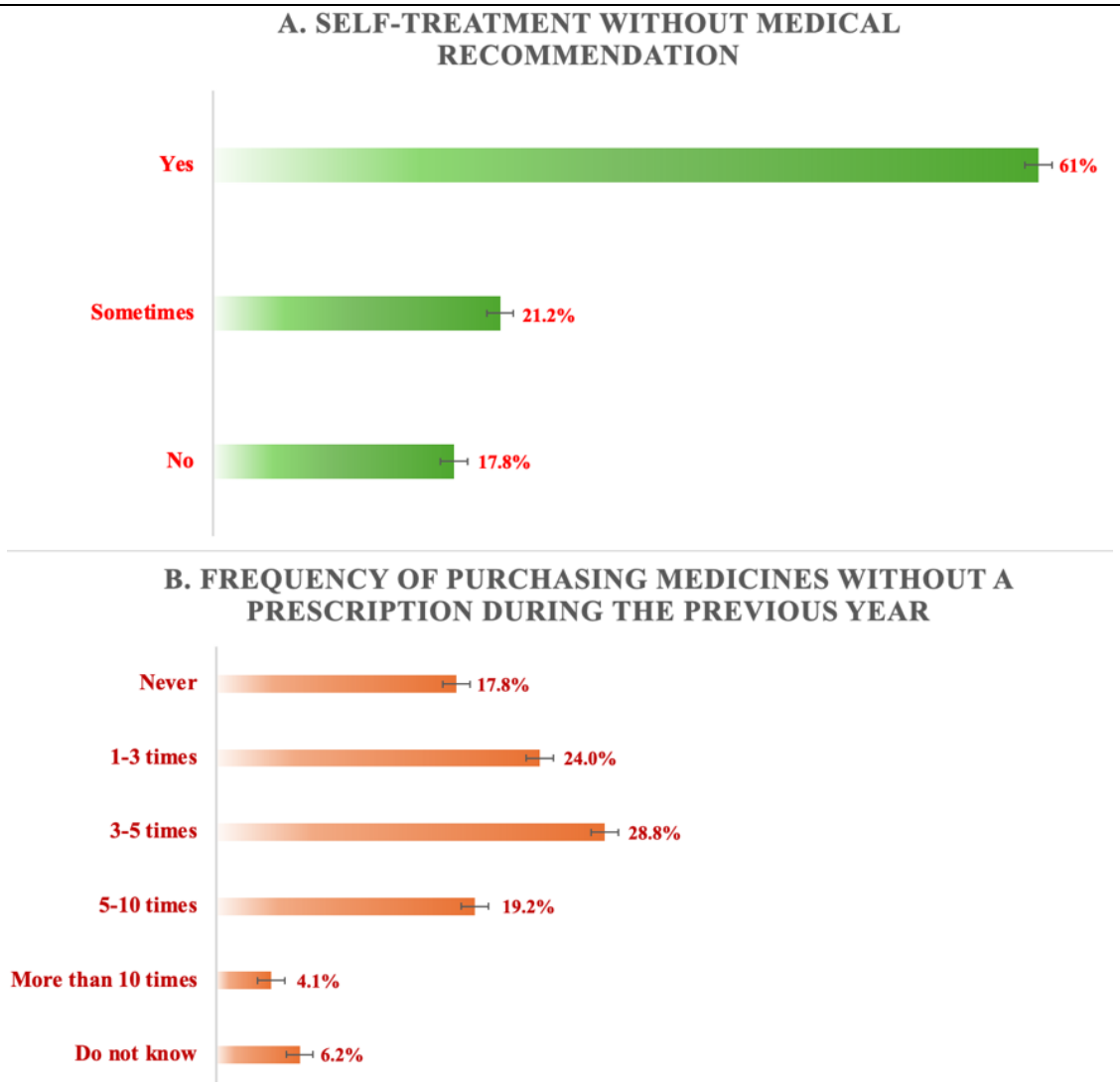

Figure 4.

Self-treatment without medical recommendation and frequency of purchasing medicines without a prescription. Panel A: responses to the item on usual self-treatment without medical recommendation. Panel B: reported number of purchases of medicines without a prescription during the previous year. Bars show percentages with 95% Wilson confidence intervals; the denominator for both items was the full analytical sample (n = 146). Response categories were mutually exclusive within each item

Medicines and health products used, and choice of pharmacy

More than one product category could be selected, so percentages do not sum to 100%. Medicines prescribed for chronic conditions were the most frequently reported category (78 participants; 53.4%; 95% CI 45.3-61.3), followed by dietary supplements used on the participant's own initiative (57 participants; 39.0%; 95% CI 31.5-47.1), medicines prescribed for acute conditions (33 participants; 22.6%), medicines for mild acute conditions selected on the basis on previous experience or pharmacist recommendation (21 participants; 14.4%) and dietary supplements recommended by a physician (16 participants; 11.0%).

One contrast in these data deserves emphasis. Dietary supplements taken on the participant's own initiative were reported more frequently than any other prescribed category, except chronic medication, and three and a half times more frequently than supplements recommended by a physician. Self-directed supplement use is therefore a substantial component of this population's medicine-related behaviour. Yet, it is a category that rarely appears in medication histories and whose potential for interaction with prescribed therapy is easily overlooked. Since more than half of the participants also reported taking chronic prescribed medication, the two behaviours coexist in a considerable proportion of the sample. Actively eliciting supplement use at the dispensing counter is a low-cost intervention with a clear rationale.

The most frequently reported category of products used, medicines prescribed for chronic conditions,

should not be interpreted as a self-medication finding, since these medicines were explicitly described as physician-prescribed. Conversely, the category that combines previous personal experience and pharmacist recommendation merges two distinct sources of decision-making whose individual contributions cannot be separated in these data.

As regards the choice of pharmacy, 88 participants (60.3%; 95% CI 52.2-67.8) reported usually buying from the nearest pharmacy, 23 (15.8%) from a pharmacy where they held a loyalty card, 18 (12.3%) from a pharmacy they liked and 17 (11.6%) from an online pharmacy. Proximity was thus the single most frequent determinant but accounted for only three-fifths of participants, so pharmacy choice in this population is not adequately described by proximity alone; commercial incentives, personal preference, and online purchasing together accounted for the remaining two-fifths. The importance of proximity is broadly consistent with previous Romanian evidence. In urban population surveys conducted in 2012 and 2020, the principal determinants of pharmacy choice were price, medicine availability, pharmacist professionalism or attitude, and proximity (33). The importance of proximity is also supported by recent evidence from Poland, where in a nationwide cross-sectional survey of 1126 adults, 61.8% reported choosing a pharmacy because of its proximity, while 40.9% considered low prices important (34). The study further indicated that pharmacy choice varied according to sociodemographic characteristics, with rural residents placing greater emphasis on product availability. Exploratory comparisons suggested differences in the preferred source by area of residence, sex, and age group, but none of these remained significant after correction for multiple testing; they are reported as hypothesis-generating only. The categories of medicines and health products reported, and the preferred source of purchase are presented in Figure 5.

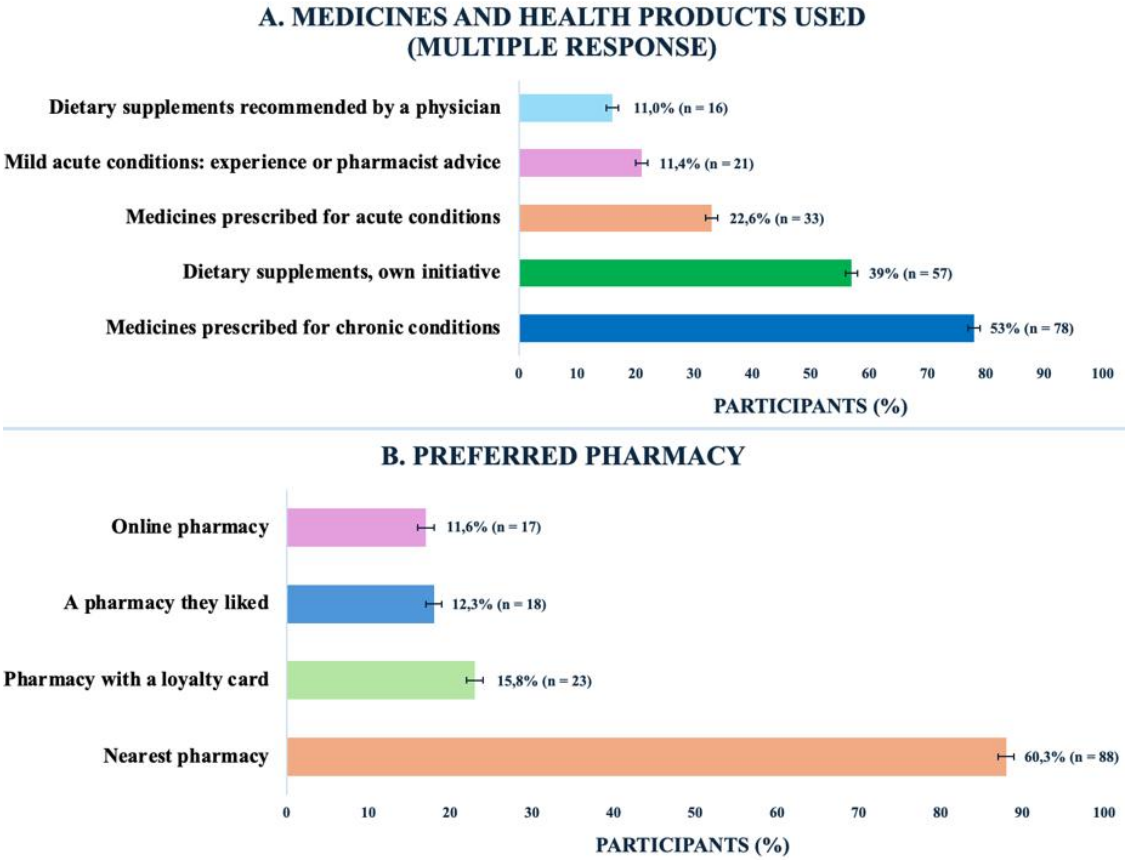

Figure 5.

Medicines and health products used and preferred pharmacy: Panel A: categories of medicines and health products reported; more than one category could be selected *per* participant, so percentages do not sum to 100%; Panel B: preferred source of medicines, dietary supplements and dermato-cosmetic products; categories were mutually exclusive. Bars show percentages with 95% Wilson confidence intervals and absolute frequencies in parentheses; denominator n = 146

Exploratory analyses

Beyond the six pre-specified urban-rural comparisons, 51 exploratory comparisons were performed by area of residence, sex and age group. Seven reached nominal significance, but none remained significant after Benjamini-Hochberg correction, with adjusted p

values ranging from 0.215 to 0.343. These analyses are therefore presented as hypothesis-generating and would require confirmation in an adequately powered study designed for that purpose.

Study limitations

This study has several limitations. The cross-sectional, non-probability and self-selected design limits causal interpretation and generalisability, and several variables reflected participants' subjective perceptions rather than measured quantities. Because the paper-based questionnaire was completed on pharmacy premises, social desirability bias cannot be excluded, and questions referring to the previous year may have been affected by recall bias. The distance of approximately 3 km was self-estimated rather than measured. Education level, employment status, the presence of chronic disease, and health insurance status were not collected and therefore could not be described or adjusted for. The findings should accordingly be interpreted as exploratory and as applying to the participants included in the study.

Content validation of the instrument was performed after data collection was completed, so the questionnaire could not be refined based on the expert review. Three items did not reach the item-level threshold for universal agreement: two concerned the perceived ease of access, and one concerned the sufficiency of counselling time. All three required respondents to judge adequacy against a standard that the questionnaire did not define, and findings derived from them should be interpreted with particular caution. The expert panel comprised five members, which imposes universal agreement as the acceptance threshold and provides limited discriminative power; all five were pharmacists, and no methodologist or public health specialist was included, which may have limited scrutiny of item construction and the conceptual coverage of accessibility. No pilot study, cognitive pre-testing, or test–retest assessment of participants' responses was conducted.

Because questionnaires were not coded by pharmacy, the geographical distribution of the returned questionnaires within the county could not be reconstructed, and the number returned *per* pharmacy is unknown. Recruitment inside pharmacies also means that individuals living in localities without a pharmacy were structurally unlikely to be represented, which may have attenuated any geographical gradient in perceived accessibility.

Conclusions

In this sample of community pharmacy users in Timiș County, perceived geographical access to pharmacies was favourable and did not differ between urban and rural residents. Access outside regular opening hours differed sharply: half of the urban but none of the rural participants considered evening or weekend access easy, and seven in ten rural participants considered additional pharmacies in their locality necessary. One-fifth of participants had been unable to obtain a necessary medication during the previous year. Interactions with pharmacists were evaluated favourably overall, yet only three-fifths reported sufficient counselling time, and only half knew which medicines they had obtained and how to administer them. Self-treatment without medical recommendation was reported by three fifths of participants. Within the limits of a self-selected, non-probability sample and of an instrument in which three items did not reach the item-level content validity threshold, these findings suggest that efforts to improve community pharmacy accessibility in this county should address opening hours and out-of-hours provision rather than the number of outlets, and that counselling should be evaluated from the patient's perspective and not from that of pharmacy staff alone.

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Availability of data and materials

The generated data in the present study are included in the figures and tables of this article. The other data generated in the present study may be requested from the corresponding author.

Ethics approval and consent to participate

The study was approved by the Ethics Committee of “Victor Babeș” University of Medicine and Pharmacy Timișoara, Romania (Approval no. 106/2023 rev 31.07.2026) and was carried out in accordance with the principles of the Declaration of Helsinki. Participation was voluntary, and completion and submission of the anonymous questionnaire were considered to indicate informed consent to participate.

AI use disclosure

During the preparation of this manuscript, the authors used QuillBot for language improvement, including spelling, grammar, clarity, and readability. The authors reviewed and revised all outputs from these tools and took full responsibility for the final content of the work.

Conflict of interest

The authors declare no conflict of interest.

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