

Marketing Analysis and Consumer Characteristics of Antihypertensive Drugs in the Azerbaijani Pharmaceutical Market

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ABSTRACT

The marketing characteristics and consumer behavior of antihypertensive drugs in the Azerbaijani pharmaceutical market were comprehensively analyzed. The study employed the content-analysis method, surveys conducted among physicians and end-users, and official statistical sources, including the state drug registry, the price lists of the Tariff Council, and data from the Analytical Expertise Center. The results indicate that preparations belonging to anatomical-therapeutic-chemical groups C03, C07, C08, and C09 dominate the market, with drugs acting on the renin-angiotensin system and their combinations occupying the leading position. Analysis of both physician and patient behavior revealed that therapeutic effectiveness and price are the principal criteria in drug selection. At the same time, poor treatment adherence, limited drug availability, and price level were identified as the key challenges in the management of arterial hypertension. The consumer-profile analysis demonstrates that the “effect–cost” balance plays a decisive role in the decision-making process, and that socio-economic factors significantly influence consumer behavior. The findings have practical implications for pharmaceutical companies, healthcare providers, and policymakers seeking to improve the accessibility, affordability, and rational use of antihypertensive therapy in Azerbaijan.

Keywords: Antihypertensive drugs; consumer behavior; arterial hypertension; pharmaceutical marketing; effectiveness; price–quality ratio; treatment adherence; pharmaceutical market; socio-economic factors; consumer profile

1. INTRODUCTION

Arterial hypertension is a chronic condition characterized by the persistent elevation of arterial blood pressure above normal limits over an extended period. A systolic pressure of 140 mmHg or higher and a diastolic pressure of 90 mmHg or higher are conventionally accepted as the diagnostic criteria (Baxşəliyev, 2018). Hypertension is one of the most widespread chronic diseases both globally and in Azerbaijan, and it is regarded as one of the principal risk factors for cardiovascular disease. Because elevated blood pressure frequently progresses without overt symptoms, it has been described as a “silent killer” whose consequences — including stroke, myocardial infarction, heart failure, and renal damage — often become apparent only after significant target-organ damage has occurred (World Health Organization, 2023).

Statistical data indicate that approximately 1.4 billion people worldwide suffer from high blood pressure. However, only a small proportion of these individuals — approximately 14 percent — have their arterial pressure effectively controlled. Overall, roughly one third of people aged 30 to 79 are affected by this problem, which demonstrates the extent of the disease’s global prevalence (World Health Organization, 2021; Meher et al., 2023). The rising prevalence of hypertension among the elderly population and high-risk groups increases the demand for pharmacological therapy (Vəliyeva & Cabbarova, 2013). The cardiovascular drug market was valued at approximately 241 billion US dollars in 2024 and, according to projections, is expected to grow at an average annual rate of 5.1 percent over the 2025–2033 period, approaching 383 billion dollars by 2033. This trajectory illustrates the growing economic significance of the cardiological segment of the pharmaceutical market over time (Grand View Research, 2025).

The large number of preparations within this therapeutic group and their availability across diverse price categories make the study of consumer selection behavior particularly relevant. In the contemporary period, patients’ drug choices are shaped not only by the effectiveness of a preparation but also by its price, accessibility, and ease of use. At the same time, instances of non-adherence to treatment create serious problems in the management of arterial hypertension, undermining the effectiveness of otherwise appropriate therapy and contributing to avoidable cardiovascular complications. For these reasons, the investigation of the marketing characteristics of antihypertensive drugs, of physician and consumer behavior, and of the socio-economic factors that influence these behaviors is of considerable importance. From this perspective, a comprehensive analysis of the marketing features and consumption behaviors associated with antihypertensive drugs in the Azerbaijani pharmaceutical market is considered relevant from both a scientific and a practical standpoint.

The aim of the present study is therefore to provide a comprehensive analysis of the marketing characteristics and consumer behavior associated with antihypertensive drugs in the Azerbaijani pharmaceutical market. The study pursues three principal objectives: first, to characterize the structure of the antihypertensive segment of the market through content analysis of official sources; second, to assess the competitiveness and consumption characteristics of these preparations through surveys of physicians and patients; and third, to construct a consumer profile that captures the socio-economic and behavioral factors shaping the demand for antihypertensive therapy.

2. MATERIALS AND METHODS

The study employed a mixed-methods design combining quantitative content analysis of official market data with survey-based investigation of physician and patient behavior. To conduct the research, data were initially collected from official statistical sources, including the state drug registry, the price database of the Tariff Council, and the data of the Analytical Expertise Center. These data were subjected to statistical analysis, with the calculation of percentage indicators and the conduct of comparative analyses.

The empirical component of the study was carried out through surveys conducted among physicians and patients at leading medical institutions located in the city of Baku, namely the J. Abdullayev Research Institute of Cardiology, the Central Oil Workers’ Hospital, Clinical Medical Center No. 1, Baku Medical Plaza, the Republican Therapeutic-Diagnostic Center, and Ege Hospital. Two structured questionnaires were developed for this purpose: one directed at physicians and one directed at end-user patients. The physician questionnaire was administered to a total of 98 physicians, and the patient questionnaire to a total of 56 patients undergoing treatment in the inpatient departments of the participating institutions. Competitiveness assessment was based on five principal criteria —

effectiveness, price, quality, brand (manufacturer), and promotion — with responses aggregated to construct a competitiveness map of the leading preparations. To assess the real accessibility and assortment diversity of antihypertensive drugs available on the market, the warehouse of Zeytun Pharmaceuticals LLC was selected as an object of study, on the basis of the company’s broad drug portfolio, developed distribution network, and significant market share.

3. RESULTS AND DISCUSSION

3.1 Structure of the Antihypertensive Drug Market

In order to assess the position of antihypertensive drugs in the Azerbaijani pharmaceutical market, a content analysis was conducted on the basis of the state registry, the price lists of the Tariff Council, and the data of the Analytical Expertise Center. The principal advantage in the market is held by preparations belonging to the C03 (diuretics), C07 (beta-blockers), C08 (calcium-channel blockers), and C09 (agents acting on the renin-angiotensin system) groups. In particular, drugs acting on the renin-angiotensin system and their combinations occupy a dominant position, which is consistent with modern treatment approaches (Mancia et al., 2023).

Analysis of official sources established that, among the drugs that have received state registration and price approval in the Republic of Azerbaijan, there are a total of 845 preparations encompassing 24 molecules. Of these, 439 are monocomponent preparations, while the remainder are of combined composition. According to the structural distribution, calcium-channel blockers and their combinations accounted for 284 preparations (33.60 percent), preparations acting on the renin-angiotensin system and their combinations for 630 (74.56 percent), and beta-adrenoblockers for 183. Analysis by trade name indicates that the preparation Carvedigamma (36 entries) is the most widely represented; this drug is produced in tablet form and is available on the market in four different dosages — 3.125 mg, 6.25 mg, 12.5 mg, and 25 mg — as well as in packaging variants of 30, 50, and 100 units.

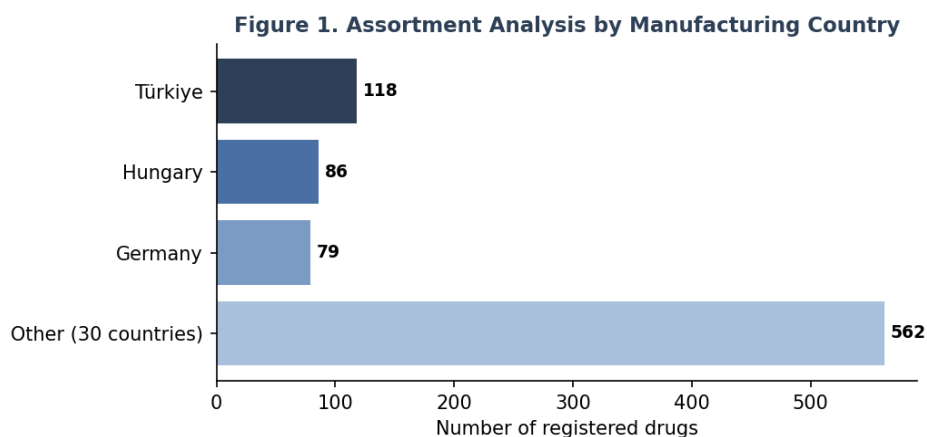


Figure 1. Assortment analysis by manufacturing country (top producers).

Analysis of the assortment by manufacturing country established that drugs produced in a total of 33 countries have been registered. Among these countries, preparations manufactured in Türkiye occupy first place, numbering 118 entries. They are followed by drugs manufactured in Hungary (86) in second place, and preparations manufactured in Germany (79) in third place (Figure 1). The numerical predominance of antihypertensive drugs of Turkish origin in the market is not coincidental. It is explained, first and foremost, by the level of development of the pharmaceutical industry in that country, the extensive production of generic preparations, and their availability at relatively more affordable prices. At the same time, geographic proximity and favorable transport conditions facilitate the import process. The development of trade relations between the two countries and the greater compatibility of

registration procedures further reinforce this advantage. As a result, Türkiye’s leading position has been shaped by the influence of a number of objective factors.

Figure 2. Monocomponent vs. Combination Antihypertensive Preparations

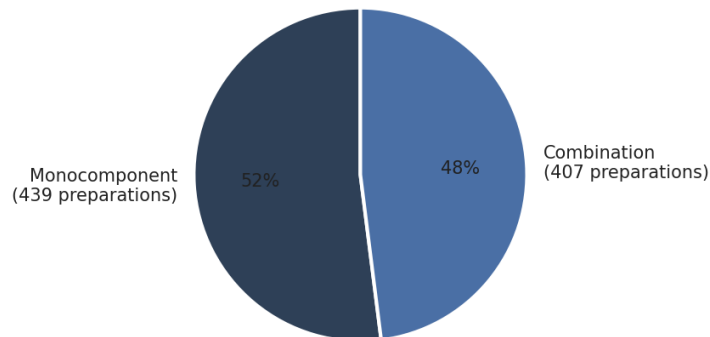


Figure 2. Monocomponent versus combination antihypertensive preparations.

Within the overall structure of the antihypertensive drug assortment, monocomponent preparations predominate, accounting for 52 percent (439 preparations). Combination preparations constitute 48 percent of the total assortment (407 preparations) (Figure 2). This relatively balanced distribution reflects the coexistence of two therapeutic strategies: monotherapy, which remains common in the initial management of uncomplicated hypertension, and combination therapy, which is increasingly recommended by international guidelines for the achievement of blood-pressure targets in patients with more severe or resistant disease (Mancia et al., 2023).

3.2 Price Analysis

The price analysis showed that the antihypertensive preparation with the highest price was the bosentan-containing “Daymond” (125 mg, No. 56), with a price of 713.77 AZN. Among the preparations used in long-term antihypertensive therapy, the highest price belonged to the bisoprolol-plus-amlodipine combination “Alotendin” (10/10 mg, No. 90), at 57.82 AZN. The lowest-priced preparations were observed mainly in the diuretic and ACE-inhibitor groups; in these groups, the cheapest preparations were “Furosemide” (40 mg, No. 10) at 0.26 AZN and “Captopril-Akos” (25 mg, No. 20) at 0.30 AZN, respectively. This very wide price range — spanning more than three orders of magnitude between the cheapest and the most expensive preparations — illustrates the substantial heterogeneity of the antihypertensive segment and underscores the importance of price as a determinant of access for patients across different income groups.

3.3 Assortment Breadth and Accessibility

After the content analysis was completed, the warehouse of Zeytun Pharmaceuticals LLC was examined in order to evaluate the real accessibility and assortment diversity of the antihypertensive drugs available on the market. As established, 845 antihypertensive agents have been registered in the state registry. In the Zeytun warehouse, however, only 199 of these are available. Studying these results allowed the determination of the breadth of assortment: dividing the number of preparations available in the warehouse by the total number registered and expressing the result as a percentage yields an assortment-breadth indicator of 23.55 percent ($199/845 \times 100$). The fact that the assortment breadth stands at the level of 23.55 percent indicates the existence of a serious limitation in the availability of antihypertensive drugs and may be regarded as insufficient from the standpoint of pharmaceutical provision. This finding highlights a gap between the nominal diversity of the registered market and the

assortment that is actually accessible to patients through the distribution network, a gap that has direct implications for treatment continuity and adherence.

3.4 Physician Survey: Competitiveness and Prescribing Criteria

The evaluation of the consumption characteristics of the drugs was carried out on the basis of a survey conducted among physicians. In the initial stage, the competitiveness of the preparations was assessed, and for this purpose effectiveness, price, quality, trade brand (manufacturer), and promotion were selected as the principal criteria. A special questionnaire consisting of three sections was prepared. The survey was conducted among a total of 98 physicians (38 cardiologists, 8 cardiac surgeons, 35 therapists, 12 endocrinologists, and 5 neuropathologists) working at the participating institutions in Baku. The first section of the questionnaire consisted of questions covering the personal and professional information of the respondents, while the second section contained specific questions concerning antihypertensive drugs. Respondents were asked to indicate the antihypertensive drug groups that they most frequently use in their daily medical practice.

Of the respondents, 52.04 percent (51 persons) work in state medical institutions and 47.96 percent (47 persons) in the private sector. At the same time, 55.1 percent of the participants (54 persons) are physicians holding an academic degree. On the basis of the survey results, a competitiveness map of the antihypertensive drug groups was constructed, and it became possible to identify the preparations considered more competitive in the pharmaceutical market.

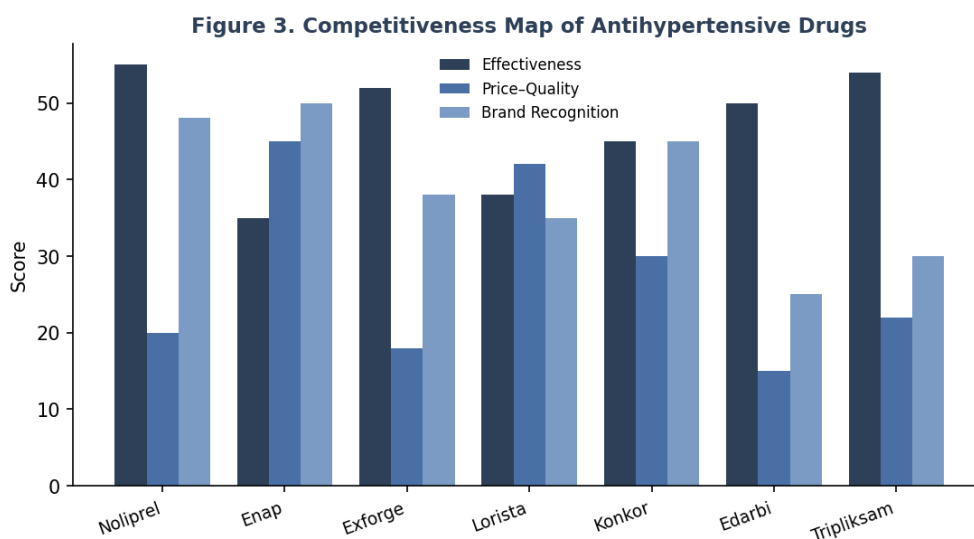


Figure 3. Competitiveness map of antihypertensive drugs (physician assessment scores).

It emerged that the most competitive preparation is “Enap” (Figure 3), followed by “Lorista” and “Noliprel.” At the same time, the results obtained indicate that the principal reason for the preference given to these drugs is the optimal nature of their price-to-quality ratio. In other words, these preparations provide satisfactory results in terms of both therapeutic effectiveness and safety, while also being considered economically accessible for patients. The detailed competitiveness scores assigned by physicians across the five assessed dimensions are presented in Table 1.

Table 1. Competitiveness scores of leading antihypertensive brands (physician assessment).

Brand (Manufacturer)	Effectiveness	Price-Quality	Brand Recognition	Price Advantage	Promotion
Noliprel (Servier)	55	20	48	12	45
Enap (KRKA)	35	45	50	40	25

Brand (Manufacturer)	Effectiveness	Price–Quality	Brand Recognition	Price Advantage	Promotion
Exforge (Novartis)	52	18	38	10	35
Lorista (KRKA)	38	42	35	38	30
Konkor (Merck)	45	30	45	20	32
Edarbi (Takeda)	50	15	25	8	40
Tripliksam (Servier)	54	22	30	15	42

According to the survey results, the criterion to which physicians give the greatest preference when prescribing drugs was therapeutic effectiveness — 73.47 percent (72 persons). This indicates that the effectiveness of treatment is the principal factor in the selection of an antihypertensive preparation. At the same time, 66.32 percent of respondents (65 persons) reported that they also attach importance to the price factor when selecting a preparation, taking into account the financial means of patients. The full distribution of prescribing criteria is presented in Table 2.

Table 2. Criteria preferred by physicians when prescribing antihypertensive drugs.

Preference parameter	Participants (n)	%
Therapeutic effectiveness	72	73.47%
Price of the preparation	65	66.32%
Safety	60	61.22%
Availability in the pharmacy	54	55.10%
Manufacturing country	41	41.84%

In the opinion of physicians, the most frequently encountered problem in the prescription of antihypertensive preparations is patients' non-adherence to treatment — 60.2 percent (59 persons). Respondents noted that patients who have experienced serious cardiovascular complications approach the treatment regimen more responsibly. Other important problems are the high price of preparations (66.33 percent; 65 persons), the limited availability of certain drugs in pharmacies (31.63 percent; 31 persons), and, in certain cases, the failure to achieve the expected clinical effect (22.45 percent; 22 persons). The statistical distribution of these problems is presented in Table 3.

Table 3. Statistical analysis of the principal problems encountered in the treatment process.

Problem	Participants (n)	%
Patient non-adherence to treatment	59	60.20%
Price of the preparation	65	66.33%
Availability in pharmacies	31	31.63%
Low effectiveness	22	22.45%

3.5 Patient Survey and Consumer Profile

The formation of a consumer profile is of considerable importance for the study of consumer behavior and the identification of target groups. For this purpose, a questionnaire consisting of two sections was prepared for end-users and applied among 56 patients undergoing treatment in the inpatient departments of the J. Abdullayev Research Institute of Cardiology, the Central Oil Workers' Hospital, Clinical

Medical Center No. 1, Baku Medical Plaza, and the Republican Therapeutic-Diagnostic Center. The first section of the questionnaire covered the socio-demographic indicators of the respondents, while the second section covered questions related to the treatment process and drug intake.

According to the survey results, 58.9 percent of consumers (33 persons) were men and 41.1 percent (23 persons) were women. By age group, 60.7 percent (34 persons) were in the 56–67 age range and 39.3 percent (22 persons) in the 40–55 age range. In terms of employment, 67.9 percent of respondents (38 persons) were retired and 32.1 percent (18 persons) were employed. By educational level, 46.4 percent (26 persons) had secondary education, 21.4 percent (12 persons) had higher education, and 32.1 percent (18 persons) had secondary-specialized or other levels of education. According to income indicators, 69.6 percent (39 persons) belonged to the middle-income group (300–500 AZN), 19.6 percent (11 persons) to the low-income group, and 10.7 percent (6 persons) to the high-income group. Analysis by medical indicators shows that 57.1 percent of respondents (32 persons) receive treatment primarily from cardiologists and 42.9 percent (24 persons) primarily from therapists for prophylactic purposes. The complete socio-demographic profile of the surveyed patients is summarized in Table 4.

Table 4. Statistical indicators of the patient survey results (consumer profile).

Category	Subgroup	n	%
Sex	Men	33	58.9%
	Women	23	41.1%
Age distribution	56–67 years	34	60.7%
	40–55 years	22	39.3%
Employment status	Retired	38	67.9%
	Employed	18	32.1%
Education level	Secondary	26	46.4%
	Higher	12	21.4%
	Other (specialized/none)	18	32.1%
Income level	Middle (300–500 AZN)	39	69.6%
	Low	11	19.6%
	High	6	10.7%

Because the survey was conducted in inpatient departments, the majority of respondents were patients who had been hospitalized with complications of arterial hypertension. For this reason, 64.3 percent of them reported taking their medications regularly — a figure that must be interpreted in light of this selection effect, since the survey of physicians identified patient non-adherence (60.2 percent) as the principal problem in routine outpatient practice. According to the results, 55.4 percent of respondents are under medical supervision once a year, while 44.6 percent are under regular supervision. Among the participants, 87.5 percent use antihypertensive preparations on a continuous basis. When selecting a pharmacy, the principal criterion was price, and 71.4 percent of respondents reported that they are not attached to any specific pharmacy. When a drug is not available at the pharmacy, 51.8 percent of respondents preferred to consult their physician rather than switch to an analogue — a behavior that reflects both trust in the prescriber and caution about therapeutic substitution.

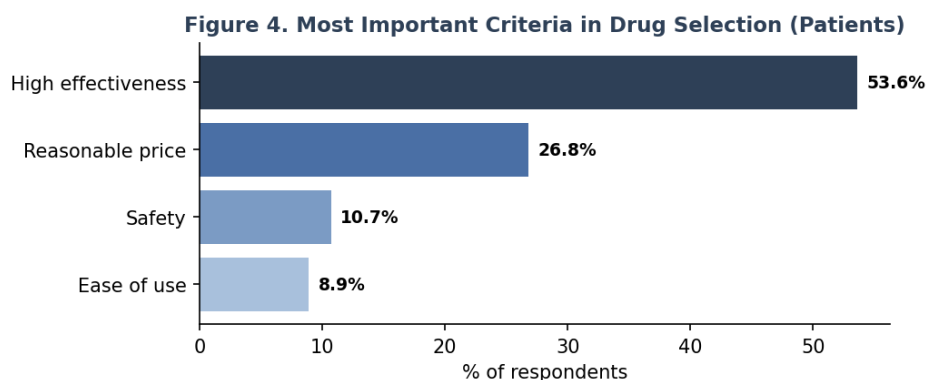


Figure 4. Most important criteria in drug selection (patient survey).

In the selection of an antihypertensive preparation, the principal criterion was high effectiveness (53.6 percent), followed by reasonable price (26.8 percent), safety (10.7 percent), and ease of use (8.9 percent) (Figure 4). These results show that patients, when selecting a drug, give priority mainly to the “effect–cost” balance. In other words, the principal question shaping their decision is essentially: “Which drug fits my budget and lowers my blood pressure effectively?” Factors such as convenient packaging, storage conditions, and shelf life do not play a serious role in the selection process. At the same time, because a large proportion of respondents have secondary or lower educational levels, the manufacturer and country-of-origin factor also does not exert a significant influence on drug selection.

The situation of consumers with respect to a healthy lifestyle was also assessed. According to the results, 55.4 percent of respondents (31 persons) are individuals who complain of constant fatigue and lack of energy, who have had harmful habits in the past (52 percent), who do not pay sufficient attention to their health (46 percent), and who are inclined toward fast-food consumption (39 percent). The other 44.6 percent (25 persons) lead a relatively healthier lifestyle; this group consists of respondents who are under regular medical supervision, who pay attention to their nutrition (34 percent), who maintain a diet, and who engage in regular physical activity (29 percent). This distribution suggests that lifestyle-related risk factors remain widespread among hypertensive patients and that behavioral and educational interventions, alongside pharmacological therapy, represent an important avenue for improving long-term outcomes.

4. CONCLUSION

The comprehensive analysis conducted in this study demonstrates that the antihypertensive segment of the Azerbaijani pharmaceutical market is dominated by preparations belonging to the C03, C07, C08, and C09 groups, with agents acting on the renin-angiotensin system and their combinations occupying the leading position, in accordance with contemporary treatment approaches. Although 845 antihypertensive preparations encompassing 24 molecules have been registered in the state registry, the assortment actually accessible through the distribution network is considerably narrower, with an assortment-breadth indicator of only 23.55 percent at the studied warehouse — a level that may be regarded as insufficient from the standpoint of pharmaceutical provision.

The analysis of physician and patient behavior consistently identified therapeutic effectiveness and price as the principal criteria in drug selection. Physicians prioritize effectiveness (73.47 percent) while remaining attentive to patients’ financial means (66.32 percent), and patients themselves are guided above all by the “effect–cost” balance. Non-adherence to treatment emerged as the single most important problem in the management of arterial hypertension, alongside the high price of certain preparations and their limited availability in pharmacies. The consumer-profile analysis revealed that the typical antihypertensive consumer in this sample is an older, predominantly retired, middle-income

individual with secondary education, for whom socio-economic factors exert a decisive influence on consumption behavior.

These findings carry practical implications for several stakeholders. For pharmaceutical companies, they underscore the importance of competitive pricing and reliable supply in a market where the effect–cost balance governs consumer choice. For healthcare providers, they highlight the centrality of treatment adherence and the value of patient education, particularly given the prevalence of lifestyle-related risk factors among hypertensive patients. For policymakers, they point to the need to improve the real accessibility and affordability of antihypertensive therapy in order to close the gap between the nominal diversity of the registered market and the assortment available to patients. Future research could usefully expand the geographic scope of the survey beyond Baku, increase the patient sample size, and incorporate longitudinal assessment of adherence in order to deepen understanding of consumer behavior in the antihypertensive segment of the Azerbaijani pharmaceutical market.

DECLARATIONS

Conflict of Interest Statement: The authors declare that there is no conflict of interest in the conduct and reporting of this study.

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Authors' Contributions: Tevekkul Khalili: data collection, content analysis, survey administration, statistical analysis, and writing – original draft. Both authors have read and approved the final version of the manuscript.

Ethical Approval: The survey was conducted on a voluntary and anonymous basis among physicians and patients, and all participants provided informed consent prior to participation.

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