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**MARKETING OF ANTIVIRAL MEDICATION****Liliana DOGOTARI\*, Stela ADAUJI, Mihail BRUMĂREL**

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Correspondent author\*: [liliana.dogotari@usmf.md](mailto:liliana.dogotari@usmf.md)**Rezumat****MARKETINGUL MEDICAȚIEI ANTIVIRALE**

Infecțiile respiratorii virale acute (IRVA) se determină la 40-60% copii de vârstă fragedă și la 30-40 % copiii cu vârstă preșcolară și școlară. Piața farmaceutică a Republicii Moldova cuprinde o gamă destul de variată a preparatelor utilizate în tratamentul IRVA, dintre care 20% revin produselor din import. Producătorii de medicamente originale dominanți pe piața farmaceutică din Republica Moldova sunt: Marea Britanie, Slovenia, Elveția. Printre producătorii autohtoni cu cele mai multe preparate antivirale înregistrate sunt: Farmaprim SRL, I.M. Farmaco SA, SC Balkan Pharmaceuticals SRL, Eurofarmaco SA, RNP Pharmaceuticals SRL. Preferințele consumatorilor în selectarea medicamentelor antivirale este influențată în mod semnificativ de politica de preț, proprietățile organoleptice, tipul formei medicamentoase, producătorul, natura originii medicamentului, posibilitatea de utilizare în practica pediatrică.

**Cuvinte cheie:** infecții respiratorii virale acute, marketing, produse antivirale, produse generice, produse originale, producători.

**Abstracts**

Acute respiratory viral infections (ARVI) are determined in 40-60% of early age children and 30-40% of preschool and school children. The pharmaceutical market of the Republic of Moldova comprises a wide range of medicinal products used in the treatment of ARVI, of which 20% are imported products. The producers of the original medicines which dominate the pharmaceutical market in the Republic of Moldova

are as follows: Great Britain, Slovenia, Switzerland. Among the domestic producers who have registered the most antiviral preparations are as follows: Farmaprim SRL, I.M. Farmaco SA, SC Balkan Pharmaceuticals SRL, Eurofarmaco SA, RNP Pharmaceuticals SRL. Consumer preferences in the selection of antiviral medicines are significantly influenced by the price policy, organoleptic properties of the drug, form of issue of the drug, manufacturer, the nature of the drug's origin and the possibility of use in pediatric practice.

**Keywords:** acute viral respiratory infections, marketing, statistics, antiviral products, generic products, original products, manufacturers.

## INTRODUCTION

The treatment of antiviral diseases remains a worldwide problem. Viruses have been and are resistant to treatment or prophylaxis more than any other form of life due to their very nature, as they are totally dependent on the cells they infect for their multiplication and survival [1]. This particular characteristic has made the development of effective antiviral chemotherapeutic agents very difficult. Acute viral respiratory infections (AVRI) are highly prevalent diseases often present in people of all ages with different clinical manifestations and forms and severity that depend of the degree of intoxication and the level of the affected respiratory system. Adenoviruses, Paramyxoviruses (V. parainfluenza and V syncytial respiratory): viruses with primary and major respiratory affinity that account for up to 90% of AVRI in children. Acute respiratory infections (ARI) determine 40-60% of early-childhood illnesses and 30-40% of preschool and schoolchildren's illnesses. The frequency of these diseases are 6-7 diseases per year in urban children in overpopulated areas, and 2-3 cases per year in adults. AVRI mortality differs according to the age: 6 000 000 children aged 0-14 years die annually from AVRI worldwide [2, 6]. The lethality for which the viruses are directly responsible it is definitely the case of pandemic influenza, adenoviruses, para-influenza virus infections, and respiratory syncytial viruses (RSV). Appropriate and effective prevention and treatment can minimize the indices of morbidity and lethality of the population.

Viral infections are among the most common diseases of humans, accounting more than half of the acute illnesses. The incidence of acute

respiratory illness in the United States is from 3 to 5,6 illnesses per person per year [4]. The highest incidence is registered in children under one year of age (6-8% of illnesses per year), with an increased rate until the age of 6, after which it is registered a gradual decrease. The rate of illness in adults is 3-4 times a year. It is estimated that starting with 2/3 up to 3/4 of cases of acute respiratory infections are caused by viruses [2, 3, 6].

The majority of viral infections affect the upper respiratory tract, but can also affect the lower respiratory tract, especially in small children and in certain epidemiological situations.

According to World Health Organization data, the most effective method of prophylaxes is vaccination. The human body is very susceptible to viruses, so a proper prophylaxis can be the key to a healthy and long living human. The most common symptoms associated with infections caused by the main respiratory virus are intoxication and lining inflammation of the upper respiratory system.

### **MATERIALS AND METHODS**

The National State Registers - the State Nomenclature of Medicines and the Classifier of Medicines - served as study materials. For the purpose of the marketing analysis of the assortment of drugs used in AVRI on the pharmaceutical market in the Republic of Moldova, it was carried out on the basis of a quantitative transferal observational study by means of the sociological questionnaire (the online version using the google forms of application) tool of 100 consumers/patients aged between 18-48 years, both male and female. The study carried out allows a clear assessment to be made regarding the frequency of illnesses during the cold period of the year, the prophylaxis measures applied, the types of medicinal products used, etc.

In terms of the marketing analysis of the antiviral product range on the Moldovan pharmaceutical market, we highlighted the following parameters:

- How do the participants of the study initiate their first symptoms of a cold?
- Frequency of illness during the cold season.

- Prophylactic measures applied.
- Drugs used in ARVI.
- Consultation requirement for antiviral drugs in the pharmacy.
- The level of satisfaction of the population used the antiviral products range from the Republic of Moldova.
- The choices of manufacturers of antiviral drugs.
- Preferred forms of medicine.
- Impact of the pricing policy on consumer choice.

### RESULTS AND DISCUSSIONS

Based on the study and the processed results, we found out that 85% of the population chooses uncontrolled self-medication by avoiding visiting a doctor because of the lack of time, financial problems and waiting for a long time to get to the doctor (Figure 1).

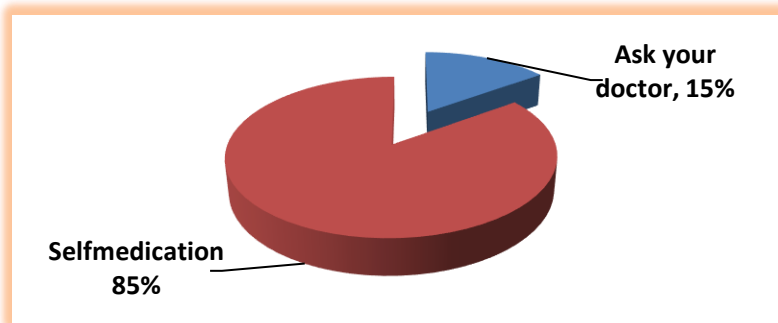


Figure 1. **What do the participants of the study do, when they have the first symptoms of a cold?**

Most of the respondents who answered this question, experienced a cold once or 2-3 times a year (Figure 2). They mentioned that a good prophylaxis, including increasing of the fruits consumption (32%), using of antiviral products (19%), vitamins (16%) and other protective measures which ensure the consolidation of an immunity system for a longer time of period and provide a reliable protection against viruses (Figure 3).

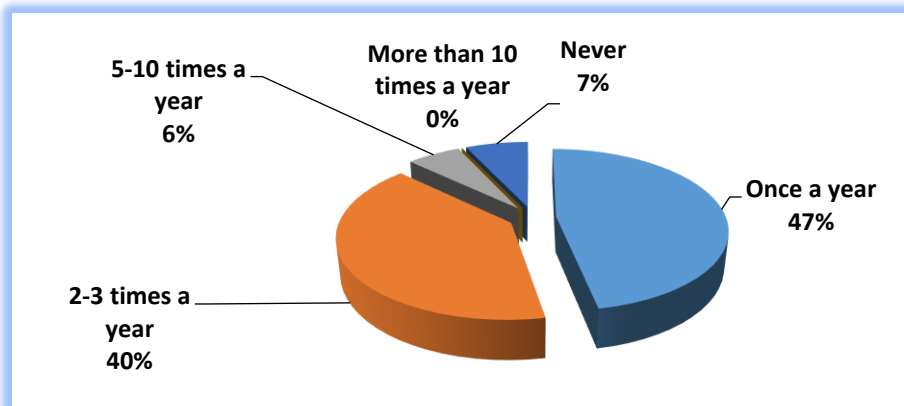


Figure 2. The frequency of illness during the cold period of the year

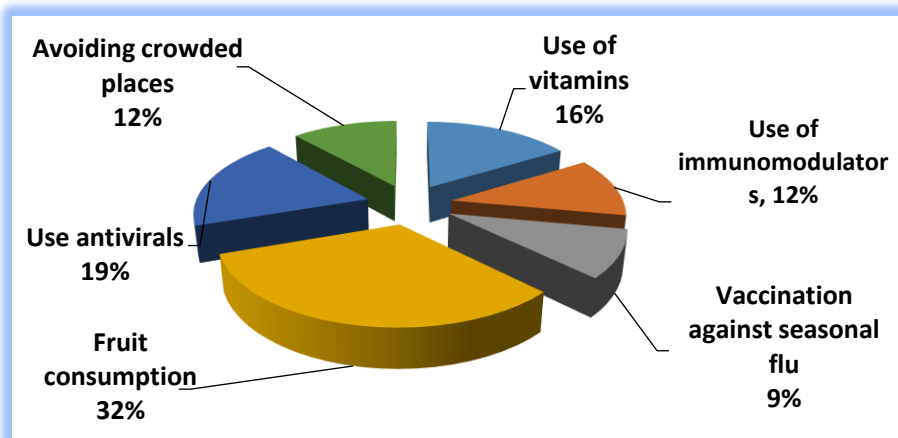


Figure 3. Prophylactic measures used

It is known that regular consumption of fruits ensures the elimination of liquids and it is used as antipyretic, diaphoretic and bactericides. Vitamins are indispensable for colds, for example, vitamin C destroys foreign organisms and strengthens the immune system; Vitamins group B (B1, B2, B5, B6, B9, B12) synthesize antibodies of the immune system, promote the absorption of other vitamins, and vitamin A strengthens mucous membrane protection.

Vaccination forms a long lasting and resistant immunity to the viral

infections and prevents the advancing of the disease. Immunomodulatory medications (e.g. Immunal, Pro immunity, Ecomer) increase the human immunity and activate the body's own defense forces. Avoiding crowded places and contact with the infected people is an absolutely necessary measure of protection.

While choosing a synthetic or natural antiviral product, there should be considered various factors such as adverse reactions, toxicity, therapeutic effect and the presence of biologically active substances. As the result of the study, it has been shown that both types are equally demanded, yet synthetic ones predominate. Synthetic products act much faster and have a maximum therapeutic effect (e.g. Arbidol, Rimantadina, Viferon). While products of natural origin have a wider spectrum of action, they are less toxic and give very few side effects (Panavir, Influcid, Imupret) (Figure 4).

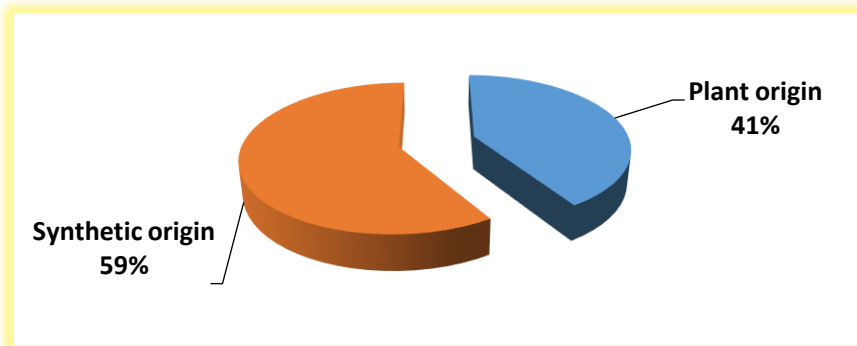


Figure 4. **Demand level of synthetic and vegetal antiviral medicinal products**

Based on the data obtained, we found that most of the visitors to the pharmacy (71%) choose the pharmacist's consultation - that of the specialist who graduated and has obtained high education, who has the necessary knowledge with reference to the medicines. The main factors that relate to the pharmacist are that they can offer high quality services, reasonable prices, has a pharmaceutical ethics and specialist ethics.

Due to an extended range of antiviral products on the Moldovan pharmaceutical market, which are presented in the most diverse forms

of issues, 69% of the population use the services of pharmacies and choose individual antiviral preparations (Figure 5).

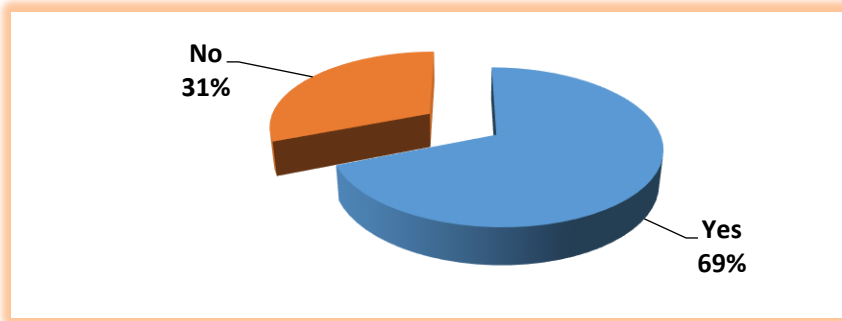


Figure 5. **The level of satisfaction of the population regarding the antiviral product range from Republic of Moldova**

The most popular antiviral products are the imported ones which constitutes 76%. These medicines are considered to be of a better quality and more effective; however, they are even more expensive, which was not stated as a problem by most participants in the study. Domestic medicines are more easily accessible to the population due to the low price, however only 24% of the population chooses them (Figure 6).

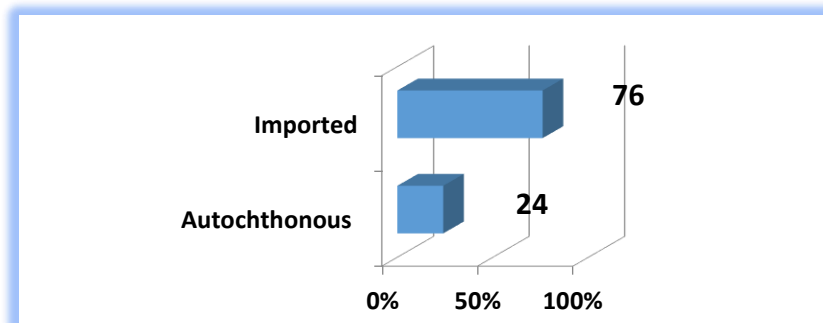


Figure 6. **The results of choosing manufacturers of antiviral products**

The most common pharmaceutical forms are tablets (30%), syrups (22%), capsules (22%) and ointments (11%) (Figure 7).

These choices are made due to the following advantages and disadvantages:

- the tablets are very convenient to administer, easily transportable, can be dosed exactly, with acceptable organoleptic properties and form of issue with prolonged action, however the therapeutic effect is delayed because of low solubility, also it can irritate the mucous membranes of the digestive system, they can change their composition, for example Lavomax, Copegus®;
- syrups are also convenient in administration, they can mask taste and odor with the correctors and are especially used in the treatment of children but cannot be accurately dosed (Amizoncic);
- capsules can be easily dosed, they are protected from light, air and moisture, protect the digestive tract against irritation, have a very high bioavailability, have a pleasant taste and smell but are difficult to be swallowed (Arbidol, Rimantadine, Arbivir-Zdorovie, Agripin-RNP);
- ointments can reach a maximum concentration in the body, are harmless, have a local emollient, antiviral, protective, therapeutic effect, are economic and sometimes can cause allergic reactions (Oxolina);
- gels give us a very good bioavailability, are harmless, local therapeutic effect, but sometimes have a narrow spectrum of action and may cause local irritation (Panavir, Aciclovir);
- suppositories can be dosed exactly, have very high bioavailability, very fast therapeutic effect, are convenient to be used in children, contain some drug substances that cannot be contained in other forms of medicine, do not cause infections but are unstable in administration (Viferon, Genferon).

In the questionnaire we noticed that for 72% of those surveyed, price plays a very important role because most medicinal products' manufacturers have high prices due to economic phenomena such as inflation, producer price, raw material costs, transportation, customs clearance, commercial additional cost of the warehouse and pharmacy. Support provided to the visitors of the pharmacies are the discounts offered and the actions taken to make medicines more accessible (Figure 8).



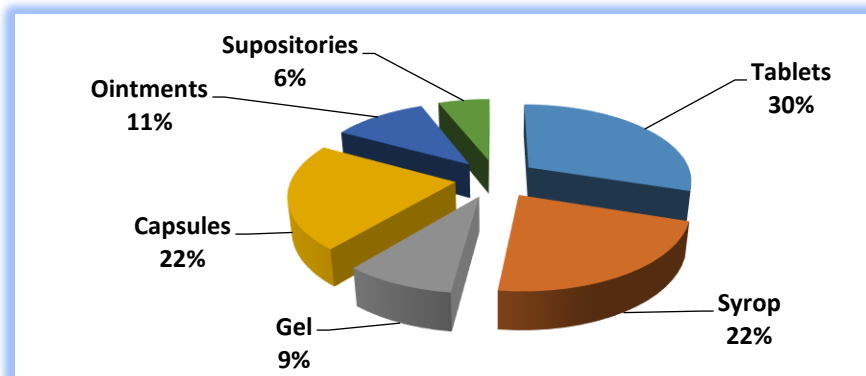


Figure 7. Total study of preferred forms of medicines

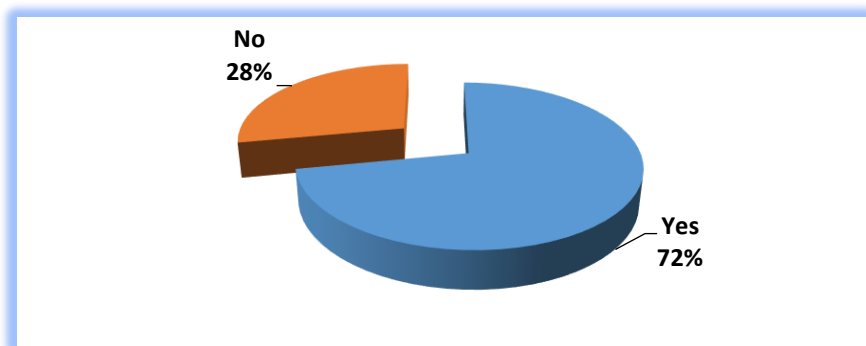


Figure 8. The impact of price policy on consumer choice

Antivirals based on plant material have a lower toxicity, a wider spectrum of activity, minimal side effects due to the presence of biologically active substances, act smoothly on the body, are hypoallergenic and can be used during pregnancy and breast feeding, but develops a therapeutic effect slower.

Synthetic antiviral products currently have an important role in the pharmaceutical market due to the worldwide epidemic situation that is steadily increasing. These products provide a maximum therapeutic effect, provide the opportunity to overcome a number of diseases, are rapid and effective, but the disadvantage is the large number of contraindications and side effects that cause toxicity, overdose and addiction.

## CONCLUSIONS

On the pharmaceutical national market on 15.02.2023 there have been registered 33 names of the original antiviral medicines, including 7 names that are used in acute respiratory viral infections. There are also 32 generic products and 6 products of plant origin used in the treatment acute viral respiratory infections. Among the most known producers of antiviral products are: Farmaprim LTD, I.M. Farmaco AS, SC Balkan Pharmaceuticals SRL, Eurofarmaco AS, RNP Pharmaceuticals LTD, although 80% of such products are imported, thus our country's pharmaceutical market is mostly supplied with these products by the following countries: Slovenia, Germany, United States of America, Belgium, India, Egypt, Belarus, Ukraine, Romania, Switzerland, Cyprus, Russia. The consumer preferences in selection of an antiviral product are significantly influenced by the price of the medicines, the manufacturer, the form of issue, the organoleptic properties, the nature of the medicine, the possibility to use in the pediatric practice.

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