

PHARMACEUTICS

WHAT THE ASSORTMENT OF STUDENT PHARMACY KITS CAN TELL US

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Abstract

Objective. To study the assortment of home medicine kits of medical students in their junior and senior years.

Research materials and methods. An anonymous online survey of students from four medical universities in the Republic of Belarus ($n = 507$). The questionnaire included information on the students' gender, age, medication group, medications stored in their home medicine kits, and the names of individual medications. Statistical processing of the results was performed using Microsoft Excel and Statistica 10.0; absolute and relative values were described, and differences were assessed using appropriate criteria ($p < 0.05$).

Results. Over-the-counter symptomatic medications predominated in home medicine kits. The percentage of students reporting having antibiotics in their medicine cabinets reaches 35-40% by the fifth year ($p < 0.001$). The percentage of students having prescription medications in their home medicine cabinets increased from 28.2% in the first year to 57.1% in the fifth year ($p < 0.001$), as well as cardiological medications, 18.2% and 52.0%, respectively ($p < 0.001$). At the same time, the percentage of antiallergic (antihistamine) medications did not change significantly (~83.5%). Bandages and antiseptics were present in ~80% of students; and the most commonly used medications were paracetamol and ibuprofen (in >90%). When choosing medications, students relied on their personal positive experience of using them, with its importance tending to increase from the junior to the senior year of university. Students with higher academic achievement were more likely to include antibiotics in their medicine cabinet than students with lower GPAs.

Conclusions: Medical education undoubtedly influences the composition of a medicine cabinet: For example, from junior to senior year, there is an increase in the purchase of antibiotics and prescription medications. However, medical education also encourages the purchase of medications without consulting a doctor, due to confidence in one's own knowledge. This necessitates developing students' respect for the professional competence of healthcare workers. In other words, when choosing a treatment, students should follow a doctor's advice rather than self-medicate.

Keywords: medicine cabinet, medical students, self-medication, antibiotics

INTRODUCTION

A home medicine cabinet reflects a person's actual health problems or the anxiety of someone who doesn't currently have a confirmed medical diagnosis but fears illness and protects themselves by purchasing medications and storing them in their home medicine cabinet. University students are no exception in this regard, and their tendency to self-medicate is high, a global practice [1-5]. As medical students gain knowledge, particularly in pharmacotherapy, they undoubtedly change their preferences, choosing what they believe are the optimal medications for their medicine cabinet. However, as research shows, for example, pharmaceutical education does not at all preclude self-medication [3]. At the same time, there are certain established patterns in the use of certain medications that are difficult to change (for example, "paracetamol is the best medicine for reducing elevated body temperature during infectious diseases"). Furthermore, students with different levels of training in pharmacology and pharmacotherapy will differ in their choice of specific medications for their home medicine cabinets. The reason is simple: if a student doesn't know the best medicine for a given condition,

they will purchase the one they know. Therefore, studying the home medicine cabinets of Belarusian medical students in their junior and senior years seems practically significant for obtaining information, in particular, on the presence and prevalence of self-medication.

RESEARCH MATERIALS AND METHODS

Data was collected through an anonymous online survey using the Google Forms platform. A total of 507 students (88.6% female, 9.3% male) participated. The study included students from Grodno State Medical University, Vitebsk State Medical University, Gomel State Medical University, and the Belarusian State Medical University. The study was conducted in accordance with the ethical standards of the World Medical Association's Declaration of Helsinki. All respondents provided voluntary informed consent to participate; selection was conducted randomly by sending questionnaires to email addresses. Statistical data processing was performed using Microsoft Excel and Statistica 10.0, with descriptions of absolute and relative values.

RESULTS AND DISCUSSION

The proportion of students with antibiotics in their home medicine cabinet is high and consistently increases from approximately 20% to 35-40% by the fifth year ($p < 0.001$). Thus, there is a significant tendency to self-medicate with antibiotics, which is a problem in other countries as well, at a similar rate (46%) as in Belarus [4]. Another study also noted a similar trend [3]. Moreover, almost half of the students' use of antibiotics was based on their confidence in their effectiveness against viral infections. This study also noted that female students with experience self-medicating with antibiotics were more likely to use antibiotics [5]. These findings indicate that, as they progress through their studies, Belarusian students perceive antibiotics as a standard element of treatment for any infection, including the most common ones, i.e., viral infections. This demonstrates a lack of understanding that such a practice leads to the spread of antibiotic resistance and shows that medical education in itself, while providing general knowledge about diseases and medications, in the absence of independent clinical practice, does not prevent the presence of antibiotics in home medicine cabinets and self-medication with them [4-6]. Research shows that during the educational process the volume of medical knowledge continuously increases, especially when studying clinical medicine in the senior years, however, as indicated above, this does not exclude the tendency of a significant number of students to self-medicate. [7]. During the survey, it was found that the presence of emergency supplies increased from 49.6% in the 1st year to 77.9% in the 5th year ($p < 0.001$). This increase indicates a qualitative change in the structure of the first aid kit, and not simply an increase in the number of drugs. In the senior years, a focus on probable emergency conditions appears, and the range of medications "in case of complications" expands, likely reflecting a shift from a predominantly theoretical to a clinical mindset. Self-medication is most evident in the acquisition and storage of prescription drugs. The proportion of students with prescription medications without a doctor's prescription increases from the first to fifth years, respectively, from 28.2% to 57.1% ($p < 0.001$). These figures indicate not only a change in the contents of the first-aid kit, but also a transformation in students' behavioral attitudes. As students move to senior years, confidence in their own knowledge increases, dependence on external recommendations (teachers, doctors) decreases, and the tendency to independently make decisions about the initiation and algorithm of pharmacotherapy increases. On the one hand, this reflects the formation of an autonomous model of medical behavior, without which it is impossible to imagine a physician's work. On the other hand, this may be accompanied by the risk of irrational use of drugs, a decrease in criticality to self-medication, both in practice and in its content [8]. Cardiological drugs are studied in depth in older years. This is reflected in the fact that the frequency of the presence of such drugs in the medicine cabinet increases from 18.2% in the first year to 52.0% ($p < 0.001$) in the fifth. However, it would probably be an oversimplification to

explain such an increase solely as a result of the learning process. A student can acquire such knowledge during part-time work in medical institutions (this is a common practice for medical students), and involvement in the treatment of elderly relatives. This leads, among other things, to the acquisition of more modern and selectively acting drugs. The fast-acting ACE inhibitor captopril was most often present in students' medicine cabinets, which indicates the presence of hypertension in students, requiring periodic elimination of high blood pressure. Thus, the first aid kit begins to reflect not only the knowledge, but also the beginnings of the clinical experience of the future physician, who selects a drug based on clinically oriented thinking [9]. Antiallergic (antihistamine) drugs demonstrate a stable level of purchase and use (83.5%), without significant fluctuations during the course of study at the university, which is easily explained by the presence of allergies in students already in the first year, with its persistence in older years, and the wide knowledge of such drugs among the population, the ease of their prescription, the unambiguous clinical response to them ("works - does not work"). Therefore, their presence in the student's first aid kit does not depend on the level of training and the course of study of the student and, given the high probability (e.g., seasonal hay fever, etc.) of the manifestation of allergic reactions in the future, a supply of such drugs is always available for students with allergies [10]. As noted above, as the course of study progresses and the transition from the junior to the senior year, the tendency to purchase and self-medicate with antibiotics increases. In other words, more educated students tend to self-medicate with drugs that are less well known to the general population than with well-known antipyretic and analgesic drugs (ibuprofen, paracetamol). Personal experience can be considered the most important factor in drug selection, making the most frequently prescribed and personally tested drugs popular among the population [9-12]. A general description of the structure of the home medicine cabinet, according to an analysis of data from a survey of medical university students ($n = 507$), showed that the structure of the home medicine cabinet is predominantly formed by symptomatic therapy and over-the-counter drugs. This model is consistent with global trends in self-medication described in a number of pharmacoepidemiological studies, for example, according to data from C M Hughes et al., the prevalence of self-medication in the general population exceeds 50%, with the main share being analgesics, anti-cold and gastrointestinal drugs.[11] Among the means for treating and dressing wounds, the most common category turned out to be dressings (adhesive tape, bandages) and antiseptics (chlorhexidine, hydrogen peroxide), which were present in the overwhelming majority of respondents (~80%). This corresponds to international recommendations for the composition of first aid kits, where antiseptics and dressings are the basic components.[13] The high prevalence of these products can be explained by their versatility of use, low cost, and the absence of the need for a prescription. In Eastern European countries, such a first aid kit structure is typical, which is associated with the historically established practice of

self-treatment of wounds. Of the painkillers and antipyretics, as noted above, paracetamol and ibuprofen were most often present in first aid kits (>90%). This is fully consistent with international recommendations. The World Health Organization recommends paracetamol and NSAIDs as first-line drugs [14], and the Cochrane Database notes them as the most common OTC analgesics. [15]. The study by Moore et al. confirms that these drugs dominate the structure of analgesic consumption. [16]. Drugs for the treatment of colds in medicine cabinets are represented, first of all, by nasal decongestants (in approximately 75–80% of respondents) – symptomatic agents for rhinitis, which is quite rational, given that the treatment of ARVI in the overwhelming majority of cases is symptomatic [17]. Although the therapeutic value of such treatment is questionable (and long-term treatment is even harmful, leading to drug-induced rhinitis), the situation with similar drugs in other countries is similar [17]. Drugs for the treatment of gastrointestinal disorders are represented in the questionnaires, first of all, by sorbents (~70%). Moreover, the World Health Organization's international recommendations for the treatment of acute diarrhea emphasize rehydration rather than sorbents [18]. Replenishing lost fluid and electrolytes, and sometimes (in non-infectious diarrhea) loperimide, are the mainstay of diarrhea treatment [18, 19]. Thus, the high prevalence of sorbents reflects the established opinion in post-Soviet medicine about their value. Sedatives, hormonal, and cardiac medications: approximately 60% of respondents indicated having the above-mentioned medications in their medicine cabinet. Research shows that in post-Soviet countries, the use of over-the-counter sedatives is widespread, especially those of herbal origin, such as valerian, motherwort, and peony [20]. It should be noted that phenobarbital-containing drugs (such as “Valocordin”, “Corvalol”) are also classified as sedatives in Belarus, although similar combination drugs with barbiturates (phenobarbital) are controlled and restricted for use in most countries of the world [21]. Of the ophthalmological drugs, moisturizing drops were the most common (~60%). Literary sources confirm the high prevalence of dry eye syndrome, especially when using digital devices [22]. First Aid Supplies: most students (~70–75%) do not have specialized first aid supplies in their home medicine cabinets. This indicates a lack of preparedness for emergency situations, despite their medical education.

CONCLUSION

The study results show that the structure and contents of medical students' medicine cabinets change significantly during their studies. The presence of antibiotics and prescription medications increases as students become more familiar with clinical conditions, i.e., by their fifth year of university studies. At the same time, the presence of antiallergic (antihistamine) medications in the medicine cabinets does not change significantly from junior to senior year (~83.5%), reflecting the specific nature of their use for allergic reactions, which tend to recur and require students to always have a medication from this group on hand. The high prevalence of dressings, antiseptics, analgesics, antipyretics, and

symptomatic remedies for acute respiratory viral infections is consistent with international practices, while the predominance of sorbents for gastrointestinal disorders reflects regional specificities in the Soviet Union. Unfortunately, however, medical education also encourages students to purchase medications without consulting a doctor, due to their confidence in their own knowledge. This necessitates developing students' respect for the professional competence of healthcare professionals. In other words, when choosing a treatment, students should follow a doctor's advice rather than self-medicate.

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