Contribution of Arabic Medicine and Pharmacy to the Development of Health Care Protection in Bosnia and Herzegovina - the Second Part

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ABSTRACT

After the collapse of the Arab rule, the Arab territorial expanses and cultural heritage were taken over by the Turks. Although scientific progress in the Turkish period slowed down due to numerous unfavorable political-economic and other circumstances. Thanks to the Turks, Arabic culture and useful Islamic principles expanded to the territory of our homeland of Bosnia and Herzegovina (B&H). Significant role in the transfer of Arabic pharmaceutical knowledge was also attributed to the Sephardic Jews who, with their arrival, continued to perform their attar activities, which were largely based on Arab achievements. However, insufficiently elaborated, rich funds of oriental medical and pharmaceutical handwriting testify that Oriental science has nurtured in these areas as well, and that the Arabic component in a specific way was intertwined with other cultures and traditions of B&H. The Franciscan monasteries in Bosnia and Herzegovina have museums which contain important exhibits and libraries rich in books, among which many from the field of medicine and pharmacy. Muslim mosques, also, had small libraries with Arabic books used for spreading medical knowledge. The second category was folk doctors and practitioners who were on disposition to the people of any religion. Some of them listened to lectures in medicine during the studies of theology and philosophy. However, most did not have any medical education, but by reading books and teaching experience they made their own recipe collection. Special books, called “Ljekaruše” (Books of recipes) were also born during the study when they came into contact with an even larger number of health books. However, it should not be neglected that a lot of them contained folk medicines that were used in some environments depending on the habits and available herbs. Although it has been proven that many recipes from Ljekaruše are pharmacologically and medically justified, one should not ignore the knowledge and skill behind them. The true flowering of medicine in B&H happening thanks to graduate doctors in Italy, Austria, Hungary, Turkey, etc. Through their action, in a short time, they greatly improved health in B&H, educated the population. The Franciscans were important because they opened the first open-air clinics, the first pharmacies, and wrote the first pharmacopoeia and regulations for the work of health care institutions. Numerous works preserved in monasteries have mostly brought about the study in only one or two copies. Their contribution to the development of health care and the prevention of illness and treatment of the population in B&H during that period is very significant.

Keywords: medicine, pharmacy, Arabic medicine, attars.

1. THE FALL OF THE ARAB AND THE ESTABLISHMENT OF THE TURKISH RULE

In this part we will try to explain how the mighty Arabic caliph fell, and that the rule of majority of his territories had established a Turkish Empire created in the late 13th century (1-10). With this enthusiasm, as it is already known, the Turkish Empire takes over the Arabic cultural heritage (11-21). Chronologically and briefly, the most important political and economic opportunities in the new empire are considered, which, among other things, have led to the development of the health system. With the insight into the general political and economic and health situation of the whole empire, we believe that it will enable a more natural shift of focus to Bosnia and Herzegovina (B&H) and a better understanding of its medical and pharmaceutical practices, complex and colorful due to various traditions and cultures, and the integration of the Arabic component into that stained glass mosaic.

There is one interesting thesis of Ibn Khaldun, and it says “that science only succeeds in wealthy societies”
take part in the emerging scientific revolution. However, science, and then that same Arab-Turkish people did not glance, as she began her Renaissance thanks to Arabic and technological progress. This is unusual at first.

In essence, while there is an advanced economy and a stable atmosphere in the state, there is a great demand for scientific and technological contributions. Namely, the Arab rulers were guided by a policy that promoted rationalism, communication and commerce, thus securing economic prosperity. Along with such political and economic prosperity of the empire, with the rich cultural heritage inherited and supplemented by the “Golden age of Arabic science” (1-4). At a wider interval of time, from the 8th to the 16th century, the contribution of scholars to Arab countries, and later to Turkish rule, was very impressive (22-30). However, due to the influence of some internal and external factors, the decline of the power and fall of the Arab caliphate has occurred. These factors were first of all new forces emerging from the East and from the West - first the Mongols that destroyed the Baghdad, the largest Arab city of that time, in 1258. On that occasion, Abbasid Halifa al-Mu’tasim was killed and the eastern Arab caliph fell. As far as the western caliphate is concerned, Spain, weakened by internal disquisitions and civil clashes, was conquered by the Christian army in the 14th century. The last Islamic province in Spain, Granada, fell down in 1492 (1, 12, 13). Not only the occupation by foreign powers hindered the cultural development of territories that from the 14th century fell under the rule of the Turks. Considering Ibn Khaldun’s thought, now in the case of the Turkish Empire, it remains to take into account the factors that have led to the decline of the political and economic power of the new empire and from which it will be offered an answer to why the scientific progress did not continue in its full swing as at the time of Golden Arabic Medicine. The geographic location was vulnerable to the invasion of the East and the West. Their consequences were the destruction of numerous cultural influences and fierce depopulation. Natural disasters and dry years in some parts of the Ottoman Empire have led to hunger and poverty, but they also helped the spread of various diseases (16). Epidemics such as plague are harassed by empires. The fall of international trade was the fruit of the West’s efforts to weaken the Ottoman Empire in various ways. Thus, in the 16th century, Europe began to dominate in political-economic stability, growth of the party, and scientific and technological progress. This is unusual at first glance, as she began her Renaissance thanks to Arabic science, and then that same Arab-Turkish people did not take part in the emerging scientific revolution. However, the explanation behind this is very simple. The West realized the seriousness of the growing power of the Turkish Empire and sought to destabilize the empire in various ways: from military penetration, to various ways of boycotting its trade, such as the Portuguese search for new routes to India, which would bypass Islamic countries. That is why scientific circles will lose their vitality and creativity especially in the 16th century. In the second half of the 16th century, the Turkish Empire became more open to ideas coming from the West. European influences are also due to the fact that due to the great freedom of movement and trade in the empire, some new, unknown illnesses have also been forced to seek western medicine (16, 22, 29).

Regional political, economic and military vulnerabilities have led to a number of reforms in the Ottoman Empire, but their intensive implementation began in the early 19th century (16). Reforms also involve a health system that is regulated by the Western model. Their implementation was aimed at modernizing the pharmaceutical and medical profession. Part of this intervention was also the construction of new modern pharmaceutical and medical schools and the implementation of rigorous drug inspection on the market. Although these measures were often disputed and resisted, the efforts of Ottoman rulers and experts set the foundation for a modern health system in the countries that was ruled by this empire. In short, medical and pharmaceutical practices have benefited from a modern character, both in the most eminent parts of the empire and in B&H, just before the establishment of the new Austro-Hungarian rule, when significant reforms were undertaken including the opening of the first modern pharmacy, the education of the first professional medical staff and limiting the book of attars, on which will be more written later (16). Until then, throughout the Ottoman Empire, the quality of medical assistance was inadequate and had no good State support, and most health care institutions were funded by charity funds. Although for centuries in the Arab and Turkish empire there has been a sanitary inspection, Ottoman institutional reforms, collectively known as Tanzimat, have made changes in this area of healthcare (1, 2, 16, 22). The incentive for these reforms, as can be assumed, was military and economic needs. This is evidenced by the military medical schools, hospitals and pharmacies which were opened before civilians. Although these changes were mostly related to the capi-
Contribution of Arabic Medicine and Pharmacy to the Development of Health Care Protection in Bosnia and Herzegovina - the Second Part

2. PHARMACY IN BOSNIA AND HERZEGOVINA AT THE TIME OF TURKISH RULE

On the soil of B&H, numerous Turkish influences have been entangled with many other during the Turkish rule (22). The following factors in the pharmacy and medicine of B&H can be considered: the first developed national medicine and pharmacy with its empirics and medicines, and then the penetration of medicine and pharmacy that had the notions of Western science from coastal cities such as Dalmatia (17, 18, 29). The third component - Arabic Medicine and Pharmacy - is added to this (1, 22). It arrived mainly through the Turks, but one can not ignore the fact that the good influence of Arabic science came also through the Jews from Spain, who had been under Arab rule for centuries and in which Arabic pharmacy simply flourished. When we imagine all these traditions and cultures living together and complementing, we can only get an approximate picture of the condition in therapy.

The faith and its principles, knowledge and experience of Arabic medicine, as well as the first educated medical staff played a significant role. Nevertheless, the focus of this part of the article should be maintained on the Arabic influence on the development of Pharmacy as part of the health system in B&H and its correlations with other influences. Up till now, the article deals with the development of Golden Arab Pharmacy whose outlines of achievements, somewhat larger and somewhat less able to be recognized in the development of the Bosnian-Herzegovinian Pharmacy (12, 30, 31). The books of advanced Arabic pharmacy as well as the scarce part of the professionally educated staff will be at the disposal of the elite society as well as the Turkish army, and on the treatment of wider public masses will not have a significant impact (22, 29). This is understandable, given that the socio-political conditions in the Ottoman Empire, as explained in the previous section, have hampered cultural progress (28-30). These unfortunate circumstances particularly surfaced in the border regions of the empire like B&H - frequent wars, outbreaks of epidemics, and a poor economic situation were the reason why Turks had “better thing to do” than to spread and teach Arabic doctrine (22). In addition to this, the arrival of the Turks and the fall of the independent Bosnian state also marked the termination of relations with the West and the establishment of the East culture. Although pharmacy in B&H did not flourish as it once did in the golden age of Arabic science, nor did it take part in the West European Renaissance, that does not mean that it did not exist (22-27). Medicine and pharmacy remained in a specific relationship until the arrival of new conquerors, so they did not officially separate, and to what extent was the influence of Arab pharmacy on B&H? (12). The answer would be subtly offered in the course of the article. The people who have accepted Islam and its principles of hygiene, the old Ash-Shizari’s law governing the book of health workers and the attar of charity with Tashlihan and Bazardani are just some of the evidence of that Arabic influences left the trace on the healthcare activity of B&H (1-3).

3. SOCIAL-POLITICAL CIRCUMSTANCES IN BOSNIA DURING THE TURKISH RULE

The Ottoman rules in B&H began with the fall of the Bosnian kingdom in 1463 and then Herzegovina in 1483 and lasted until the Austro-Hungarian annexation in 1878 when, under Article 25 of the Berlin Peace Treaty, of 13 July 1878 the Administration of B&H was entrusted to the Austro-Hungarian Monarchy (22). During that eighty-year Ottoman occupation, despite the newly-created religion of Islam, much of the local population did not suffer drastic social and political changes, so our country has in many respects its Slavic character. All the time, in spite of the Ottoman rulers, the homeland nobility had the leading word in this area and always had an exceptional position in the Ottoman Empire. The power of the nobility grew to such an extent that in the eighteenth century B&H in the Ottoman Empire was somewhat like a state within the state, and Sarajevo was a sort of Ottoman republic with extraordinary trades and crafts (29). And because of the trade it came once again in more tight connection with the East.

The biggest reforms in all segments of society, and partly in the health care segment, were conducted by Gazi Husrev-bey and Sheriff Topal Osman-pasha (22). Gazi Husrev Bey financed the establishment of the first
hospitals in B&H from his waqf funds, and Osman-pasha founded the Waqf hospital in Sarajevo in 1866 (later in Tuzla, Travnik, Mostar and Banja Luka) (22). The Organized Health Service in Bosnia and Herzegovina is actually started with the treatment of patients in Hajji Sinan’s Tekke in Sarajevo, founded in 1638-1640, by Silahdar Mustafa-pasha, son of Hajji Sinan-aga. Before that time, the civilian population was mostly treated at homes, and armies in barracks or rented hams. There was a small number of literate population, and basic literacy could be gained in madrasah and maktabor in mosques among Muslims, or in monasteries among Christians, and partly among Bosnian nobility. (Figures 1-4)

With the arrival of Turkey and Islam in B&H, a different attitude towards health culture arisen. As explained in the article, the Turks bring with them the medical experience and the literature they have adopted from the Arabs. For centuries, Arabic doctors gathered and translated rich medical materials from various languages, supplemented their research and experience, and left to other nations for use in the form of rich encyclopedias and other medical manuscripts (1-3). Although these Arabic books of medicine were only available to higher levels of the Bosnian-Herzegovinian society, the Turks brought a new lifestyle that, among other things, emphasized the maintenance of hygiene (Figures 3, 4). The book “Nihajat ar-rutba fitalab al-hisba”, by author Abdullah Ibn Nasr aa-Shizeri from the 12th century, is the oldest law on sanitary inspection (22, 29).

4. CULT OF WATER AND HYGIENE AS AN EASTERN ISLAMIC HERITAGE

First of all, it should be emphasized that the sanitary hygiene measures alone could not suppress the illnesses that had raged the Ottoman Empire, but it certainly played a significant role as a preventative measure of public health, and Islamic religious hygiene regulations prompted the creation of special sanitary and market control services (22).

Islam as a religion that, among other things, taken over by Arabs from Turks, prescribes Muslims frequent rituals and generally emphasizes the importance of maintaining hygiene, for which Muslims gained the reputation of being among the purest peoples. For this purpose, public baths, hammams are being build, and most Muslim houses have a special type of home bathroom, the so-called washroom (22, 29). The Turkish travel writer, Evliya Çelebi, notes that up to the middle of the 17th century, 56 public baths were built in B&H, out of which four in Sarajevo. Public baths were set up in every place, and wealthy citizens brought water to their yard. In addition to each mosque, public parlors were built. The first water supply systems are also being built, which establishes the first sanitary facilities in Bosnia and Herzegovina (22). Hamam was built by various charities and although they were built primarily for Muslims, they were open to residents of all other confessions, at all times. Gazi Husrev-bey and Isa-bey, whose male hammam was also the first and the last Sarajevo hammam, were especially built by raising of public debts among Turkish soldiers. Men and women in Hammam, even seek a cure for some diseases, and the medicine respected the hygienic and healing value of the hammam. In the first place, those who went in the hammam felt the need that they need to sweat, because medieval medicine used sweating for the purpose of treatment. Who felt the pain in his back, he also went to the hammam to get rid of it as well. People who could not urinate, went to the hammam and let the hot water heat their waists. They also used it to get rid of sneezing, fatigue, improve digestion of treat inflammation and flu (22, 29).

5. FIRST RULEBOOKS IN B&H

In Bosnia and Herzegovina there was a good Arabic tradition that was not used intensively as in the Arab era, but it came to us through the Turks. With the conquest of B&H, the Turks also brought their social relations, their political organization and arrangement. In the canons of the Bosnian Sanjak from the 16th century, codified by the collections of imperial provisions, the “Law of ihtisaba” (oversight of all activities, private and social, to maintain order, law and proper business) is also mentioned (16). The servant who was entrusted with the hijab (supervision) was called multesib. The Turks took over the service from Arabs, and there have already been words about it.

The main sanitary and market security law was the book dating back to 1234, called “Nihajat ur-rutbe fi ta-lab-il hisbe” written by Abdullah bin Nasr bin Abdullah
bin Muhammed Es-Shazeri Es-Safi (author is from Syria), and today is deposited in Gazy Husrev-bey library in Sarajevo. This re-written book is older than 500 years (original manuscript is in Turkey, older more than 700 years). This book, called in English “Market Inspection” is rulebook, which was used in the 15th century in B&H. Among the numerous authorizations given by this piece to muhtesib, for the maintenance of hygiene is very important the authority to supervise the purity of the hammam, so great attention has been given to this. Further, health and pharmacy was of great importance in the 17th and 18th centuries. In particular, the author drew attention to the falsification of pharmaceuticals and merchandise by revealing their harm and carefully guarded secrets of the cheaters. The author further states that drug forgery is much more damaging than any other falsification because it can seriously harm the patients. That is why the pharmacy in Islam had a sacred duty to make its “thoughts to God” in its making. In addition, this Ordinance foresees control of all measures, weights and scales, pharmacists, attars, manufacturers of medicinal beverages and doctors. Chapter 18 is dedicated to the attorneys and the monitoring of drug and sanitary trade proves that the Attar profession was not just a branch of ordinary commerce, but had also a report on its book, such as the control of medicines prepared and sold by the attars (16, 22).

6. FOLK MEDICINE AND PHARMACY IN B&H

There were a variety of folk doctors in B&H who were engaged in various occupations, so they were specialized in fractures, wound healing, removing cataracts, treating snake bites, etc., depending on the occupation they were dealing with originated their names: “ranari” (wound healer), “travari” (herbalist), “berberi” (barber) (16, 22). Already in the 15th and 16th centuries, there were people who engaged in drug preparation and the sale of herbs, so their name “attars”, which is of Arab-Tusca origin, was derived from there. They played the most important role in the development of pharmacy at the territory of B&H, first in the promotion of folk medicine, and then as a transition to the modern way of treatment, that is, of the lawful apotheosis. In addition to this, which is of crucial importance for this article, the attars had a lot of Arab roots, which we see in the very origin of the name “attar”, but there will be more words later, after briefly expounding basic information on the folk medicine of B&H, to explain the circumstances and view the whole picture of health activities in B&H during the Turkish rule.

In B&H, as well as in other parts of the Ottoman Empire, they are concerned with various epidemic and endemic diseases that have affected the lives of many Bosniaks. Some of them are: frenzy, tuberculosis, leprosy, syphilis, trachea, favus, cholera, varicose, abdominal typhus, dysentery, morbilli, charlote and diphtheria. As a result of severe epidemics, the population was entrusted their health to anyone, and they also trusted in the folk medicine that carried many superstitions. The licensed health services, the Turkish administration, allowed everybody to treat, prepare and sell drugs (16, 22, 29). However, during the four-year Ottoman occupation, many folk doctors and apothecaries succeeded to become good in treatment. An example of this is a special category of expert barbers called jarrah - wound healers, who because of their abilities were engaged in the Turkish army as military doctors. The performers were Ine-Beg, Muharem and Sarail from Foca, Mehmed Pasha Ibrahim’s son, Ahmed Celebi, Izet from Kostajnica, Alija from Jezera near Jajce and Avdaga Vilajetovic. For the folk pharmacy, interesting barber classes were also those who worked with the preparation of balms and medicines, so-called hapars because they produced the haps - pills and balms for the wounds. The most famous hapars were Mustafa Cadordzija and Musalih Bric, famous for their steps for treating syphilis. Drugs were, however, largely crafted and sold by folk specialty drug dealers, attars, and they made it from various oils and herbs (16).

7. ARAB-TURKISH LJEKARUŠE (MEDICINE BOOKS) AND SUPERSTITIONS

Particularly at the beginning of Turkish rule there were just few true health workers. The people have come to various forms of treatment and sought advice from a few literate and educated people. These were mostly priests of all religions, merchants, and some civil servants (28-31). To help people, literate people began collecting instructions and prescriptions for treating various illnesses. They wrote from their own experience, folk recipes, and from medical books that came to Bosnia from the East and from the West, or from other writings, sort to say from everywhere. Thus, the folk books of the “pharmacists” were born. Therefore, it can not be said that pharmacies are only folk medicine, although they have many elements of folk medicine. They give insight into the real state of health culture of some space and time. In B&H, during the period of Turkish rule, Muslim, Jewish, Orthodox and Catholic or Franciscan pharmacists wrote their ljekaruša “The book of medical recipes” (Figures 5, 6, 7, 8) (16, 22). For this article, the most interesting are
Muslim, Franciscan and Jewish ljekaruša, because the influence of Arabic culture on them was the greatest, so the way in which they originated would be described below. The Muslim ljekaruša was written in Arabic and Turkish scripts, so they were legible to imams, hojja, clerks, and senior civil servants. Following the establishment of Turkish authorities, medical books and manuscripts in Oriental languages have gradually begun to arrive in B&H. These books have begun to be rewritten, which has considerably raised the culture of that time in B&H. This is evidenced by medical manuscripts of oriental languages in our libraries (27). These transcriptions were available mainly to intellectuals and people from more affluent circles. Some of them also came to imams, hojja, scribes and chroniclers. They wrote in their “drafts” of recipes and instructions from these books, supplementing them with folk recipes. These medicines was the real doctors of the Muslim population. Thus, in our regions, there have been many references in the Arabic pharmacy, as well as the aspirations of Islam, and they have also been used for the writing of most Muslim ljekaruša. The Muslim ljekaruša left traces and views from the West and also from the Franciscan ljekaruša. Dervis Nidai was mostly rewritten. There were about 30 transcriptions of his book “Menafi-un us-tibbi Nidai”, or “To Benefit the People of Niday’s Books”, which were created from 1557 to 1839 (Figure 5). There were also several transcriptions of Ibn Sina, Ibn al-Nafis, ar-Razy and others (2, 3).

Of Jewish ljekaruša, it is important to mention that they did not arise in the earlier period of Ottoman rule because then the small Jewish community had their own doctors, so their ljekaruša were not needed. The first preserved dates back to the nineteenth century, and there were some sefard ljekaruša such as “Ljekaruša of Avram Papo”, and some attarical manuals. Through the Spanish Jewish doctors and attars, came to B&H and brought the Arab (Mauritian), Spanish and Jewish medicine and customs (22-26). These booklets containing advice and guidance on illness, treatment and medication were transmitted from father to son. Their contents were very varied, ranging from medicinal herbs, water treatment, parenting, and delivery, to the release of blood, organ-therapy and impure pharmacies full of superstitions. Many drugs have been recommended for one disease, taking the logic that if the first one does not help, the second or third will help.

Muslim and Jewish ljekaruša, or those containing Turkish and Arabian views, were in use until the 19th century. Although in these ljekaruša, to a lesser or greater extent, they joined various magic elements and superstitions. M.F. Kulenovic writes that there were two ways of treatment in folk medicine with Bosnian Muslims: scouring and writing notes. If somebody was scared, he had to go for a spell, and if he had to get married in explainable, he had to receive a record. Also, various talismans were used. These are items that are attributed to supernatural properties such as protection from illness, happiness and well-being. Among these religious related objects in the Turkish occupation, especially the talismans who were falsely attributed to Islamic origin, were called the “Qur’an-hamajli” because they wrote down passages from the Quran, the holy book of Muslims, and then they packed and wore hanging over their left shoulder at the side of the heart. This, of course, was not Islam, and Prophet Muhammad (s.a.w.s.) and his followers were eager to fight such delusions by pointing people to hygienic habits and seeking advice from the proper doctors (22).

8. ATTARS IN SERVICE OF POPULATION HEALING

The word “attar” is of Arab-Turkish origin and marks a pharmacist, the one who sells medicines, herbs and spices (28-31). Attars were the predecessors of modern pharmacists and they have great

![Figure 6. The pages from Ljekarusas in the library of the monastery of Fojnica from the time of the Turkish rule (beginning of the 19th century). It is witnessed the richness and value of the Fojnica Monastery (original manuscripts, with partially damaged covers)](image)

![Figure 7. Fra Grga Martic, writer and historian](image)
credit for the development of folk pharmacy. Actually, the start of the attars is co-indicated with the arrival of Sephardian Jews in B&H in the mid-16th century. The Jews have played a significant role in the preservation of the Arabic cultural heritage by attending attar business. This is, of course, because of the places that had settled before that - a country that had been to the aforementioned Christian conquest was largely under the aegis of the Arab rule. The Arabs have conquered it already in the 8th century and it has become an important ground for the flowering of pharmacy and the place of famous scientific centers of the world. It is in Spain that Arabic pharmacology has reached its peak. The Arabs brought many useful plants there, and in Andalusia they cultivated medicinal herbs that had made great success there. In addition, the Arabs knew that they could use the mineral wealth of Spain well. In the 11th century, when domestic sparring began in Spain, many scientists who were largely Jewish wrote a lot of pharmacy discussions that included, among other things, discussions about synonyms in nomenclature of drugs, including Arabic, Persian and Spanish names (12).

Attar activity, apart from the Jews, begins to deal more and more Muslims, so that they are soon more numerous than Jews who have begun with this work. After obtaining religious education in mekteb and literacy in Oriental languages, they gained further education about folk apothecary in the actions of some attars. In addition to attending secondary education, they learned theoretical material from medical-pharmaceutical books usually in Turkish, Arabic, and Persian. The Muslims became involved in the guild, and the Jews continued to work independently. In the 16th century in Sarajevo, the attar region was developed with Taslic and Bazardane, where good drug stores were developed. Attractive pharmacies were more reminiscent of stores than in modern pharmacies, although numerous medicines were prepared. They were full of diverse herbs in pots and boxes with inscriptions in Turkish, Hebrew and Bosnian. Various balms, patches, ointments, pills, and various paints and oils were sold in the books (26-29). If we look at the matter of medicine, or the assortment of these actions, then we see that the choice of drugs was also according to the understanding of scientific medicine proper and that the predominant number of these drugs is still in use. There were no elements of “impure pharmacies” as they were in European apothecaries at the beginning of the new era.

How much attar activity was important was written by Baseskija about the events of 1751 when to the attars was issued a ban on labor, but they continued to work. They had a more prominent job than the owners of the official pharmacies that had been half opened because, among other things, people could remain in debt and pay later to attars. In their shops they got the cure for every real or imaginative disease. It was there from expensive aphrodisiacs, tertiary, eleucarium, cancer drugs to as to non against gluten. In addition, all kinds of spices could be obtained at the attars. And, to the goods of domestic origin, they filled up merchandise with imported goods from the East and from the West, because in the west part of Turkish Empire, there were no strict state borders, caravans with goods could be relatively easy to navigate everywhere. The manuals written by the attorneys thanks to their experiential knowledge and medical knowledge in the Jews were called “manuali”, and in the Muslim “tibbs”. The Jews usually wrote in Old-Slavic or Hebrew, and Muslims in Arabic and Turkish. Although Omer Pasha-Latas rigorously conducted the orders of Sultan Selim and abolished the guilds, and thus the Attars guards, the attarers continued to engage in this activity. Such a situation is condemned by Austro-Hungarian Empire, which then bans work for all persons who did not have their diploma. Attars are successfully tackling this obstacle and continuing to work. Its actions are being registered as herbalists, although everything remains the same inside. The last Muslim attar shop was held until the First World War, and Jewish until the beginning of the Second World War. The best example is the Jewish family Papo, which keeps this tradition for more than 350 years. This was preserved in the City Museum of Sarajevo as a rare cultural heritage (Figure 9).

For attar shops it can be said that they were a transition from folk pharmacotherapy to the official pharmacy and as such for the population of Sarajevo was much closer and dear. Therefore, they could be held for so long and in addition to the growing number of private and hospital pharmacies (16, 22, 29). In 1848, Bosnian sovereign Mehmed Tahir-pasha issued an order to take from Sarajevo the “Kalifilema” - a document that guarantees all tradesmen and merchants to each other in the event...
of disturbances of public order and peace. In Gazi Husrev-bey’s library there is a copy of this transcript and thanks to this cephalet we know that there were 33 Muslim attars in Sarajevo at that time. For they came together with their “ćehaja” to enter and reciprocate for each other while the coffin guarantees for all (23, 26).

9. FIRST HEALTH CARE PROFESSIONALS

These professionals have almost no contact with Arab culture and science, but were of great importance for establishing a new and more modern health system in B&H at the time of Ottoman rule. For this article, among other things, to illustrate the complete picture of health care in B&H at the time of Ottoman rule, this first qualified medical practitioner will be briefly considered, who will also have to deal with national medicine and pharmacy stronger Arabic influences. In these professionals, Friars and Jews will work the most for the general public benefit (25-31). The first qualified medical personnel gained their knowledge at the Istanbul in 1873 (Mehmed Serbic, Zarif Skender, Jakov Sumbul) (Figure 10) or European universities. These were the few inhabitants of B&H who went abroad to study, or foreigners who came to B&H for various interests: Turkish military service, driven by an adventurous spirit like dr. Josef Kechet or even political emigrants like dr. Gustav Gaal (Vali-bey). Some of them were educated and respected by Dubrovnik doctors and pharmacists, but they were treated only the Turkish people. By the middle of last century there was very little. Since they were overburdened with their job, because at the same time they had to lead military hospitals and ambulances, to work in recruiting commissions, and to suppress epidemics, they did not have time to do medical practice among common people, so they did not have the time for greater benefit for common Bosnian-Herzegovinian population. The first graduated Bosnian pharmacist was Jakov Sumbul. The first promoted doctors among the Friars were Petar Busic, Petar Maresic and Mijo Sucic (Figures 7, 8). Of Jews, Jozef and Isak Salom were most famous, and Samuel and Jakov Sumbul, who conducted the apothecary. From the apothecary, Mehmed Naili is mentioned as the apothecary of the first Bosnian section in Sarajevo before the seduction of the Austro-Hungarian administration. They will devote more of the above-mentioned foreigners to practices that were of great importance to the Bosnian-Herzegovinian population. These professionals play a significant role in preventing and treating illnesses among the population, such as plague, cholera, syphilis, tuberculosis, fever and various fungal diseases. These diseases and artificial abortions caused high mortality. That is why it is interesting to note that in 1838 an order from Istanbul was received, which all doctors and pharmacists had to commit to not perform artificial abortion (22).

10. FIRST OFFICIAL PHARMACIES

The oldest data on the existence of a pharmacy in B&H dates back to the 16th century. It is mentioned in 1515 when the pharmacy was founded by Sandjak-bey Junuz-aga, and was led by a doctor and pharmacist Matej. For this pharmacy it is considered that it was the beginning of an arthropod attendant drugstore. In the first pharmacies that were open in Sarajevo, therefore, they were employed by apothecaries. The model of modern pharmacy began in 1852 when an Pharmacy in Sarajevo opened a certain Josip Josefac, which was soon closed, and then in 1854 the pharmacy in Sarajevo was opened by Djordje Djordjevic, who also quickly left Sarajevo. After that, the opening of the modern pharmacy in Sarajevo continued to be visible at the beginning of the Austro-Hungarian rule. In the 17th century, three types of pharmacy were discovered: attars shops,
11. CONCLUSION

After the collapse of the Arab rule, the Arab territorial expanses and cultural heritage were taken over by the Turks. Although scientific progress in the Turkish period slowed down due to numerous unfavorable political-economic and other circumstances. Thanks to the Turks, Arabic culture and useful Islamic principles expanded to the territory of B&H. Significant role in the transfer of Arabic medical and pharmaceutical knowledge was also attributed to the Sephardic Jews who continued to perform their attars activities, which were largely based on Arabs achievements (31-33). However, insufficiently elaborated, rich funds of oriental medical and pharmaceutical handwriting testify that Oriental science has nurtured in these areas as well, and that the Arabic component in a specific way was intertwined with other cultures and traditions of B&H. The Franciscan monasteries in B&H have museums which contain important exhibits and libraries rich in books, among which many from the field of medicine and pharmacy. For example, in the library of the monastery in Kraljeva Sutjeska (near the royal town of Bobovac, where the last Bosnian kings Stjepan and Tomaš have lived), the library contains more than 11,000 books from all scientific fields, written in Italian and Latin, but the domestic books have also been preserved written in Glagolitic and Bosančica script. Although persecuted during the Ottoman rule, the Franciscans, thanks to the acquired reputation and respect enjoyed by the people, became equal and recognized members of society. By Charter by Sultan Mehmed Fatih II Franciscans received permission (in the year 1463) to practice their faith, but also greater freedom of action, and accordingly began to deal with medicine. A great number of Franciscans have attended a study of philosophy and theology, and in later years, according to the preferences and the recommendation of the Province, more and more of them started to study medicine. They attended faculties mostly in Italy and Austria. During the studies, they learned about different cultures, acquired new knowledge and expanded the horizons. At the end of the studies (sometimes without diploma), the acquired knowledge was applied to the patients and recorded in books intended for the education of new generations of doctors. Acting as graduate physicians they have contributed significantly to the development of medicine and pharmacy in B&H, so they can be considered as pioneers of medical and pharmaceutical profession. The second category was folk doctors and practitioners who were on disposition to the people of any religion. Some of them listened to lectures in medicine during the studies of theology and philosophy. However, most did not have any medical education, but by reading books and teaching experience they made their own recipe collection. The making of these collections was adjusted to the fact that they were always in motion and that they should carry them with them in their pockets or bags. Collections known as pharmacists included instructions for making preparations intended for the treatment of humans and animals. They contained plants for the preparation of medicines characteristic to specific area. In addition to plant species in the recipes, the use of livestock, soil, minerals, ore, and similar is also mentioned. During this period of folk medicine there was a greater number of Franciscans who are now recognizable by their pharmacists. The most significant of them are: Fr. Grga Martić, Fr. Mirko Mačuga, Fr. Mijo Sućić, Fr. Mato Nikolić and many others. Pharmacy is a witness to our people's past and based on experience, but are at the same time the ultimate product behind which is much effort and work. A product that has been created thanks to the versatility, education and follow-up of the Franciscan call. They were the ones who, on the basis of all the information they covered in the available health literature, came to certain conclusions that they wrote on paper to make them always available. Ljekaruse were also born during the study when they came into contact with an even larger number of health books, so some of the recipes were overwritten so they could use them when returning home. However, it should not be neglected that a lot of them contained folk medicines that were used in some environments depending on the habits and available herbs. Although it has been proven that many recipes from Ljekaruše are pharmacologically and medically justified, one should not ignore the knowledge and skill behind them.

Today, when it comes to interprofessional co-operation in healthcare, when trying to compromise and reach agreement, the past witnesses something more important. Testifies that 500 years ago we could not have been without each other. That medicine did not exist without pharmacy or dentistry, and pharmacy without botany and biology, so that each of them developed even more.

The true flowering of medicine in B&H is happening thanks to graduate doctors. Through their action, in a short time, they greatly improved health in B&H, educated the population and encouraged a large number of younger generations of Franciscans to follow their footsteps. Their influence on health is enough to tell the fact that the first doctor, the first surgeon and the first doctor of medical science were from the Franciscan order. First graduate physician and pharmacist, Fr. Mato Nikolić worked on the suppression of the plague, and he also intensively dealt with pharmacy. Fra Mijo Sućić (Figure 8), the first graduate surgeon, enjoyed great trust among
brothers Friars and peoples, and he was also granted approval for performing surgical activities.

The Franciscans were important because they opened the first open-air clinics, the first pharmacies, and wrote the first pharmacopoeia and regulations for the work of health care institutions. Numerous works preserved in monasteries have mostly brought about the study in only one or two copies. Muslim physicians in the Ottoman period mostly studied in Istanbul at the “Le Ecole de Medicine” founded in 1843 (Mehmed Serbic (Figure 10), Zarif Skender and Jakov Sumbul), and the population was treated in 5 Vakuf hospitals (the first one opened in Sarajevo in 1866), the rule of Sherif Topal Osman Pasha (the governor of B&H from 1861 to 1869) and in Turkish military hospitals which were located at the Turkish Army garrisons (first opened in Sarajevo in June 1866). Turkish physicians, in addition to the military, treated the civilian population at the time of Ottoman rule.

The contribution all of them, to the development of health care and the prevention of illness and treatment of the population in B&H was very significant (16, 22, 28, 31-33).

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