Structural, Technological and Innovative Developments in The Healthcare Buildings Architecture in the 100th Anniversary of The Republic of Turkey

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Abstract

On October 29, 1923, with the proclamation of the republic and the establishment of the Republic of Turkey, many innovations and radical changes were experienced in social and political life. New healthcare policies have also been one of them. With the statist policy adopted in the first years of the Republic, health investments were realized by the state and modern health buildings, which are the basis of today's health buildings, were started to be built. At the stage we have reached today, in the 100th anniversary, it is evident that there have been great developments in the healthcare industry and the production and operation processes of healthcare buildings. As a result of the increasing human population and the demand for healthcare services in urban areas, large-scale and complex, state-of-the-art modern hospitals are produced with a fast and mechanized approach. In this study, the structural, technological and innovative developments of healthcare buildings in Turkey since the proclamation of the Republic of Turkey is identified, the current state of affairs is presented and suggestions are made on how these investments should develop in the future, with the aim of with the aim of contributing to the literature by revealing and evaluating the reasons for the formation of healthcare policies and innovative approaches followed in each successive term of the hundred-year period and their effects on the architecture of healthcare buildings in general terms as a whole.

Keywords: Development, healthcare building, healthcare policy, Republic of Turkey, technology

Introduction

The right to have a healthy life is one of the most fundamental human rights guaranteed by many national and international agreements. The protection of this right and the provision of services to meet public demand for healthcare are among the primary responsibilities of states. Throughout the hundred-year process since the establishment of the Republic of Turkey, serious attention has been paid to the provision of effective and egalitarian healthcare services throughout the country, as well as the production of healthcare buildings in accordance with the political, social and technical conditions and needs of the period. In this process, the Republic of Turkey has also endeavored to play its role in contributing to global goals by taking part in international collaborations, following global and technological developments closely and integrating them into its own policies and projects.

Philosophy is a set of concepts, values and principles that form the basis of a field of science or knowledge. Policy means, “organizing and structuring all areas of social life in line with the philosophy adopted”; based on this, healthcare policy may be defined as “organizing and structuring the healthcare industry in a country in line with the philosophy adopted” (Akdur, 2008: 1). In order to develop in a world system where globalization is increasing day by day, countries are developing new policies and establishing international collaborations. In order to determine the accurate policies for the future, it is essential to recognize not only the present circumstances, but also the development that occurred from the past to date. And also, comparisons with other countries should be made throughout these processes, strengths and weaknesses should be identified, deficiencies should be addressed, proven approaches should be strengthened and shared with the rest of the world.

One of the most important factors affecting the development of a country is the health of its citizens, as it is not possible for an unhealthy society to develop, therefore the healthcare policies pursued. Health is a state of

complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, 2024). According to Güller (2007), all medical services provided to eliminate various factors that harm human health, get rid of and protect the society from the effects of these factors, to treat patients, and to return those with reduced physical and mental competence to a normal state are all gathered as 'healthcare' (Caymaz, 2019: 5). It would not be incorrect to say that healthcare in the world started with the emergence and development of medicine, in other words, with human history (Kavuncubaşı & Yıldırım, 2012: 127). Architecture is also a practice as old as the history of humanity, starting with the activities of transforming the natural environment into the built environment by using the materials found nearby, from the need of safety and shelter. Healthcare buildings, which are the joint product of architecture and medicine, may be defined as all of the organizations where healthcare is provided. The first examples of healthcare buildings are 'asclepion' structures which were built around healing water springs with strong connections to social spaces such as sports centers, ancient theaters and libraries during the Ancient Greek and Roman periods in the 4th century BC. With a holistic approach that values not only the physical health but also the mental and spiritual health of patients, asclepions, have made significant impacts on the development of the modern healthcare system and the healthcare buildings in the historical process. Since then, social and global events such as technological developments, disasters, epidemics, climate changes and environmental issues etc. have been effective in the transformation and evolution of the healthcare buildings worldwide as in Turkey.

On October 29, 1923, with the proclamation of the republic and the establishment of the Republic of Turkey, many innovations and radical changes were experienced in social and political life. As in many other sectors, new policies were defined in the healthcare industry and a new healthcare system established. In line with the needs of the period, existing healthcare buildings have been renovated and maintained, also new ones have been designed and constructed. These developments constituted the foundations of the healthcare system and the healthcare buildings of the Republic of Turkey in its 100th anniversary. The aim of this study is to identify the reflections of the healthcare policies determined in the 100-year period since the foundation of the Republic of Turkey on the architecture of healthcare buildings in structural, technological and innovative aspects. In order to preserve the integrity of the subject and for a better understanding, the healthcare policies and the healthcare buildings of the Ottoman Empire, which ruled in this area before the establishment of the Republic of Turkey, are briefly mentioned in the first part of the study. The architectural design and spatial organization of healthcare buildings were also not prioritized, mainly focused on structural and technological aspects during the study. While conducting, a literature review was made in this context especially including specifications, regulations, international declarations and agreements, and also face-to-face interviews were conducted with the Bursa Provincial Health Directorate Investments Unit team. In order to support the study, images of the facades, constructions and architectural plans of the healthcare buildings used as reference have also been included.

Healthcare Policies in the 100-Year Process and Their Reflections on the Architecture of Healthcare Buildings

During the Ottoman Empire period, which governed this region before the establishment of the Republic of Turkey, the healthcare services provided by the government were mostly for the palace and the military, while the public received healthcare services from self-employed physicians and surgeons. The 'darüşşifa' buildings where health services were provided in this period were traditional masonry structures that were built by using stone and brick materials with religious architectural elements such as domes and vaults. These buildings which were inherited from the Seljuk period continued to be used during the Ottoman period, and new healthcare buildings were also added to the areas required with a similar architectural approach. Similar to asclepions, healthcare services were also provided in complexes that included social facilities such as mosques, madrasahs and baths with large green areas and courtyards. The treatment methods that applied in these places were beyond the age, such as using water sounds and music for the mentally ill patients.

During the late 19th and early 20th centuries Tanzimat period, also known as the Late Ottoman, various reforms were carried out in many fields such as health care, healthcare management and medical education with the aim of modernization. The government, also undertook remarkable modern hospital-building activities. Compared to the traditional healthcare buildings in the Ottoman Empire, these modern hospitals had larger capacities, better ventilation and lighting, and were built in accordance with sterilization standards. Modern technologies such as laboratories and x-rays were also included. The beginning of healthcare buildings under the name of 'hospital' in Turkey was Gureba hospitals (Figure 1). Gureba hospitals were the first public hospitals that were established in this period. In these hospitals, where traditional materials and construction techniques are applied

with a modern approach, healthcare was provided not in a few small rooms as in the darüşşifa buildings, but in a multi-bedded ward system.



Figure 1. Bursa-Hamidiye Gureba Hospital / *A postcard dated December 10, 1909 (Karaaslan, 2015: 77; from Bilici, 2023: 3*)

The innovations and establishments of new healthcare buildings in this period also formed the basis of the healthcare system in the Republic of Turkey. The beginning of healthcare as a primary duty of the government started with the Grand National Assembly of Turkey (Akdur, 2008: 1). In this period, when the War of Independence had just ended, many systems and infrastructure were built from scratch, new policies were adopted in many industries, laws were created and ministries were established. On May 2, 1920, with the law adopted by the Turkish Grand National Assembly, the ministry, which is the basis of today's Ministry of Health, was established and healthcare services became an essential government duty carried out by a separate ministry. In this period, the number of healthcare buildings is almost non-existent. In line with the principle of statism adopted by the government, Memleket hospitals and additional pavilions have been built in many provinces, and in some provinces the foundations for these hospitals have been laid or projects have been prepared. A representative image of the construction process of Bursa Memleket Hospital is presented in Figure 2. As it can be seen, new material and construction technologies such as reinforced concrete were started to be used in the construction of these hospitals.

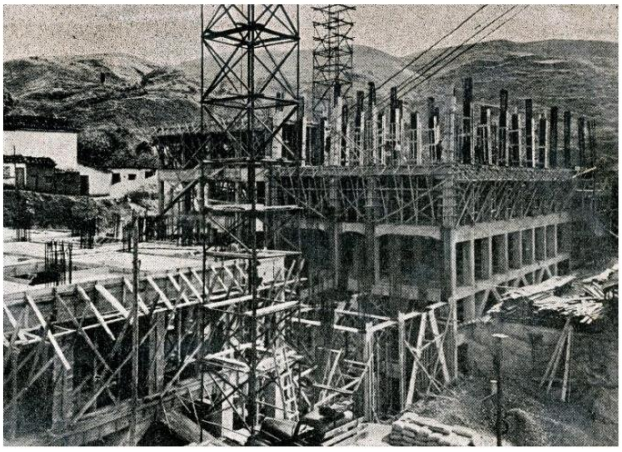


Figure 2. Bursa Memleket Hospital Construction (*Bilici, 2023: 4)*

As well as public investments, private investments were also realized in this period. American Hospital, which built in 1920, was the first private hospital of the Republic of Turkey (Figure 3). This building, which was literally constructed with the modern hospital understanding of the West, shows that the Republic of Turkey prioritized the healthcare buildings to be built to be innovative and to have a foundation in accordance with international

standards. The foreign architects invited to Turkey were also very influential in these efforts. It is known that the Italian architect Giulio Mongeri, who has contributed to important architectural projects in Turkey since the Late Ottoman period, was also involved in the production process of the American Hospital. In 1950s, the liberal ideas and policies of the period were effective in the healthcare industry as in many other fields, and investments began to categorize into two groups: public investments and private investments. From this period until today, the number of private hospitals has increased. Following the 2002 Regulation on Private Hospitals, the number of private hospitals has doubled Turkey-wide, as reported in the health statistics yearbooks published annually by the General Directorate of Health Services.



Figure 3. American Hospital, 1920 (*from Vehbi Koç Foundation Encyclopedia*)

In the fight against various epidemics from the early years of the Republic to the present day, specialized healthcare buildings were also built where patients were being treated in isolation and research was conducted. The sanatorium built in Uludağ Kirazlıyayla in 1949 as a result of increasing tuberculosis was one of them (Figure 4). As a mountain sanatorium, the building's remoteness from the urban area, its fresh air and its connection with the natural environment strengthened its healing qualities.



Figure 4. Bursa Kirazlıyayla Sanatorium, 1949 (*from Bursa Municipality Archive*)

In the last decades of the 20th century, there were several developments in the types of hospital plan schemes. Mostly simple schemes such as 'T', 'L' and 'U' were preferred, with diagnostic departments such as outpatient clinics, laboratories and x-rays on the ground floors and patient care units on the upper floors. These buildings were cubic structures in the international modern architectural approach, with quadrangular or band windows, grid plan and facade design with tiled building envelops. Competition method was also started to be used in hospital projects.

During World War II, epidemics caused severe consequences in many countries where the war was effective. Although Turkey did not actually participate in the war, it also had its share of this situation and as a result of the economic picture created by the war throughout the world, the country was struggling with epidemics

throughout the country (Işık, 2022: 1). Instead of hospitals with a 100-200 bed capacity at most, hospitals with 500-1000 beds are on the agenda, and diagnostic departments have started to be solved as separate blocks. There were also examples where the operating rooms, diagnostic-treatment and polyclinic departments were located on the ground floor, and patient care units were located above with a smaller floor area, depending on a single core. This type of constructions required reorganizations as it required a terrace roof, which was not suitable for that period. Due to the difficulties in solving problems in the construction processes, the Ministry forbade the use of terrace roofs in the 1970s, and the development of schemes suitable for tile roofs became a priority. This has resulted in typical projects that give the impression of being produced by the same hand.

In addition to epidemics and global developments, disasters in Turkey have also influenced the development of new policies affecting the design of healthcare buildings. Major earthquakes in Turkey have required the development of regulations and design decisions in this context. In 2013, the Ministry of Health made the use of seismic isolators an obligation in hospitals built in first- and second-degree earthquake zones with a bed capacity of 100 or more. Similarly, in the following years after major fire disasters, the first comprehensive fire regulation, the Regulation on the Protection of Buildings from Fire, was developed in 2002, and revised to be more comprehensive in 2007. These kinds of regulations remain to be developed by making various adjustments as needed.

As we approach the 100th anniversary of the Republic of Turkey, one of the global events that also affected Turkey was the pandemic experienced in the aftermath of the Covid-19 outbreak in 2020. It would not be wrong to say that this event, which affects social life and the whole sector, has the most impact on the healthcare industry and healthcare buildings. The conversion of waiting areas into patient care units or the off-site organization of diagnostic units has revealed that existing healthcare buildings do not offer sufficient flexibility. And, new pandemic hospitals and supporting units had to be produced rapidly.

Developments in the Healthcare Buildings in the 100th Anniversary of the Republic of Turkey

The 21st century is a period of numerous global and technological developments, where everything is produced, consumed and transformed very rapidly. Some of the developments that occurred in this century and which were also influential in the architecture of healthcare buildings are as follows:

- Migrations to urban zones, which started with the Industrial Revolution, gained momentum, and with the density of the human population in these areas, epidemics and many health problems (with the effect of consumerism and unhealthy lifestyles) have increased,
- Ideologies that have turned almost every sector into a market place have also influenced the healthcare industry,
- As a result of the acceleration and intensification of mass production processes with increasing demand, the irresponsible use of resources and energy, and the devastation of the natural environment, environmental problems have increased and the climate crisis has become an urgent issue,
- With the emergence of advanced technologies such as Artificial Intelligence (AI) and the Internet of Things (IoT) and their rapid impact on social life as well as manufacturing sectors, the fourth industrial revolution has been experienced.

As a result of these developments;

- Demand for quality healthcare and improved healthcare buildings has increased,
- Healthcare buildings have become intense energy and resource-intensive places with a great number of users and visitors, with a variety of functions that fulfil all kinds of needs of the occupants,
- International collaborations for global development and confrontation with environmental problems have increased, and 'health and quality life' has become more prominent among the goals adopted by participating countries,
- The global recognition and utilization of green building certification systems introduced by some countries to certify the performance of buildings to be renovated or newly constructed in terms of ecological sustainability and energy efficiency and to encourage their development have increased, while in some countries they have become an obligation,
- Health management, healthcare and design of healthcare buildings have transformed.

According to Yıldırım (2008); although the healthcare industry is considered as a labour-intensive sector, the ability to produce adequate, high quality, efficient, effective and sensitive to user expectations and, as a result, to increase the health level of the society is highly dependent on the technology used (Caymaz, 2019: 36). In this century, accelerated technological developments led to various developments and transformations such as diagnosis and treatment methods in medical science, the provision of healthcare and the healing process of patients, the production, maintenance and renovation processes of healthcare buildings, and many other aspects.

With the developments in information technologies and the use of advanced technologies, smart hospitals have been produced and applications such as tele-health and in-home healthcare services have been implemented. While the size of electronic devices used in healthcare have decreased, their capabilities have increased. Technologies such as robotic surgery, cyber-knife technology, hybrid operating room etc. have been developed and started to practice. These new technologies have influenced the design of healthcare workspaces, and therefore the design of healthcare buildings.

Bursa City Hospital, which completed its construction in 2019, would be a good example to observe the structural and technological progress of the healthcare buildings in the Republic of Turkey, which completed its 100th anniversary last year (Figure 5). Built on a 745,000 m² area and completed in a public-private partnership, it consists of three different healthcare buildings with a total capacity of 1,355 beds. The advanced construction techniques and technologies of the period have been used throughout the project, and high-tech seismic isolators have been included in the building foundations. Energy efficiency, waste and water management, environmentally friendly material preferences, promoting public and alternative transportation, green areas both indoors and outdoors contribute to the building's sustainable qualities. In addition, it is a complex organization that includes social areas and different functions (food and beverage areas, book and souvenir shops, hairdressers, etc.) that appeal to various user groups.



Figure 5. Bursa City Hospital, 2018 (*from Renaissance Healthcare Investment*)

Although the example of Bursa City Hospital shows that the technological, structural and innovative developments in the healthcare industry have been successfully implemented in Turkey, there are also differences in some of the current hospitals. For example, in the field of sustainable building production, Turkey is participating in international cooperation and developing policies in line with the goals it identifies for the future. However, it is observed that the necessary steps in this regard are still not realized in the production or renovation of public investments.

Conclusion

Since the establishment of the Republic of Turkey, the healthcare industry has received a significant importance and has been included in the policies pursued. Westernization movements and the modern approach, which started with the Late Ottoman period, were adopted in every term that followed, and world standards were tried to be followed. The traditional masonry system has been replaced with new technologies such as the utilization of reinforced concrete and steel, and the schemes of healthcare buildings have been kept simple and functional. In response to epidemics and disasters, new policies and approaches have been developed, and healthcare buildings have been transformed, improved or new ones have been built in line with requirements. Although this

may seem positive, it would be much better to undertake these activities in anticipation of bad events rather than after they have already occurred. In addition, it is observed that the healthcare buildings that support the healing process, which were at the forefront in asclepions and darüşşifas, have been relegated to the background in line with economic concerns and social demand.

At the current stage, healthcare buildings should be structures that accommodate intense personnel and visitor traffic, respond to the various demands of users, have a flexible design that can adapt to rapidly changing technologies and extraordinary situations, prevent service interruptions and increase capacity in disasters, be sustainable and respectful to the natural environment, support the healing processes of patients, be robust and secure. As a result of the study, it has been observed that the Republic of Turkey has been trying to exhibit an attitude that has these concerns in every period. It would be beneficial to strengthen this effort, and to project the healthcare buildings to be newly constructed or renovated as capable of responding to the possibilities and needs of the future as well as the present, in order to ensure that it continues to develop rationally in the following centuries.

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