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Explanation of the Emergence of the First “Academic Medical Center” (AMC) Model in Ancient Iran: An Analysis of the Connection Between Bi-osecurity, Qanat, and the Institutionalization of Clinical Education in the Sassanid Era

Abstract

The Sassanid period (224–651 CE) was a turning point in urban planning, economy, and knowledge management in ancient Iran. Major changes in policies, especially shifting international trade routes from the northern Silk Road to southern routes through the Persian Gulf, led to big economic changes and the founding of new cities.

Sassanid kings built new cities in strategic areas like Khuzestan. This growth needed many workers, who came through migration. However, the rapid population increase caused serious public health problems and made it easier for infectious diseases and epidemics to spread.

New evidence shows the Sassanids created a medical education hub in Khuzestan (in Shushtar, Susa, and especially Gondishapur). They trained doctors and sent them to new cities.

This article argues that Gondishapur was the world’s first Academic Medical Center (AMC) because it combined education, research, and treatment in one place. This model was based on clinical education at the bedside and helped control diseases across the empire.

Introduction

The Sassanid Empire tried to create a more centralized government after the Parthian period. By emphasizing wisdom and learning from different cultures, it reached the peak of ancient Iranian civilization.

In this era, medicine was not just a private profession. It was part of the government's strategy for survival at economic, political, and biological levels. Sassanid kings knew that economic development needed a healthy workforce. Epidemics could destroy production and military power. So they used a systematic approach to manage biosecurity.

The shift of trade routes to the south made it necessary to build many new cities, especially in Khuzestan. This economic boom caused fast population growth in areas that previously had few people. Newcomers brought the risk of new diseases and epidemics.

To face these threats, the Sassanids created a health monitoring triangle with the cities of Shush-tar, Susa, and Gondishapur. The need to train doctors skilled in clinical treatment and public health led to the birth of a new structure in Gondishapur — what we today call an Academic Medical Center (AMC).

Findings

To understand Sassanid policies, we must look at qanat technology and water management. Ancient Iran was semi-arid, so settlements depended on qanats. Because each qanat could only support a limited population, they built many smaller cities instead of large crowded ones.

This dispersion helped during epidemics — cities separated by deserts acted like quarantine zones.

The Sassanids divided diseases into two groups:

- **Nogarishn:** Contagious diseases that needed government management (quarantine, migration control, etc.).
- **An-Nogarishn:** Non-contagious diseases managed at the individual level.

This was one of the earliest forms of public health policy. Iran was the first country to treat health management as a royal duty for the whole society.

Due to geography (Zagros Mountains), Khuzestan was the main entry point from the west. Gondishapur was built as both a medical university and a biological quarantine station.

Gondishapur was the first place in history to fully combine **education, research, and treatment**. Students had to study texts and also work directly with patients at the bedside. The empire

also created the first known licensing system for doctors. Kings like Kavad I sent trained doctors from Gondishapur to new cities.

Discussion

Gondishapur was a systematic response to biological crises. It linked population dispersion with biosecurity. The Sassanids saw health as a key part of national power.

Their classification of contagious and non-contagious diseases laid early foundations of epidemiology. This model later influenced hospitals in the Islamic era and modern medical universities in the West.

Conclusion

The Sassanids connected water engineering, trade strategy, military needs, and medical knowledge. Their scattered city system became an effective defense against pandemics.

Gondishapur, as the heart of this system, created the Academic Medical Center model, institutionalized clinical education, and made public health a government responsibility. This Iranian model is still alive in today's academic medicine.

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