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Architecture of Hospitals and Music Therapy Healing in the Anatolian Seljuk State-A New Perspective

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ABSTRACT

The period of Anatolian Seljuk State is very rich in the architecture of madrasas, mosques and hospitals. While mosques and madrasas are mostly preserved until today, the hospitals from that period are very few in situ examples. The ones which still exist today will be discussed in this paper: Gevher Nesibe hospital and medical school in Kayseri, Turan Melike hospital in Divrigi, Izeddin Keykavus hospital in Sivas and Anber bin Abdullah hospital in Amasya. The plans which were following originally the madrasa plan, are proved to have excellent acoustical solutions through the usage of the material, ornaments and position of venues inside the buildings. Also, the ornamentation is interesting as it goes out of the frame of classical Islamic decoration.

The overview of settlement and history of construction will be given, as well as the overview of the history of music therapy, along with the recent research made regarding the makams and their healing attributes, Music as therapy in the Islamic world is known since 8th century from the works of al-Farabi, al-Kindi and Ibn Sina. They were the first ones to write about therapeutic effects of music on human soul, spirit and body. In this light, the recent research has been made to prove what is the healing in the makams which are still in use from 9th century until today. Not only the old scores, but also the new ones who are following the tradition in musical writing, are proved to have the healing effect, through frequencies of the specific tones.

This new perspective opens many questions, proves ideas which were "urban legend" until now, and connects architectural ideas with musical knowledge and mathematical calculations from 11th century until today.

INTRODUCTION

As a part of the research for the doctoral thesis, the analysis of the makams have been recently done, in a way that the deconstruction of the melodies to the single intervals and tones was made.

The main idea of the research was that belief of the healing through makams had been known in the region of Anatolia and wider since 9th century. Following the works of al-Kindi, al-Farabi, Ibni Sina and others, who were stating in their works about the therapeutic effects and healings through makams, the makam analysis was made in the melodic segment, not including the rhythmic patterns. Some of the results will be shown in this text.

The second idea was to show the connection between architecture of hospitals and healing and in what way are they interconnected to provide to the patients the benefits of the healing methods in the medieval Anatolia under the Rum Seljuks.

1. **General history**

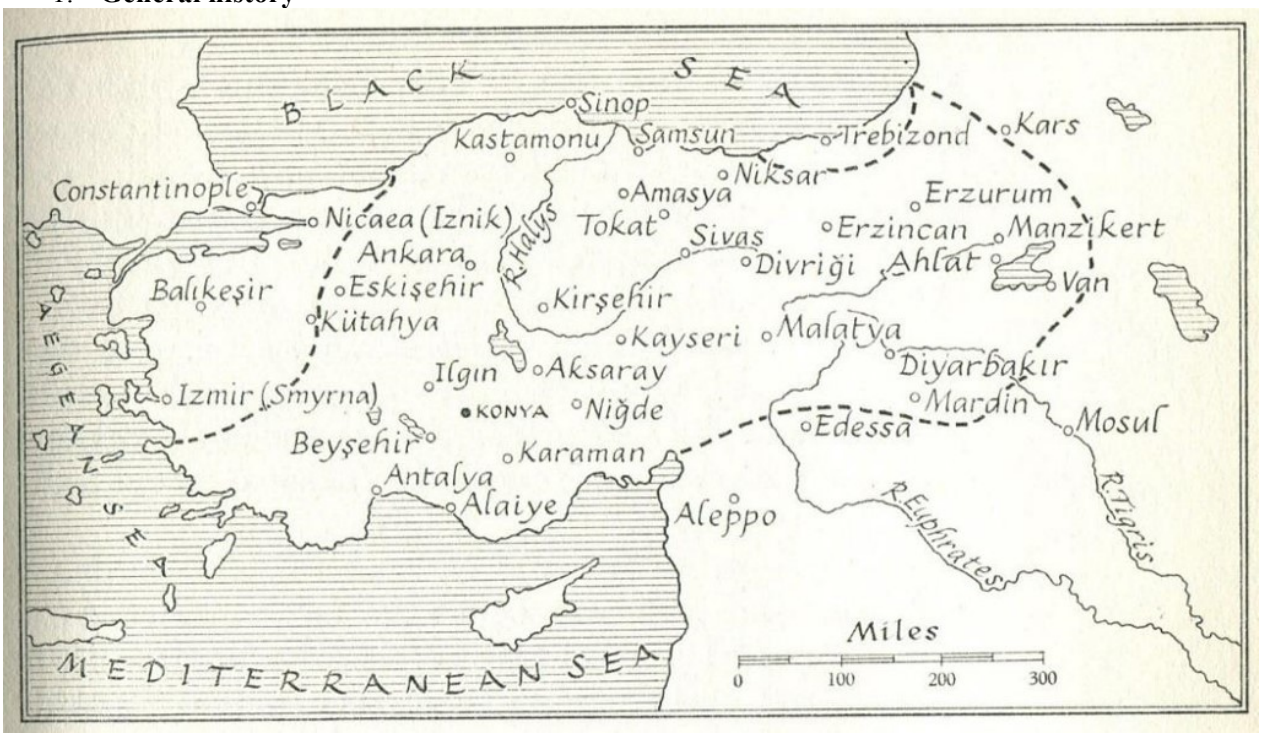


Figure 1. Talbot Rice, 1961:47

When we discuss about the Anatolian Seljuk State, we should bear in mind the period between 1078-1308. The state was founded in Iznik after the Manzikert battle and ended with the Mongol invasion. It was settled on the crossroad of Byzantine Empire on one, and Great Seljuk Empire on the other side. The sources of historical texts regarding the foundation of the Anatolian Seljuk State are limited, but historian Köprülü gave some overview of the local chronicles written in Anatolia that has been known until today, as well as the list of lost chronicles which can be considered as a guidance for the researchers (Köprülü, 1993: 55) [1].

Nevertheless, the most solid resources are the physical evidences from which we are learning about the past and making some conclusions. One of the most solid examples are the buildings which remained from the Anatolian Seljuk Period. Unfortunately, due to the turbulent years which followed the Seljuks, not many written data were preserved, but fortunately many edifices survived, some full, some only partially. As the construction of the buildings, mainly

[1] Mehmet Fuat Köprülü (1890-1966) in the book "Islam in Anatolia after the Turkish Invasion (Prolegomena) gives the following list of chronicles: Anis al-gulub by Durhan al-Din Al-Alawi, 13th century, Ibni Bibi-Saljuqname, 13th century (Al-Husain al-Ja'fari), Tadhkira-I Aqsarayi by Muhammad al-Aqsarayi, 14th century, Al-Wallad al-shafiq by Ahmad of Nigde, 14th century and Ta'rikh-I al-I Saljuq by Anonymous, 14th century (1993:55)

mosques and tombs, was the most dominant expression of that time, the richness and variety in the architectural style is still a subject of many research and discussions.

When it comes to social life, we can only assume how the life was in Medieval Anatolia, based on the writings of the pilgrims from that and later times. What is known is the production of the coins, which was needed for daily life as well as for the quests, and the existence of the buildings such as kervansarays, hans, masjids, madrasas and mosques, as the religion was very important part of everyday life.

From the first Sultan Rükneddin Suleyman Şah I until last, Kiliç Arslan V, we can follow the timeline of the building construction, some of it from the inscriptions left by masters working on the specific building.

As this text discusses about connection of the hospital buildings and music therapy in medieval Anatolia, an overview of some buildings will be given which are following the idea of "architectural design which embodies central religious belief, natural and mystical landscape, prayer and the music" (Koen, 2009: 75).

Madde I. The buildings

Anatolian Seljuk hospitals were built accordingly with madrasa plan. Although it is known that 12th century Anatolia was rich with hospital complexes, there is no any data in the written sources, except some examples as Emineddin Darussifa in Mardin and some buildings in Silvan, Hatay and Antakya (Cantay, 1992: 9). Hospital buildings are somewhat preserved and visible today, some of which will be mentioned later, but beside them, some other examples have been mentioned in the historical texts, such as in Havza, which was built by Kiliç Arslan I (1116) and in Akşehir, built by Vizier Sahip Ata.

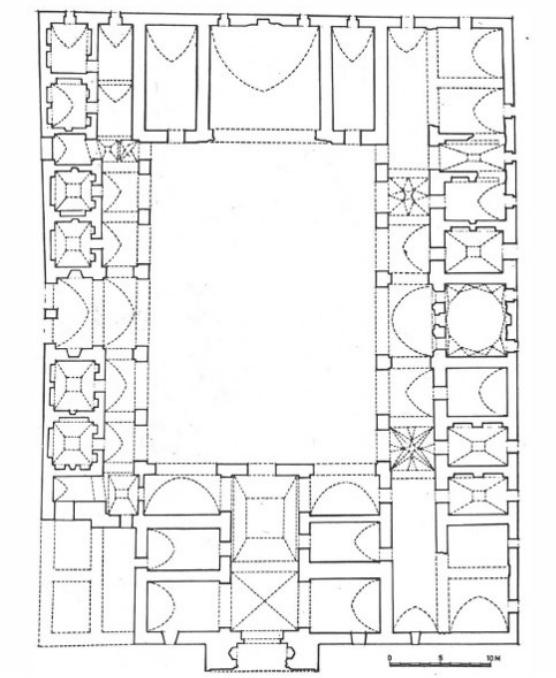


Figure 2. Sivas Keykavus Hospital (Cantay, 1992, plan 3)

Significant in archive documents is also mentioning of the Küçük Darussifa (1173) and Büyuk Darussifa (1221) in the Anatolian Seljuk Capital city of Konya (Köker, 1991: 9). Some researchers also point out Kilic Arslan Hospital in Kirsehir (1145), Alaeddin Keykubad Hospital in Ilgin (1236), Rahatogullari Hospital in Sivas (1288), as well as hospitals in 12th century Kars and 13th century Malatya[2]. Interestingly, hospital buildings have always been built by Sultans and their families, because the construction of the health building was considered as a kind of task, mission for the rulers (Eser, 2000: 139) which were the works of endowments. Let here be mentioned that there are various names in Turkish language used for "hospital building" – Darüşşifa, Şifahane, Bimaristan, Maristan, Şiffaiye and Timarhane.

On the other hand, from the various sources it can be seen that medical education in the Seljuk period is relatively developed considering the period conditions. The doctors who were joining the Crusaders claimed that they had learned a lot from the Muslim doctors, especially about the patients' treatment in the Islamic army (Çetin, 2011: 325).

2. Architectural design

As mentioned before, the hospital buildings were built accordingly with madrasa plan. The shape of the main space is defined with the courtyard shape structure respectively.

[2] For more information see Inan (1972:4); Ünver (1972:14); Aciduman (2010:11)

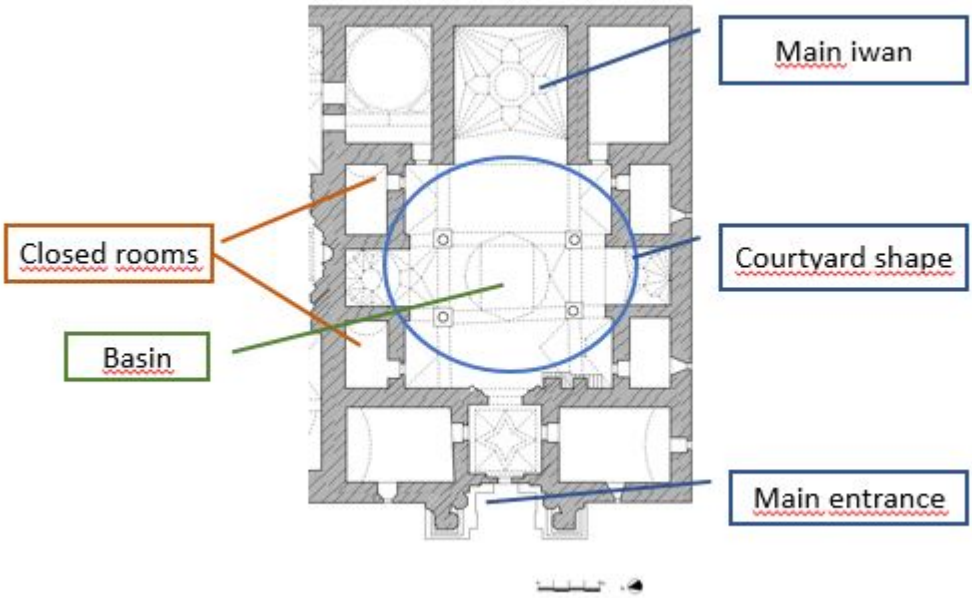


Figure 3. Divrigi Hospital (Cantay, 1992, plan 4)

Most of the hospitals in the Anatolian Seljuk period were built in the direction East-West. Beside this, the most important space of the building is the main iwan, positioned opposite to the entrance, which can be understood as the main diagnostic center as well as venue for lecture and praxis. Closed rooms between side iwans can be understood as hospital units, probably as the rooms for the patients. In some examples, the basin is situated in the center of the courtyard, which is also considered to have had a therapeutic function. Quality stone production allowed the buildings to stay in good condition for a long period, and in the same time, good heat and noise isolation was provided.

In terms of acoustics, iwans with opened walls and iwans opened towards the courtyard are very successfully constructed, and even today, considering all the interventions and reparations made in the venues through the years, acoustical performances are still remarkable, which is undoubtedly supportive factor in the treatment with music.

Figure 4. Divriği Hospital, view from above the main entrance to the East (taken by I.M.)

Figure 5. Divriği Hospital, view from main iwan to the main entrance on the West (taken by I.M.)

One of the characteristics which drags the attention to the buildings is the decorative characteristic specific for the Anatolian Seljuk period.

Figure 6. Kayseri Gevher Nesibe, main portal (Taken by E.E.)

Floral, geometric and written ornaments carved in stone on the main portal, courtyard and iwans can be seen, as well as the figures of living beings on some examples such as Gevher Nesibe (1205-06) hospital in Kayseri, Keykavus hospital (1217-18) in Sivas, Turan Melik (1228-29) in Divriği and Anber bin Abdullah (1308-09) hospital in Amasya.

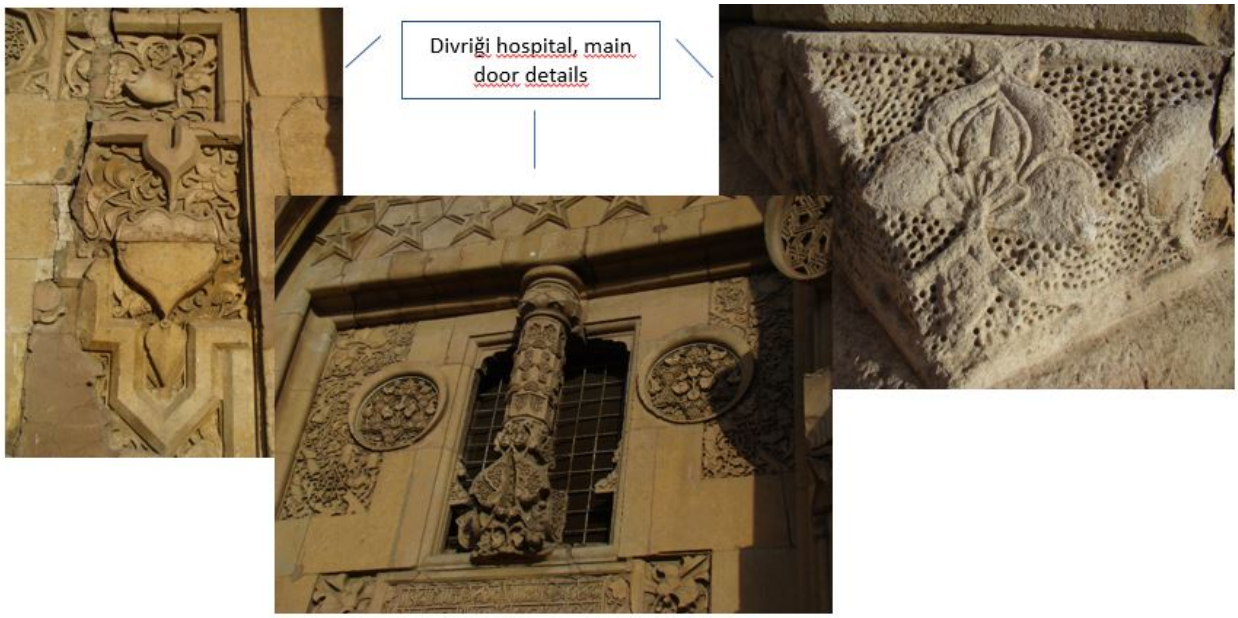


Figure 7. Divriği Hospital, main door details (taken by I.M.)

Figure 8. Sivas, Izzeddin Keykavus Hospital, human figures on the main iwan wall (Taken by E.E.)

Figure 9. Amasya, main door, human relief, detail

Figure 10. Divriği, two human figures on the North side of the main door (taken by I.M.)

Hospital Gevher Nesibe (1205-1206) has a relief of Lion, while on the main portal of Keykavus hospital (1217-1218) is visible relief of two lions facing each other. On each side of iwans arcade in the Keykavus hospital is the relief of man's and woman's head, while at Turan Melik hospital (1228-1229) in Divriği, on the main portal from both sides a relief portrayal of man's and woman's head is visible. The Anber bin Abdullah (1308-1309) hospital's outer part is richer in ornamentation.

It is known that on many buildings from Anatolian Seljuk times were depictions of living beings. Those depictions were mostly of animals, dragons, eagles, bears and lions. Sometimes they were shown individually, sometimes in the animal fight scene. Usage of the strong and predator animal's depictions on the buildings had the purpose of using their protective features.

Figure 11. Details from Erzurum Yakutiye Madrasa, Ince Minareli Madrasa and Divrigi Great Mosque, (taken by E.Eser)

Human depictions on the buildings from that period can be found only in the examples of palace and hospital decorations. Human figures used in the palace decorations can mostly be seen in the interior venues, while in hospitals they are situated on the outer parts, on the spots which can be easily noticed. Due to the fact that the health problems are connected with people, it is understandable that on those buildings are relief depictions of humans.

3. Religious beliefs and mystical landscapes

In the medieval Islamic world, mystical streams were spreading on the Anatolian area, where they came to the favorable environment. Following the Golden age of Muslim civilization, in which the works of Pythagoras, Aristotle, Aristoxenes and Plato were obtained during the reign of dynasty of Abbasids, who collected many manuscripts from the libraries, these works were the inspiration and base for the development of the Islamic philosophy and science (Pacholczyk, 1996: 142).

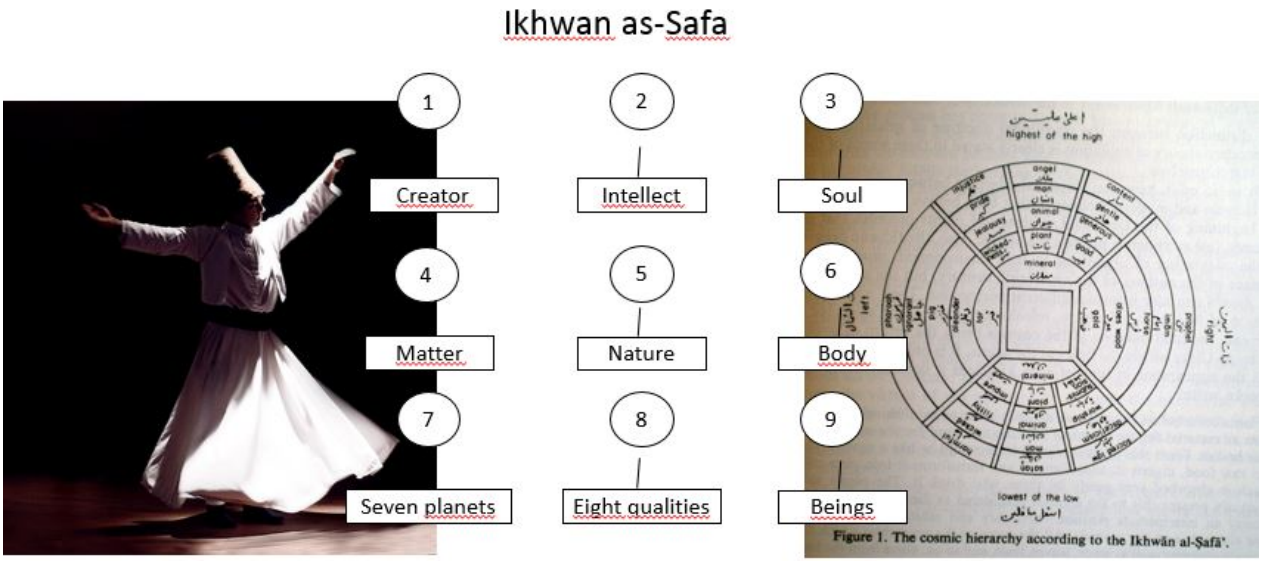


Figure 12. Representation of Ilkwan as-Safa's (Brotherhood of men) hierarchical model of numbers (source: whirling dervish from https://www.theistanbulinsider.com/wp-content/uploads/2010/03/whirling-dervishes-istanbul-02.jpg, the cosmic hierarchy from Cousto (2000: 14)).

The Plato's idea that *mathematics represents pure, absolute truth in its most beautiful form* and that it is *the most important factor of understanding the nature* was accepted by Muslim philosophers, who applied this to all fields, as well as the idea from Neo-Pythagoreans that *numbers have an esoteric significance*, which especially influenced Shi'a and Sufism. The hierarchical model of numbers contains an analogy to the Islamic model of the cosmos, represented in astronomical categories. The idea of wholeness, which is omnipresent in that time, includes religion, astronomy, mathematics, music, aesthetics and others, which are all intertwined. For (because), the music is based on determined mathematical division of ratios; religion and astronomy understand the natural numbers in the terms of order, Creator, Soul, Matter, Body, nature, four elements of the Earth and Beings. The members of the mystical school believed in the influence and benefits of music on human health and its characteristics, as a proof of the usefulness and necessity of this art, which they were using and protecting. Through the prayers and chanting, the idea was to achieve the balance of the body, mind and soul in order to become one with the God. Only the human which is in balance can stream to the oneness with the Creator (Pacholczyk, 1996: 145).

4. Music, prayer and healing

According to the sources, the music therapy was used in 1154 under the Seljuk atabeg Nureddin Zengi in Şam hospital, and was still ongoing even in the 17th century. Actually, examining the effect and usage of music therapy started before, in the works of doctors and physicians of 9th

and 10th century, among which the most prominent ones are Zekeriya Er-Razi, Al Farabi, Al-Kindi and Ibni Sina (Çoban, 2005:42-43, 47). It is known that music therapy used in hospitals was for the socialization, ease of pain and to make people feel more comfortable. As people, from the beginning of time, are surrounded with different sounds and frequencies from the nature, there is a constant search for those which will make them balanced, in order to function normally. Over the years there had been many research conducted in the various fields, to prove the impact of music therapy[3].

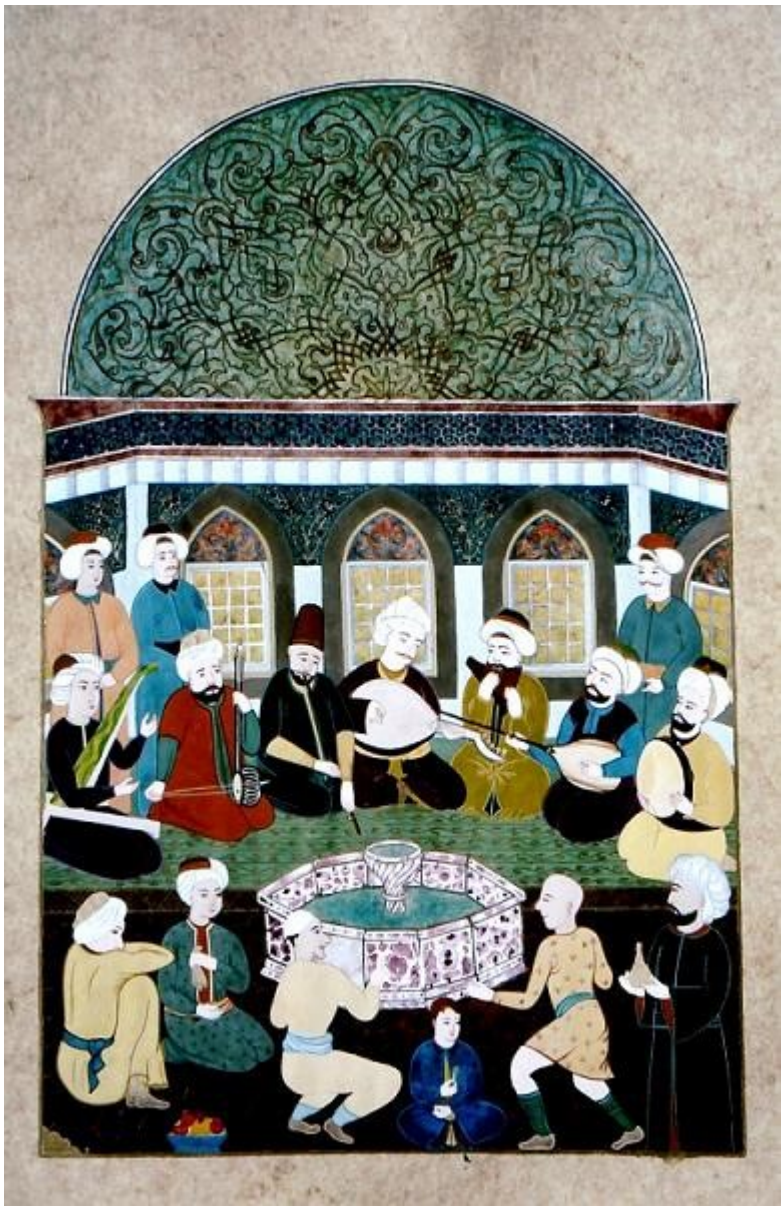


Figure 13 Painting by Nil Sari depicting the treatment of an insane patient by musical therapy (http://www.muslimheritage.com/article/ottoman-music-therapy)

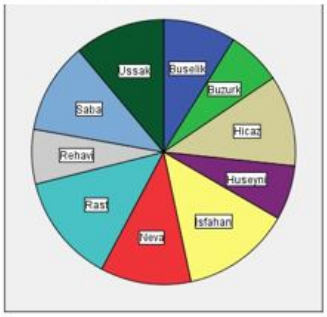
[3] For more information see Spiegel, A.D. and Springer, C.R. (1997); Medley, A. (1943); Saleebym C.W. (1929); Hammerschlag, C.A. (2009); Murrock, C.J. & Higgins, P.A. (2010); Callahan, C. (2000); Sudhir Kakar (2003); L. Kay Metzger (2006); H. M. Evans (2007); Akdemir, S., S. Kara, and V. Bilgiç (2010).

But how it was in the medieval time? Specifically, Anatolian Seljuk period? Which sounds and melodies were used? Where the therapy was conducted? [4]

The music which was used in Anatolia is based on the makam modes, and this was the starting point of the idea how and where it was used. The musical healing is practiced within the context of belief and religion, which often functions as holistic entities (Koen (2009: 4). For the therapy purposes, definitely the instrumental music was used, as the words/lyrics would be dragging away the attention of the patients. As it is known, there are many different types of makams, but the main focus is on the 13 makams which are the basic ones, and which were mentioned in the works of the previously mentioned Islamic philosophers al Farabi, al Kindi and Ibni Sina.[5]

Table 1. The correspondence of the ratios between the diameters of the Earth and some of the spheres to the ratios of musical intervals.

SPHERES	RATIO	INTERVAL
Earth - Moon	3:2	fifth
Moon - Air	4:3	fourth
Venus - Earth	16:8 (2:1)	octave
Venus - Moon	4:3	fourth
Sun - Air	18:9 (2:1)	octave
Sun - Moon	3:2	fifth
Jupiter - Moon	24:12 (2:1)	octave
Jupiter - Earth	24:8 (3:1)	octave and a fifth
Sun - Venus	24:16 (3:2)	fifth
Fixed Stars - Jupiter	32:24 (3:2)	fifth
Fixed Stars - Venus	32:16 (2:1)	octave
Fixed Stars - Earth	32:8 (4:1)	two octaves



String of the Lute.	Bamm (A string).	Mathlath (D string).	Mathnā (G string).	Zīr (C string).
Rhythm.	Hazaj, ramal *and* khafīf.	Thaqīl al-mumtad.	Thaqīl awwal *and* thaqīl thānj.	Mākhūrī.
Quarter of the Zodiac.	Capricornus to Pisces.	Libra to Sagittarius.	Aries to Gemini.	Cancer to Virgo.
Element.	Water.	Earth.	Air.	Fire.
Wind.	West.	North.	East.	South.
Season.	Winter.	Autumn.	Spring.	Summer.
Quarter of the Month.	21st to last day.	14th to 21st day.	1st to 7th day.	7th to 14th day.
Quarter of the Day.	Midnight to Sunrise.	Sunset to Midnight.	Sunrise to Mid-day.	Mid-day to Sunset.
Humour.	Phlegm.	(Black Bile)	Blood.	Yellow Bile.
Quarter of Life.	Old Age.	Middle Age.	Infancy.	Youth.
Faculty of the Soul.	Masculine.	Preserving.	Fantastic (*Fantāsiyya*).	Thinking.
Faculty of the Body.	Resisting.	Prehensile.	Assimilative (*lit.* Digestive)	Attractive.
External Actions.	Mildness.	Goodness.	Intellect.	Courage.

MAQĀM-s		
Maqām	**Zodiac**	**Element**
1. *Rāst*	Aries	fire
2. *'Irāq*	Taurus	earth
3. *Isfahān*	Gemini	air
4. *Zīrāfkand*	Cancer	water
5. *Buzurg*	Leo	fire
6. *Zengūlah*	Virgo	earth
7. *Rahāwī*	Libra	air
8. *Husainī*	Scorpio	water
9. *Hijāzī*	Sagittarius	fire
10. *Abū Salīk*	Capricorn	earth
11. *Nawā*	Aquarius	air
12. *'Ushshāq*	Pisces	water

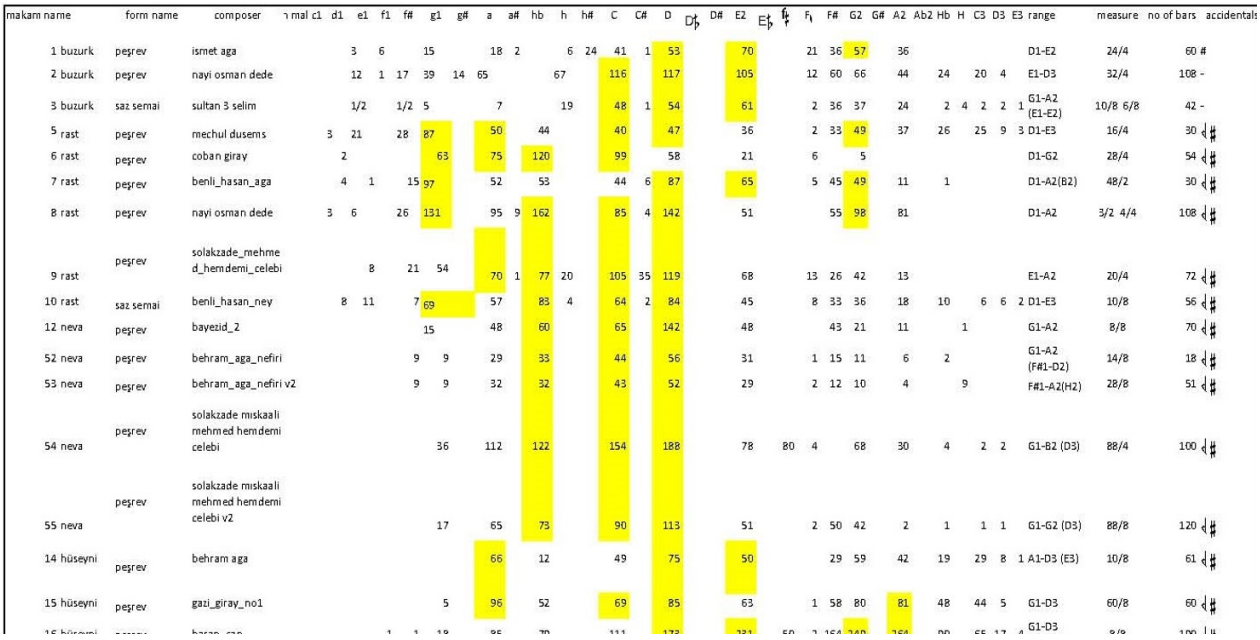
AVĀZ-s		
Avāz	**Planet**	**Element**
1. *Gawasht*	Saturn	earth
2. *Nāw Rūz*	Jupiter	fire
3. *Salmak*	Mars	fire
4. *Shāhnāz*	Sun	fire
5. *Hisār*	Venus	water
6. *Gardāniyā*	Mercury	mixed temperaments
7. *Māyah*	Moon	air

Al Kindi

Figure 14. Compiled from Pacholczyk, 1996, the chart pie by I. Mihaljinec

[4] The answers to those questions are the subject of the doctoral thesis in progress "Music and Healing in the Anatolian Seljuk Times" by Ivana Mihaljinec.

[5] For more information regarding the makams and works of Ibni Sina see Farmer (1926)



makam name	form name	composer	normal c1	d1	e1	f1	f#	g1	g#	a	a#	hb	h	h#	C	C#	D	D♭	D#	E2	E♭	F♮	F♯	G2	G#	A2	Ab2	Hb	H	C3	D3	E3	range	measure	no of bars	accidentals
1 buzurk	peşrev	ismet aga			3	6		15		18	2		6	24	41	1	53		70			21	36	57		36						D1-E2	24/4		60	#
2 buzurk	peşrev	nayi osman dede			12	1	17	39	14	65			67		116		117		105			12	60	66		44		24		20	4	E1-D3	32/4		108	-
3 buzurk	saz semai	sultan 3 selim			1/2		1/2	5		7			19		48	1	54		61			2	36	37		24		2	4	2	2	1 G1-A2 (E1-E2)	10/8 6/8		42	-
5 rast	peşrev	mechul dusems		3	21		28	87		50		44			40		47		36			2	33	49		37		26		25	9	3 D1-E3	16/4		30	♮ ♯
6 rast	peşrev	coban giray			2				63	75		120			99		58		21			6		5								D1-G2	28/4		54	♮ ♯
7 rast	peşrev	benli_hasan_aga			4	1		15	97	52		53			44	6	87		65			5	45	49		11		1				D1-A2(B2)	48/2		30	♮ ♯
8 rast	peşrev	nayi osman dede		3	6		26	131		95	9	162			85	4	142		51				55	98		81						D1-A2	3/2 4/4		108	♮ ♯
9 rast	peşrev	solakzade_mehmed_hemdemi_celebi				8	21	54		70	1	77	20		105	35	119		68			13	26	42		13						E1-A2	20/4		72	♮ ♯
10 rast	saz semai	benli_hasan_ney		8	11		7	69		57		83	4		64	2	84		45			8	33	36		18		10		6	6	2 D1-E3	10/8		56	♮ ♯
12 neva	peşrev	bayezid_2						15		48		60			65		142		48				43	21		11			1			G1-A2	8/8		70	♮ ♯
52 neva	peşrev	behram_aga_nefiri					9	9		29		33			44		56		31			1	15	11		6		2				G1-A2 (F#1-D2)	14/8		18	♮ ♯
53 neva	peşrev	behram_aga_nefiri v2					9	9		32		32			43		52		29			2	12	10		4			9			F#1-A2(H2)	28/8		51	♮ ♯
54 neva	peşrev	solakzade miskaali mehmed hemdemi celebi						36		112		122			154		188		78		80	4		68		30		4		2	2	G1-B2 (D3)	88/4		100	♮ ♯
55 neva	peşrev	solakzade miskaali mehmed hemdemi celebi v2						17		65		73			90		113		51			2	50	42		2		1		1	1	G1-G2 (D3)	88/8		120	♮ ♯
14 hüseyni	peşrev	behram aga								66		12			49		75		50				29	59		42		19		29	8	1 A1-D3 (E3)	10/8		61	♮ ♯
15 hüseyni	peşrev	gazi_giray_no1						5		96		52			69		85		63			1	58	80		81		48		44	5	G1-D3	60/8		60	♮ ♯
16 hüseyni	peşrev	hasan_can				1	1	18		86		70			111		173		231		60	2	164	240		264		90		65	17	4 G1-D3	8/8		100	♮ ♯

Figure 15. Results by I. Mihaljinec

The research showed that the first, fourth and fifth degree in a composition, made in instrumental form of peşrev, are the most repetitive ones and therefore their frequencies are the influential ones for the listener/patient. Secondly, the basin, which is situated in the center of the courtyard, was used also as a part of the healing treatment. The sound of water which was constantly present, had also a healing effect in the combination with the music which was coming from the main iwan. As it was mentioned before, the acoustical performances of the hospital are remarkable which is also an important component in the healing. The overall experience of the patients, sitting around the basin, listening to the sound of water and the music coming from the main iwan, probably also in the combination with the herbal smell, and with a support of focused acoustics had a positive impact in calming down the mind and restoring the balance in the body, supported by the specific frequencies to which they were exposed to.

In today's practice of music therapy in Turkey, some of these elements are still used, but the understanding of the true impact is still not conscious. It must be taken into consideration the architectural design of the interior which is, as I mentioned before, made on the madrasa plan. The focus of the research considering the specific architecture, condition of the hospital and access, as well as its meaning in the 13th century Anatolia was on the Divriği hospital.

Figure 16. Divrigi hospital (taken by E.Eser)

Conclusion

The acoustic analysis which has been made on the example of Divriği hospital is very interesting in terms of comparison, as this is the first example of such analysis when Seljuk hospitals are in question. Some similar acoustical researches have been made on the Ottoman mosques, but not on the hospitals. In this light, it can be said, as a preliminary result of the

analysis, that Seljuk hospitals were built as music (acoustic) halls. They have acoustical characteristics of the concert hall, which has an added value to the music therapy which was conducted. These results once they will be published, can encourage the new way of thinking regarding the construction, and open some new ideas regarding other hospitals, especially ones built in the Seljuk and Ottoman times.

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