

The Illustrations and Terminology of Hamse-i Sâ nizâ de written by Sâ nizâ de Ataul lah Efendi: The Stomach

Las Ilustraciones y Terminología de Hamse-i Sâ nizâ de
escrito por Sâ nizâ de Ataul lah Efendi: El Estómago

Mine Farı maz¹; Hilal Akdemir Aktas²; Sinem Akkasoglu³; Aysegül Fı rat²; M. Mustafa Aldur² & Hakan Hamdi Celik²

FARIMAZ, M.; AKDEMİR AKTAS, H.; AKKASOĞLU, S.; FIRAT, A.; ALDUR, M. M. & CELİK, H. H. The illustrations and terminology of Hamse-i Sâ nizâ de written by Sâ nizâ de Ataul lah Efendi: The stomach. *Int. J. Morphol.*, 40(6):1662-1667, 2022.

SUMMARY: The book “Mirâtü'l-Ebdân fi Tesrîh-i Âzâü'l-İnsân” written by Sâ nizâ de Mehmet Ataul lah Efendi was the first illustrated anatomy book published in the Ottoman Empire. The aim of this study was to determine the similarities and differences between the terms and definitions of stomach anatomy used by Sâ nizâ de at that time and those used today. The stomach section of the “Mirâtü'l-Ebdân fi Tesrîh-i Âzâü'l-İnsân” was examined and related plates were translated into the Turkish language. Anatomical terms and definitions of stomach anatomy in this book were compared to the stomach terminology used in “Terminologia Anatomica” which is the reference book for terminology today. The stomach section was explained under the title “El-Babu-Sâ lis fi Tesrihi'l-Mi'de” (Illustrated Stomach Anatomy) in this book. Parts, margins, arteries, veins, nerves and layers of the stomach were explained with the terms and definitions of that period. *Terminologia Anatomica* has 33 anatomical terms related to the stomach, while 15 terms were identified in the book “Mirâtü'l-Ebdân fi Tesrîh-i Âzâü'l-İnsân”. Although more terms related to the stomach anatomy are used today, the fundamental information on stomach anatomy in Sâ nizâ de's book was compatible with much of the information used in modern anatomy books today.

KEY WORDS: Anatomy; Terminology; Medicine; Stomach; History.

INTRODUCTION

Mehmed Atâ ullah Efendi was a son of Sâ ni-zâ de el-Hac Mehmed Sâ dik Efendi and was born in Istanbul in 1771 (Inal, 1969; Acı duman & Arda, 2014). He was born approximately 2100 years after Herophilus (335 - 280 BC), who was known as a father of anatomy. He translated the western source materials and contributed to the recognition of western medicine in the Ottoman period. He was a versatile scientist who showed the importance of dissection and illustration in medical education and wrote the first illustrated anatomy book published in the Ottoman period (Tubbs & Oakes, 2002; Acı duman & Arda, 2014; Erdogan, 2016).

He was a member of a family with a high educational and cultural level in the Ottoman Empire. He completed most of his educational life in the last quarter of the 18th century, where the classical Ottoman education approach continued

(Sehsuvaroglu, 1951; Uzluk, 1951). He examined the works of Ibn-i Sina and Kadims before studying medicine at Süleymaniye Medical Madrasah (Unver, 1947). He graduated from the madrasah in 1786. After graduating from the madrasah, he started to study in Halıcıoğlu Engineer School (Zulfı kar, 1991). However, he did not have any publications in the field of engineering (Erol, 2012). In addition to knowing Arabic and Persian languages at an advanced level, he could also speak Italian, Greek and Latin. After working as a professor in madrasahs, he worked as a judge of Havass-ı Refi'a (Eyüp), and then Mekka (Sehsuvaroglu, 1951; Uzluk, 1951).

He was appreciated and supported by Sultan Mahmud II (1785-1839), who had a great influence on the progress of the Ottoman state in science. He worked as a historian in the Ottoman state between 1808-1821 (Ortu g *et al.*, 2018).

¹ Department of Anatomy, Faculty of Medicine, Ufuk University, Ankara, Turkey.

² Department of Anatomy, Faculty of Medicine, Hacettepe University, Ankara, Turkey.

³ Department of Anatomy, Faculty of Medicine, Ankara Yıldırım Beyazıt University, Ankara, Turkey.

After disbandment of the Janissary corps, the scientists living in Besiktas, were banished on the charge of bektashism. For this reason, he was banished to Tire and died two months later in 1826 (Zulfikar, 1991; Aciduman *et al.*, 2009).

Sânzâde was interested in many disciplines of science. In addition to medicine, he wrote and translated articles on history, military affairs, mathematics, geometry, literature and geography (Sehsuvaroglu, 1951; Uzluk, 1951; Adıvar, 2000; Aciduman & Arda, 2014). The Sehsuvaroglu classified his works as those belonging to nature, those belonging to history, those belonging to military service, those belonging to literature and those belonging to geography (Sehsuvaroglu, 1951).

On the other hand, science historian Esin Kahya has divided his works into works and translations in the field of medicine, and non-medical sciences (Kahya, 1991; Erol, 2012). She compiled his works on history in four volumes in the work titled "Tarih-i Sânzâde" (History Book of Sânzâde) and published it in 1820 (Ortug *et al.*, 2018). It's known that he has a work on geography titled "Müfredât-ı Külliye Fi Sevâllâ'l-Bahriyye" (Book of Navy) but the book is not available today which is believed to be a great loss in terms of geography (Zulfikar, 1991). Sânzâde Mehmed Ataullah Efendi was also interested in poetry. He named his work in which his own poems were collected "Divan-ı Sânzâde" (Works of Sânzâde). He wrote his poems on subjects such as God, Prophets and love (Erdogan, 2016).

Sânzâde's only book on military service available today is "Vesâyânâme-i Seferiyye" (Book of the Army). At the request of Selim III, he translated a book about western military service (Erdogan, 2016). Sânzâde has three translation works on mathematics titled Terceme-i Cedîde-i Usûl-i Ta'limiyye (New Teaching Method), Cebir Mukabele (Algebra) and Hendese (Geometry) (Zulfikar, 1991).

His works in the field of medicine were quite innovative in terms of both Islamic and Ottoman Medicine. In addition to using his medical knowledge in his works, he contributed a new perspective to medicine (Erdogan, 2016). The most important medical work, Hamse-i Sânzâde (Five Books of Sânzâde) or Kanun-ı Sânzâde (Law of Sânzâde), consists of five books. These are "Mirâtü'l-Ebdân fi Tesrîh-i Âzâü'l-İnsân" (Illustrated Atlas of Human Anatomy), "Usûlü't Tabi'a" (Learning Method), "Miyârü'l-Etibbâ" (Value of Doctors), "Kânunu'l Cerrâhîn" (Laws of Surgeons) and "Mîzânü'l Edviye" (Logic of Pharmacy) (Zulfikar, 1991). The first book of Hamse-i Sânzâde is "Mirâtü'l-Ebdân fi Tesrîh-i Âzâü'l-İnsân" (Illustrated Human Anatomy Atlas). This book is the first illustrated anatomy book published in

the Ottoman Empire (Erdogan, 2016). It was published in two different types. The copy distributed to the sultan and statesmen is sour cherry color and covered with leather. On the cover is Sultan Mahmud II's monogram in golden relief, and the pictures inside are colorful and ornamented. In the second type, the pictures inside are black and white, the Sultan's monogram is silver and unadorned (Kahya, 1991; Erdogan, 2016). The book consists of 267 pages. 131 of these pages are texts, 56 of them are anatomical illustrations, and 80 pages are illustrated explanations (Uzluk, 1951). These drawings are engraved on copper plates and printed in woodcut style. This book is composed of two main sections, namely osteology and sarcology (Zulfikar, 1991). Sânzâde stated that he received 20th and 21st illustrations from Albinus B.S. (1697-1770), 53rd and 54th illustrations from Haller A. (1708-1777), 49th and 1st form of 55th illustrations from Vieussens R. (1614-1715), the 52nd illustration from Havers C. (1657-1702) and the 56th illustration from Duverney JG (1648-1730), 2nd form of the 55th illustration from Eustachio B. (1510-1574) and 50th illustration from Drake *et al.* (2015) (Zulfikar, 1991; Aciduman *et al.*, 2009; Bahsi & Bahsi, 2019a,b; Ortug, 2019). The study conducted by Ortug *et al.* (2018) also reported that he took the 1-19, 23-48 and 51st illustrations from Palfin J (1650-1730) (Ortug *et al.*, 2018; Ortug, 2019). It is thought that the illustrations inside the book were taken from the book of Vesalius titled "De Humani Corporis Fabrica", and these illustrations are mostly related to the skeleton. However, Sanizade did not mention the name of Vesalius in his book (Aciduman & Arda, 2014). In addition, the illustrations 5, 6, 7 and 56 seen in the lower-left corner of the book belong to Agob Erzurumi. The common feature of these four plates is the detailed illustrations of the skull. There was no name or signature for other illustrations (Zulfikar, 1991; Erdogan, 2016). "Usûlü't Tabi'a" (Physiology Book) is the second book of Hamse-i Sânzâde. It is considered to be the first physiology book written in the Ottoman Empire. He called the Greek term Physiology "system (usul)" in Turkish (Uzluk, 1951).

Hamse's third book "Miyârü'l-Etibbâ" is a book on internal diseases, translated from Italian. "Miyârü'l-Etibbâ" is the first book he wrote in the field of medicine. Although Sânzâde wrote this book before his book Mirâtü'l-Ebdân, it was published later (Erdogan, 2016). The fourth book is the book titled "Kânunu'l Cerrâhîn". In the first part of the book, he talked about surgery, and in the second part he talked about special diseases that concern surgery (Erdogan, 2016).

The last book of Hamse-i Sânzâde is the book titled "Mîzânü'l Edviye", in which he discussed medications. This work has not been published. Only the first chapter of the book, "Mîzânü'l Edviye" survived to this day and it is a single copy (Erdogan, 2016).

The aim of this study was to determine the similarities and differences between the terms and definitions of stomach anatomy used by Sâniẓâde at that time and those used today.

MATERIAL AND METHOD

The current copy of the book “Mirâtü'l-Ebdân fi Tesrih-i Âzâü'l-Insân” was found in the archive of Prof. Dr. Dogan Aksit (Fig. 1). The stomach section of this book was examined and related plates were translated into Turkish language. Anatomical terms and definitions about stomach anatomy in this book were compared to the stomach terminology used in *Terminologia Anatomica* which is the reference book for terminology today.

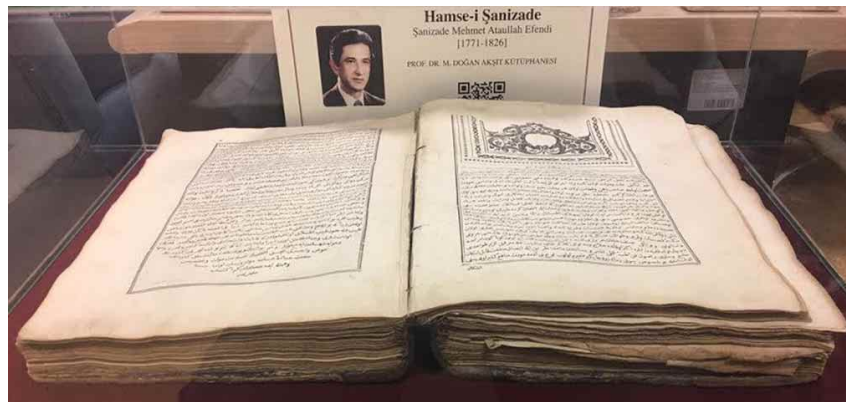


Fig. 1. “Mirâtü'l Ebdan fi Tesrih-i Azâü'l İnsan” found in the archive of Prof. Dr. Dogan Aksit.



Fig. 2. Pages 73 [left]-74 [right] related with the stomach in “Mirâtü'l Ebdan fi Tesrih-i Azâü'l İnsan”.

RESULTS

The stomach section of this book was described under the title “In El-Babu's-Salis fi Tesrihi'l-Mi'de” (Illustrated Stomach Anatomy) (Fig. 2). First of all, the shape and position of the stomach was explained. Later, the parts, margins, arteries, veins, nerves and layers of the stomach were defined (Fig. 3).

The comparison of terms related to stomach used in this book and current terminology is shown in Table I.

The shape of the stomach was described as a sac in the book. In addition, the adjacent organs of the stomach were explained. As mentioned in today's anatomy textbooks, it was described as an organ under the diaphragm and it was a continuation of the oesophagus. The stomach was located between the liver and spleen. After the stomach, the duodenum (*isna asere*) began. “Tabaka-ı mi'de” meant the layers of the stomach. The outermost layer of the stomach was called “*tabaka-i gısa*” in the book which was known as a peritoneum today. The second layer was composed of “*fiber-ı lahmiye*” (muscle fibers). Sanizade mentioned in the book that muscle fibers surrounded the stomach in a circular and oblique ways. The third layer called “*tabaka-i asabiye*” (nerve layer) was defined as a sensitive layer. The fourth layer called “*tabaka-i rabia*” (mucosa layer) was the innermost layer and adjacent to the “*tabaka-i asabiye*”. It was stated that this layer contains small follicles. “*Usaretü'l-mi'de*” (gastric juice) was secreted from these follicles in order to digest food. “*Serayin-i mi'deviye*” meant the arteries of the stomach. He divided gastric arteries into two groups; “*uruk-ı eymen-i mi'de*” (right gastric artery) and “*uruk-ı eyser-i mi'de*” (left gastric artery). *Uruk-ı mi'deviye* meant gastric veins.

Additionally, the parts of the stomach were described as “*fem-i mide*” (cardiac orifice), “*mi'denin gavr*” (fundus of stomach) and “*mide'nin canibleri*” (margins of stomach- lesser and greater curvature) (Table I).

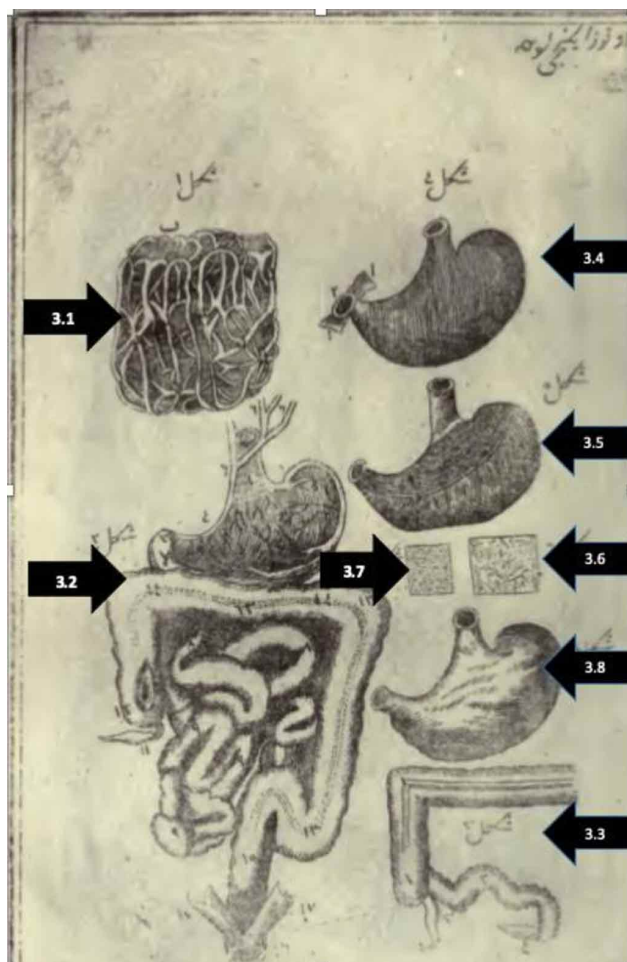


Fig. 3. 32th table of "Miratü'l Ebdan fi Tesrih-i Azaü'l İnsan", between pages 39-40. 3.1: Interior of stomach 3.2: Stomach and small intestines surrounded by large intestines; vessels coursing on lesser curvature. 3.3: Small intestine continuing with the large intestine. 3.4: Tunica muscularis and part of the stomach continuing with duodenum. 3.5: Muscular layer of the stomach. 3.6 and 3.7: Probably histological view of stomach wall. 3.8: Overview of the stomach.

DISCUSSION

Sânzâde did not explain the stomach in a sequential way by dividing it into parts as described in the textbooks available today. However, while describing the stomach, he mentioned all four parts (cardia, fundus of stomach, body of stomach, pyloric part) with a paragraph for each that we have addressed in terminology today (Drake *et al.*, 2015). He described the shape of the stomach as a sac in general. We thought that this part, which he described as a sac, might be the body of the stomach. The adjacent organs of the stomach such as the liver, spleen, oesophagus, duodenum were mentioned in the book, but the adjacent anatomical structures besides organs were not stated. The margins of the stomach were simply described, but the terms associated with the margins such as cardiac notch and angular notch were not stated. He mentioned that the histological structure of the stomach consists of four layers as known today. The outermost layer of the stomach was defined as a peritoneum, but ligaments related to the peritoneum were not mentioned in the book. He stated that the muscular layer was composed of longitudinal, circular and oblique smooth muscle fibers. The direction of muscle fibers was shown in the related illustration (Fig. 3). The third layer from outside to inside called submucosa was defined as a nerve layer of the stomach in the book. The layer called mucosa was not described in detail as it is known today. While only right and left gastric arteries were mentioned in the arteries section, the right-left gastro-omental arteries and short gastric arteries were not stated.

We thought that the main vein mentioned in the gastric veins was the portal vein, a vein coming from the spleen was the splenic vein, and the vein called the terminal branches corresponded to the short gastric veins. The term superior mesenteric vein was not stated in the book. He

Table I. Evaluation of the terminology related to stomach.

Mirâtü'l-Ebdân fi Tesrih-i Âzâü'l-İnsân	Contemporary sources
Bevvab	Pyloric orifice
İsna asere	Duodenum
Fem-i mide	Cardiac orifice
Usaretü-l mide	Gastric juice
Serayin-i mideviye	Gastric arteries
Uruk	Blood vessel (artery or vein)
Uruk-ı mi'deviye	Gastric veins
Ev'iye-i kasire-i mi'de	Short gastric artery
Uruk-ı eyemen-i mi'de	Right gastric artery
Uruk-ı eyser-i mi'de	Left gastric artery
Tabakat-ı mi'de	Gastric layers
Tabaka-i gınsai	Peritoneum
Mi'denin gavr	Fundus of stomach
Mide'nin canibleri	Lesser and greater curvature (margins of stomach)
Tabaka-i rabia (endothelium)	Gastric mucosa
Tabaka-i asabiye (tunica nervosa)	Enteric plexus of stomach

mentioned that the stomach was innervated by the eighth cranial nerve.

Today, it is known that the parasympathetic nerve supply to the stomach is provided by the vagus nerve or the tenth cranial nerve. There is no anatomical term related with the lymphatics of the stomach in the book.

Similar to our study, Uluçam *et al.* (2009) compared the urinary system section of the “Mirâtü'l-Ebdân fi Tesrîhi Âzâü'l-Insân” with the urinary system in modern anatomy textbooks. As a result of their investigations, they determined that Sanizade explained the urinary system in terms of the locations, appearances and internal structures of the organs, as in the stomach section.

Aciduman *et al.* (2009) translated the anatomical terms of the central nervous system placed in this book into contemporary Turkish language. They reported that Sanizade explained general topographic anatomy of the central nervous system, and briefly mentioned the functions of anatomical structures. They emphasized that Sanizade paid great attention to preservation of the Turkish medical terms. Also, they discussed the situation of Ottoman medicine at that time in their manuscript.

When the studies comparing the anatomical terms in the book titled “Mirâtü'l Ebdan fi Tesrih-i Azaü'l İnsan” with the anatomical terms used today were examined, it was seen that Sanizade gave more topographic anatomy information, showed the information on the illustrations, and revealed the functions and internal structures of few organs in his book.

CONCLUSION

The book “Mirâtü'l Ebdan fi Tesrih-i Azaü'l İnsan” is the first illustrated anatomy book published in the Ottoman Empire. There are 15 anatomical terms related to the stomach in this book, while 33 anatomical terms were located in *Terminologia Anatomica* (Federative Committee of Anatomical Terminology, 1998). It was noted that the information about stomach anatomy explained by Sanizade is compatible with much information used today. We also thought that Sanizade’s aim was to create a medical terminology consisting of the Ottoman Turkish language.

ACKNOWLEDGEMENTS. For allowing us to use the current copy of “Mirâtü'l-Ebdân fi Tesrîhi-î Âzâü'l-Insân” we would like to thank our teacher Prof. Dr. Dogan Aksit, and Ali Çakır for translating the relevant chapter.

FARIMAZ, M.; AKDEMİR AKTAS, H.; AKKASOĞLU, S.; FIRAT, A.; ALDUR, M. M. & CELİK, H. H. Las ilustraciones y terminología de Hamse-i Sâniẓâde escrito por Sâniẓâde Ataullah Efendi: El estómago. *Int. J. Morphol.*, 40(6):1662-1667, 2022.

RESUMEN: El libro “Mirâtü'l-Ebdân fi Tesrîhi-î Âzâü'l-Insân” escrito por Sâniẓâde Mehmet Ataullah Efendi fue el primer libro de anatomía ilustrado y publicado en el Imperio Otomano. El objetivo de este estudio fue determinar las similitudes y diferencias entre los términos y definiciones de la anatomía del estómago utilizados por Sâniẓâde en ese momento y los que se utilizan en la actualidad. Se examinó la sección del estómago del “Mirâtü'l-Ebdân fi Tesrîhi-î Âzâü'l-Insân” y las placas relacionadas se tradujeron al idioma turco. Los términos anatómicos y las definiciones de la anatomía del estómago en este libro se compararon con la terminología del estómago utilizada en *Terminologia Anatomica*, el libro de referencia para la terminología utilizado actualmente. La sección del estómago se explicó bajo el título “El-Babu-Sâlis fi Tesrihi'l-Mi'de” (Anatomía del estómago ilustrada) en este libro. Fueron definidas las partes, márgenes, arterias, venas, nervios y capas del estómago con los términos y definiciones de esa época. *Terminologia Anatomica* tiene 33 términos anatómicos relacionados con el estómago, mientras que 15 términos fueron identificados en el libro “Mirâtü'l-Ebdân fi Tesrîhi-î Âzâü'l-Insân”. Aunque hoy en día se utilizan más términos relacionados con la anatomía del estómago, la información fundamental sobre la anatomía del estómago en el libro de Sâniẓâde era compatible con gran parte de la información utilizada en los libros de anatomía modernos en la actualidad.

PALABRAS CLAVE: Anatomía; *Terminologia Anatomica*; Medicamento; Estómago; Historia.

REFERENCES

- Aciduman, A. & Arda, B. Physician-anatomists of Italy in Sanizade Mehmed Ata'ullah Efendi's work Mir'a't al-Abda'n (mirror of bodies). *Clin. Anat.*, 27(6):808-14, 2014.
- Aciduman, A.; Er, U. & Simsek, S. Sâniẓâde Atâullah Mehmed Efendi ve Mirâtü'l-Ebdân fi Tesrîhi-î A'zâü'l-Insân Adlı Eserindeki Santral Sinir Sistemi Anatomisi ile İlgili Bölümler. *Turk. Klinik. J. Med. Ethics Law Hist.*, 17(2):71-86, 2009.
- Adivar, A. A. *Osmanlı Türklerinde İlim*. İstanbul, Remzi Kitabevi, 2000. pp.214.
- Bahsi, I. & Bahsi, A. A reply to the letter to the editor by Ortug with regard to the paper “Sâniẓâde Mehmed Atâullah Efendi (1771?-1826), who is the author of the first modern anatomy book Mir'âtü'l-Ebdân fi Tesrîhi Âzâü'l-Insân in the Ottoman Empire”. *Childs Nerv. Syst.*, 35(7):1099-102, 2019a.
- Bahsi, I. & Bahsi, A. Sâniẓâde Mehmed Atâullah Efendi (1771?-1826), who is the author of the first modern anatomy book Mir'âtü'l-Ebdân fi Tes, rîhi Âzâü'l-Insân in the Ottoman Empire. *Childs Nerv. Syst.*, 35(6):903-6, 2019b.
- Drake, R. L.; Vogl, A. W. & Mitchell, A. W. M. *Gray's Anatomy for Students*. 3rd ed. Philadelphia, Churchill Livingstone Elsevier, 2015. pp.310-1.
- Erdogan, M. *Sani-zade Mehmed Ataullah Efendi (Hayati, kisiligi, eserleri, etkileri)*. Master's Thesis. İstanbul, Social Sciences Institute, Eskisehir Osman Gazi University, Eskisehir, 2016, pp.10-52.

- Erol, H. I. Sanizade Mehmet Ataullah: Bir Osmanlı tarih tasavvur ve yazımı örneği. *J. Hum. Soc.*, 2(3):33-56, 2012.
- Federative Committee of Anatomical Terminology (FCAT). *Terminologia Anatomica*. Stuttgart, Georg Thieme Verlag, 1998, pp.51-52.
- Inal, M. K. *Son asır Türk sairleri 1*. İstanbul, Milli Eğitim Basımevi, 1969, pp.103.
- Kahya E. Sâniẗâde Mehmet Ataullah Efendi. *Erdem Dergisi*, 5(15):847-61, 1991.
- Ortug, A. Letter to the editor regarding the cover editorial: "Sâniẗâde Mehmed Atâullah Efendi (1771?-1826), who is the author of the first modern anatomy book Mir'âtü'l-Ebdân fi Tes,rihi Âzâü'l-I'nsân in the Ottoman Empire". *Childs Nerv. Syst.*, 35(7):1097-8, 2019.
- Ortug, G.; Ortug, A. & Kurt, N. K. Miratü'l'Ebdan Fi Tesrih-i Azaül-Insan: first printed illustrated anatomy book in Ottoman-Turkish medicine. *Folia Morphol. (Warsz.)*, 77(4):764-70, 2018.
- Sehsuvaroglu, B. N. Hekim Sanizade Ataullah Efendi biyografisi ve eserleri. İstanbul Tıp 1. *Fak. Mecmuası*, 14:482-95, 1951.
- Tubbs, S. R. & Oakes, J. W. Letter to the Editor. *Neuroanatomy*, 1-14, 2002.
- Uluçam, E.; Gökçe, N.; Çıkmaç, S. & Yılmaz, A. A comparison of the urinary system in the first printed modern Turkish anatomy book and contemporary anatomy books. *Balkan Med. J.*, 26(3):256-60, 2009.
- Unver, A. S. Sanizada Ataullah Efendi. *Dirim*, 22:233-6, 1947.
- Uzluk, F. N. *14 Mart 1951 Tıp Bayramı Dolayısıyla Sani-Zade Mehmet Ataullah*. Ankara, Örnek Matbaası, 1951. pp.3-10.
- Zulfikar, M. B. *Tabip Sanizade Mehmed Ataullah hayatı ve eserleri*. In: Kazancıgil, A. Yüzyılda Osmanlı İmparatorluğ'unda Anatomi. İstanbul, Özel Yayınlar, 1991. pp.5-85.

Corresponding author:
Dr. Mine Farimaz
Department of Anatomy
Faculty of Medicine
Ufuk University
Ankara 06520
TURKEY

E-mail: minefarimaz@gmail.com