

Research Article

Hospital Selection Factors For Private Doctors Concerning Their Surgery Operations Services: An Application Of Fuzzy Analytic Hierarchy Process (FAHP)

Özel Muayenehane Hekimlerinin Ameliyat Operasyonlarına İlişkin Özel Hastane Seçim Faktörleri: Bulanık Ahp Uygulaması

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Öz

Özel muayenehane hekimlerinin bazı operasyonlarını gerçekleştirmek için hastanelerle iş birliğine girmektedir. Hastanelerin dış hekim olarak adlandırdıkları uzman hekimlerin rekabetin arttığı sağlık sektörü içerisinde hastalarının tıbbi işlemlerini (ameliyat, doğum vb.) gerçekleştirmek için faydalandıkları hastaneleri seçerken kullandıkları seçim kriterleri ServQual hizmet kalitesi boyutları çerçevesince ele alınmış ve Bulanık bir AHP uygulaması gerçekleştirilerek İzmir ilinde yer alan 3 hastane için bir genel cerrahi kliniği açısından araştırma gerçekleştirilmiştir. Bu çalışma Covid-19 Pandemisi öncesinde (2020 yılı öncesi) özel muayenehane hizmeti veren işletmelerin dış paydaş hastane seçimleri üzerinde ele alınmıştır. Sonuç olarak nihai 3 hastane özelinde Bulanık AHP metodu uygulanarak dış hekim hastane seçimleri ServQual hizmet kalitesi boyutları çerçevesinde 10 ayrı hizmet kalitesi ifadesi dikkate alınarak karşılaştırılmıştır.

Anahtar Kelimeler: Hizmet Pazarlaması, Servis Sistemleri, Hizmet Kalitesi, ServQual, Muayenehane Hizmetleri, Dış Hekim Hastane Seçimi, Sağlık Hizmetlerinde Lojistik, Bulanık AHP

Abstract

The Doctors, who work in their own private clinic, cooperate with hospitals to perform specific surgery operations. In the healthcare sector the competition among health institutions is increasing. Therefore, the selection of an appropriate hospital is an important decision problem for the private doctors. There is some decision criterias used among private doctors to choose the hospitals to conduct medical operations (such as surgery, delivery) for their patients are addressed within the context of ServQual service quality dimensions. Besides, by using a Fuzzy Analytic Hierarchy Process (FAHP) application, an examination of three hospitals in the Izmir province has been performed. This study has addressed the external stakeholder hospital choices of businesses that provide private clinic services before the Covid-19 Pandemic (before 2020). As a result, the FAHP method was used in the final three hospitals. Private Doctors' hospital choices were compared using the ServQual service quality dimensions, which included 10 different service quality aspects.

Keywords: Service Marketing, Service Systems, Service Quality, ServQual, Clinic Services, Private Doctors' Choice of Hospital, Logistics in Health Services, Fuzzy Analytic Hierarchy Process (FAHP)

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1. Introduction

Healthcare services are provided to the citizens as a public service through a variety of institutions and organizations. In Turkey, prominent institutions are public and private hospitals, medical centers, polyclinics, and private practices. The authorization to these institutions is issued through different licenses, and they are entities subject to Ministry of Health inspections. Related authorization processes are carried out pertaining to various physical and human factors' competencies and some fundamental competencies required to provide certain healthcare services. These criteria typically consist of sufficiently trained professionals (specialist doctors, etc.), physical conditions, and intensive care units. These elements gain legal status for health institutions following their proven existence condition corresponding to various regulations. Health care organizations that do not meet all of these criteria form various partnerships and fulfill their offerings in this manner. Doctors who practice medicine and medical sciences in compliance with Article 12 of Law No. 1219 on the Mode of Execution of Medicine and Medical Sciences (1219 sayılı Tababet Ve Şuabatı San'atlarının Tarzı İcrasına Dair Kanun) may diagnose and treat their patients who seek care in private hospitals (Republic of Turkey Ministry of Health, 2014, pp. 16). For example, while obstetricians can follow the baby's development process in their private clinic, s/he makes agreements with various hospitals as an external doctor to perform the delivery operations in these hospitals. In this case, hospitals serve as external stakeholders to provide and fulfill clinical facilities for specialist doctors who own private practices. These external stakeholders are referred to as "external doctors" in private hospitals.

Unlike other categories of services, healthcare services are one of the fields where reparation is complicated. Since it is a service involving the human body within its classification, the process should be performed with great care, discipline, and precision. For this reason, the choice of health institutions and physicians becomes an essential issue for patients. Hospital preference is defined as when a health care client prefers one of the health care providers (Tengilimoğlu, 2001: 86). Several academic studies are in the literature of health services on the criteria used by patients in selecting health services offered and the quality-of-service measurement (Boscarino and Steiber, 1982; Tengilimoğlu, 2001; Samancı and Kök, 2020; Sezer et al., 2020).

On the other hand, the number of researches undertaken on the criteria used by private doctors who have their own clinic to choose hospitals where they benefit through outsourcing as part of the health care they offer is quite limited. While the choice of urology specialist who performs private practice is the patient's preference, the doctor's preferences become essential in selecting the hospital where the doctor will perform the patient's operation when necessary. Similar decision-making problems are encountered by general surgeons, orthopedists, cardiovascular surgeons, etc., in the sector. In this study the hospital selection requirements of private doctors who offer private health care were presented. In addition to this, a comparative study was conducted using the Fuzzy AHP method, considering the three A-group hospitals in Izmir province that can perform high-risk surgeries to select one of them.

2. Additional Income for Hospitals: External Doctors Who Have Their Own Clinic

The healthcare industry evolves as a service sector that has been under the spotlight by many countries, especially in the aftermath of the Covid-19 Pandemic, and whose significance is increasingly recognized (Roder-DeWan, 2020: 1). During this period, the number of hospitals is increasing day by day. (Hoşgör and Gündüz Hoşgör, 2019: 439). While hospital clients are always regarded as patients, doctors who work as external doctors in hospitals and have their private operations are also significant hospitals' revenue sources. Due to the growth in the number of hospitals and the related competition, the options of doctors who are referred to as external physicians have increased as well. External doctors act after considering many factors when choosing a hospital. Doctors favor hospitals that meet these criteria. As a result, it allows medical care to be used by patients of other doctors as well and, when looking at the big picture, the number of patients in hospitals increases. The satisfaction of patients referred by external doctors

with the service provided encourages them to choose the same hospital for another problem that they may experience in the future. In addition, this is very important in terms of the patients who are being treated to recommend the relevant health facility to other patients. (Heischmidt, K. A. and Heischmidt, C. E. 1991: 14). Today's intense competition conditions are also evident in the health sector, and every health institution aims to get a market share in its field. They, therefore, want to diversify the services they provide in many ways and improve the quality of the service (Rahman et al., 2007: 38). Essentially the users of the services offered in the healthcare sector are patients. Besides, hospitals also sell various services to external doctors as their stakeholders. To get a share from this market and attract external physicians to their facilities, the hospitals also make several efforts.

3. Literature Review: Measuring Service Quality in Healthcare Services and the ServQual Model

Quality of service is expressed as meeting customers' expectations at every stage of the service provided (Lewis and Booms, 1983: 99). The quality of service in healthcare facilities can be defined as satisfying patients' expectations without interruption. This definition encompasses 'actions and performance' undertaken on crucial issues such as human life and the complex nature of health services. It is vital to decide the dimensions that influence service quality and measure service quality for businesses (Ergenç, 2021: 54). One of the most widely used methods for evaluating these dimensions is the ServQual model developed by Parasuraman et al. in 1988 (H. Min and H. Min, 1997: 582). Parasuraman et al. (1988) have examined the service quality dimensions by considering several factors. After performing multiple studies, these dimensions have been reduced to 5 fundamental dimensions: tangibles (physical characteristics), reliability, responsiveness, assurances, and empathy (Carman, 1990: 33). Service quality is one of the problems that should be addressed for service businesses.

According to the ServQual model, service quality is measured by subtracting expectations from perceptions (Seth et al., 2005: 917). The research scale composed of ServQual dimensions is recognized as a valid and standardized scale for measuring patient expectations and service quality for health institutions (Devebakan and Aksaraylı, 2003: 43). For this purpose, it is possible to use the ServQual scale to determine the service quality dimensions of health institutions and analyze service statements within the context of the ServQual dimensions. In this study, the criteria taken into account by private practice doctors when choosing the hospitals as their prospect stakeholders are discussed within the frame of Servqual dimensions.

When it comes to businesses' physical characteristics, it is necessary to understand their physical and material assets. Physical assets generate physical evidence from service marketing mix elements. Physical evidence of healthcare services is building, staff's physical appearance, other clients in the patient rooms, operating room facilities (Şeker kaya, 1997: 35), location, and accessibility. Accessibility and easy travel are just as critical to a patient who wishes to receive medical services, and as also important for who uses the hospital as an external doctor. For example, when a surgeon working in a private clinic leaves the clinic to reach the hospital to perform surgery has a series of logistical processes. Here, ease of transport, preventing loss of time and energy may be of critical significance and can impact the surgical procedure's efficiency in which physical performance is required. In addition to these, according to Zeithaml and Bitner (2003), businesses whose physical assets are insufficient will also fail to increase their service quality (Zeithaml and Bitner, 2003: 98; Oğuz et al., 2016: 11).

Another Servqual dimension is reliability. Reliability is about whether the service's promises are fulfilled, and it is the most crucial aspect for shaping the perception of service quality (Kekeç, 2008: 50). Besides, in the study conducted by Devebakan and Aksaraylı (2003), reliability is proven to be the most crucial dimension, with 56.2%. Among the hospital selection criterion for external doctors, claims on the reasonable price of healthcare services, the accurately determining and pricing of the test and examination procedures needed for diagnosis and treatment of the

condition, and the recognition of the hospital's brand and the presence of a positive reputation are related to the reliability factor. According to a study conducted by Berkowitz and Flexner (1981), the hospital's good reputation and public image are considered essential elements in patients' hospital selection. For this reason, brand awareness and public image are critical issues for the external doctors who sell the service directly. However, another critical issue is related to pricing. In practice, hospitals' different pricing to external physicians during the process and the excessive and non-standard pricing of the tests conducted during the diagnosis and treatment stages are harmful to hospitals' reliability. In general, this situation applies to individual hospitals that do not have a professional management team and specific accreditation and systems. Turkish Medical Association highlights the different fees charged by private hospitals during the Covid-19 pandemic process with the following statement: "Diagnostic methods and treatments should not be at the discretion and mercy of the market" (Turkish Medical Association, 2020). Similar conditions diminish external doctors' credibility in the hospital and damage the hospital's favorable public image. In Table 1, there are factors that external doctors consider when choosing a hospital within the scope of ServQual dimensions.

Table 1: Expressions of External Doctors While Choosing a Hospital within the Scope of ServQual Dimensions

No	ServQual Dimensions	Expressions of External Doctors While Choosing a Hospital
1	Tangibles (Physical Characteristics)	<ul style="list-style-type: none"> • Physical Conditions of the Hospital • Ease of Hospital Access to the Clinic
2	Reliability	<ul style="list-style-type: none"> • Affordable Hospital Services • Hospital's Brand Awareness and Positive Image
3	Assurances	<ul style="list-style-type: none"> • Experienced and Equipped Assistant Health Personnel • Use of Quality Medical Equipment and Materials
4	Responsiveness	<ul style="list-style-type: none"> • High Clinical Effectiveness of Hospital Services • Collaborative Organizational Culture
5	Empathy	<ul style="list-style-type: none"> • Existence of Customer Relationship System • Hospital Ownership of Private Clinic Patients

Source: This table has been adapted from the study of Parasuraman et al., (1985).

Another ServQual dimension is the assurances. The assurance dimension is about the risks of the service and minimizing the risks. For patients, their loyalty applies to the doctor whom they receive the service. (Bekaroğlu, 2005: 19). However, Assurance is a feature that should be offered to patients with various service variables. For assured hospital service, the assistant healthcare personnel working in the hospital must be experienced in their field and professionally equipped. This situation directly affects the customer experience (Leister and Stausberg, 2007: 14). Besides, the use of high-quality instruments and materials in diagnostic and treatment procedures in the hospital, the availability of an adequate and equipped intensive care unit, and the standard of sterilization and sanitation of the hospital are significant variables. Hospitals need to make useful and accurate choices about the supply of the medical equipment essential for patients (Doğan and

Akbal, 2019: 440). Experienced personnel and high-quality medical equipment are necessary for external doctors. One of the most important reasons is that the doctor purchases physical items and various hospital services. External doctors also need additional health care staff to accompany them during surgery, and these supplementary health services are also included in the price they pay. The staff engaged in the process will be actively involved in the surgical operation and directly influence the quality of the health service provided.

Another ServQual dimension is responsiveness. Responsiveness includes matters related to enthusiasm and readiness in service processes (Rahman et al., 2007: 40). It also includes speed and feedback in services. For external doctors, the hospital services' high clinical effectiveness, the collaboration, and solution-oriented hospital organizational culture, and the hospital's patient transportation support for external physician's patients are examined in the dimension of responsiveness when choosing a hospital. In particular, external physicians use the hospitals' in-patient services to receive service for the care and completion of postoperative patients. These services' clinical effectiveness is identified as one of the key factors for selecting hospitals by external physicians. This effectiveness covers elements such as drug treatment and patient follow-up, hospital sanitation, and food services. If these are executed properly, it will also improve the perceived level of care to patients (Zerenler and Ögüt, 2007: 516). Hygiene conditions of the hospital are also an important criterion when choosing a hospital (Oğuz et al., 2016: 11). Besides, coordination between the clinic supervisor and the doctor has a vital role in the healthcare service during the visits and the patient's follow-up.

The last ServQual dimension is empathy. Empathy's meaning in this situation is to understand and get to know customers properly, equivalent to its meaning in communication (Wieseke et al., 2012: 316). Looking from an external doctors' perspective, it is crucial to see that medical personnel welcome external doctor's patients, a good customer relationship team and system in the hospital, and satisfactory customer care for patients and their families. As a result, it may be possible for an external doctor to encounter some difficulties while performing their hospital procedures because they are not part of the staff. Taking ownership of both the external physicians and their patients by the hospital staff becomes essential in increasing its quality. According to a study conducted by Bilgin (2019) on private hospitals, the most important factor was the hospital staff's tolerance and patience. To eliminate the shortcomings in these specific issues, the hospital must have an effective customer relations system.

Lastly, the Fuzzy AHP method used within the scope of the study is applied in all areas with decision problems. In this section, it is aimed to give examples of AHP and Fuzzy AHP applications from different fields. Acar and Köylüoğlu (2020) applied the AHP method to select supplier of a construction company with a sustainability approach. AHP method was used to determine the most suitable supplier. This study could be a different decision problem in terms of supply chain management.

4. Aim of the Study

Doctors who run private clinics work with some hospitals where they can serve as external stakeholders while conducting their current services and operations. In fact, private clinic operators work as external doctors in this ecosystem. Throughout this process, external doctors' benefit from a number of services such as technical, infrastructure, equipment, operating room, customer service and patient rooms. Here, there are many alternative hospitals in this intense competitive ecosystem. And also, there are many important criteria for hospitals to improve their service levels and operational activities.

The aim of the study is to analyze the ability of a private general surgery clinic operating in Izmir to choose among 3 different hospitals where they can receive service as external stakeholders according to their specific service and operational levels. While doing the study's analysis, within the Multi-Criteria Decision Making (MCDM) method, Analytic Hierarchy Process (AHP) and

Fuzzy AHP was used to select the most appropriate alternative hospital in terms of service and operational activities.

5. Methodology

This study aims to find out the hospital stakeholder selection factors of private general surgery clinic doctors using the Fuzzy AHP method. After a comprehensive literature review, the selection criteria for the stakeholder hospital of the private clinic doctors were determined. In the study, as suggested by Parasuraman, Zeithaml and Berry (1985), the Servqual scale was used to classify hospital selection criteria into certain classifications. The importance weights of 10 hospital stakeholder selection criteria were determined by using the Fuzzy AHP method for a private clinic operating in Izmir. The determined hospital stakeholder selection criteria were evaluated under 5 main service quality factors such as *tangibles*, *assurance*, *reliability*, *responsiveness* and *empathy* in the Servqual scale. Here, this private general surgery clinic has already worked with these 3 hospitals and operational capabilities and processes of hospitals are known by private clinics.

Multi-Criteria Decision Making (MCDM) is one of the most widely used methods in decision theory. MCDM includes methods that enable the evaluation of multiple decision criteria, selection among alternatives, grouping or ranking of alternatives. MCDM has some problems related to the issues. These problems mainly consist of some components like aim, decision maker's choices, alternative options, related criteria and ultimate outcomes (Wang et al., 2009).

5.1. Analytic Hierarchy Process (AHP) Method

It is a powerful and easy-to-understand methodology that allows groups and individuals to combine qualitative and quantitative factors in the decision-making process (Saaty and Vargas, 1994). A general guide within the Multi-Criteria Decision Making for complex, obscure or unstructured problems. It uses a hierarchy model of objectives, criteria, possible sub-criteria levels, and options for each problem.

This interactive method allows the decision maker or group of decision makers to express their preferences and discuss the results (Saaty, 2008). This method is also used to assign priorities to criteria, sub-criteria and indicators (Mendoza and Prabhu, 2000).

5.2. Establishing the Decision of Analytic Hierarchy Process

AHP problems are defined in at least three layers as purpose, criteria and alternatives. Firstly, the decision maker evaluates how successful each alternative is in each criterion. After the decision maker evaluates the relative importance of each criterion in achieving the goal. Finally, the decision maker evaluates the success of each alternative in reaching the goal by synthesizing these two conditions (Saaty, 1980).

The establishment of the AHP decision hierarchy starts with placing the general purpose of the problem at the top level. Then, the criteria to be used in the evaluation of alternatives are determined and these criteria are arranged in a hierarchical structure. There is a level of criteria in this hierarchy. By placing the decision alternatives of the problem at the lowest level of the hierarchy, the process of creating a hierarchy is completed. A decision hierarchy is created consisting of purpose, criteria, sub-criteria levels and options (Saaty, 1980). Figure 1 shows the AHP decision hierarchy within the study. It includes the purpose of the study, criteria and options.

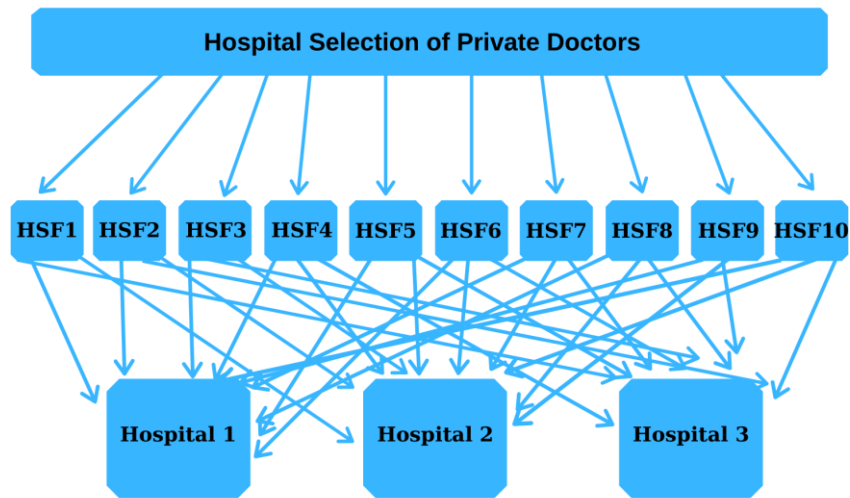


Figure 1. Purpose, Criteria and Options of the AHP Decision Hierarchy

The AHP obtains priorities from binary comparison judgments of decision-related items with respect to the next level element. First, binary comparison judgments are put in a matrix. After, priorities are found by calculating the largest eigenvector of the matrix. Inconsistencies in judgments are also calculated.

After clarifying the hierarchical model of the questions in AHP application, it is necessary to compare the criteria at each level. Elements in a binary comparison matrix are shown in the form of a_{ij} . The diagonal elements of the binary comparison matrix are 1 and the elements below the diagonal are found with the following equation (Kırbaç and Tektaş, 2021);

$$a_{ji} = \frac{1}{a_{ij}}$$

After determining the priorities of the criteria and sub-criteria in the AHP, the $(n \times n)$ binary comparison matrix shown below is created to determine the importance of the criteria and sub-criteria among themselves (Saaty, 1995);

$$D = \begin{bmatrix} a \\ ij \end{bmatrix} = \begin{bmatrix} 1 & a & \dots & a \\ 1/a & 1 & \dots & a \\ \vdots & a^{21} & & 2n \\ 1/a & 1/a & \dots & 1 \\ n1 & n2 & & \end{bmatrix}_{n \times n}$$

The next step after the creation of a paired comparison matrix is to calculate the eigenvector that shows the importance of each item in the relevant matrix compared to other items (Tektaş and Ünal, 2018). The $(n \times 1)$ dimension eigenvector of the matrix is determined as follows:

Where, $i= 1, 2, 3, \dots, n$ and $j= 1, 2, 3, \dots, n$;

$$b^{ij} = \frac{a^{ij}}{\sum_{i=1}^n a_{ij}} \quad w_i = \frac{\sum_{j=1}^n b_{ij}}{n}$$

In the AHP method, significance weights for all criteria are found and priority vector (w) is obtained. Here, the Consistency Ratio must be found to test the consistency of the priorities vector. The Consistency Ratio (CR) is calculated for each of the pairwise comparison matrices. It is desirable that there is an upper limit of 0.10 for this ratio. A ratio above 0.10 indicates an inconsistency in decision making. In this case, improvement in judgments is required. While finding the CR, first, the weighted sum vector Axw is calculated (Saaty and Vargas, 1994). Then the highest eigenvalue (λ_{max}) of the matrix is calculated using the following equation:

Where, $i= 1, 2, 3, \dots, n$ and $j= 1, 2, 3, \dots, n$;

$$D = [a^{ij}]_{n \times n} \times [w_i]_{n \times 1} = [d_i]_{n \times 1}$$

$$\lambda_{max} = \frac{\sum_{i=1}^n \frac{d_i}{w_i}}{n} \quad CR = \frac{\lambda - n}{(n-1).RI}$$

Here, Table 2 shows the Random Consistency Index (RI) numbers.

Table 2: Random Consistency Index (RI) Numbers

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RI	0	0	0,58	1,12	1,24	1,32	1,41	1,45	1,49	1,51	1,51	1,53	1,56	1,57	1,59

Table 3 shows the significance scale used for comparison in AHP method.

Table 3: Significance Scale Used for Comparison in AHP

Scale of Significance	Definition	Explanation
1	Equally significant	Two elements considered equally important
3	Weakly significant	One elements in weakly important than another
5	Really significant	One elements in strongly important than another
7	Very strongly significant	The importance of one element over the other is very strongly
9	Absolutely significant	The evidences show that one element is absolutely important than the others
2, 4, 6, 8	Intermediate values	These are intermediate values of decision

Source: Saaty, T.L. (2008). Decision Making with the Analytic Hierarchy Process. International of Journal Services Sciences, 1: 83–98.

5.3. Fuzzy Analytic Hierarchy Process (FAHP) Method

Fuzzy AHP is a method created by applying Fuzzy Set theory to AHP algorithms in order to determine the most suitable option according to certain criteria. Chang (1996) established this method based on the rank analysis. Many researchers have contributed to the development of the method. Liou and Wang (1992) included the optimism index in the Fuzzy AHP algorithm. Also, Weck et al. (1997) developed a method to reveal the fuzzy set in Fuzzy AHP. Besides these studies, Kwong and Bai (2003) developed a method used to rank Triangular Fuzzy Numbers in the final stage in Fuzzy AHP.

Table 4: The Scale of Fuzzy AHP

The relative importance of the two sub-elements	Fuzzy triangular	Reciprocal fuzzy
Equally important	1 1 1	1, 1, 1
intermediate value between 1 and 3	1 2 3	1/3, 1/2, 1
Slightly important	2 3 4	1/4, 1/3, 1/2
intermediate value between 3 and 5	3 4 5	1/5, 1/4, 1/3
Important	4 5 6	1/6, 1/5, 1/4
intermediate value between 5 and 7	5 6 7	1/7, 1/6, 1/5
Strongly important	6 7 8	1/8, 1/7, 1/6
intermediate value between 7 and 9	7 8 9	1/9, 1/8, 1/7
Extremely important	9 9 9	1/9, 1/9, 1/9

Source: Saaty, T. L. and Vargas, L. G. (2001).

Table 4 shows the significance and reciprocal scale used for Fuzzy AHP method. In the context of the study, both Comparative AHP and Fuzzy AHP methods were used. Comparative AHP method was used for hospital selection factors in terms of private clinic doctors. And also, Fuzzy AHP method was used for hospital factors. After gathering related data, both results are combined.

5.4. A Comparative and Fuzzy Analytic Hierarchy Process Implementation and Findings

After the necessary information and formulas about Fuzzy AHP application, in this part of the study AHP application was made on the factors evaluated by private clinic doctors in hospital selection. Here, as suggested by Parasuraman et al. (1985), the Servqual scale was used to classify the external stakeholder hospital selection factors of private clinic doctors. In this context, 10 external stakeholder hospital selection factors were determined.

Table 5: Hospital Selection Factors (HSF) in Terms of Private Clinic Doctors

Hospital Selection Factors	Abbreviations
Physical Conditions of the Hospital	HSF1
Ease of Hospital Access to the Clinic	HSF2

Hospital Selection Factors	Abbreviations
Affordable Hospital Services	HSF3
Hospital's Brand Awareness and Positive Image	HSF4
Experienced and Equipped Assistant Health Personnel	HSF5
Use of Quality Medical Equipment and Materials	HSF6
High Clinical Effectiveness of Hospital Services	HSF7
Collaborative Organizational Culture	HSF8
Existence of Customer Relationship System	HSF9
Hospital Ownership of Private Clinic Patients	HSF10

Table 5 shows the hospital selection factors in terms of private clinic doctors. In order to facilitate the continuation of the study, abbreviations are used on the aforementioned factors.

Table 6: Normalized Hospital Selection Factors with AHP

	HSF 1	HSF 2	HSF 3	HSF 4	HSF 5	HSF 6	HSF 7	HSF 8	HSF 9	HSF 10	Middle of Row (w)
HSF1	0,035	0,224	0,142	0,184	0,091	0,030	0,017	0,007	0,115	0,009	0,085
HSF2	0,006	0,037	0,142	0,138	0,091	0,036	0,015	0,012	0,135	0,131	0,074
HSF3	0,005	0,005	0,020	0,184	0,061	0,026	0,011	0,007	0,058	0,007	0,038
HSF4	0,004	0,006	0,003	0,023	0,052	0,030	0,017	0,023	0,096	0,175	0,043
HSF5	0,140	0,149	0,121	0,161	0,363	0,544	0,437	0,329	0,154	0,306	0,270
HSF6	0,210	0,187	0,142	0,138	0,121	0,181	0,350	0,235	0,135	0,175	0,187
HSF7	0,175	0,224	0,162	0,115	0,073	0,045	0,087	0,188	0,115	0,131	0,132
HSF8	0,245	0,149	0,142	0,046	0,052	0,036	0,022	0,047	0,077	0,015	0,083
HSF9	0,006	0,005	0,007	0,005	0,045	0,026	0,015	0,012	0,019	0,009	0,015

	HSF 1	HSF 2	HSF 3	HSF 4	HSF 5	HSF 6	HSF 7	HSF 8	HSF 9	HSF 10	Middle of Row (w)
HSF10	0,175	0,012	0,121	0,006	0,052	0,045	0,029	0,141	0,096	0,044	0,072
Column Total	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00

Table 6 shows the normalized hospital selection factors using AHP method. Comparative private clinic decisions were found prior to normalizing these factors. After the column totals are calculated, hospital selection factors are normalized. Looking at the row weights (w) calculated by taking the averages of each normalized value, Experienced and Equipped Assistant Health Personnel factor has the highest importance with its 0.270 row weight. Use of Quality Medical Equipment and Materials factor has the second highest importance with its 0.187 row weight. High Clinical Effectiveness of Hospital Services factor has the third highest importance with its 0.132 row weight.

In order for the row weights of the above hospital selection factors obtained in the study to be more meaningful, Fuzzy AHP method was applied to each hospital selection factor separately for three hospitals. Then, the total effect of the hospitals was calculated by synthesizing and combining all the data obtained.

Table 7: Normalized Physical Conditions of the Hospital (HSF1) Factor with Fuzzy AHP

Physical Conditions of the Hospital (HSF1)	Fuzzy Weights			Average	Normalized (w)
Hospital 1	0,394	0,455	0,523	0,457	0,454
Hospital 2	0,394	0,455	0,523	0,457	0,454
Hospital 3	0,075	0,091	0,114	0,093	0,093
Column Total	0,863	1,000	1,159	1,007	1

Table 7 shows the normalized Physical Conditions of the Hospital factor using Fuzzy AHP method. Here, Fuzzy AHP method was applied by taking comparative evaluations in three different hospitals for these all 10 factors in terms of private clinics. Also, evaluations were made on three different hospitals that the private clinic operator can choose one of them as an external stakeholder. Here, the weight of importance of Hospital 1 is higher than Hospital 2 and Hospital 3. In addition, the weight of importance of Hospital 2 is higher than the weight of Hospital 3.

Table 8: Normalized Ease of Hospital Access to the Clinic (HSF2) Factor with Fuzzy AHP

Ease of Hospital Access to the Clinic (HSF2)	Fuzzy Weights			Average	Normalized (w)
Hospital 1	0,357	0,614	0,998	0,656	0,595
Hospital 2	0,145	0,268	0,521	0,312	0,283
Hospital 3	0,076	0,117	0,211	0,135	0,122
Column Total	0,578	1,000	1,730	1,103	1

Table 8 shows the normalized Ease of Hospital Access to the Clinic factor using Fuzzy AHP method. After gathering the related comparative evaluations in terms of normalized Ease of Hospital Access to the Clinic factor to choose one of the hospitals as an external stakeholder, the following evaluations can be made. The weight of importance of Hospital 1 is higher than Hospital 2 and Hospital 3. In addition, the weight of importance of Hospital 2 is higher than the weight of Hospital 3.

Table 9: Normalized Affordable Hospital Services (HSF3) Factor with Fuzzy AHP

Affordable Hospital Services (HSF3)	Fuzzy Weights			Average	Normalized (w)
Hospital 1	0,341	0,567	0,871	0,593	0,554
Hospital 2	0,236	0,357	0,604	0,399	0,373
Hospital 3	0,055	0,075	0,108	0,079	0,074
Column Total	0,632	1,000	1,582	1,071	1

Table 9 shows the normalized Affordable Hospital Services factor using Fuzzy AHP method. After gathering the related comparative evaluations in terms of normalized Affordable Hospital Services factor to choose one of the hospitals as an external stakeholder, the following evaluations can be made. The weight of importance of Hospital 2 is higher than Hospital 1 and Hospital 3. In addition, the weight of importance of Hospital 3 is higher than the weight of Hospital 1.

Table 10: Normalized Hospital's Brand Awareness and Positive Image (HSF4) Factor with Fuzzy AHP

Hospital's Brand Awareness and Positive Image (HSF4)	Fuzzy Weights			Average	Normalized (w)
Hospital 1	0,473	0,540	0,612	0,541	0,538
Hospital 2	0,247	0,297	0,358	0,301	0,299
Hospital 3	0,145	0,163	0,187	0,165	0,164
Column Total	0,865	1,000	1,157	1,007	1

Table 10 shows the normalized Hospital's Brand Awareness and Positive Image factor using Fuzzy AHP method. After gathering the related comparative evaluations in terms of normalized Hospital's Brand Awareness and Positive Image factor to choose one of the hospitals as an external stakeholder, the following evaluations can be made. The weight of importance of Hospital 1 is higher than Hospital 2 and Hospital 3. In addition, the weight of importance of Hospital 2 is higher than the weight of Hospital 3.

Table 11: Normalized Experienced and Equipped Assistant Health Personnel (HSF5) Factor with Fuzzy AHP

Experienced and Equipped Assistant Health Personnel (HSF5)	Fuzzy Weights			Average	Normalized (w)
Hospital 1	0,291	0,327	0,371	0,330	0,323
Hospital 2	0,291	0,413	0,535	0,413	0,405
Hospital 3	0,201	0,260	0,371	0,278	0,272
Column Total	0,782	1,000	1,278	1,020	1

Table 11 shows the normalized Experienced and Equipped Assistant Health Personnel factor using Fuzzy AHP method. After gathering the related comparative evaluations in terms of normalized Experienced and Equipped Assistant Health Personnel factor to choose one of the hospitals as an external stakeholder, the following evaluations can be made. The weight of importance of Hospital 2 is higher than Hospital 1 and Hospital 3. In addition, the weight of importance of Hospital 1 is higher than the weight of Hospital 3.

Table 12: Normalized Use of Quality Medical Equipment and Materials (HSF6) Factor with Fuzzy AHP

Use of Quality Medical Equipment and Materials (HSF6)	Fuzzy Weights			Average	Normalized (w)
Hospital 1	0,382	0,628	0,971	0,661	0,612
Hospital 2	0,061	0,086	0,134	0,094	0,087
Hospital 3	0,175	0,285	0,514	0,325	0,301
Column Total	0,618	1,000	1,619	1,079	1

Table 12 shows the normalized Use of Quality Medical Equipment and Materials factor using Fuzzy AHP method. After gathering the related comparative evaluations in terms of normalized Use of Quality Medical Equipment and Materials factor to choose one of the hospitals as an external stakeholder, the following evaluations can be made. The weight of importance of Hospital 1 is higher than Hospital 3 and Hospital 2. In addition, the weight of importance of Hospital 3 is higher than the weight of Hospital 2.

Table 13: Normalized High Clinical Effectiveness of Hospital Services (HSF7) Factor with Fuzzy AHP

High Clinical Effectiveness of Hospital Services (HSF7)	Fuzzy Weights			Average	Normalized (w)
Hospital 1	0,507	0,694	0,928	0,710	0,692
Hospital 2	0,111	0,132	0,161	0,134	0,131
Hospital 3	0,139	0,174	0,232	0,182	0,177
Column Total	0,757	1,000	1,322	1,026	1

Table 13 shows the normalized High Clinical Effectiveness of Hospital Services factor using Fuzzy AHP method. After gathering the related comparative evaluations in terms of normalized High Clinical Effectiveness of Hospital Services factor to choose one of the hospitals as an external stakeholder, the following evaluations can be made. The weight of importance of Hospital 1 is higher than Hospital 3 and Hospital 2. In addition, the weight of importance of Hospital 3 is higher than the weight of Hospital 2.

Table 14: Normalized Collaborative Organizational Culture (HSF8) Factor with Fuzzy AHP

Collaborative Organizational Culture (HSF8)	Fuzzy Weights			Average	Normalized (w)
Hospital 1	0,488	0,678	0,918	0,695	0,676
Hospital 2	0,118	0,142	0,177	0,146	0,142
Hospital 3	0,143	0,179	0,240	0,187	0,182
Column Total	0,749	1,000	1,335	1,028	1

Table 14 shows the normalized Collaborative Organizational Culture factor using Fuzzy AHP method. After gathering the related comparative evaluations in terms of normalized Collaborative Organizational Culture factor to choose one of the hospitals as an external stakeholder, the following evaluations can be made. The weight of importance of Hospital 1 is higher than Hospital 3 and Hospital 2. In addition, the weight of importance of Hospital 3 is higher than the weight of Hospital 2.

Table 15: Normalized Existence of Customer Relationship System (HSF9) Factor with Fuzzy AHP

Existence of Customer Relationship System (HSF9)	Fuzzy Weights			Average	Normalized (w)
Hospital 1	0,186	0,221	0,275	0,227	0,226
Hospital 2	0,296	0,319	0,346	0,320	0,318
Hospital 3	0,373	0,460	0,549	0,461	0,457
Column Total	0,855	1,000	1,170	1,008	1

Table 15 shows the normalized Existence of Customer Relationship System factor using Fuzzy AHP method. After gathering the related comparative evaluations in terms of normalized Existence of Customer Relationship System factor to choose one of the hospitals as an external stakeholder, the following evaluations can be made. The weight of importance of Hospital 3 is higher than Hospital 2 and Hospital 1. In addition, the weight of importance of Hospital 2 is higher than the weight of Hospital 1.

Table 16: Normalized Hospital Ownership of Private Clinic Patients (HSF10) Factor with Fuzzy AHP

Hospital Ownership of Private Clinic Patients (HSF10)	Fuzzy Weights			Average	Normalized (w)
Hospital 1	0,489	0,540	0,592	0,540	0,539
Hospital 2	0,286	0,297	0,309	0,297	0,297
Hospital 3	0,149	0,163	0,181	0,165	0,164
Column Total	0,924	1,000	1,082	1,002	1

Table 16 shows the normalized Hospital Ownership of Private Clinic Patients factor using Fuzzy AHP method. After gathering the related comparative evaluations in terms of normalized Hospital Ownership of Private Clinic Patients factor to choose one of the hospitals as an external stakeholder, the following evaluations can be made. The weight of importance of Hospital 1 is higher than Hospital 2 and Hospital 3. In addition, the weight of importance of Hospital 2 is higher than the weight of Hospital 3.

Table 17: Normalized Total Impact of Hospitals with Fuzzy AHP

	HSF 1	HSF 2	HSF 2	HSF 4	HSF 5	HSF 6	HSF 7	HSF 8	HSF 9	HSF 10	Total Impact of Hospitals
HSF Weights	0,085	0,074	0,038	0,043	0,27	0,187	0,132	0,083	0,015	0,072	
Hospital 1	0,454	0,595	0,554	0,538	0,323	0,612	0,612	0,676	0,226	0,539	0,508
Hospital 2	0,454	0,283	0,373	0,299	0,405	0,087	0,087	0,142	0,318	0,297	0,262
Hospital 3	0,093	0,122	0,074	0,164	0,272	0,301	0,301	0,182	0,457	0,164	0,230

Lastly, Table 17 shows the normalized Total Impact of Hospitals using Fuzzy AHP method. Initially, the importance weights of each hospital selection factor are shown. Then, importance weights are given separately in terms of hospital selection factors for each hospital. Finally, the total impact of the hospitals was calculated by multiplying the weights of each hospital selection factor and the weights of the hospitals one by one. However, in this part of the study, a synthesis and combination of the weights of the hospital selection factors and the weights of the hospitals has been made.

In substance, when analyzing the total impact of hospitals, *Hospital 1* is the best alternative hospital as an external stakeholder for private clinics with its 0.508 total significance weight. However, the *Hospital 2* is the second best alternative hospital as an external stakeholder for private clinics with its 0.262 total significance weight. Furthermore, the *Hospital 3* is the third

best alternative hospital as an external stakeholder for private clinics with its 0.230 total significance weight.

6. Conclusion

In this study, Fuzzy AHP method was conducted on external stakeholder hospital selection factors of a private clinic serving as general surgery. As suggested by Parasuraman et al. (1985), the Servqual scale was used to classify the external stakeholder hospital selection factors of private clinics. In this context, 10 external stakeholder hospital selection factors were determined in terms of the patients requirements of the private clinic and its corporate experience.

The importance weights of these 10 hospital selection factors were calculated using the Fuzzy AHP method. Accordingly, when we look at the weight of importance, it is seen that factors such as *Experienced and Equipped Assistant Health Personnel* and *Use of Quality Medical Equipment and Materials* are more important than other factors.

Then, each of the hospital selection factors was evaluated in terms of three alternative hospitals, and their weights were calculated using the Fuzzy AHP method. Lastly, the weights of hospital selection factors and the weights of each hospital were synthesized and combined together.

Considering the obtained results, it can be said that the total effect (fuzzy weight) of *Hospital 1* (0.508) is higher than the total effect (fuzzy weight) of *Hospital 2* (0.262) and *Hospital 3* (0.230). Also, the total effect (fuzzy weight) of *Hospital 2* (0.262) is higher than the total effect (fuzzy weight) of *Hospital 3* (0.230).

On the other hand, it is so clear to examine the logistics of the private clinic doctors' patients within the service process. In this study, the logistics operations and service processes of private clinic patients after the selection of hospital were discussed.

Lastly, this study was conducted before the Covid-19 pandemic. For future works related to this study's topic, It is planned to conduct a study on how the factors affecting hospital selection criteria after Covid-19 pandemic.

References

- Acar, Ö. E., Köylüoğlu, A. S. 2020 Sürdürülebilir Tedarikçi Seçiminin Analitik Hiyerarşi Prosesi (AHP) Yöntemiyle Analizi, Üçüncü Sektör Sosyal Ekonomi Dergisi, 55(1), 419-440
- Bekaroğlu, Ş. B. (2005). Toplam Kalite Yönetimi Uygulamalarının ve ISO 9000 Kalite Güvencesine Sahip Olmanın Hastane Performansına Etkileri: İstanbul'daki Özel Hastaneler Üzerine Bir Araştırma. Akdeniz İİBF Dergisi, 5(9), 18-32.
- Berkowitz, E.N., & Flexner, W.A. (1981). The Market For Health Care Service: Is There a Non-Traditional Consumer? Journal of Health Care Marketing, 1(1), 25-34.
- Bilgin, Y. (2019). Sağlık hizmetlerinde fiyatlandırma politikalarının hastane seçimine etkisi: Bir özel hastane örneği (Master's thesis, Necmettin Erbakan Üniversitesi Sağlık Bilimleri Enstitüsü).
- Boscarino, J., & Stelber, S. R. (1982). Hospital shopping and consumer choice. Journal of health care marketing, 2(2).
- Carman, James M., (1990). Consumer Perceptions Of Service Quality: An Assessment Of The Servqual Dimensions, Journal Of Retailing, 66 (1), (33-55).
- Chang, D. Y. (1996), Applications of the Extent Analysis Method on Fuzzy AHP, European Journal of Operational Research, 95(3), pp. 649-655.
- Devebakan, N. & Aksaraylı, M. (2003). Sağlık işletmelerinde algılanan hizmet kalitesinin ölçümünde SERVQUAL skorlarının kullanımı ve Özel Altınordu Hastanesi uygulaması.

- Doğan, N. Ö. & Akbal, H. (2019). Sağlık sektöründe tedarikçi seçim kararının ahp yöntemi ile incelenmesi: bir üniversite hastanesi Örneği. *Manisa Celal Bayar Üniversitesi Sosyal Bilimler Dergisi*, 17(4), 440-456.
- Ergenç, E. (2020). Çevrimiçi (Online) Uzaktan Eğitim Hizmetlerinde E-Hizmet Kalitesi Boyutları; Bir Kalite Fonksiyon Göçerimi Ve AHP Uygulaması. Yayınlanmamış Doktora Tezi. İzmir Katip Çelebi Üniversitesi Sosyal Bilimler Enstitüsü.
- Heischmidt, K. A., & Heischmidt, C. E. (1991). Hospital choice criteria: an empirical evaluation of active hospital clients. *Journal of hospital marketing*, 5(2), 5-16.
- Hoşgör, H., & Hoşgör, D. G. (2019). Hastaların Hastane Seçimini Etkileyen Faktörler: Sistematik Derleme (1996-2017). *Hacettepe Sağlık İdaresi Dergisi*, 22(2), 437-456.
- Kekeç, D. (2008). Hizmet kalitesi ölçümünde ServQual ölçeği ve otelcilik sektöründe bir uygulama. Yayınlanmamış Yüksek Lisans Tezi. Marmara Üniversitesi Sosyal Bilimler Enstitüsü.
- Kırbaç, G. & Tektaş, B. (2021). Blokszinciri Teknolojisinin Üçüncü Parti Lojistik (3PL) İşletmelerinde Kullanılmasına Yönelik Analitik Hiyerarşi Süreci (AHP) Uygulaması. *İşletme Ekonomi ve Yönetim Araştırmaları Dergisi*, 4 (1), 1-16. DOI: 10.33416/baybem.763265
- Kwong, C. K. and Bai, H. (2003), Determining the Importance Weights on the Customer Requirements in QFD Using a Fuzzy AHP with an Extent Analysis Approach, *IIE Transactions*, 35, pp. 619-626.
- Leister, J. & Stausberg, J. (2007). Why Do Patients Select a Hospital?. *Journal of Hospital Marketing & Public Relations*, 17(2), 13-31.
- Lewis, R. C. & Booms, B. H. (1983). The marketing aspects of service quality. *Emerging perspectives on services marketing*, 65(4), 99-107.
- Liou, T. S. and Wang, M. J. J. (1992), Ranking Fuzzy Numbers with Integral Value, *Fuzzy Sets and Systems*, 50(3), pp. 247-255.
- Mendoza, G., Prabhu, R. (2000). Multiple criteria decision-making approaches to assessing forest sustainability using criteria and indicators: a case study. *Forest Ecology and Management*, 131: 107–126.
- Min, H. & Min H (1997), “Benchmarking the Quality of Hotel Services: Managerial Perspectives”, *International Journal of Quality & Reliability Management*, 14.6, 582-597.
- Oğuz, I. Ş. I. K., Erişen, M., & Fidan, C. (2016). Tüketicilerin hastane seçiminde etki eden faktörlere ilişkin algılamaları. *İşletme Bilimi Dergisi*, 4(1), 99-110.
- Parasuraman, A., Zeithaml, V. & Berry, L. (1985). A Conceptual Model of Service Quality and Its Implications for Future Research, *Journal of Marketing*, 49 (Fall), 41-50.
- Parasuraman, A., Valarie A., Zeithaml & Leonard L. Berry (1988), “SERVQUAL: Multiple-Item Scale for Measuring Consumer Perceptions of Service Quality”, *Journal of Retailing*, 64.1 (Spring), 12-40.
- Rahman, S., Erdem, R., & Devebakan, N. (2007). Hizmet Kalitesinin SERVQUAL Ölçeği ile Değerlendirilmesi: Elazığ'daki Hastaneler Üzerinde Bir Çalışma.
- Roder-DeWan, S. (2020). Health system quality in the time of COVID-19. *The Lancet Global Health*, 8(6), e738-e739.
- Saaty, T. L. (1980). *The Analytic Hierarchy Process*. McGraw–Hill, New York.

- Saaty, T. L., Vargas, L. G. (1994). "Decision Making with Analytic Hierarchy Process" 1st Ed. RWS Publications, Pittsburg.
- Saaty, T. L. (1995). Decision Making for Leaders: The Analytic Hierarchy Process for Decisions in a Complex World. RWS Publications, Pittsburg.
- Saaty, T. L. (2008). Decision making with the analytic hierarchy process. International of Journal Services Sciences, 1: 83–98.
- Saaty, T. L. and Vargas, L. G. (2001), Models, Methods Concepts & Applications of the Analytic Hierarchy Process. Kluwer Academic Publishers, Boston.
- Sağlık Bakanlığı (2014). Özel Hastaneler Yönetmeliği. <https://www.mevzuat.gov.tr/File/GeneratePdf?mevzuatNo=4854&mevzuatTur=KurumVeKurulusYonetmeli&mevzuatTertip=5> (Son Erişim: 31.01.2021)
- Samancı, M., & Kök, S. B. (2020). Sağlık Kurumlarında Algılanan Hizmet Kalitesi: Samsun İli Örneği. Journal of Healthcare Management And Leadership, (1), 43-53.
- Seth, N., Deshmukh, S.G. & Vrat P. (2005). Service Quality Models: A Review, International Journal of Quality and Reliability Management, 22(9), 913-949.
- Sezer, C., Durmuş, A., & Beşik, M. (2020). Özel Sağlık Kuruluşlarında Hizmet Alan Bireylerin Kalite Algılarının Belirlenmesi: Bir Servis Uygulaması. Sakarya Üniversitesi İşletme Enstitüsü Dergisi, 2(2), 93-98.
- Tektaş Sivrikaya, B. & Ünal, E. (2018). AHP Grup Karar Verme Yöntemi İle Bilgi İşlem Çalışanlarının Yetkinlik Temelli Performanslarının Değerlendirmesi. Uluslararası İktisadi ve İdari İncelemeler Dergisi, 17. UIK Special Issue, 501-514. Retrieved from <https://dergipark.org.tr/en/pub/ulikidince/issue/38166/433996>
- Tengilimoğlu, D. (2001). Hastane seçimine etkili olan faktörler: Bir alan uygulaması. Gazi Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 3(1), 85-98.
- Türk Tabipler Birliği, (2020). Salgında Tanı Yöntemleri ve Tedaviler Piyasasının İnsafına Terk Edilemez. https://www.ttb.org.tr/kollar/COVID19/haber_goster.php?Guid=74165d0a-346f-11eb-a453-e3d6872009d0 (Son Erişim: 28 Şubat 2021).
- Wang JJ, Jing Y-Y, Zhang C-F, Zhao J-H. (2009). Review on multi-criteria decision analysis aid in sustainable energy decision-making. Renew Sustain Energy Rev;13:2263–78, [12//].
- Weck, M., Klocke, F., Schell, H., R and Ruenauber, E. (1997), Evaluating Alternative Production Cycles Using the Extended Fuzzy AHP Method, European Journal of Operational Research 100(2), 351-366.
- Wieseke, J., Geigenmüller, A. & Kraus, F. (2012). On the role of empathy in customer-employee interactions. Journal of service research, 15(3), 316-331.
- Zerenler, M., & Ögüt, A. (2007). Sağlık Sektöründe Algılanan Hizmet Kalitesi ve Hastane Tercih Nedenleri Araştırması: Konya ÖRNEĞİ. Selçuk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, (18), 501-519.

Araştırma Makalesi

Hospital Selection Factors For Private Doctors Concerning Their Surgery Operations Services: An Application Of Fuzzy Analytic Hierarchy Process (FAHP)

Özel Muayenehane Hekimlerinin Ameliyat Operasyonlarına İlişkin Özel Hastane Seçim Faktörleri: Bulanik Ahp Uygulaması

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Genişletilmiş Özet

Özel muayenehane hekimleri bazı operasyonlarını gerçekleştirmek için hastanelerle işbirliğine girmektedir. Hastanelerin dış hekim olarak adlandırdıkları uzman hekimlerin rekabetin arttığı sağlık sektörü içerisinde hastalarının tıbbi işlemlerini (ameliyat, doğum vb.) gerçekleştirmek için faydalandıkları hastaneleri seçerken kullandıkları seçim kriterleri ServQual hizmet kalitesi boyutları çerçevesince ele alınmış ve karşılaştırmalı bir Bulanık AHP uygulaması gerçekleştirilerek İzmir ilinde yer alan 3 hastane için bir genel cerrahi kliniği açısından bir araştırma gerçekleştirilmiştir. Bu çalışma Covid-19 Pandemisi öncesinde (2020 yılı öncesi) özel muayenehane hizmeti veren işletmelerin dış paydaş hastane seçimleri üzerinde ele alınmıştır. Sonuç olarak nihai 3 hastane özelinde Bulanık AHP metodu uygulanarak dış hekim hastane seçimleri ServQual hizmet kalitesi boyutları çerçevesinde 10 ayrı hizmet kalitesi ifadesi dikkate alınarak karşılaştırılmıştır.

Bir kamu hizmeti olarak sağlık hizmetleri birçok farklı kurum ve kuruluş tarafından halkın hizmetine sunulmaktadır. Türkiye’de bu kurumların başında kamu ve özel hastaneleri, tıp merkezleri, poliklinikler ve özel doktor muayenehaneleri gibi işletmeler bulunmaktadır. Bu işletmelerin yetkileri çeşitli ruhsatlandırmalarla sağlanmakta ve bu işletmeler Sağlık Bakanlığı denetimine tabi kuruluşlar olarak karşımıza çıkmaktadır. Bu ruhsatlandırmalar ise çeşitli fiziki ve beşeri faktörlerin yeterliliklerine göre gerçekleştirilmekte ve bazı sağlık hizmetlerinin verilebilmesi için bazı temel yeterliliklere ihtiyaç duyulmaktadır. Bu ihtiyaçlar genelde yeterli nitelikli personel (uzman doktor vb.), fiziki şartlar ve yoğun bakım hizmetleri gibi bileşenlerden oluşmaktadır. Bu bileşenler çeşitli yönetmeliklerle bir şart olarak sağlık kurumları için hukuki statü kazanmaktadır. Bu şartların tamamını sağlayamayan sağlık kuruluşları ise birbiriyle çeşitli işbirlikleri içerisine girmekte ve hizmetlerini bu şekilde tamamlamaktadır. 1219 sayılı Tababet Ve Şuabatı San'atlarının Tarzı İcrasına Dair Kanun’un 12. maddesine uygun olarak mesleğini gerçekleştiren doktorlar muayenehanesine müracaat eden hastalarının teşhis ve tedavisini özel hastanelerde gerçekleştirebilmektedirler (Sağlık Bakanlığı, 2014: 16). Örneğin; bir kadın doğum uzmanı bir bebeğin doğum sürecini kendi özel muayenehanesinde takip ederken, doğumun gerçekleştirilmesi için çeşitli hastaneler ile dış hekim olarak anlaşmalar yaparak, doğumu bu hastanelerde gerçekleştirmektedir. Burada hastaneler özel muayenehanelere sahip uzman doktorların bir paydaşı olarak sağlık hizmetinin verilmesi ve tamamlanması sürecinde onların dış paydaşı olmaktadır. Bu dış paydaşlara özel hastanelerdeki bu uygulamada “dış hekim” adı verilmektedir.

Sağlık hizmetleri diğer hizmet türlerinden farklı olarak hizmet telafisinin zor olduğu hizmet alanlarından birisidir. Hizmet sınıflandırılması içerisinde insan bedenine yönelik bir hizmet olması, verilen hizmetin karmaşık ve yüksek bir disiplin altında gerçekleştirilmesini gerektirmektedir. Bu nedenle hastalar için sağlık kurumu ve hekim seçimi önemli bir konu haline gelmektedir. Hastane seçimi; bir sağlık hizmeti müşterisinin sağlık hizmeti veren işletmelerden birini tercih etmesi durumu olarak tanımlanmaktadır (Tengilimoğlu, 2001: 86) Literatürde hastaların verilen sağlık hizmetlerini seçerken kullandıkları kriterler ve hizmet kalitesinin ölçülmesi ile ilgili geçmişten günümüze birçok akademik çalışma bulunmaktadır (Boscarino ve Steiber, 1982; Tengilimoğlu, 2001; Samancı ve Kök, 2020; Sezer vd., 2020). Bununla birlikte özel muayenehane hekimlerinin verdikleri sağlık hizmetlerinin bir parçası olarak dış kaynak kullanımı ile hizmetlerinden faydalandıkları hastaneleri seçmek için kullandıkları kriterler adına gerçekleştirilen çalışma sayısı ise oldukça azdır. Özel bir muayenehane işletmecisi üroloji uzmanı doktorun seçimi bizzat hastanın tercihi iken, gerektiğinde doktorun hastanın ameliyatını gerçekleştireceği hastane seçiminin de ise doktorun tercihleri önem kazanmaktadır. Benzer karar seçim problemleri sektörde yer alan genel cerrahlar, ürologlar, kalp damar cerrahlar vb. doktorların karşısına çıkmaktadır. Bu çalışmada özel sağlık hizmetleri sunan özel muayenehane hekimlerinin hastane seçim kriterleri ortaya konulmuş ve İzmir ilinde yer alan A grubu, yani yüksek riskli ameliyatların gerçekleştirilebildiği 3 hastane dikkate alınarak Bulanık AHP yöntemi ile bir araştırma gerçekleştirilmiştir.

Söz konusu kavramlar ve alan ile ilgili literatürde bulunan çalışmalara bakıldığında belirli tespitler yapmak mümkündür. Hizmet kalitesi; hizmet sürecinin her aşamasında müşterilerin beklentilerinin kesintisiz karşılanması olarak ifade edilmektedir (Lewis ve Booms, 1983: 99). Sağlık hizmetlerinin karmaşık doğası ve insan hayatı gibi önemli bir konuda gerçekleştirilen “eylemleri ve performansları” içerdiğinden sağlık işletmelerinde de hizmet kalitesi hastalarının beklentilerini kesintisiz bir şekilde karşılamak olarak tanımlanabilir. İşletmeler için hizmet kalitesinin ölçülmesi adına hizmet kalitesini etkileyen boyutların tespit edilmesi gerekmektedir (Ergenç, 2021: 54). Bu boyutların tespitinde en çok kullanılan yöntemlerden biri de Parasuraman ve çalışma arkadaşlarının 1988 yılında geliştirdikleri ServQual modelidir (Min ve Min, 1997: 582). Parasuraman ve arkadaşları çeşitli faktörleri dikkate alarak hizmet kalitesi boyutlarını incelemişlerdir (Parasuraman vd, 1988: 30). Gerçekleştirilen çeşitli çalışmalardan sonra bu boyutlar 5 temel boyuta indirgenmiştir, bunlar; fiziksel özellikler, güvenilirlik, heveslilik, güvenlik ve empatidir (Carman, 1990: 33). Hizmet işletmeleri için üzerinde önemle durulması gereken konulardan biri de hizmet kalitesidir. ServQual modeline göre, algılardan beklentilerin çıkarılması ile hizmet kalitesine ulaşılmaktadır (Seth vd, 2005: 917). ServQual boyutlarından oluşan araştırma ölçeği, sağlık kuruluşları için hasta algılarını ve hizmet kalitesini ölçümlemek adına geçerli ve standart bir ölçek olarak kabul edilmektedir (Devebakan ve Aksaraylı, 2003: 43). Bu nedenle sağlık işletmelerinin hizmet kalitesi boyutlarını tespit etmek adına Servqual ölçeğini kullanmak ve servqual boyutları çerçevesinde hizmet ifadelerini incelemek mümkündür. Bu çalışmada muayenehane hekimlerinin paydaş olarak seçmeyi düşündüğü hastaneleri seçerken değerlendirmeye aldığı kriterler Servqual boyutları çerçevesinde ele alınmıştır.

Tablo 1:Dış Hekimlerin Hastane Seçimi Faktörleri

No	ServQual Boyutları	Dış Hekimlerin Hastane Seçiminde Değerlendirdiği Faktörler
1	Fiziksel Özellikler	<ul style="list-style-type: none"> Hastanenin Fiziki Şartları Hastanenin Muayenehaneye Ulaşım Kolaylığı
2	Güvenilirlik	<ul style="list-style-type: none"> Alınan Hizmetlerin Uygun Fiyatlı Olması Hastanenin Marka Bilinirliği ve Olumlu İmaj
3	Güvenlik	<ul style="list-style-type: none"> Yardımcı Sağlık Personelinin Deneyimli ve Donanımlı Olması Kaliteli Tıbbi Ekipman ve Malzeme Kullanması
4	Heveslilik	<ul style="list-style-type: none"> Servislerin Klinik Etkililiğinin Yüksek Olması Örgütsel Kültürün İşbirlikçi Olması
5	Empati	<ul style="list-style-type: none"> Müşteri İlişkileri Sisteminin Varlığı Personelin Dış Hekim Hastalarını Sahiplenmesi

Tablo 1’de ServQual boyutları kapsamında dış hekimlerin hastane seçiminde dikkate aldıkları faktörler bulunmaktadır. Bu kapsamda söz konusu bu faktörler öncelikle AHP yöntemi ile analiz edilmiştir. Burada AHP yöntemine ait adımlar çalışma kapsamında adım adım uygulanmıştır.

İkili karşılaştırma matrisindeki öğeler a_{ij} biçiminde gösterilir. İkili karşılaştırma matrisinin köşegen elemanları 1’dir ve köşegenin altındaki elemanlar aşağıdaki eşitlikle bulunur;

$$a_{ji} = \frac{1}{a_{ij}}$$

AHP’deki kriter ve alt kriterlerin öncelikleri belirlendikten sonra, kriterlerin ve alt kriterlerin kendi aralarında önemini belirlemek için aşağıda gösterilen $(n \times n)$ ikili karşılaştırma matrisi oluşturulmuştur (Saaty, 1995);

$$D = \begin{bmatrix} a_{ij} \end{bmatrix} = \begin{bmatrix} 1 & a_{12} & \dots & a_{1n} \\ 1/a_{12} & 1 & \dots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ 1/a_{1n} & 1/a_{2n} & \dots & 1 \end{bmatrix}_{n \times n}$$

İkili karşılaştırma matrisinin oluşturulmasından sonraki adım, ilgili matristeki her bir maddenin diğer maddelere göre önemini gösteren özvektörün hesaplanmasıdır. Matrisin $(n \times 1)$ boyut özvektörü aşağıdaki gibi belirlenir:

$i= 1, 2, 3, \dots, n$ ve $j= 1, 2, 3, \dots, n$;

$$b^{ij} = \frac{a^{ij}}{\sum_{i=1}^n a_{ij}} \quad w_i = \frac{\sum_{j=1}^n b_{ij}}{n}$$

AHP yönteminde, tüm kriterler için önem ağırlıkları bulunmakta ve öncelik vektörü (w) elde edilmektedir. Burada, öncelikler vektörünün tutarlılığını test etmek için Tutarlılık Oranı bulunmalıdır. Tutarlılık Oranı (CR), ikili karşılaştırma matrislerinin her biri için hesaplanır. Bu oran için 0.10'luk bir üst sınır olması arzu edilir. 0.10'un üzerindeki bir oran, karar vermede bir tutarsızlığı gösterir. Bu durumda, yargılarda iyileştirme gereklidir. CR bulunurken önce ağırlıklı toplam vektörü Axw hesaplanır (Saaty ve Vargas, 1994). Daha sonra matrisin en yüksek öz değeri (λ_{max}) aşağıdaki denklem kullanılarak hesaplanır.

$i= 1, 2, 3, \dots, n$ and $j= 1, 2, 3, \dots, n$;

$$D = [a^{ij}]_{n \times n} \times [w_i]_{n \times 1} = [d_i]_{n \times 1}$$

$$\lambda_{max} = \frac{\sum_{i=1}^n \frac{d_i}{w_i}}{n} \quad CR = \frac{\lambda - n}{(n-1).RI}$$

Burada, özel muayenehane işleten doktorların hastane seçim kriterlerini gösterirken HSF1 - HSF10 aralığındaki kısaltmalar kullanılmıştır. Ardından söz konusu 3 hastane için belirlenen 10 hastane seçim kriterleri Bulanık AHP yöntemindeki gerekli adımlar ve formüller uygulanarak analiz edilmiştir. Bu sürecin ardından Bulanık AHP ile elde edilen satır ağırlıkları bulunmuştur.

Table 2: Bulanık AHP Yöntemi ile Hastanelerin Normalize Edilmiş Toplam Etkisi

	HSF 1	HSF 2	HSF 2	HSF 4	HSF 5	HSF 6	HSF 7	HSF 8	HSF 9	HSF 10	Hastane Toplam Etkisi
HSF Ağırlıkları	0,085	0,074	0,038	0,043	0,27	0,187	0,132	0,083	0,015	0,072	
Hastane 1	0,454	0,595	0,554	0,538	0,323	0,612	0,612	0,676	0,226	0,539	0,508
Hastane 2	0,454	0,283	0,373	0,299	0,405	0,087	0,087	0,142	0,318	0,297	0,262
Hastane 3	0,093	0,122	0,074	0,164	0,272	0,301	0,301	0,182	0,457	0,164	0,230

Burada Tablo 2, Bulanık AHP yöntemi kullanılarak hastanelerin normalleştirilmiş toplam etkisini göstermektedir. Başlangıçta, her bir hastane seçim faktörünün önem ağırlıkları gösterilmiştir. Daha sonra her hastane için hastane seçim faktörleri açısından önem ağırlıkları ayrı ayrı

verilmiştir. Ayrıca, her bir hastane seçim faktörünün ağırlıkları ile hastanelerin ağırlıkları tek tek çarpılarak hastanelerin toplam etkisi hesaplanmıştır.

Son olarak, hastanelerin toplam etkisi analiz edilirken, Hastane 1, 0,508 toplam önem ağırlığı ile özel klinikler için dış paydaş olarak en iyi alternatif hastanedir. Bununla birlikte, Hastane 2, 0.262 toplam önem ağırlığı ile özel klinikler için dış paydaş olarak en iyi ikinci alternatif hastanedir. Ayrıca, Hastane 3, 0,230 toplam önem ağırlığı ile özel klinikler için dış paydaş olarak üçüncü en iyi alternatif hastanedir.

Anahtar Kelimeler: Hizmet Pazarlaması, Servis Sistemleri, Hizmet Kalitesi, ServQual, Muayenehane Hizmetleri, Dış Hekim Hastane Seçimi, Sağlık Hizmetlerinde Lojistik, Bulanık AHP

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