

Determining The Optimal Combinations Of The Factors Affecting The Choice Of Health Facility

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Abstract

This dissertation study aims to determine the patients' primary focus in choosing healthcare facilities. For this purpose, we tried to identify the optimal combination of the factors that affect the patient choice of healthcare facilities. In this study aiming to determine the optimal combinations, multivariate statistical methods, primarily conjoint analysis, were utilized. In the lights of the study results, it is aimed to ameliorate the existing healthcare facilities and complete those under construction by considering these findings. Thus, unnecessary expenses would be reduced and supply and demands of both patients and the healthcare facilities would be converged on more quickly and wastage in state budget would be prevented.

Keywords: health facility, conjoint analysis, optimal, combinations

1. Introduction

Since the importance of technology and the competition brought by it increased, sample needs to be constantly observed so that presented goods or service can be harmonic with the demands from consumers. There is the idea which when supply is met in the production of goods or services there will also be demand. Abandoning this idea, which gives importance to creating supply in accordance with the demand of consumer, presented the necessity of exchange of information about several topics from convenience of presented goods or services for expectations of consumers to how much this convenience return profit to producer. Thus, demand for market surveys increased because which of the features of goods and products, that is going to be produced, need to be given importance to are known (Yeniay, 2007).

1.1 Aim of the Study

All consumers make a choice between goods and services by taking their conditions and needs based on them into consideration. While buying a car, is color or brand more important than price? While choosing a travel company, is comfort given more importance to than service quality?

While even appealing of financially valuable goods or services to the consumer increases the probability to be preferred, in the topic of health, which can not be measured with materiality in question, knowing which factors are given importance to by consumers increases the probability to be preferred.

It is advised for facilities existing with this increase to make arrangements and for facilities in foundation phase to complete their foundation taking account of these measurements. In this way, it will be economized in the subjects, which consumers do not give importance to, and both health and also government facilities will avoid wastage. In 2005 Germany, Jans Leister and Jürgen Stausberg perceptibly showed the expectations of patients in Germany with a similar study. With this study, it is aimed to greatly contribute to the state budget in expenses of subjects to which patients do not give importance in Germany (Leister J. and Stausberg, 2007).

Aim of this study is to determine optimal combination of factors to which health service areas give importance for Samsun in particular. Also the second aim is to help decision makers in developing strategies.

1.2 Literature Research

In this study, a lot of studies carried out in various sectors either domestic or abroad regarding conjoint analysis are explored. In one of the studies, which aim to understand how much and which features people give importance to in transportation sector, it is seen that people give importance to the name of bus company the most and in others to the brand of bus (Gurbuz and Kaygusuz, 2004; Yeniay 2007).

In a study done in the health insurance sector, it is determined that the first thing to pay attention while being insured for a comprehensive insurance is the name of the insurance company (Aslan, 2006).

In the study of the factors affecting energy saving, it was seen that the most important factor in energy saving according to participants was environmental anxiety and socio-demographic types (Poortinga et al, 2003).

In a study investigating the quality of service in the health sector in Konya with an ANOVA analysis, it was observed that patients preferred the hospital they stayed with, and that most patients emphasized whether or not they had an agreement with social security facilities (Zerenler and Ogut, 2007).

In both of the two studies that have been conducted to determine what consumers are paying attention to when choosing a mobile phone, it has been seen that the first thing to pay attention to is the phone brand (Camlidere, 2005; Dikici, 2006).

In hospitals operating in the health sector, it has been determined that when patients evaluate hospitals in terms of general services, the primary problem is the inconvenience experienced in the placement of hospital and hospital units (Kılınc, 2006).

In a study on cessation policy of smoking in Japan, the demand for nicotine gum was investigated (Ogura et al., 2006).

In Hungary, a study was conducted aiming to determine patient preferences and to make a health reform in the direction of patients' demands while establishing health policy (Akkazieva et al., 2006).

It has been observed that tests using monitor devices have yielded more reliable results in a study comparing pregnancy-related tests to determine whether or not infants had Down's syndrome (Bishop et al, 2004).

In a study to understand the university preferences of students who graduate in Australia, it has been reached the conclusion that students give importance to academic dignity (Soutar and Tumer, 2002).

A study comparing the types of analyzes in the evaluation and design of health care unit programs showed that the conjoint analysis yielded better results than other survey researches (Graf et al, 1993).

It was observed that the nurses in the Emergency Department unit made these decisions based on the future health status of the nurses in the study regarding to understanding the decisions taken by the nurses in place of the mentally handicapped individuals (Fisher et al., 2010).

In a study conducted in Japan, it is explored what Japanese people, whom has caught a cold, give importance regarding to selecting health facility and according to what (Suzuki and Ohkusa, 2000).

2. Determining The Factors That Can Affect The Choice Of Health Facility

In this study, since while determining the factors that can affect the choice of health facility it is not possible to present all the factors, which can affect consumers, in terms of cost and time, a limited number of factors were included in the study considering what expectations the vast majority of consumers might have. These are the location of the health care facility, the capacity of the health care facility, the modernity of the health care

facility, the freedom of gender choice in the procurement of health care services, qualified staff competence and the level of interest of the staff.

3. Conjoint Analysis

Conjoint analysis is a market research method which determines consumer preferences of multi-featured goods or services that are effective in determining demand (Tatlidil, 1995). The word “conjoint” consists of the combination of the words “CONside” and “JOINT”.

Conjoint Analysis has been used in several fields such as automotive, mobile technology, information technology, retail, and health. For the name of this analysis to be closer to our language, it can be expressed as “analysis of relations” or “analysis of synergies”. It is included in literature in 1971 and afterward, many theorists and researchers used it in their preference analysis (Gustafsson et al, 2003). The reason for it to be quite widespread is its availability to be used in several fields. Conjoint analysis provides important information about topics such as how businesses can make changes in their products or services, what points in product development work should be addressed, how current and potential customers in the market can respond to these changes, how the overall trend in the market will affect business products and services, how balances in the market will change if they continue or develop new products and services, how the new products and services of the competitors will affect consumers, and how pricing will reflect the market.

There are two assumptions related to conjoint analysis. The first one is that it can be determined as combinations of quality levels of products and services and the second one is that it can identify detailed impressions of these quality levels left on consumers for that product or service (Gill and Sanchez, 1997).

The application of the conjoint analysis begins with defining the problem and determining the aim of the research and ends with determining the variables and their levels and collecting and evaluating the data accordingly. The steps between the beginning and end of the analysis consist of 12 steps. These steps are outlined as following (Hair et al, 1995; Malhotra, 1996; Gustafsson et al, 2003; Green and Srinivasan, 1978; Tull and Hawkins, 1993; Yalniz and Bilen, 1997; Deniz, 2002; Sonmez, 2001).

Step 1: Defining the problem and determining the aim of the research.

Step 2: Determining the variables and their levels

Step 3: Determining preference function (Vector Function, Ideal Point Function, Piecewise Function)

Step 4: Choosing the method for data collection (Full profile method, Trade-Off method, Paired comparison method)

Step 5: Forming a trial combination (Multi-factorial design, Fractional multi-factorial design)

Step 6: Determining the scale of preferences

Step 7: Determining survey method and design pattern for card/screen preferences.

- Step 8: Assumptions
- Step 9: Preference of the estimation method
- Step 10: Evaluating and interpreting results
- Step 11: Testing the validity and reliability of results
- Step 12: Applying conjoint results

4. Application

This study was prepared to show whether the characteristics such as transportation, capacity, modernization, gender selection freedom, staff interest and quality affect consumer preferences in the selection of health facilities. When consumers receive health care services or choose their preferences how they perceive the various factors related to the health care in the study were made in order to determine in general the degree of importance of the determined factors in the consumer decision and in particular the contribution of each factor level to the consumer benefit.

In total, 484 people participated in the survey carried out in this conjoint analysis study conducted regarding the selection of the health facility. The survey was applied in various districts of Samsun in July 2012 and the districts, where the questionnaires were surveyed, were determined at random. The demographic information of participants participating in the surveys is given in Table 01.

Table01 Demographic information of participant

Factor		Level	%
Gender		Female	47.73
		Male	52.27
Age		16-25	25
		26-35	25.83
		36-45	18.19
		46-55	20.04
		56-65	10.94
Education Level		Primary school	23.14
		Secondary school	14.46
		High school	28.51
		Univercity-College	26.45
		Graduate school	7.44
Income Level		0-500 TL	18.6
		500-1000 TL	32.84
		1000-1500 TL	21.7
		1500-2000 TL	12.4
		2000 TL and more	14.46
Insurance State		Forced Health Insurance	7.65
		Social Security Facility Insurance	83.47
		Special Health Insurance	8.88
Do You Think The Title of a Doctor Is Important?		Important	76.24
		Not Important	23.76
What kind of health establishment do you prefer when you divide the severity of the disease three times to be light, moderate and heavy?	Lightly Severe	State Hospitals	30.17
		Training and Research Hospitals	4.96
		Private Hospitals	8.88
		Community Clinics (Family Practice Center)	49.38
		University Hospitals	6.61
	Moderate Severe	State Hospitals	43.18
		Training and Research Hospitals	16.94
		Private Hospitals	23.97
		Community Clinics (Family Practice Center)	2.27
		University Hospitals	13.64
	Heavy Severe	State Hospitals	14.05
		Training and Research Hospitals	16.74
		Private Hospitals	30.37
		Community Clinics (Family Practice Center)	0
		University Hospitals	38.84

5. Results

Health sector is one of the fastest developing service sectors. Especially in recent years, technological developments and transformations in the medical world have made the health sector one of the most important sectors. In health facilities input is the people who are ill and output is people who are treated and the health facilities are serving all day every day of the year thus increasing the importance and the numbers of them day by day (<http://ispartamyosdu.edu.tr/tr/yonetim-ve-organizasyon/saglik-kurumlari-isletmeciligi-738s.html>).

Increased knowledge and technology are pushing to change faster than today's healthcare industry is. Healthcare facilities within the healthcare sector that are in the process of rapid change and that play an important role in improving the health status of the community also have to change with the industry [18]. Since this change will increase the likelihood of being preferred by the health facility because it is in line with consumer desires, consumer wishes should be determined. At this stage, statistical decision-making methods allow the producer to know the liking of the consumer in advance. Conjoint analysis is one of the multivariate statistical methods used for this purpose.

When taking goods or services, multiple factors play a role in the decision-making process. And each individual's preference over these factors may be different. In this case, a survey including combinations of these variable levels and these variables which are thought to be efficient in preferring the product, which is going to be produced, by the consumer in conjoint analysis are prepared. This survey is presented to consumers and they are asked to give preference to combinations. From these given preference scores, it is tried to determine the optimal product combination. The main point of this analysis is that the taking of complex decisions, including the decision to buy, is not based on a single factor or criterion, but rather a combination of factors.

In case the sex is accepted as variable, the healthcare facility, which is with the same optimal combination by the male and female respondents, is in the center of the city, its healthcare facility capacity is big enough for all kind of health services, is modern, choice of gender is possible in its health service procurement, its number of qualified personnel in health facility is many and its personnels are concerned with patients, has become the healthcare facility with the highest level of preference.

In case the sex is accepted as variable, the healthcare facility, which is with the same optimal combination by the respondents between 16 – 25, 26 – 35, 36 – 45 and 56 – 65 age ranges, is in the center of the city, its healthcare facility capacity is big enough for all kind of health services, is modern, choice of gender is possible in health service procurement, number of qualified personnel in health facility is many and personnels are concerned with patients, has become the healthcare facility with the highest level of preference.

However, the healthcare facility, which is with the same optimal combination by the respondents between 46 – 55 age ranges, is in the center of the city, healthcare facility

capacity is big enough for all kind of health services, is modern, choice of gender is not possible in health service procurement, number of qualified personnel in health facility is many and personnels are concerned with patients, has become the healthcare facility with the highest level of preference.

In case the education level is accepted as variable, the healthcare facility, which is with the same optimal combination by the primary, secondary and highschool graduate respondents, is in the center of the city, healthcare facility capacity is big enough for all kind of health services, is modern, choice of gender is possible in health service procurement, number of qualified personnel in health facility is many and personnels are concerned with patients, has become the healthcare facility with the highest level of preference. However, the healthcare facility, which is with the same optimal combination by the university-college and graduate school graduate respondents, is in the center of the city, healthcare facility capacity is big enough for all kind of health services, is modern, choice of gender is not possible in health service procurement, number of qualified personnel in health facility is many and personnels are concerned with patients, has become the healthcare facility with the highest level of preference.

In case the monthly income is accepted as variable, the healthcare facility, which is with the same optimal combination by the respondents between 0 – 500 TL and 500 – 1000 TL monthly income ranges, is in the center of the city, healthcare facility capacity is big enough for all kind of health services, is modern, choice of gender is possible in health service procurement, number of qualified personnel in health facility is many and personnels are concerned with patients, has become the healthcare facility with the highest level of preference. However, the healthcare facility, which is with the same optimal combination by the respondents between 1000 – 1500 TL, 1500 – 2000 TL and 2000 TL and more monthly income ranges, is in the center of the city, healthcare facility capacity is big enough for all kind of health services, is modern, choice of gender is not possible in health service procurement, number of qualified personnel in health facility is many and personnels are concerned with patients, has become the healthcare facility with the highest level of preference.

In case the answers given to question "Do You Think The Title of a Doctor Is Important?" is accepted as variable, the healthcare facility, which is with the same optimal combination by the respondents with the answer "It is important", is in the center of the city, healthcare facility capacity is big enough for all kind of health services, is modern, choice of gender is not possible in health service procurement, number of qualified personnel in health facility is many and personnels are concerned with patients, has become the healthcare facility with the highest level of preference.

However, the healthcare facility, which is with the same optimal combination by the respondents the center of the city, healthcare facility capacity is big enough for all kind of health services, is modern, choice of gender is possible in health service procurement,

number of qualified personnel in health facility is many and personnels are concerned with patients, has become the healthcare facility with the highest level of preference.

In case the type of health insurance is accepted as variable, the healthcare facility, which is with the same optimal combination by the respondents belonging to forced health insurance and social security facility insurance (retirement fund, ssk, bağ-kur etc.), is in the center of the city, healthcare facility capacity is big enough for all kind of health services, is modern, choice of gender is possible in health service procurement, number of qualified personnel in health facility is many and personnels are concerned with patients, has become the healthcare facility with the highest level of preference. However, the healthcare facility, which is with the same optimal combination by the respondents belonging to private health insurance, is in the center of the city, healthcare facility capacity is big enough for all kind of health services, is modern, choice of gender is not possible in health service procurement, number of qualified personnel in health facility is many and personnels are concerned with patients, has become the healthcare facility with the highest level of preference.

In case the type of when you divide the severity of the disease three times to be light, moderate and heavy is accepted as variable, the healthcare facility, which is with the same optimal combination by the respondents who chose state hospitals and community health centers (family practice center), is in the center of the city, healthcare facility capacity is big enough for all kind of health services, is modern, choice of gender is possible in health service procurement, number of qualified personnel in health facility is many and personnels are concerned with patients, has become the healthcare facility with the highest level of preference. In case the type of lightly severe disease, the healthcare facility, which is with the same optimal combination by the respondents who chose training-research hospitals, private hospitals and university hospitals, is in the center of the city, healthcare facility capacity is big enough for all kind of health services, is modern, choice of gender is not possible in health service procurement, number of qualified personnel in health facility is many and personnels are concerned with patients, has become the healthcare facility with the highest level of preference. In case the type of moderately severe disease, the healthcare facility, which is with the same optimal combination by the respondents who chose state hospitals, training and research hospitals, community health centers (family practice center) and university hospitals, is in the center of the city, healthcare facility capacity is big enough for all kind of health services, is modern, choice of gender is possible in health service procurement, number of qualified personnel in health facility is many and personnels are concerned with patients, has become the healthcare facility with the highest level of preference. However, in case the type of moderately severe disease, the healthcare facility, which is with the same optimal combination by the respondents who chose private hospitals, is in the center of the city, healthcare facility capacity is big enough for all kind of health services, is modern, choice of gender is not possible in health service procurement, number of qualified personnel in health facility is many and personnels are concerned with patients, has become the healthcare facility with the highest level of preference. In case the type of heavily severe disease, the healthcare facility, which is with the same optimal combination by the respondents who chose state

hospitals, training and research hospitals and university hospitals, is in the center of the city, healthcare facility capacity is big enough for all kind of health services, is modern, choice of gender is possible in health service procurement, number of qualified personnel in health facility is many and personnels are concerned with patients, has become the healthcare facility with the highest level of preference.

However, in case the type of heavily severe disease, the healthcare facility, which is with the same optimal combination by the respondents who chose community health centers (family practice centers), is in the center of the city, healthcare facility capacity is big enough for all kind of health services, is modern, choice of gender is not possible in health service procurement, number of qualified personnel in health facility is many and personnels are concerned with patients, has become the healthcare facility with the highest level of preference.

When the results of the general conjoint analysis for all levels of the variables of gender, age, educational status, monthly income, doctor's title, type of health insurance utilized and disease severity variables are taken into consideration, combinations where healthcare facility is in the center of the city, healthcare facility capacity is big enough for all kind of health services, healthcare facility is modern, number of qualified personnel in health facility is many and personnels are concerned with patients are efficient in forming the healthcare facility with the highest level of preference. And in case the factor of choice of gender in health service procurement, it is seen different choices on a lot of variable and levels. It has been observed that there is a sharp contradiction in gender selection freedom in the health care procurement at the level of education level, the level of income and the importance given to the doctor's name, the level of the health insurance beneficiary's private health insurance, while the remaining variables and levels are requested to be free of gender selection in health services.

When all the variables and levels are taken together and general conjoint analysis is applied, as a result; While consumers prefer health care facilities, they were first to pay attention to the number of qualified personnel. As a result of the overall analysis of the respondents, the number of qualified personnels showed that they gained importance to the variables of gender selection freedom, the interest of the patients, the place of the health facility, the modernity of the health facility and the capacity of the health facility, respectively. In addition to this, the results of the simulation are supported by the results of the general and specific conjoint analysis.

Table 02 Table of general conjoint analysis

GENERAL CONJOINT ANALYSIS TABLE			
Mean Significance	Utility Coefficient	Variable Name	Variable Level
16.061	0.387	Location of Health Facility	In The Center of The City
	-0.387		Outside of The City
10.873	-0.422	Capacity of Health Facility	Big Enough to Give All Kinds of Health Care
	-0.844		Big Enough to Give Some Kinds of Health Care
12.605	-0.735	Modernity of Health Facilities	Modern
	-1.47		Not Modern
16.981	0.83	Freedom of Gender Selection in Health Service Procurement	Gender Selection is Possible in Service Procurement
	-0.83		Gender Selection is Not Possible in Service Procurement
26.667	-1.92	Number of Qualified Personnels in Health Facilities	Number of Qualified Personnels is High
	-3.84		Number of Qualified Personnels is Low
16.812	-1.196	Consideration of Personnels in Health Facilities to Patients	Personnels are Considerate
	-2.392		Personnels are Not Considerate
CONSTANT	10,905		
Pearson's R = 0,999		Significance= 0,000	
Kendall's Tau = 0,929		Significance= 0,000	

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