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## Priority of Determinants Influencing the Behavior of Purchasing the Capital Medical Equipments using AHP Model

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**Abstract:** Knowing the consumers' behavior can help many of the medical equipments supplier companies to maintain their competitive strength and employ more effective strategies. The goal of this study was to study of determinants influencing the behavior of purchasing the capital medical equipments using AHP model. The present study is a descriptive cross-sectional study conducted in 2012. 31 managers of hospitals medical equipments in Tehran University of Medical Sciences' hospitals were selected using census method. For data gathering a researcher-made questionnaire was used. Then, the collected data was analyzed using AHP model, SPSS 17.0 and Expert choice 5.0. Four determinants were influencing the purchase of capital medical equipments among which "quality" was the most influential determinant with the highest geometric mean (0.58) and "price" was the least influential one with the lowest geometric mean (0.08). Conclusion: quality and brand as the determinants influencing the medical capital equipments customers' behavior must be taken into consideration by the medical equipments supplier companies and it is necessary for them to choose the customers' priorities as a basis for their development plans and actions.

**Key words:** Purchasing % Behavior % Medical Equipments % AHP

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### INTRODUCTION

In today's world, understanding consumer behavior and identifying important features of products that play a role in consumer decision-making are the cores of marketing programs for each organization [1-3]. Consumer behavior is the behavior which a consumer shows before, during and after buying a product. So, comprehensive approach by companies to understanding the consumer perception is needed [4-8].

With the advancement of information technology, medical technology in field of equipments especially capital equipments has also grown [9-11]. In the meantime, medical equipments as a tool for diagnosis and treatment of diseases have an important role in healthcare so that

there is a relatively high volume of transactions in the market for medical equipments and high costs are also paid for providing these equipments [12-13].

Product sales in the current era are not as easily as those in the past decades because the products are more diverse and purchaser have good chances to choose products which fulfill their needs. Therefore, those organizations and companies are successful which take their consumers' needs into consideration and meet them [14,15].

Understanding the determinants that could influence consumer purchasing decisions is critically important for companies, especially companies that are competing in global markets [16]. A common belief is that consumers buy products based on the products quality [17].

It can help manufacturers and companies design marketing strategies, price, segment markets, promote and distribute their products [18,19].

Consumer behavior is activities which are associated with choosing, purchasing and making decisions to meet consumers' needs. Study of consumer behavior can determine why people consider certain products and which determinants have effects on their decision-making processes [20].

Models of consumer behavior have two main goals: first, to describe, control and predict consumer behavior; and the second one is to help researchers communicate among determinants which influence the product purchasing [21]. Some models of consumer behavior are including black box model that includes input, purchaser and output [22], mathematical models which are based on mathematical formulas and are used to measure customer attitudes, beliefs and judgments [23], decision-making models which consist of input, process (assessing needs, searching information, evaluating alternatives, deciding and reacting after purchase) and output [24].

Philip Kotler in a Marketing Mix model for consumer behavior analysis has taken four determinants into consideration to satisfy target groups: product, price, place and promotion [25]. Also, based on the findings of Armstrong and Kotler's study, in addition to the marketing mix determinants (4P), other determinants including cultural, social, personal and psychological determinants have effects on the purchase [26]. The findings of Ranjbarian's study showed that promotions and advertisements, perceived quality, price and brand had relationship with buyers' attitudes [5].

Among the existing multiple-criteria decision making methods, Analytic Hierarchy Process (AHP), which was first introduced in 1970, has been welcomed by managers because of its simplicity and comprehensiveness. This method solves complex problems using the relative importance of a set of related criteria and has been used by decision makers around the world to solve problems of policy making, resources allocation and strategic planning. One of the most important features of this method is its ability to combine qualitative and quantitative determinants in the decision-making process [27-32].

So far many researches have been done on consumer behavior, however, most of them considering the extent and complexity of determinants that influence consumer behavior, have studied the relationship between the determinants in researchers' mind and the behavior of consumers. Also, more of these researches have not done in the field of the capital medical equipments. According

to those mentioned, this study has been conducted to examine the determinants influencing the purchase of capital medical equipments from the perspective of medical equipments managers of Tehran University of Medical Sciences hospitals. Acquaintance of policy makers, importers and representatives of large companies with determinants influencing managers' decisions can be very important and help them plan, take decisions and develop key strategies for their products.

## **METHODS**

The present study is a descriptive cross-sectional study conducted in 2012 for the purpose of prioritizing the determinants influencing the behavior of purchasing the capital medical equipments from the perspective of Tehran University of Medical Sciences hospitals' medical equipments managers.

31 managers of hospitals medical equipments in Tehran University of Medical Sciences' hospitals were selected using census method and entered into the study.

A researcher-made questionnaire was used for gathering data. There are many determinants involved in decision making for purchase. Among numerous models introduced in different studies regarding the purchasing behavior models of the industrial supplies customers, four determinants including quality, price, brand and after-sale services were exploited as the most important one. The basic model in this research was Kuada Model [33] and thereafter the exploited determinants were finalized using the medical equipments and marketing experts' viewpoints. Before the actual distribution, the questionnaire was sent for 5 experts for reviewing and its validity was confirmed by them. The reliability of questionnaire was estimated and confirmed using Cronbach's alpha coefficient ( $\alpha=0.84$ ) using SPSS 17.0. Also the managers' consent was obtained for entering into the study and filling out the questionnaire.

In the AHP model, having determined the study goal, which in this study was identifying determinants affecting the purchasing decisions about capital medical equipments, the influential determinants were determined that were 4 determinants. Then, some criteria were determined for each determinant and, accordingly, a paired scales questionnaire was developed which compared determinants on the basis of numerical paired comparisons using numbers 1 to 9 which the number 1 indicated the equal importance of the two determinants and the number 9 represented the greatest importance of a determinant in relation to another one. In Figure 1, AHP model for this study has showed.

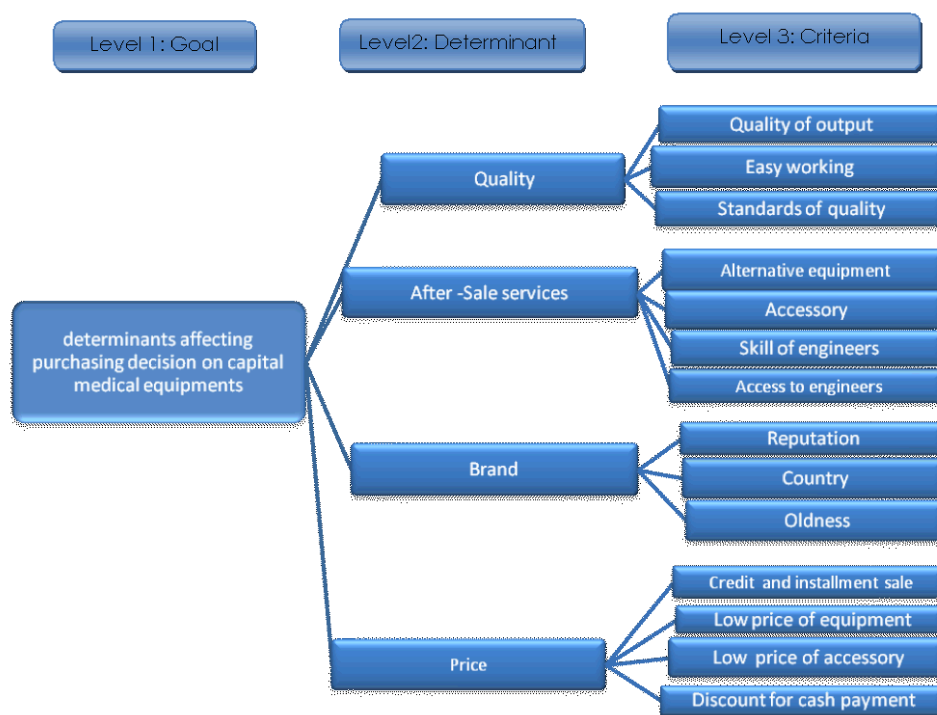


Fig. 1: AHP model for determinants affecting purchasing decision on capital medical equipments

**RESULTS**

Determinants which had effects on the purchasing equipments included four determinants and 14 criteria and following results were achieved after making related calculations:

C Determinants influencing the purchase of equipments were four determinants among which "quality" was the most influential determinant with the highest geometric mean (0.58) and "price" was the least influential one with the lowest geometric mean (0.08) (Table 1).

Table 1: Determinants affecting purchasing decision on capital equipments

Determinant	Weight	Priority	IR
Quality	0.58	1	0.07
After-sale services	0.12	3	
Brand	0.21	2	
Price	0.08	4	

Table 2: Ranking variables affecting purchasing decision on capital equipments

Determinant	Variable	Weight	Priority	IR
Quality	Quality of outputs	0.14	3	0.05
	Easy working	0.49	1	
	Standards of quality	0.31	2	
After-sale services	Alternative equipments	0.08	4	0.05
	Accessory	0.42	1	
	Skill of engineers	0.15	3	
	Access to engineers	0.32	2	
Brand	Reputation	0.31	2	0.03
	Country	0.49	1	
	Oldness	0.19	3	
Price	Credit and installment sale	0.30	1	0.04
	Low price of equipments	0.11	2	
	Low price of accessory	0.49	3	
	Discount for cash payment	0.09	4	

- C Quality included three criteria which "easy working" was the most influential criteria (with the geometric mean of 0.49) and "quality of output" were the least influential one (with the geometric mean of 0.14).
- C After-sale services included four criteria which "accessory" had the greatest influence (with the geometric mean of 0.42) and "alternative equipments" had the lowest influence (with the geometric mean of 0.10).
- C Brand included three criteria which "country" had the greatest impact (with the geometric mean of 0.49) and "oldness" had the lowest impact (with the geometric mean of 0.19).
- C Finally, price included 4 criteria which "credit and installment sale" was the most influential criteria (with the geometric mean of 0.30) and "discount for cash payment" was the least influential one (with the geometric mean of 0.09).

## DISCUSSION

This study was conducted for the purpose of prioritizing the determinants influencing the behavior of purchasing the capital medical equipments in Tehran University of Medical Sciences' hospitals. Nowadays considering the competitive conditions among medical suppliers companies, paying attention to the customers' attitudes and priorities is the prevalent strategy for dealing with such conditions. The prevalent attitude is that the customers tend to rely on the criteria that principally affect their decision making process and in this era, more attention have been paid to the marketing mixed determinants [34-35].

Results of this study showed that among the determinants effective in purchasing behavior including the quality, price, brand and after-sale services, the quality is the first priority and the price is the last one. Also the brand is the next priority after the quality and is indicative of the fact that the health services organizations assign considerable importance to the quality of the medical equipments and consider it as part of the quality health delivery system. Because one of the success determinants of the health services providers is a correct diagnosis in which the use of the quality medical equipments plays an important role.

Zucker's study results showed that paying attention to the determinants like "brand", "after sale services", "price", software and hardware was necessary when making medical equipments purchases, which is consistent with the results of this study in respect of some determinants [36].

Results of a study conducted in Iran (2009) to study the determinants influential in purchase of the ultrasound devices indicate that effective determinants in opinion of the radiologists who privately provided radiology services included four determinants including price, quality, brand and after-sale services, so that the quality is the first and the brand constitutes the last priority which is contrary to the present study results in which the "price" is the last priority. The important point to infer is that the present study has been carried out by participation of the hospitals' medical equipments managers which are a combination of the experts who assign abundant attention to the aspects entailing quality of the services, while in the above mentioned study only the radiologists have participated and the price has been important to them, as they may seek earning profit anyway [37]. Another study results showed that when the quality of a specific product is guaranteed, the buyer is willing to pay more for that product [38].

Another study results showed that the brand had influences over the purchaser's behavior; because mental image of the manufacturer country reflects the overall perception of the customer about the quality of that product and influences over the customers' preferences in selection of the products; for the trade name entails a symbolic value for the product. In the present article, the "brand" ranks second in the priority order and the customer searches for the quality products through brand, so that some companies aware of the brand's advantage supply products with fake brands and deceive the customers [39-40].

As one of the determinants influential in purchase of the medical equipments, "after-sale services" ranks after the "price" and before the "brand". Other studies' results show that the quality of after-sale services has positive effects on the customer satisfaction and plays an essential role in shaping the customer thoughts for choosing a particular product. Also, this determinant helps to improve the design and quality of the products continuously and acts as a competitive advantage for the medical equipments supplier companies; when the companies seeking higher profits fail in providing optimized after-sale services, the customer substitutes that company for another one [41,42].

In this study, the "price" as one of the determinants influencing the purchasing the medical equipments, is ranked as the last priority, indicating that in providing the patients with the health services, no matter how the expenses may be, it will be the next in priority order. The price is one of the determinants that can generate high

income for the medical equipments supplier companies however suitable prices can attract the customers provided that the quality is observed [43,44].

In competitive space surrounding the organizations, therefore, those organizations will achieve success that recognize their customers' behavior and set their strategies accordingly. Based on the results of this study, the quality, the brand and the after-sale services as determinants influencing the behavior of the medical capital equipments customers must be taken into consideration by the medical equipments supplier companies and it is necessary for them to choose the customers' priorities as a basis for their development plans and actions.

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