

The Effect of Supplier Selection on Operational Performance in Pharmacies

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Abstract -

There are several factors that improve the performance of organizations, and one of these factors is supply chain selection. The supply chain provides a competitive advantage in customer-oriented organizations. Supply chain selection refers to the process of identifying, evaluating and concluding contracts with the suppliers. The supply chain is as important for pharmacies as it is for all businesses.

The aim of this study is to determine the effect of supplier selection criteria on operational performance in pharmacies. Due to time and cost constraints, the research was conducted in Çankaya, Keçiören, Yenimahalle and Altındağ districts of Ankara. In the research conducted in the pharmacy selected by simple random sampling method, a questionnaire was applied to 100 people by face to face interview method. The survey consists of two parts. In the first part, questions containing demographic information, in the second part of the questionnaire, 5-point Likert-type questions, which include the criteria of supply chain selection (cost, quality, timely delivery) and operational performance criteria (market share and profitability), which are formed by the researchers by scanning the literature.

Research data were obtained between March and May 2017. Descriptive statistics, correlation analysis, ANOVA analysis and regression analysis were used to analyze the data. According to the research findings, supplier selection criteria in pharmacy enterprises had a positive effect on operational performance by 49%. According to the results of the study, it was found that there is a statistically significant relationship between the cost, quality and timely delivery operational performance of the supplier selection criteria and that the supplier selection criteria affect the operational performance.

Keywords - Health, Pharmacies, Supply Chain, Operational Performance, Ankara.

I. INTRODUCTION

Supplier selection is an important factor in providing a competitive advantage for organizations.

Supply chain management contributes to reducing costs, improving product quality and improving product or service production. Most of the studies in

The literature emphasizes the effect of supplier choice on productivity [19]. Therefore, supplier selection is very important for all businesses. Supplier selection provides a strategic advantage in achieving the long-term goal of the enterprise and reducing risks. In the supplier selection process, the most important issue is to determine the appropriate decision-making criteria for selecting the right supplier.

Today, businesses in the United States (USA) spend about half of their average income to buy goods and services. The main purpose of the selection of suppliers in businesses is to select the appropriate source to minimize the cost but to improve quality increase customer satisfaction and market share. Providing the input that the enterprises need effectively and efficiently depends on communication with the supplier [1]. The selection of suppliers for businesses is difficult to solve when material and spiritual factors are considered [2]. Therefore, many studies in the literature have developed various criteria and solution suggestions in order to solve the problems encountered in supplier selection effectively and efficiently.

Pharmacies are seen as an important element in the health sector and the pharmaceutical sector [9]. Today, pharmaceutical expenditures are one of the most important areas of the health sector. For this reason, supplier selection is of great importance in performance evaluation as it is an important indicator for managers both about the allocation of resources allocated to health services and the quality of the services provided.

The main purpose of the pharmaceutical sector; has been identified as the establishment of pharmaceutical factories that have international competitiveness, increase the quality of life and meet the majority of the pharmaceutical needs of the countries [25]. Today, in the pharmaceutical sector; the rules tightened by legislation, increased price and market interventions of the state, excessive



competition in the domestic and foreign markets, the adoption of patent protection in pharmaceuticals, adverse economic conditions experienced throughout the country, decrease in exports and increases in imports, public drug purchases and payments have always suffered damage, planned and expected breakthroughs and investments. Like all stakeholders in the pharmaceutical sector, pharmacies are affected by such negativities.

In the Law on Pharmacists and Pharmacies (number of laws: 6197) [26], pharmaceuticals is expressed as “preparing and presenting different types of pharmaceuticals from natural and synthetic pharmaceutical raw materials used in diagnosis and treatment of diseases and prevention of diseases; analysis of the drug, monitoring of its pharmacological effect in terms of sustainability, safety, efficacy and cost; It is the health service that carries out activities to ensure standardization and quality safety of drugs and to inform patients about problems related to drug use and to report problems”. Pharmacist; presenting the medicines in prescriptions issued by doctors to the customer, preparing/having the medicines required to be prepared; in the laboratory, pharmaceutical industry and in drug stores is working as an intermediate staff in drug stores. The importance given to the concept of health and disease with people all over the world and developing is increasing day by day in Turkey. In the health sector serving these concepts, significant developments have been experienced in recent years. The importance given to the health sector in Turkey's economic development is also increasing. In parallel with the developments in health services and the expansion of access to these services, the working areas within the health system are expanding day by day. Accordingly, the range of services provided by pharmacists has increased. Increasing service diversity, changing customer expectations, and global competition brought the importance of supplier selection in pharmacies serving in the health sector.

In a world where global competition is accelerating, supply management plays an important role in reaching pharmaceuticals and medical supplies to the end consumer. It is very difficult to deliver the final product to the customer as soon as possible and safely. Unsupplied products can cause a critical loss of sales for pharmacies. Some customers are willing to wait for products that are not in stock, while others do not want to wait. This situation affects sales negatively and leads to customer losses. Based on the importance of supplier selection, this study aims to examine the impact of supplier selection on operational performance in pharmacies, an important part of the health sector.

II. CONCEPTUAL FRAMEWORK

Supply chain management emerged in the late 1980s as a result of rapid changes in the industrial and business world and the competitive environment, and

its importance has increased gradually since the early 1990s [16]. Supply; is defined as the activity of procuring the materials that the enterprise needs from the market [21]. Although many definitions are encountered in the literature about supply chain, procurement is often defined as the supply of raw materials, equipment and materials with adequate quality and quantity, at an affordable price, with an appropriate delivery [17].

There are many definitions of the supply chain in the literature. Kotler [11] refers to the supply chain as the supply of the materials needed by the enterprise and the supply of these materials with the purchaser after the conversion of these materials into products. Lummus et al. [22], supply chain management; logistics flow, customer order management, production process and all the activities in each supply chainring, including the concept of information flow.

The SCOR (Supply Chain Operations Reference Model) model was developed in 1996 as a result of the efforts of the American Supply Chain Council member institutions. This model is the first and only reference model in the world which is accepted as an inter-industry standard for the supply chain management. The SCOR model, defined as the Referans Supply Chain Operations Reference Model Turkish, defines all supply chain structures in five basic processes:” planning”, “supply”, “production”, “distribution”, and “return“. The planning process aims at balancing aggregate demand and supply to meet supply, production and delivery requirements (Balstorff, Rosenbaum, 2003).

In the literature, some important criteria are defined in the supplier selection process. Dickson (1969) considers 23 selection criteria as critical factors in supplier selection. Therefore, among these factors, quality, price and the year of establishment of the enterprise is the most critical factor. Following Dickson's work, Weber, Current and Benton (1991; 1966 and 1991) argue that the net price, quality and delivery time of the product are the most widely used criteria in the literature. In addition to this, it shows that after the 1990s, an increasing change in critical success factors and increasing competition and globalization can be seen [4].

New factors have emerged in the supplier selection process. These are reliability, flexibility, consistency and long-term relationship. A framework for defining supplier selection criteria is proposed by examining quantitative and qualitative criteria when developing business strategies. It is necessary to determine that companies can exhibit different purchasing behaviour under different conditions and criteria of supplier selection in a company's purchasing activities (Sen, Basligil, Sen & Baraclı, 2008). These criteria are quality, delivery, cost, manufacturing capacity, service, management, technology, research and development, finance, flexibility, reputation etc. [8]. While quality and delivery time are more important

than price, it is argued that the traditional assessment approach, which is only the choice of a supplier based on the lowest price, is not effective today in supply chain management.

In modern supply chain management, traditional criteria such as price, quality and delivery time, as well as operational performance, service quality, training of personnel, technology, financial capacity, process control ability, after-sales service and sustainability are effective, and these criteria It is stated that it will contribute [14].

The two most important decisions in the procurement process are the selection of suppliers and the periodic evaluation of their performance [13]. In addition, when defining supplier selection parameters, it is emphasized that cost, quality and service are three main categories and the supplier selection process is generally based on cost, quality, delivery and decision making process [6]. The quality, price and delivery time criteria of the product, which are the traditional supply chain criteria, are explained below.

Competitive Price: Competitive price is expressed as one of the dimensions of customer satisfaction that can improve overall business performance [18]. In addition, when purchasing high-tech products, reaching the breakeven point is an important criterion in supplier selection because it takes a longer time [12]. There is a perception in customers that high-tech medical devices are often too expensive, too high-priced. As a result, some healthcare enterprises have to postpone the procurement process as there are financial constraints on health expenditures. Health enterprises determine the specifications of the product to be purchased by negotiating with various suppliers. Therefore, the competition between the suppliers of medical equipment is very strict. However, price alone may not provide a lasting competitive advantage for suppliers; because quality is seen as the main factor in the supply of medical equipment. The price strategy comes up after the product meets the basic needs of customers. For this reason, it is necessary to meet customer demands and expectations first (to provide quality products) and then to compete in price dimension [7].

Product Quality: Product quality increases the strengths of the company and contributes to the improvement of customer satisfaction and business performance. Product quality is the first factor in the supply of medical supplies [18]. In addition, Perry and Perkins [24] emphasize that performance, reliability, durability and maintenance ability are important factors in industrial procurement. Although said dimensions depend on the product and the buyer, similar product buyers are looking for suppliers to meet similar product quality dimensions. Suppliers require a specification of the characteristics of the medical equipment normally required by healthcare enterprises [5]. Health businesses then review all

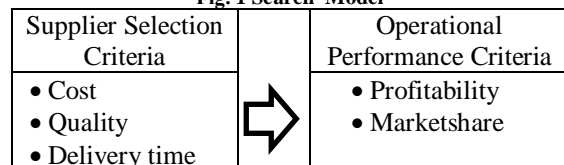
available options and list various criteria based on the functionality, ease of use, ergonomics, and workflow integration of medical equipment. It evaluates with the criteria of flexibility, reliability, support and education [3].

On-Time Delivery: The supplier's commitment to timely delivery can affect supplier selection. The supplier's ability to deliver faster than its competitors can provide a competitive advantage [18]. He stated that delivery time, flexibility to change orders and delivery in good condition are important criteria for decision support in supplier selection. It also expresses the response of suppliers to after-sales services such as equipment installation. In the purchasing organization, these follow-ups are important for procurement planning [23].

III. MATERIAL-METHOD

The main purpose of this study is to investigate the effect of supplier selection criteria on operational performance in the health sector. The problem sentence of the research was determined as Does the selection criteria of suppliers in the health sector affect operational performance? This cross-sectional study was conducted on pharmacists in Ankara. There are approximately 4 thousand pharmacies in Ankara. The population of the study consists of the pharmacies in Çankaya (640 Pharmacy), Keçiören (314 Pharmacy), Yenimahalle (227 Pharmacy) and Altındağ (195 Pharmacy) districts where the population and number of pharmacies in Ankara are high. In the study, no sample selection was made, and a questionnaire was applied to all pharmacists and pharmacy employees (n = 100) who agreed to voluntarily participate in the study. In addition to the personal information form created by the researchers, variables related to supplier selection and operational performance variables are included in the data collection. 5-point Likert-scale questions developed by researchers based on cost, profitability, timely delivery, market share and quality variables are included in the questionnaire literature review regarding supplier selection criteria and operational performance.

Fig. 1 Search Model



There are a variety of factors in supplier selection and evaluation criteria. In this research, three potential factors such as price, quality and delivery time, which play a very important role in the selection and evaluation criteria of the supplier, are discussed. The main hypothesis of the research;

H1:In pharmacies, there is a positive effect between supplier selection criteria and operational performance.

H1₁:In pharmacies, there is a positive impact between supplier selection criteria (cost, quality, timely delivery) and profitability.

H1₂: In pharmacies, there is a positive impact between supplier selection criteria (cost, quality, timely delivery) and market share.

IV. RESULTS/FINDINGS

Demographic characteristics were determined by frequency analysis. Multiple Correlation Analysis was used to determine the relationship between supplier selection criteria, and ANOV A test and Multiple Regression Analysis were used to determine the operational performance impact of supplier selection criteria.

Table 1. Demographic Features

| Sex | n | (%)Percent |
|-----------------------------------|------------|--------------------|
| Male | 73 | % 73 |
| Female | 27 | % 27 |
| Age | n | (%)Percent |
| 24-29 | 31 | % 31 |
| 30-39 | 35 | % 35 |
| 40-49 | 27 | % 27 |
| 50↑ | 7 | 7% |
| Title | n | (%)Percent |
| Tradesman | 33 | 33% |
| Tradesman Asistant | 33 | 33% |
| Worker | 26 | 26% |
| Other | 8 | 8% |
| Operating Time of Bussines | n | (%)Percent |
| 1-4 | 21 | 21% |
| 5-8 | 38 | 38% |
| 9-12 | 28 | 28% |
| 13↑ | 13 | 13% |
| Business Location | n | (%)Percent |
| Cankaya | 36 | 36% |
| Altındag | 24 | 24% |
| Kecioren | 16 | 16% |
| Yenimahalle | 24 | 24% |
| Educational level | n | (%)Per cent |
| Bachelor's degree | 62 | 62% |
| Postgraduate (Master) | 26 | 26% |
| Postgraduate (Doctorate) | 12 | 12% |
| Business Ownership | n | (%)Percent |
| Own | 33 | 33% |
| Lessee | 65 | 65% |
| Other | 2 | 2% |
| Number of Employee | n | (%)Percent |
| 1-3 | 58 | 58% |
| 4-6 | 33 | 33% |
| 7-9 | 8 | 8% |
| 10↑ | 1 | 1% |
| Total | 100 | 100 |

The majority of the participants were male (73%) and undergraduate (62%). In addition, 35% were in the 30-39 age range, 31% were in the under 30 age group, 27% were in the 40-49 age range. When the titles of the participants were examined, 33% were business owners, 33% were business assistants, and 26% were employees. In addition, 38% of the enterprises that are employed or owned by the participants have a working life of 5-8 years, and 58% of the pharmacies have 1-3 people. In summary, the majority of pharmacists are men, adults, bachelors; pharmacy rent and pharmacy employ 1-3 people.

Table 2. Reliability Analysis of Questionnaire

| | Sub-dimension | Cronbach's Alpha | k |
|--------------|----------------------|-------------------------|----------|
| SSC* | Cost | 0.759 | 9 |
| | Quality | 0.714 | 7 |
| | On-Time Delivery | 0.809 | 4 |
| OPC** | Profitability | 0.752 | 5 |
| | Marketshare | 0.690 | 5 |

*Supplier Selection Criteria

**Operational Performance Criteria

Table-2 shows the reliability analysis results of the questionnaire sub-dimensions applied to the participants. When the reliability coefficients of the 30-item questionnaire were examined, it was found that the Cronbach’s Alpha value of the general questionnaire was 0.878. This value indicates that the reliability of the scale is very high. When the reliability levels of the sub-dimensions are considered, the “on-time delivery” sub-dimension of supplier selection criteria and “profitability” sub-dimension of operational performance criteria were found to have higher reliability when compared to other sub-dimensions.

Table 3. Participants' Survey Total Score Average and Sub-Scale Average Scores

| Criteria and Sub-Scale | \bar{X} | S | S² |
|-------------------------------|-----------------------------|----------|----------------------|
| SSC | 3.62 | 0.467 | 0.219 |
| Cost | 3.42 | 0.550 | 0.303 |
| Quality | 3.92 | 0.538 | 0.290 |
| On-Time Delivery | 3.56 | 0.536 | 0.542 |
| OPC | 3.72 | 0.443 | 0.197 |
| Profitability | 3.51 | 0.684 | 0.468 |
| Marketshare | 3.93 | 0.549 | 0.302 |

Table 3 presents the mean, standard deviation and variance of the participants' supplier selection and operational performance criteria. The highest average market share in flour ($X = 3.93$) was obtained in the dimension sub-dimension, and the lowest average was obtained in the “cost ($X = 3.42$)” dimension sub-dimension.

Table 4. Average of the participants at the districts in which they operate

| | | Cost | Quality | On-Time Delivery | Profitability | Marketshare |
|-------------|-----------|-------|---------|------------------|---------------|-------------|
| Altındag | \bar{X} | 3.46 | 3.73 | 3.50 | 3.61 | 3.92 |
| | n | 24 | 24 | 24 | 24 | 24 |
| | S | 0.528 | 0.549 | 0.707 | 0.577 | 0.631 |
| Cankaya | \bar{X} | 3.37 | 4.00 | 3.65 | 3.43 | 3.96 |
| | n | 36 | 36 | 36 | 36 | 36 |
| | S | 0.530 | 0.659 | 0.765 | 0.723 | 0.552 |
| Kecioren | \bar{X} | 3.21 | 4.01 | 3.28 | 3.21 | 3.90 |
| | n | 16 | 16 | 16 | 16 | 16 |
| | S | 0.700 | 0.434 | 0.926 | 0.888 | 0.560 |
| Yenimahalle | \bar{X} | 3.61 | 3.92 | 3.67 | 3.67 | 3.93 |
| | n | 24 | 24 | 24 | 24 | 24 |
| | S | 0.451 | 0.326 | 0.544 | 0.543 | 0.477 |

The average of pharmacists operating in Ankara regarding supplier selection variables is shown in Table 4. Pharmacists operating in different districts of Ankara have the highest average market share and quality variable in supplier selection (market share: X=3.92 (Altındag); X=3.96 (Cankaya); X=3.90 (Kecioren); X=3.93 (Yenimahalle); quality: X=3.73 (Altındag); X=4.00 (Cankaya); X=4.01 (Kecioren); X=3.92 (Yenimahalle). In general, the average of the variables determined in suppliers selection of pharmacists operating in different districts of Ankara is high. The variables with the lowest average differ according to districts.

Table 5. Correlation Analysis between Supplier Selection and Operational Performance Criteria

| | 1 | 2 | 3 | 4 | 5 |
|--------------------|-------|-------|-------|------|---|
| 1-Cost | 1 | | | | |
| 2-Quality | .224* | 1 | | | |
| 3-On-time Delivery | .903* | .237* | 1 | | |
| 4-Profitability | .785* | .340* | .668* | 1 | |
| 5-Marketshare | .051 | .326* | .071 | .024 | 1 |

*Correlation is significant at the 0.05 level

Table 5 presents the multiple correlation analysis of supplier selection criteria for pharmacies within the scope of the study. As a result of the analysis, when the relationship between supplier selection variables is examined; Significant and positive weakness ($r = .224$, $p < 0.05$) between cost and quality, significant and positive strong level ($r=0.903$, $p < 0.05$) between cost and timely delivery, a significant and positive strong level between cost and profitability ($r=0.785$, $p < 0.05$). Among the selection variables of the supplier, there is a significant and positive weakness ($r= 0.237$, $p < 0.05$) between quality and timely delivery, significant and positive intermediate quality ($r = 0.340$, $p < 0.05$), meaningful between quality and market share. and a positive intermediate level ($r =$

0.326 , $p < 0.05$). It was concluded that there was a significant and positive ($r = 0.668$, $p < 0.05$) relationship between timely delivery and profitability.

The relationship between the variables may vary according to each region. For this reason, correlation analysis of each region to reveal the relationship between the variables are given below.

Table 6. Correlation Analysis between Supplier Selection and Operational Performance Criteria by Cankaya Region

| | 1 | 2 | 3 | 4 | 5 |
|--------------------|-------|-------|-------|------|---|
| 1-Cost | 1 | | | | |
| 2-Quality | .306 | 1 | | | |
| 3-On-time Delivery | .915* | .323 | 1 | | |
| 4-Profitability | .738* | .515* | .595* | 1 | |
| 5-Marketshare | .060 | .417* | .094 | .152 | 1 |

*Correlation is significant at the 0.05 level

Correlation analysis according to Çankaya district is given in Table 6. The results are similar to the general correlation analysis. No significant relationship was found between cost and quality, quality and timely delivery. There was a statistically significant relationship between the other variables.

Table 7. Correlation Analysis between Supplier Selection and Operational Performance Criteria by Altındag Region

| | 1 | 2 | 3 | 4 | 5 |
|--------------------|-------|-------|-------|------|---|
| 1-Cost | 1 | | | | |
| 2-Quality | .431* | 1 | | | |
| 3-On-time Delivery | .933* | .344 | 1 | | |
| 4-Profitability | .834* | .363 | .745* | 1 | |
| 5-Marketshare | .158 | .576* | .107 | .027 | 1 |

*Correlation is significant at the 0.05 level

Table 7 shows the correlation results according to the Altındag district. A statistically significant positive correlation was found between cost and quality, timely delivery and profitability and between quality and market share.

Table 8. Correlation Analysis Between Supplier Selection and Operational Performance Criteria According to Yenimahalle Region

| | 1 | 2 | 3 | 4 | 5 |
|--------------------|-------|-------|-------|-------|---|
| 1-Cost | 1 | | | | |
| 2-Quality | -.028 | 1 | | | |
| 3-On-time Delivery | .877* | -.162 | 1 | | |
| 4-Profitability | .735* | -.011 | .615* | 1 | |
| 5-Marketshare | -.184 | .008 | -.095 | -.375 | 1 |

*Correlation is significant at the 0.05 level

Table 8 shows the correlation results according to the Yenimahalle district. Between cost and on-time delivery and profitability; There is a statistically significant positive relationship between timely delivery and profitability.

Table 9. Correlation Analysis Between Supplier Selection and Operational Performance Criteria According to Keçioren Region

| | 1 | 2 | 3 | 4 | 5 |
|--------------------|-------|-------|-------|------|---|
| 1-Cost | 1 | | | | |
| 2-Quality | .136 | 1 | | | |
| 3-On-time Delivery | .926* | .165 | 1 | | |
| 4-Profitability | .827* | .362 | .786* | 1 | |
| 5-Marketshare | .980 | -.137 | .083 | .104 | 1 |

*Correlation is significant at the 0.05 level

Table 9 shows the correlation results according to the Keçiören district. The results are similar to the Yenimahalle district.

Regression analysis was performed to determine whether there was a significant effect between the variables, and the results are given in Table 10, Table 11, and Table 12.

Table 10. Effect of Supplier Selection Criteria on Operational Performance (Regression Analysis)

| H1 | n | r | R ² | ANOVA | |
|----|-----|------|----------------|--------|------|
| | | | | f | p |
| | 100 | .700 | .490 | 94.173 | .000 |

According to the ANOVA test and regression analysis, the R² value was found to be 49% (p <0.05). According to this result, supplier selection criteria have a significant and 49% effect on operational performance. H1 hypothesis was accepted.

Table 11. Effect of Supplier Selection Criteria on Profitability (Regression Analysis)

| H1 ₁ | n | r | R ² | ANOVA | |
|-----------------|-----|------|----------------|--------|------|
| | | | | f | p |
| | 100 | .810 | .655 | 60.843 | .000 |

According to the ANOVA test and regression analysis, the R² value was found to be 65.5% (p <0.05). According to this result, supplier selection criteria have a significant and 65.5% effect on profitability. Therefore, the H11 hypothesis was accepted.

Table 12. Effect of Supplier Selection Criteria on Market Share (Regression Analysis)

| H1 ₂ | n | r | R ² | ANOVA | |
|-----------------|-----|------|----------------|-------|------|
| | | | | f | p |
| | 100 | .328 | .107 | 3.854 | .012 |

According to the ANOVA test and regression analysis, the R² value is 10.7% (p <0.05). According to this result, supplier selection criteria have a significant and 10.7% effect on market share. Therefore, the H12 hypothesis was accepted.

V. CONCLUSION

In the health sector, pharmacies play the most important role in providing the medicines prescribed by the physician to the patient. Providing pharmacies to the patients in the shortest time with the most cost-effective and high-quality drugs directly affects the healing process of the patients and indirectly affects

the health level of the country. In this study, the effect of supplier selection on operational performance in pharmacies operating in the health sector was investigated, and it was determined whether supplier selection criteria (cost, quality and timely delivery) affect operational performance criteria (profitability and market share).

100 people consisting of pharmacy owners and employees participated in the study, and the majority of the participants were male and undergraduate graduates. The study was conducted in 4 districts (Çankaya, Yenimahalle, Altındağ and Keçiören) in Ankara. According to the results of the study, it was found that there is a statistically significant relationship between the cost, quality and timely delivery operational performance of the supplier selection criteria and that the supplier selection criteria affect the operational performance. When the results of districts are analyzed, it is observed that there are similar results and supplier selection criteria that affect the operational performance.

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