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THE EFFECTS OF BUSINESS EXCELLENCE TO INTERNAL AND EXTERNAL CUSTOMER OPINIONS IN HEALTHCARE

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Abstract

Aim: Hospitals can determine the strengths of organization and improvement strategies by implementing business excellence models to increase customer satisfaction. The aim of the study is to evaluate the effects of business excellence dimensions on internal and external customer opinions.

Methods: The universe of the study is public hospitals in Izmir urban area. Four hospitals included in the study and 488 healthcare workers agreed to participate to study. Survey was developed from the Malcolm Baldrige National Excellence Award Healthcare Criteria.

Findings: Factor analysis revealed six business excellence dimensions: strategic planning; workforce focus; process management; customer focus; leadership; and measurement, analysis, knowledge management. Correlation analysis showed that business excellence dimensions have strong relations between each other and internal and external customer opinions. According to regression analysis,

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customer focus, process management and measurement, analysis, knowledge management effect to the external customer. Workforce focus, process management and leadership effect to the internal customer.

Conclusion: In order to improve the internal and external customer opinions in healthcare organizations, hospital managerial teams have to focus on processes and workforce, give importance to be more patient centered and plan their strategies according to customers' opinions. This study helps the hospitals, in which areas should be focused on primarily when developing policies and strategies; and preparing plans for future developments.

Keywords: Business Excellence, Internal Customer, External Customer, Hospital, Healthcare

Introduction

The environment of healthcare organizations is excessively complex. The expectations of customers increase day by day, organizations are faced with intense competition and technology is advancing rapidly. In this context, organization's management structure must be based on solid foundations and processed efficiently. In order to respond to the environmental pressures, to overcome the global competition, to adapt to changes, to take costs down and to improve the productivity, it is required to carry out performance measurement and quality improvement activities. While improving organizational performance and quality, companies engage in approaches which are internal and external customer (IaEC) focused and which aim to identify expectations and needs for both IaEC. Thus, companies can develop strategies according to self-assessment reports in the field of business excellence (BE) model (Buttigieg *et al*, 2016).

1. Background

1.1 Business Excellence

One of the ways of improving organizational quality is using business excellence models based on the criteria of quality awards (Lee and Quazi, 2001), which are internationally recognized and contribute organizations to improve their performance in various sectors. In 1951, the first business excellence model called Deming Prize was developed in Japan, but it was not very common in the world and only used by Japanese organizations. In 1988, Malcolm Baldrige National Quality Awards was adopted by many organizations in the USA. It has become an internationally recognized model for its particular methods used to describe strengths, weaknesses and performance in organizational activities (Mackerron *et al*, 2003) Then, European Foundation for Quality Management created its own model, which is called European Quality

Awards in 1991, and it acquired worldwide recognition. According to Koura, the basic issues that are shared by the these excellence models are leadership; customer focus; process management; workforce focus; social responsibility; continuous improvement and innovation (Koura, 2009).

Since the 1990s, BE has been used as a tool to achieve organizational objectives by contributing the employee; and providing feedback and ensuring continuous improvement (Hillman, 1994). BE revises operations and outcomes of the organization by comparing comprehensively, systematically and regularly based on a business excellence model. BE has become one of the most considerable management tools (Zink and Schmidt, 1998), and excellence models increasingly being applied by organizations all over the world (Gómez, 2017). It creates opportunity of self-evaluation for organizations and it monitors the development processes (Caffyn, 1999). According to Hillman (1994), the components of the BE are model which is chosen, measurement success and management effectiveness. Excellence models, which are used for self-assessment, affect organizational performance and promote organizational excellence (Tutuncu and Kucukusta, 2007). There is no single technique or approach to be followed by organizations to manage the quality in healthcare in the context of BE. There are different models but the basic principles are common (Ritchie and Dale, 2000). Each organization must be evaluating its own structural dynamics including employees, resources, capabilities, strengths and weaknesses, and according to these dynamics, appropriate methods must be chosen and applied in the organization.

Upon implementation of BE models by businesses, academic studies started. First group of studies focused on analyzing internal improvements like positive effects of the implementing a BE model on the outcomes and organizational performance (Lee et al, 2003; Corredor and Goñi, 2010; Davies, 2008), employee satisfaction (Eskildsen and Dahlgaard, 2000), enhancing the management system (Eskildsen, 1998), and customer focus and satisfaction (Pannirselvam and Ferguson, 2001). Second group of studies focused on the relationship among the model criteria (Bou-Llusar et al, 2005; Ghosh et al, 2003) and some researchers specialized their study areas in education (Badri et al, 2006) and healthcare system (Goldstein and Schweikhart, 2002). In addition, some researchers analyzed the achievements and the competitive advantages by implementation the BE models (Tutuncu and Kucukusta, 2007; Kim et al, 2010).

1.2 Hypotheses Development

There are different studies in various sectors, which has positive effects to organizational dynamics in the field of BE. Additionally, within the scope of this study, from the view of healthcare workers, IaEC opinions wanted to be analyzed. For this reason, healthcare workers would be able to evaluate the service quality from the patient's point of view. It is asked which BE dimensions' effect on internal and external customer in order to improve quality in this study. Following hypotheses and reasons discussed in the research are stated.

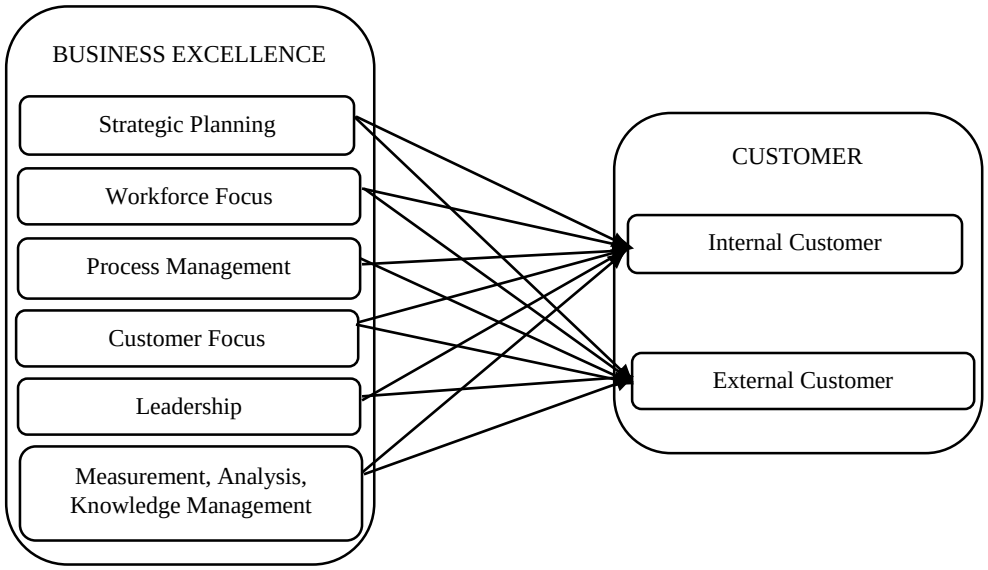

Figure 1. Research Model

Compared with many public services, it requires to focus more sensitively on health services and to provide the highest quality of health services. In healthcare, it is so difficult to evaluate the quality by analyzing the patient opinions, especially technical quality. During treatment process, patients are not only being aware from the clinical aspects of care, but also many other non-clinical aspects to evaluate the quality of the service (Berkowitz, 2016). Patients evaluate the service received according to their expectation (Kupfer and Bond, 2012), if the service quality meets to expectations, patients judge quality high and satisfied. To create quality culture, systematic approach should adopt and widespread throughout the organization. BE dimensions include the basic component to create a quality culture and improve service quality. There is a relationship between the quality of the service and patient satisfaction (Kupfer and Bond, 2012).

From the view of patients, healthcare organizations want to create a positive perception and improve patient experience by providers focusing on fulfilling patient desires and expectations. (Price et al, 2014). Because of supply creates its own demand (Pruckner, 2010), healthcare workers define the treatment process and medication for patients; and patient thoughts related to healthcare workers and processes are beyond a healthcare provider's control (Price et al, 2014). Because of patients do not have the expertise needed to evaluate the quality of care (Price et al, 2014), it is difficult to evaluate the quality of services as it's supposed to be. Therefore, healthcare workers can be evaluate the patient feelings by observing patients' behaviors and the healthcare services. For these reasons, opinions of healthcare workers should be taken into consideration and first hypothesis is analyzed from the point of healthcare workers:

Hypothesis 1: Business excellence dimensions have positive and meaningful effect on the external customer opinions.

Healthcare organizations are labor intensive organizations, for this reason, human factor have a great impact on the quality of services. Healthcare services delivered by healthcare workers can be affected positively or negatively by tangible or intangible factors including job satisfaction, career advancement, social life, formal or informal relations in the organization, reward and incentive system etc. For example, top management support, positive relations and working conditions can cause higher satisfaction with nurses care (Vahey et al., 2004) Healthcare worker job satisfaction has a significant impact on service quality, commitment to work, effectiveness, and additionally on healthcare costs (Miljkovic, 2007). Service provision may change by time to time or from a person to a person, because of the difficulty in standardization of services. At the same time, patients and their diseases also changes the way service delivered. Being lack of the standardization has an impact on patient and employee safety. Business excellence approach can be used as a management tool in order to assess and improve workers' well-being, satisfaction and motivation (Tutuncu and Kucukusta, 2007) and ensure standardization of the services provided to patients. For these reasons, opinions of healthcare workers should be taken into consideration and second hypothesis can be analyzed:

Hypothesis 2: Business excellence dimensions have positive and meaningful effect on the internal customer opinions.

2. Research Methodology

2.1 Design and study population

The present study aimed to assess the effects of BE dimensions on IaEC. The questionnaires gathered from healthcare workers (physician, nurse, administrative staff, technical staff and others). This study was approved by the research hospitals and reviewed by the Noninvasive Research Ethics Board, Dokuz Eylul University. In total, about 2200 healthcare workers were working in the state hospitals which are located in Izmir urban area, excluding education and research hospitals. The sample size encompasses 4 hospitals which are operating under the Turkish Ministry of Health, and located in Izmir urban area. In total, 1200 questionnaires distributed and after scanning process 488 questionnaires are taken into the study, with a usable response rate of 40,66%, which is statistically acceptable for data analysis.

2.2 Measurement

Data was obtained by administrating a structured-questionnaire consisting three parts. The main part of the survey was developed from the Malcolm Baldrige National Excellence Award Healthcare Criteria (NIST, 2008; NIST, 2013) and adapted into Turkish and inquired 48 questions to evaluate the thoughts of healthcare workers on BE. The study focused all the dimensions of BE except the results. The reason behind this, it is difficult to evaluate the results dimension of BE for healthcare workers. In other words, results can be analyzed with the view of top management. There were 8 statements in the second part, regarding the dependent variables, which were representing internal and external customer opinions. The items were rated on a five-point scale (5= very good; 4=good; 3=neither good nor bad; 2=bad; 1=very bad). The last part inquired demographic questions.

2.3 Data analysis

After scanning process, questionnaires which are eligible to be included in the analysis, were computerized. Statistical program was used for data analysis. Exploratory factor analysis (Principal Axes Factoring) was applied in the study to measure construct validity. The reliability (Cronbach's alpha) of the data which were intended for overall BE items, internal and external customer opinions, and each BE subscale items were tested. Correlation analysis was conducted in order to determine the direction and strength of the relationships among the BE dimensions, internal and external customer opinions. Finally, stepwise regression analysis was conducted to

determine the effects of independent variables on the dependent variable. Statistically, *p* value which was equal or less than 0,05 was accepted to be significant.

3. Analysis

Respondents' demographic characteristics are stated in Table 1. 488 respondents have participated in the research. The duration of the quality process also stated in the study. According to the frequency distribution, 70.65% of the respondents were women and 29.35% were men. 14.47% were physician 43.20% were nurses and the remainder was other medical staff. The skewness and kurtosis were within the range for assuming a normal distribution.

Table 1. Numerical and Percentage Dispersion of Sample Profile

	n	**%**		**n**	**%**
Sex			*Occupation*		
Female	337	70.65	Physician	67	14.47
Male	140	29.35	Nurse	200	43.20
Total	477	100.00	Other	196	42.33
			Total	463	100.00
Age			*Year of Work*	82	17.41
30 years and less	184	38.74	3 years and less	95	20.17
31-40 years	169	35.58	4-6 years	83	17.62
41 years and more	122	25.68	7-9 years	211	44.80
Total	475	100.00	10 years and more	471	100.00
			Total		
Education			*Quality Process*		
Secondary school and less	144	30.44	3 years and more	280	64.22
University and more	329	69.56	3 years and less	156	35.78
Total	473	100.00	Total	436	100.00

In order to identified the number of dimensions in exploratory factor analysis, Horn's parallel analysis and Velicer's minimum average partial test were carried out on the BE and internal and external customer opinions data sets (Horn 1965; Velicer 1976). The results of the tests showed that for the BE six-factor solution and for the internal and external customer opinions two-factor solution should be accepted for extractions. First results of Principal Axis Factoring showed that factor correlations were higher than 0.56 and lower than 0.72. Because of nonorthogonal factors, the promax oblique solution was used for rotation.

For the BE data set, Kaiser-Meyer-Olkin illustration value realized as 0.96, 48 variables are formed under six factors and explained 69,30% of the common variance. These factors are named as strategic planning; workforce focus; process management; customer focus; leadership; and measurement, analysis, knowledge management. According to the second factor analysis, 8 items related internal and external customer opinions, are formed under two factors and explained 61.35% of the common variance. Kaiser-Meyer-Olkin illustration value for internal

and external customer opinions realized as 0.85. The communalities were all above 0.41 and over the recommended value of 0.30 (Hair et al. 2007). Summary results of factor analysis of business excellence are presented in the Table 2 and Table 3.

Table 2. Factor Analysis Results (Business Excellence)

Business Excellence	Factor Loading	Eigenvalue	Variance Explained
Factor 1- Strategic Planning		**25.21**	**52.52**
Analyzing knowledge and data in strategic planning process	.97		
Planning and monitoring of the strategic objectives	.83		
Allocation of the resources to strategic plans	.82		
Performance indicators in the strategic plans	.81		
Forecasting the future according to the of strategic plans	.77		
Activity plans in the strategic plans	.74		
Consistency of the strategic goals	.68		
Planning of the human resources strategically	.63		
Factor 2- Workforce Focus		**2.73**	**5.68**
Participation of workers to organizational processes	.91		
Organizational culture adopted by workers	.84		
Support of career improvement for workers	.82		
Evaluation of the capacity of workers	.80		
Recruitment of the workers	.71		
Providing support for workers	.70		
Supporting the organizational policies by workers	.67		
Workplace health and safety	.61		
Factor 3- Process Management		**1.98**	**4.13**
Updating the processes according to needs	.86		
Designing the processes according to needs	.80		
Development of new processes related to health	.79		
Meeting the patient's expectations	.78		
Effectiveness of the process	.74		
Adequacy of the emergency process	.70		
Complete fulfillment of the processes	.68		
Adequacy of administrative and medical work process	.67		
Factor 4- Customer Focus		**1.28**	**2.67**
Value given to patients	.92		
Quality of healthcare provided to patients	.89		
Determination of patient needs	.85		
Speed of the health services provided to patients	.78		
Receiving and evaluating of patient recommendations	.75		
Establishing of new areas for patients	.58		
Factor 5- Leadership		**1.11**	**2.32**
Communication of the leaders with workers	.83		
Adopting the moral behaviors to workers	.72		
Giving importance to patient safety	.63		
Identifying the environment health needs by leaders	.61		
Future plans created by leaders	.60		
Knowledge of the leaders about health system	.58		
Adopting the organizational values to workers	.58		
Analyzing the risks	.55		
Monitoring efficiency indicators	.53		
Monitoring the leaders' performances by each other	.51		
Giving importance to workers' safety by leaders	.44		
Factor 6 - Measurement, Analysis, Knowledge Management		**,95**	**1.97**
Managing of the data and information	.86		
Evaluating the data systematically	.83		
Security of the software and hardware	.79		
Accessing to software and hardware systems in an emergency	.77		
Using the data for development of the organization	.72		
Analyzing the data	.70		
Performance measurement system	.64		

Table 3. Factor Analysis Results (Internal & External Customer)

Internal & External Customer Opinions	Factor Loading	Eigenvalue	Variance Explained
Factor 1- External Customer		**4.03**	**50.39**
Patient satisfaction in our hospital	.97		
Patients' recommendations of our hospital to other patients	.85		
Patient centeredness in our hospital	.72		
Patient safety in our hospital	.54		
Factor 2- Internal Customer		**.88**	**10.95**
Workers' motivation in our hospital	.87		
Occupational safety in our hospital	.82		
Job satisfaction in our hospital	.62		
My commitment to our hospital	.50		

For internal consistency, the reliability tests were conducted on data. The general Cronbach's alpha is found 0.98 for BE, and 0.88 for IaEC data sets, for reliability analysis, over the 0.70 recommended (Nunnally, 1967). Results of reliability analysis for BE and IaEC opinions variables were also shown in Table 4.

In order to analyze the relationship among dimensions of BE and IaEC, correlation coefficient values were calculated. Descriptive statistics and correlation matrix of continuous variables were presented in Table 4. There is a positive relationship between the dimensions. All correlations were moderately strong to strong, ranging between $r = 0.45$, and $r = 0.78$, $p < 0.001$. The Cronbach's alpha coefficient was also calculated for each dimension in order to test the internal consistency reliability. According to reliability analysis, Cronbach's alpha values of dimensions, means and standard deviations are shown in Table 4.

Table 4. Correlation Matrix among the Factors of Business Excellence and Internal and External Customer

	1	2	3	4	5	6	7	8
1. Leadership	1							
2. Strategic Planning	0.78[a]	1						
3. Customer focus	0.55[a]	0.56[a]	1					
4. Measurement, analysis, knowledge management	0.71[a]	0.72[a]	0.52[a]	1				
5. Workforce focus	0.74[a]	0.68[a]	0.45[a]	0.71[a]	1			
6. Process management	0.68[a]	0.65[a]	0.63[a]	0.70[a]	0.69[a]	1		
7. Internal Customer	0.71[a]	0.66[a]	0.47[a]	0.65[a]	0.78[a]	0.68[a]	1	
8. External Customer	0.54[a]	0.55[a]	0.75[a]	0.58[a]	0.48[a]	0.64[a]	0.56[a]	1
Means	3.31	3.21	3.72	3.29	2.85	3.25	3.21	3.63
S.D.	0.74	0.77	0.82	0.83	0.91	0.71	0.83	0.73
Cronbach's Alpha	0.93[a]	0.96[a]	0.94[a]	0.94[a]	0.95[a]	0.95[a]	0.82[a]	0.87[a]

[a] $p < 0.01$

Preliminary analyses were conducted for the assumptions of normality, linearity, and homoscedasticity. Examination of casewise diagnostics with Cook's distance (External Customer, Min = 0.00; Max = 0.88; Internal Customer, Min = 0.00, Max = 0.17) suggested there were no cases exerting undue influence on the models. The Durbin-Watson statistic was computed to evaluate independence of errors and was 1.85 for external customer and 1.97 for internal customer, which is considered as acceptable (Cohen et al. 2003). Tolerance was greater than 0.10 (External customer, Min = 0.43; Internal Customer, Min = 0.38), and the variance inflation factor was less than 10 (External Customer, Max = 2,33; Internal Customer, Max = 2.67).

Regression analysis is applied to determine the importance of independent variables on dependent variables. It is found out that R square values in both regression analyses are in the sufficient level for the researches made in social sciences (Hair et al. 2007). The first regression analysis aims to determine the relative importance of BE dimensions on the "Internal Customer". Using the stepwise method, it was found that the overall model explains 0.68 of the variation in BE (F (3, 455) = 318.90, p<0.001 with R = 0.82, adjusted R^2 = 0.68). The Beta coefficients are presented in Table 5. Workforce focus, process management and leadership were statistically significant and positively related to internal customer. Therefore, hypothesis 1 was accepted for the workforce focus, process management and leadership dimensions.

Table 5. Regression Analysis of the Business Excellence Dimensions Affecting to Internal Customer

VARIABLES	*β*	*95% CI*
Workforce focus	0.49[a]	[0.38, 0.54]
Process Management	0.22[a]	[0.16, 0.34]
Leadership	0.20[a]	[0.13, 0.31]
Constant	0.34[b]	[0.12, 0.57]
R^2	0.68	
F	318.90[a]	

[a] p<0.001, [b]$p \leq 0.05$, n = 410, CI = confidence interval

The second regression analysis aims to manifest comparative importance of BE factors on the "external customer". Using the stepwise method, it was found that the overall model explains 0.62 of the variation in external customer (F (3, 454) = 244.46, p< 0.001 with R = 0.79, adjusted R^2 = 0.62). Customer focus, process management and measurement, analysis, knowledge management were statistically significant and positively related to external customer. The Beta coefficients are presented in Table 6. According to the results of multiple regression, hypotheses

2 was supported for the customer focus, process management and measurement, analysis, knowledge management dimensions.

Table 6. Regression Analysis of the Business Excellence Dimensions Affecting to External Customer

VARIABLES	*β*	*95% CI*
Customer Focus	0.53[a]	[0.41, 0.55]
Process Management	0.22[a]	[0.14, 0.32]
Measurement, Analysis, Knowledge Management	0.13[b]	[0.05, 0.20]
Constant	0,69 [a]	[0.47, 0.91]
R^2	0.62	
F	244.46[a]	

[a] $p<0.001$, [b] $p \leq 0.05$, n = 457, CI = confidence interval

4. Conclusions and Recommendations

BE can improve internal and external customer opinions positively. This study showed that how BE is strikingly important on customer opinions. Business excellence models can be used to ensure occupational and patient safety. If the BE model which was chosen by the organization, fits the organizational culture, it facilitates the processes adopted by the workforce and becomes widespread throughout the organization. BE can create and maintain internal and external customer satisfaction in order to get competitive advantage.

This study takes a micro stand by focusing on the views of healthcare workers on the effects of BE dimensions to internal and external customer opinions. It is limited by the region and it can be carried out in country wide. Moreover, healthcare workers' ideas can be analyzed by considering their profession (physician, nurse, etc.).

In this research, healthcare workers have been included as an internal customer and patients and their companions included as an external customer. Suppliers have not been evaluated as external customer and excluded in the scope of study. Patient and their companions' thoughts, needs and expectations also are important and to serve excellent, their ideas have to be analyzed. By analyzing the both healthcare workers and patients' opinions, necessary action plans should be put into effect by managerial team.

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THE INNOVATION PERSPECTIVES OF EMPLOYEES IN A PRIVATE HOSPITAL

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Abstract

Aim: The aim of the study was to evaluate the innovation perspective of employees from technical, administrative and medical units in a private hospital of a health group.

Methods: In this cross-sectional study, 177 employees from different departments in a private hospital were included. The data were collected by a questionnaire regarding use of health technologies and innovation related items. These items were scored by using 5-point Likert scale (1: Strongly disagree; 2: Disagree; 3: Neither agree nor disagree; 4: Agree; 5: Strongly agree). After performing both Explanatory and Confirmatory factor analyses, the 15-item *Healthcare Innovation Scale* with 4 subgroups regarding "*Innovation Perception*", "*Innovation and Sector Relationship*", "*Innovation and Project Management*" and "*Innovation and Relationship with Competitors*" were defined.

Results: The item regarding "*expectations of patients"* (n=52, 30.1%) was stated primarily issue in the innovation process. In the scale, the score of the *"Innovation Perception"* subgroup was significantly higher in employees from the medical unit (4.07±0.58) and administrative unit (3.89±0.53) compared to those from the technical unit (3.48±0.62) (p=0.000). The score of the *"Innovation and Relations with Competitors"* subgroup was found to be significantly higher in administrative unit employees (3.53±0.76) compared to technical unit employees (3.14±0.76)(p=0.014).

Conclusion: Since innovation activity is a competitive factor for hospitals, health managers could take into consideration patients' expectations and employees' innovation perspectives. In addition, Healthcare Innovation Scale as a reliable and valid scale could be helpful for this purpose.

Keywords: Healthcare Professionals, Innovation Perspective, Private Healthcare Organization

Introduction

The intensive use of technologies is enabled knowledge to take its place among the production factors in economics (Thompson, 2018). In this respect, a rapid change process is undergone with the effect of technologies in each sector, like healthcare (Susanto and Chen, 2017). Nowadays, the development of health technologies requires a multidisciplinary approach and begins with the adaptation of scientific knowledge in basic sciences, medicine, and engineering. This process refers to the period starting with the introduction of the new health technology ideas (Stewart, et., al 2020; The AdHopHTA Project partners, 2015; WHO, 2015).

In this perspective, the term “Innovation” is defined in different ways. One of the internationally accepted definitions was included in the Oslo Guide published by the OECD in 2018. Here, the definition of innovation is: “The implementation of a new or significantly improved product, or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations” (OECD/Eurostat, 2018). Since innovations create economic value in the sector, it is defined as the transformation of knowledge and skills obtained by using science and technology into an economic product or service that the society can benefit. Innovation skills in businesses contribute to reducing costs, providing a competitive advantage, developing cheaper and higher quality products or services compared to competitors. For this reason, innovation is one of the resources that provide a significant competitive advantage for the business environment (Hana, 2013; MacNeil, et., al 2019).

Healthcare has a technology-intensive and multidisciplinary structure. Both organizations and patients could demand to see more technological structures for better healthcare (Berry, 2019; Bhavnani, et., al 2017; Pacifico Silva, et., al 2018). In this dynamic and complex environment, health professionals work together to provide best healthcare through new technologies. Therefore, healthcare organizations could also focus on research and innovation activities in this competitive sector for ensuring high qualified healthcare services and improving patient satisfaction in the healthcare organizations (Ruco, et., al 2021). Currently, patient-driven healthcare innovation is also new trend for healthcare organizations (Aghdam, et., al 2020).

Since benefits of innovation are converting knowledge into economic value, improving working conditions of health professionals and providing individual needs of patients, innovation process is triggered by multidisciplinary healthcare professionals (Berry, 2019; Bhavnani, et., al 2017; MacNeil, et., al 2019; Omachonu and Einspruch, 2010; The AdHopHTA Project partners, 2015; Pacifico Silva, et., al 2018). The aim of the study was to evaluate the innovation perspectives of employees from technical, administrative and medical units in a private hospital of a health group.

1. Research Methodology

In this cross-sectional study, a total of 177 employees (F/M: 104/73, mean age: 28.67±7.05 years) from the technical unit (n=59), administrative unit (n=79), and medical unit (n=39) included in a private hospital of a healthcare group. Response rate was 57.1%. Data were collected by a questionnaire regarding socio-demographic properties of healthcare professionals, use of health technologies and innovation related items. The main inclusion criterion was being a volunteer to participate the study. Missing data and inconsistent responses were exclusion criteria.

Innovation related items were selected from literature review (n=5) and the innovation scale (n=10) that was not specific for the health sector (Can, 2012). After ethical permission was taken from the developer of innovation scale, suitable items were selected and revised for health sector. In addition, the other items were added by the study group according to the literature review (Aghdam, et., al 2020; Berry, 2019; Bhavnani, et., al 2017; Birken, et., al 2013; Jagadeeswari, et., al 2018; Länsisalmi, et., al 2006; MacNeil, et., al 2019; Millenson, et., al 2019; Omachonu and Einspruch, 2010; Ruco, et., al 2021; Stewart, et., al 2020; Susanto and Chen, 2017; The AdHopHTA Project partners, 2015; Thompson, 2018). Then, final form was obtained by performing a pilot study (n=10). The study was approved by the Ethics Committee of the Marmara University Health Sciences Institute (19.11.2018-220) and informed consent was given by all the participants.

2. Analysis

After performing basic statistical tests, both Explanatory Factor analysis and Confirmatory Factor Analysis were used for the scale. Explanatory factor analysis was used to determine the construct validity of the "*Healthcare Innovation Scale"*. Principal Component Analysis and Varimax Rotation method were used to examine the factor structure of the scale. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was used to test the sampling adequacy, and Bartlett's Test of Sphericity was used to test the sample size. KMO sampling adequacy measure was found to be 0.805. The result of Bartlett's Test of Sphericity was found to be p=0.000. Therefore, data were found to be sufficient for factor analysis (Tabachnick and Fidell, 2014). According to the Explanatory Factor Analysis, a structure consisting of 4 factors with 15 questions was obtained. It explained 63.28% of the total variance. These factors as

subgroups of the scale were named *"Innovation Perception", "Innovation and Sector Relationship", "Innovation and Project Management"* and *"Innovation and Relations with Competitors".* The reliability of the scale was evaluated by Cronbach's alpha coefficient and found to be high for all items (0.869) and subgroups (0.749-0.781) (Table 1).

Considering the goodness of fit indexes of the "*Healthcare Innovation Scale"* according to the Confirmatory Factor Analysis; it was at the acceptance level of compliance with RMSEA value of 0.08 and $\chi 2$ value of 2.316 (p=0.000). CFI, AGFI, IFI, GFI, TLI, NFI indices were found to correspond to an acceptable fit at the 0.90 level (Tabachnick and Fidell, 2014).

Table 1: Explanatory Factor Analysis of The Healthcare Innovation Scale

	Items*	**Innovation Perception (n=5)**	**Innovation and Sector Relationship (n=4)**	**Innovation and Project Management (n=3)**	**Innovation and Relations with Competitors (n=3)**	****Mean**	**SD**
1	It is important for us to develop health technologies for different fields of activity.	0.754				3.87	0.84
2	The number of patents received is significant for our institution.	0.682				3.42	0.96
3	Diversity of product/service is important for our institution.	0.659				4.06	0.80
4	Numerous projects originating from new ideas, already initiated are successfully completed and implemented.	0.583				3.75	0.74
5	Efficiency is our primary goal for innovation.	0.533				3.86	0.91
6	We often lead our competitors while making changes that affect our sector.		0.757			4.11	0.83
7	We are usually the first to apply health technology products that will shape the sector.		0.716			3.96	0.84
8	Patient satisfaction is one of our primary goals.		0.708			4.37	0.81
9	We heed the suggestions, demands, and feedback from our patients while developing new products/services.		0.656			4.20	0.80
10	Project outputs are thoroughly evaluated and know-how for the next project.			0.815		3.88	0.84
11	Failed projects provide us an opportunity to analyse our shortcomings.			0.745		3.85	0.85
12	We actively use mobile platforms in the delivery of services.			0.681		3.99	0.91
13	We often compare the new products and projects of our competitors with our own products and projects.				0.849	3.54	0.95
14	We conduct research on our competitors' products, ongoing projects, and product development strategies.				0.764	3.70	0.98
15	We are inspired by the products and services of our competitors when designing new products/services.				0.710	3.22	0.95
	Variance (63.282 %)	17.197	16.841	14.926	14,318		
	Croncbach's Alpha Values **(**0.869**)**	0.767	0.781	0.762	0.749		
	Mean±SD	3.79±0.61	4.16±0.64	3.91±0.71	3.49±0.79		

Note(s): * 5-point Likert Scale (1: Strongly disagree - 5: Strongly agree)
**Means and SD values of items in the group

The profile of the study group was shown in Table 2. A total of 177 employees from technical unit (n=59; 33.3%), administrative unit (n=79; 44.6%), and medical unit (n=39; 22.1%) participated in the study. An increase in age and male predominance was seen in Technical unit

employees compared to other professionals (p=0.000). The ratio of married employees and mean age were lower in Administrative unit employees than the others (p=0.000). Educational profile was found to be similar among employees (p=0.062) (Table 2).

Table 2: The Profile of the Study Group

	Technical Unit Employees (n=59)		**Administrative Unit Employees (n=79)**		**Medical Unit Employees (n=39)**		**Total (n=177)**	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Gender*								
Male	38	64.4	26	32.9	9	23.1	**73**	**41.2**
Female	21	35.6	53	67.1	30	76.9	**104**	**58.8**
Marital status**								
Married	30	50.8	14	17.7	15	38.5	**59**	**33.3**
Single	29	49.2	65	82.3	24	61.5	**118**	**66.7**

	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Age (years)***	32.22	5.54	26,25	4.52	28.23	10.48	28.67	7.05
Education duration (years)******	15.74	1.06	15,25	1.69	15.84	1.38	15.54	1.46

Note(s): * p=0.000 Technical Unit Employees vs Administrative Unit Employees **p= 0.000** Technical Unit Employees vs Medical Unit Employees **p= 0.000** Medical Unit Employees vs Administrative Unit Employees p= 0.37
p=0.000 Technical Unit Employees vs Administrative Unit Employees **p= 0.000 Technical Unit Employees vs Medical Unit Employees p= 0.31 Medical Unit Employees vs Administrative Unit Employees **p= 0.01**
*** Technical Unit Employees vs Administrative Unit Employees **p= 0.000** Technical Unit Employees vs Medical Unit Employees **p= 0.022** Medical Unit Employees vs Administrative Unit Employees **p= 0.0003**
**** p=0.062

The main health technologies developed in the organization were "*Information management systems"* (n=106) and *"Applications related to patient monitoring system"* (n=88). According to employees, *"saving time"* (n=69; 20.3%), *"Increase in workforce productivity"* (n=66; 19.4%) and *"Increase in user satisfaction"* (n=56; 16.5%) were prominent points among expected benefits from the last health technology development projects. When employees were asked to factors affecting the health technology innovation process, the item regarding "*Expectations of patients"* (n=52, 30.1%) was stated primarily issue in the innovation process.

In the Healthcare Innovation Scale, the highest score was found as *"Patient satisfaction is one of our primary goals"* (4.37±0.81), *"We heed the suggestions, demands, and feedbacks from our patients while developing new products/services"* (4.20±0.80). The statements with the

lowest score were *"We are inspired by the products and services of our competitors when designing new products/services"* (3.22±0.95), *"The number of patents received is significant for our institution"* (3.42±0.96), and *"We often compare the new products and projects of our competitors with our products and projects"* (3.54±0.95) (Table 1).

After Explanatory factor analysis, 4 subgroups were determined as *"Innovation Perception", "Innovation and Sector Relationship", "Innovation and Project Management"* and *"Innovation and Relations with Competitors"* in Healthcare Innovation Scale. Subgroup scores of the scale were compared according to the occupational distribution of the employees.

No significant difference was found when the *"Innovation and Sector Relationship"* and *"Innovation and Project Management"* subgroup items were evaluated according to the occupational distribution of the employees in the study group (p>0.05) (Table 3).

The score of the *"Innovation Perception"* was significantly lower in technical unit employees (3.48±0.62) compared to medical unit employees (4.07±0.58) and administrative unit employees (3.89±0.53) (p=0.000 for both) (Table 3). As related to them, scores of items regarding *"The number of patents received is significant for our institution"*, *"It is important for us to develop health technologies for different fields of activity"* were significantly lower in a technical unit employee than the others (p<0.05). In addition, scores of items *"Diversity of product/service is important for our institution"* (p=0.032) and *"Efficiency is our primary goal for innovation"* (p=0.001) were significantly lower in employees from the technical unit compared to those in medical units (p<0.05) (Table 4).

Table 3: Scores of Subgroups in Healthcare Innovation Scale According to the Occupational Groups

	Occupational Groups	n	Mean	SD	p*
Innovation Perception	Technical Unit Employees	59	3.48	0.62	**0.000****
	Administrative Unit Employees	79	3.89	0.53	
	Medical Unit Employees	39	4.07	0.58	
Innovation and Sector Relationship	Technical Unit Employees	59	4.02	0.74	0.247
	Administrative Unit Employees	79	4.20	0.60	
	Medical Unit Employees	39	4.28	0.50	
Innovation and Project Management	Technical Unit Employees	59	3.79	0.79	0.358
	Administrative Unit Employees	79	3.95	0.71	
	Medical Unit Employees	39	4.01	0.55	

Innovation and Relations with Competitors	Technical Unit Employees	59	3.14	0.76	**0.000*** **
	Administrative Unit Employees	79	3.53	0.76	
	Medical Unit Employees	39	3.91	0.66	

Note(s): * 5-point Likert Scale (1: Strongly Disagree - 5: Strongly Agree)

* Kruskal Wallis test was used ** Technical Unit Employees vs Administrative Unit Employees **p= 0.000** Technical Unit Employees vs Medical Unit Employees **p= 0.000**** Technical Unit Employees vs Administrative Unit Employees **p= 0.014** Technical Unit Employees vs Medical Unit Employees **p= 0.000** Medical Unit Employees vs Administrative Unit Employees **p= 0.013**

Table 4: Scores of Items in Innovation Perception Subgroup According to the Occupational Groups

Innovation Perception	Occupational Distribution	n	Mean	SD	p*
It is important for us to develop health technologies for different fields of activity.	Technical Unit Employees	59	3.51	0.91	**0.001** **
	Administrative Unit Employees	79	4.01	0.79	
	Medical Unit Employees	39	4.11	0.65	
The number of patents received is significant for our institution.	Technical Unit Employees	59	2.91	0.93	**0.000** ***
	Administrative Unit Employees	79	3.59	0.90	
	Medical Unit Employees	39	3.84	0.82	
Diversity of product/service is important for our institution.	Technical Unit Employees	59	3.82	0.87	**0.032** ****
	Administrative Unit Employees	79	4.13	0.76	
	Medical Unit Employees	39	4.26	0.72	
Numerous projects originating from new ideas, already initiated are successfully completed and implemented.	Technical Unit Employees	59	3.58	0.84	0.103
	Administrative Unit Employees	79	3.80	0.65	
	Medical Unit Employees	39	3.92	0.74	
Efficiency is our primary goal for innovation.	Technical Unit Employees	59	3.56	0.89	**0.001** *****
	Administrative Unit Employees	79	3.90	0.84	
	Medical Unit Employees	39	4.23	0.94	

Note(s): * 5-point Likert Scale (1: Strongly Disagree - 5: Strongly Agree) * Kruskal Wallis test was used. ** Technical Unit Employees vs Administrative Unit Employees **p= 0.003** Technical Unit Employees vs Medical Unit Employees **p= 0.001**** Technical Unit Employees vs Administrative Unit Employees **p= 0.000** Technical Unit Employees vs Medical Unit Employees **p= 0.000**** Technical Unit Employees vs Medical Unit Employees **p= 0.027***** Technical Unit Employees vs Medical Unit Employees **p= 0.002**

The score of the *"Innovation and Relations with Competitors"* subgroup was found to be significantly lower in technical unit employees (3.14±0.76) compared to administrative unit employees (3.53±0.76) (p=0.014). It was also found to be significantly higher in medical unit employees (3.91±0.66) than the others (p=0.000, p=0.013 respectively) (Table 3).

In this subgroup scores of items including *"We often compare the new products and projects of our competitors with our own products and projects"* and *"We are inspired by the products and services of our competitors when designing new products/services"* were significantly higher compared in the medical unit employees than the others (p<0.05). Moreover, *"We conduct research on our competitors' products, ongoing projects, and product development*

strategies" item score was significantly lower in technical unit employees compared to those of others ($p<0.05$) (Table 5).

Table 5: Scores of Items in Innovation and Relations with Competitors Subgroup According to the Occupational Groups

Innovation and Relations with Competitors	Occupational Distribution	n	Mean	SD	p*
We often compare the new products and projects of our competitors with our own products and projects.	Technical Unit Employees	59	3.22	1.00	**0.001****
	Administrative Unit Employees	79	3.55	0.93	
	Medical Unit Employees	39	3.97	0.71	
We conduct research on our competitors' products, ongoing projects and product development strategies.	Technical Unit Employees	59	3.31	1.10	**0.001*****
	Administrative Unit Employees	79	3.78	0.91	
	Medical Unit Employees	39	4.08	0.74	
We are inspired by the products and services of our competitors when designing new products/services.	Technical Unit Employees	59	2.91	0.90	**0.000******
	Administrative Unit Employees	79	3.21	0.94	
	Medical Unit Employees	39	3.72	0.86	

Note(s): * 5-point Likert Scale (1: Strongly Disagree - 5: Strongly Agree)
* Kruskal Wallis test was used. ** Technical Unit Employees vs Medical Unit Employees **p=0.000** Administrative Unit Employees vs Medical Unit Employees **p=0.024**** Technical Unit Employees vs Administrative Unit Employees **p=0.020** Technical Unit Employees vs Medical Unit Employees **p=0.000***** Technical Unit Employees vs Medical Unit Employees **p=0.000** Administrative Unit Employees vs Medical Unit Employees **p=0.012**

3. Conclusions and Recommendations

Healthcare institutions have technology-intensive structure with dynamic character (Pacifico Silva, et., al 2018). Since patients are the centre of the health system, innovative health technologies focus on facilitating access to healthcare services, shortening the duration of diagnosis and treatment of diseases (Millenson, et., al 2019). Within the scope of this study, it was aimed to evaluate innovation perspectives of employees in a private hospital of a health group.

In the study, "Information *management systems"* and "*Patient monitoring systems"* were recently developed innovative products in the organization. These results were predicted when innovation in healthcare where data can be followed in a digital environment (Länsisalmi, et., al 2006). Healthcare is a technology-intensive industry that undergoes an accelerated transformation in the digitalizing world. Innovation activities in healthcare focus on digital

products, information management systems, monitoring of the patient and patient-related processes at the forefront (Bhavnani, et., al 2017; Omachonu and Einspruch, 2010).

In the study, "*Healthcare Innovation Scale"* that consisted of 4 subgroups with 15 questions was used to evaluate the innovation perspectives of employees. Factor analyses for construct validity and Cronbach's alpha values for internal validity were carried out. When the scale was examined as item-based, the highest scores were observed in items regarding *"Patient satisfaction is one of our primary goals", and* "*We heed the suggestions, demands and, feedbacks from our patients while developing new products/services"* item. Innovation process is carried out according to project management principles and has vital importance for achieving the desired health outcomes and ensuring satisfaction in healthcare (Birken, et., al 2013; Länsisalmi, et., al 2006). Since the principle of economic transformation into a product/service is the most fundamental aim of innovation activities, this statement fits with the concept of innovation. Therefore, "*Meeting customer demands and needs"* was determined as the most important expression for innovation processes (Hana, 2013). Therefore, the primary factor is to increase the satisfaction level by meeting the patient's expectations.

Employees from different occupations work together for providing the best healthcare. The key superiority condition for using integrated different technologies in healthcare is to create a platform for employees in organizations (European Commission, 2019). In the study, the *"Innovation Perception"* and the *"Innovation and Relations with Competitors"* subgroups of the scale showed a significant difference according to occupational distribution. Scores of the *"Innovation Perception"* subgroup and items in this subgroup regarding *"The number of patents received is significant for our institution"* and *"It is important for us to develop health technologies for different fields of activity"* were lower in the technical unit employee than the others. Moreover, an increase in scores of items regarding *"Diversity of product/service is important for our institution"* and *"Efficiency is our primary goal for innovation"* were seen in medical unit employees than technical unit employees in the study. The technical unit employees are involved in the project process and the medical unit employees are involved as the end-user. It can be inferred that the administrative unit staff is involved in reporting, finding resources, evaluating patient and user demands and preparing project proposals (Birken, et., al 2013). According to the findings, medical unit employees had the highest score making this difference.

This situation reveals that medical unit employees have a high level of awareness of the process, even if they could not be involved in the innovation process, directly. In medical units' perspectives, the increasing competition, the rapid development of health technologies, changes in patients' expectations, and providing the best diagnosis and treatment are associated with the innovation in healthcare (Omachonu and Einspruch, 2010).

Score of *"Innovation and Relations with Competitors"* subgroup was lower in Technical unit employee than the others whereas, the highest score was seen in employees from medical unit and their items found to be low in employees from technical unit. Similar trend was seen in items including *"We often compare the new products and projects of our competitors with our own products and projects"* and *"We are inspired by the products and services of our competitors when designing new products/services"*, *"We conduct research on our competitors' products, ongoing projects and product development strategies"*. Since health technology innovation is a process that includes technical issues; technical unit employees are predominantly involved in the projects. Moreover, administrative and medical unit employees are involved in different processes such as determining the needs, evaluating the effectiveness, and finding resources because the critical point is to improve the quality of healthcare services (Omachonu and Einspruch, 2010).

The expected benefits of health technology innovation are increased *efficiency* and *quality of patient care for the healthcare professionals*. These can be considered as institutional benefits because increasing workforce efficiency and time-saving also contribute to the delivery of integrated healthcare services. Thus, accessing more information about patients enables personalizing healthcare services by innovative health technologies (Jagadeeswari, et., al 2018). In the study, it was determined that the demands and expectations of the patients were more effective in the innovation process. Benefits expected from innovative activities in health technologies are addressed in two stages such as patient-oriented and organizational benefits. All innovative activities are carried out in this direction for their competitive advantages (Berry, 2019; Hana, 2013).

There is no significant difference in the *"Innovation and Sector Relationship"* subgroup according to the occupational distribution. It is not possible to think of innovation activities in the health industry independently from the health system. Innovation activities should be carried

out with a multidisciplinary approach and with the contributions of all stakeholders of the health sector (Berry, 2019; Bhavnani, et., al 2017; Hana, 2013).

When the *"Innovation and Project Management"* subgroup was examined, no significant difference was found between the occupational distributions. It is known that project management skill has a significant impact on innovation processes in the service sector. It should not be forgotten that the innovation process shows a complex structure and ideas for the correct management of projects have priority (Schultz, et., al 2019).

In the study, it is seen that the medical unit employees provided more supportive scores. It has been determined that patient expectations are prioritized, and administrative unit employees also make demands. On the other hand, technology-intensive processes are on the agenda because the expectations of patients are constantly increasing in the health sector (Berry, 2019). For this reason, it was emphasized that innovation should not be perceived only as technological development or providing a competitive advantage, but as projects in which strategic priorities are determined (Bhavnani, et., al 2017; WHO, 2015). Therefore, the qualified employees are important for the sustainable development in healthcare (Francisco Shapovalova, et., al 2015).

In innovation processes, health managers involve the innovation process by supporting projects and organizations of resources and creating innovative environment for employees. At this point, managerial processes are the centre of innovation process. Therefore, health managers' point of views and the experiences of human resources in the team contribute to innovation by facilitating organizational processes (Malik, et., al 2017).

Although the study contributed information about innovation perspective of employees, it had some limitations. Cross-sectional design of the study carried out in a private hospital was the main limitation of the study. Both of qualitative and quantitative studies should be planned for "*Healthcare Innovation Scale"* in large groups.

Declaration of competing interest

The authors declare no conflicts of interest and any specific grant from funding agencies.

Supplementary

Supplement 1: Items in The Healthcare Innovation Scale*

1	It is important for us to develop health technologies for different fields of activity.
2	The number of patents received is significant for our institution.
3	Diversity of product/service is important for our institution.
4	Numerous projects originating from new ideas, already initiated are successfully completed and implemented.
5	Efficiency is our primary goal for innovation.
6	We often lead our competitors while making changes that affect our sector.
7	We are usually the first to apply health technology products that will shape the sector.
8	Patient satisfaction is one of our primary goals.
9	We heed the suggestions, demands and feedbacks from our patients while developing new products/services.
10	Project outputs are thoroughly evaluated and know-how for the next project.
11	Failed projects provide us an opportunity to analyse our shortcomings.
12	We actively use mobile platforms in the delivery of services.
13	We often compare the new products and projects of our competitors with our own products and projects.
14	We conduct research on our competitors' products, ongoing projects and product development strategies.
15	We are inspired by the products and services of our competitors when designing new products/services.

Note(s): *5-point Likert Scale (1: Strongly Disagree - 5: Strongly Agree)

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RISK FACTORS OF NON-COMMUNICABLE DISEASES IN TURKEY: A SHORT REVIEW

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Review Article

Abstract

Non-communicable diseases (NCDs) have been rapidly increasing globally, negatively affecting countries' health systems and economies. In the world, NCDs are considered as one of the most important reasons of disability, death and inequality. Therefore, new models need to be developed in the field of health in order to minimize and manage the risk factors of NCDs. The risk factors of NCDs can be successfully combated by developing both national and international policies and strategies. As in the rest of the world, NCDs' prevalence and risk factors are increasing in Turkey.This review aims to give information about the NCDs in Turkey and explain the risk factors that cause these diseases as well as making recommendations.

Keywords: Health Systems, Health Policies, Non-communicable Diseases

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Introduction

Non-communicable diseases (NCDs) are diseases which last for a long time and progress slowly. The most common types of NCDs are cancers, cardiovascular diseases, diabetes and chronic respiratory diseases (WHO, 2011). The number of deaths caused by NCDs are higher than the sum of all other causes of death. NCDs cause more than 40 million people's death yearly. NCDs account for 70% of the global deaths. They are therefore among the world's biggest causes of death. About 85% of deaths caused by NCD appear in countries with low- and middle-income. Furthermore, more than 9 million of all deaths which are linked to NCD take place before the age of 60. NCDs are considered to be affecting women and men almost equally across the world (WHO, 2013; Allen and Feigl, 2017).

Although there are many factors of risk in the progression of NCDs, the most crucial risk factors are physical inactivity, tobacco and alcohol use; and unhealthy nutrition. Moreover, NCDs can be largely prevented and controlled with effective interventions addressing these risk factors (WHO, 2013; WHO, 1998).

NCDs cannot only be considered as a health problem, but also a developmental problem. NCDs expose a lot of people to high-cost expenses for treatment. Therefore, they place a heavy economic burden on both countries' health systems and individuals (Maimela et al. 2018).

The risk factors of NCDs can be successfully combated by developing both national and international policies and strategies (WHO, 2015). The prevalence of NCDs and risk factors are increasing in Turkey as in the rest of the world (Republic of Turkey Ministry of Health, 2017).

The rates of NCD-induced death in Turkey are likely to the rates in other countries in the WHO European Region (Republic of Turkey Ministry of Health, 2017). This review aims to give information about the non-communicable diseases in Turkey, and explain the risk factors that cause these diseases as well as making recommendations.

1. Background

1.1 Non-Communicable Diseases

NCDs are also known as chronic diseases and they are long-lasting. They are the result of a combination of physiological, genetic, behavioral and environmental factors. NCDs cause the death of more than 40 million people every year, which is 70% of the deaths globally. Every year, approximately 15 million people who are between the ages of 30-69 die at the initial stages

due to NDSs (WHO, 2013; WHO, 2014). Poverty is fairly closely related to the non-communicable diseases, and they mostly affect people living in countries with low- and middle-income. It is anticipated that the effects of NCDs are to continue to grow as more impacts appear in the low- and middle-income countries (WHO, 2014; Maimela et al. 2018).

Among the most common NCD types, cancers, chronic respiratory diseases, cardiovascular diseases (CVD) and diabetes can be counted. 80% of all death cases in relation to NCDs are caused by these diseases. CVDs are the most common cause of NCD deaths. In the world, there are about 17.9 million people who lose their lives due to CVD every year. This is followed by cancers which cause the death of 9 million people per year, respiratory diseases cause the death of 3.9 million people and diabetes cause the death of 1.6 million people (WHO, 2013).

1.2 Risk Factors

1.2.1. Modifiable Behavioral Risk Factors: Tobacco and alcohol use, unhealthy nutrition and physical inactivity are the most important factors (GBD, 2016; WHO, 2013).

- Global tobacco use results in killing about 6 million people a year. This number can rise to 7.5 million, accounting for 10% of all deaths by 2020.
- 3.3 million people lose their lives every year due to harmful alcohol use. If cancer is included, diseases associated with NCD account for more than half of the deaths caused by alcohol use.
- 4.1 million people die every year because of salt and sodium consumption.
- Every year 1.6 million people lose their lives due to inadequate physical activity.

1.2.2.

1.2.2. Metabolic Risk Factors: There are four main metabolic risk factors increasing the risk of non-communicable diseases. These are (WHO, 2013):

- Hypertension
- Obesity
- Hyperglycemia
- Hyperlipidemia

The highest global metabolic risk factor can be regarded as hypertension (19% of global deaths) which is followed by excess weight, obesity, and hyperglycemia. Lack of healthy diets and physical activity can manifest themselves in humans as hypertension, hyperglycemia,

hyperlipidemia, and obesity. All of these can be seen as risk factors that can result in cardiovascular diseases. There was a tenfold increase regarding childhood and adolescent obesity in the last forty years. According to WHO data, approximately 1.5 billion adults who were aged 20 and older happened to be obese due to malnutrition in 2008 while approximately 43 million children who were under the age of 5 were obese in 2010 (WHO, 2013).

A decrease by three-quarters is expected in heart diseases, and it is also predicted that type 2 diabetes and 40% of cancers can be prevented provided that the NCDs' major risk factors are controlled (WHO, 2018a).

NCDs are globally regarded as the most crucial public health problem in the 21st century. Poverty is closely related to NCDs. It is predicted that the dramatic increase of NCDs will delay attempts to reduce poverty in countries with low-income since they increase household costs which are associated with health care particularly. The excessive costs of NCDs, which often require long and expensive treatment, push millions into poverty every year (WHO, 2013; Nuget, 2016).

WHO published the *Global Action Plan for the Prevention and Control of NCDs* in the year of 2013 so that it can intervene in the NCD burden globally. According to this plan, important global targets have been set for reducing NCD-induced premature deaths by 25% by 2025 (WHO, 2013).

Individuals with low socio-economic status are more likely to be subjected to the risk factors that initiate the development of NCDs. In addition, because they have limited access to health care, people in this group get sick and lose their lives faster than people in higher social positions. Also, countries whose health insurance coverage is insufficient are unlikely to have universal access to basic NCD interventions (Ezzatil et al. 2018).

NCDs have a negative impact on national health systems and economies. The negative effects are further increasing, and health expenditures are challenging individuals and families in low- and middle-income countries. The important way to control NCDs is to develop effective interventions to reduce the risk factors related to these diseases (Maimela et al. 2018; Knight et al. 2019).

The risk factors of NCDs can be successfully combated by developing both national and international policies and strategies. It is important to follow the development, trends and risks of

NCDs in order to guide policies and priorities. The government and other stakeholders should cooperate to decrease the effects of NCDs on people and the society. A comprehensive approach covering all sectors, particularly health, finance, transportation, education, agriculture etc. and encouraging preventive interventions is needed. Overcoming risk factors will not only save lives but also provide a major boost for economic development of countries (Bartlett, 2018; Maimela et al. 2018, Deniz et al. 2021).

Investing in the management of NCDs is critical for countries. The management of NCDs provides access to the detection, screening and treatment of diseases and palliative care for people in need. At the same time, management of NCDs also requires an integrated approach to patient, family and community as lifelong active participants. Management of NCDs should also be regulated according to people's strengths and difficulties in managing their care. Successful NCD management can take place with a primary care approach in order to be able to detect early and treat in time. Such managements provide excellent investments in a country's economy. If diseases diagnosed early are brought under control by primary care services, the need for more expensive treatments will decrease. NCD management interventions are necessary to reach the global target of decreasing the premature death risks of non-communicable diseases by 25% by 2025 and having a one-third decrease in the number of premature deaths which non-communicable diseases cause by 2030 (WHO, 2013; Maimela et al. 2018; Knight et al. 2019; Ali et al. 2015)

1.3.Risk Factors Of Non-Communicable Diseases In Turkey

The problem of non-communicable diseases is very crucial in Turkey. According to WHO statistics, 407,300 (218,600 men and 188,700 women) out of 455,000 deaths in Turkey in 2016 were as a result of NCDs. Cardiovascular diseases (34%), cancer (23 percent), other NCDs (21 Percent), chronic respiratory diseases (7%), injuries (6%), diabetes (5%) and communicable, maternal, perinatal and nutritional conditions (4%) are the most common reasons of deaths in Turkey (WHO, 2018b).

It is expected that 86% of total deaths in Turkey are as a result of NCDs. According to WHO statistics from 2016, the risk of premature death due to NCDs between the ages of 30 and 70 is 16%. This rate is 22% for males and 11% for females. In 2016, the premature death rate from the four main NCDs was 303 in 100,000 (WHO, 2018b).

There are many risk factors that can cause NCDs in Turkey. The most frequent ones (Republic of Turkey Ministry of Health, 2017; Republic of Turkey Ministry of Health, 2011):

- Harmful alcohol use
- Physical inactivity
- Salt and sodium consumption
- Tobacco use
- High blood pressure
- Obesity

Policies, strategies and action plans are carried out in order to prevent and take NCDs under control in Turkey. Examples include health warning campaigns, media advertising, promotion and sponsorship bans, and smoke-free area policies. Efforts to reduce unhealthy nutrition include salt and sodium policies, saturated fatty acid and trans-fat policies, and restrictions on marketing to children. An awareness campaign was launched in Turkey about public education and physical activity. However, drug treatment conditions or counseling services have not been provided yet to prevent heart attacks and paralysis (WHO, 2017; Republic of Turkey Ministry of Health, 2017).

The study titled "*National Household Health Survey in Turkey: Prevalence of Noncommunicable Disease Risk Factors*" was conducted in Turkey using the chronic disease surveillance approach of WHO (STEPwise) in 2017. According to the study (Republic of Turkey Ministry of Health, 2017):

Use of Tobacco Products

- 31.5% of the total 6053 participants from Turkey aged 15 and over still smoked tobacco products. Smoking of tobacco products in males was higher than in females. (respectively; 43.4% and 19.7%).
- 31.6% of the participants including 43.6% of the males and 19.7% of the females still used tobacco products.
- 3 out of 10 people who were using tobacco products at that time had tried to stop using tobacco products in the last 12 months.

Alcohol Use

- 8% of the participants including 13.1% of the males and 3% of the females used alcohol.

- One out of the twenty current alcohol users consumed a lot of alcohol on a periodical basis.
- More than four out of every five participants (83.6%) had never consumed alcohol in their lives while 4.3% had never consumed alcohol in the past 12 months even though they had previously consumed alcohol.

Physical Activity

- 4 out of every 10 adults did insufficient physical activities.
- 43.6% of the population were not considered to meet the WHO's recommendations in terms of physical activity for health (33.1% of the males, 53.9% of the females).
- The mean daily physical activity time in Turkey was calculated as 30.0 minutes. The total time spent on physical activity by males (51.4 minutes) is higher than the time spent by females (17.1 minutes).
- 81.3% of the participants including 70.1% of the males and 92.2% of the females did not engage in effective physical activity.
- 40.5% of the research group received counseling or training from health workers on one or more issues related to wellness in the last twelve months (38.1% of the males, 42.9% of the females).

Obesity

- Two out of three people were overweight (BMI≥25 kg/m2).
- 3 out of every 10 people (28.8%) were obese (BMI≥30 kg/m2) and obesity was found to be 1.6 times greater in females (35.9%) than males (21.6%).

Nutrition

- 87.8% of the participants including 87.8% of the males and 87.9% of the females consumed less than five portions of fruit and vegetables daily.
- The average daily salt consumption was 9.9 grams with males consuming 11.0 g and females consuming 8.7 g.

Cancer Screening

- 5 out of every 10 women between the ages of 30 and 65 had a cervical smear test at one time.
- 6 out of every 10 women between the ages of 40 and 69 had a mammogram at one time.
- 1 out of every 10 adults between the ages of 50 and 70 had a colonoscopy in the last 10 years.

High Blood Pressure

- Three out of every 10 people had hypertension.
- 27.7% of the participants including 26.1% of the males and 29.3% of the females had high blood pressure.

Hyperglycemia

- 11.1% of the participants including 10.6% of the males and 11.5% of the females had high blood sugar.

Awareness

- More males knew two or more negative health effects of NCD risk factors when compared to females in general.
- More than half (51.2%) of the population had three or more risk factors for non-communicable diseases, which increased in proportion to age. The study found that only 1.3% of the population had none of the 5 risk factors for non-communicable diseases.

2. Conclusions and Recommendations

Around the world, the prevalence of NCDs are worried about and this causes many countries to try finding ways to avoid NCDs through public policies of nations which help avoid NCDs requiring the participation of various sectors. Thus, strategies for community interventions are implemented and maintained in a coordinated manner in order to avoid and take the appraised factors of risk under control and to provide a healthy life from childhood on. At the same time, NCDs require keeping an eye on risk factors based on samples representing the population regularly (WHO, 2013; Hunter and Reddy, 2013).

Death rates from NCDs are increasing rapidly in Turkey as in the whole world. Looking at the results obtained from the study titled “National Household Health Survey in Turkey: Prevalence of Noncommunicable Disease Risk Factors” conducted in 2017, more than half of the population in Turkey has at least three risk factors for non-communicable diseases and they

increase in proportion to age. The study found that only 1.3% of the population had none of the 5 risk factors for non-communicable diseases (Republic of Turkey Ministry of Health, 2017). Unless NCDs are brought under control in Turkey, death rates due to these diseases will gradually rise and continue to consume a significant portion of health resources.

Effective NCD management requires an integrated approach that addresses individuals, families and the society as people participating actively lifelong. At the same time, effective interventions are needed to control the development of diseases and reduce the risk to have complications. Examples of these interventions include the following (WHO, 2013; Republic of Turkey Ministry of Health, 2017);

- Primary protections for eliminating causes of disease such as tobacco use control, promoting physical activity, reducing alcohol use, promoting healthy eating etc.,
- Secondary protections such as development of early diagnostic strategies to prevent cancer, early detection of the disease etc.,
- Tertiary protections such as keeping the disease under control, ensuring the continuity of health care, increasing the life quality of the patient by providing rehabilitative services when necessary, and providing counselling services etc.,
- Monitoring patients at appropriate intervals as NCD treatment lasts a lifetime.

Studies show that NCD prevention and early interventions will make the highest difference in rates of NCD. Evidence-based and pragmatic guidelines need to be developed to standardize these interventions and test their value. Furthermore, the specialist workforce required in this process should also be taken into account.

Health policies should be developed and implemented continually at both national and international levels in order to realize the problems, know the necessity for interventions, improve interventions appropriately, to decrease the burden of the disease and to underline health inequalities, and to be able to monitor the success of the goals.

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EVALUATING THE COST-EFFECTIVENESS OF DENTAL IMPLANT AND PROSTHESIS INTERVENTIONS: A SYSTEMATIC REVIEW[1]

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Abstract

Aim: Aim of this review is to compare cost-effectiveness in the implant and prosthesis for missing teeth, and to explore the methods used in cost-effectiveness analysis using published studies.

Methods: A systematic review was conducted on cost-effectiveness analysis in the dental implant and prosthesis for single, partial or complete replacement via PubMed, Scopus, Web of Science, EBSCO and Cochrane Library databases. Review was restricted to published articles in English language without time limit. Reporting quality assessment of dental replacement cost-effectiveness analysis used the Consensus Health Economic Criteria (CHEC) extended checklist guidelines.

Findings: Of the 526 publications identified initially, a total of 17 studies on the cost-effectiveness of dental implants and prosthesis were included in the systematic review. Of these, 8 (47.1%) were

[1]The summary of this article was presented as an oral presentation at the 6th IHMC

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originated in the last four years. Most of articles (n=8, 47.1%) were on the cost-effectiveness for single-tooth replacement. The median of reporting quality of studies, assessed by the CHEC extended checklist is 74% (from 55% to 90%). Ten studies were able to define the most cost-effective among the interventions compared. Most studies were in concurrence that over the long term, dental implants represent a cost-effective treatment option. The methodology for the economic evaluation of prosthetic treatments is quite complex. Although there are concepts such as QAPY and QATY introduced into the literature, their applications have remained rather limited and not developed.

Conclusion: The majority of studies were able to provide conclusions regarding the most cost-effective intervention among the different options compared: this will assist in healthcare decision-making and resource allocation. For edentation, implant was cost-effective treatment option in comparison with dental prosthesis.

Keywords: Tooth Lost, Dental Implants, Dental Prosthesis, Cost-Effectiveness, Health Economics

Introduction

Despite the development of curative and preventive dental care and technology in the last years, edentulism continues to be a challenging problem to healthcare provider (Al-Rafee, 2020). Tooth-loss is a quite important public health problem globally because of its high prevalence and related disability (Peltzer et al., 2014; Tyrovolas et al., 2016). Globally, there were 267 million that had total tooth loss prevalence in 2017 (Bernabe et al., 2020). Prevalence's of edentulism, severe tooth loss, and lacking functional dentition in U.S were 10.8%, 16.9%, and 31.8%, respectively (Parker, Thornton-Evans, Wei, & Griffin, 2020). Dental conditions are mostly chronic and, the costs of treating dental diseases impose on families large economic burdens to and healthcare systems (Peres et al., 2019).

Dental implants started to be used more recently while dental prostheses are a technology with more a long history for treatment of tooth-lost. But, implants have been a very strong alternative treatment to dental prostheses. As time moves on patients prefer the very best in tooth replacement choices for their present and future needs (Rajput et al., 2016). Therefore, implant treatment may have been more preferred. Since especially implant technology is more expensive and the opportunities for application are extensive, questions about its effectiveness and efficiency have been asked. A lot cost-effectiveness evaluations inclusive different conclusion

has been published so far. However, there are no systematic review of CEA (Cost-Effectiveness Analysis) studies for dental implant modalities versus prosthesis modalities.

As in all areas of health, there are discussions for budget optimization in oral and dental health. Detailed descriptions of the resources used, together with estimates of the costs and outcome data of the treatments, can provide good guidance in the decisions made. Dentists always want to apply the most effective method to the patient. However, in some cases, serious differences may arise between alternatives in terms of cost and effect. Due to scarcity of the clinical trials aimed to compare the implants with prostheses, it is indefinite whether implants are more effective than the prostheses (Chun, Har, Lim, and Lim, 2016). But, implant is believed use a longer time than the prosthesis although the implant brings a higher cost. In order to explore this issue, articles using CEA have been published in recent years. These studies provided considerable information for the clinical decision-making process. This study aims to review published articles on CEA of dental implant modalities in comparison with prosthesis modalities for dental replacement, and also to explore the methods used in CEA.

1. Background

The replacement of missing teeth used removable dental prosthesis, fixed dental prosthesis and implants. Removable Dental Prostheses are artificial appliances that can be inserted and removed from the mouth. Removable dental prosthesis is commonly referred to as ‘‘dentures’’ or ‘‘false teeth’’ (Schütte and Walter, 2010). Removable dental prostheses are relatively economical to make and maintain. However, the compliance of this type of prostheses is inferior to that of the dental implants and fixed prosthesis. Also, it does not preserve dental bone the same way dental implants do. The patients preferred more a fixed prosthesis in opposition to the removable. (Resnik, 2020: Aslam et al., 2017).

Fixed prosthodontic treatment involves replacement of lost natural teeth using fixed artificial substitutes with an aim to restore function, esthetics and comfort (Shah et al., 2014). The abutmenting of healthy teeth makes them less favorite (Prasanna et al., 2012).3, But fixed dental prostheses (FDPs) are still preferred because of their esthetics, lack of any surgical preparation and especially less cost (Riaz, Aslam and Aziz, 2018). In general, fixed dental prostheses (FDPs), supported by teeth, have proven to yield good medium- and long- term

results. In the past decades, dental implants have become widely used and implants too seem to provide a reliable support for dental restorations (Pjetursson et al., 2015; Pjetursson et al., 2014).

Dental implants have become a vital part of prosthodontics for especially partially and completely edentulous patients. The implant is similar as self-natural of teeth and often offer a more predictable treatment course than removable and fixed prosthesis. Dental implant restorations have the highest survival rate compared with any other type of prosthesis to replace missing teeth. They do not decay, no require endodontic treatment, also less prone to fracture and resist periodontal disease better than a natural tooth. But is the treatment plan and the treatment of complications (such as screw loosening, crystal bone loss, prosthesis fracture, or implant failure) are most often unique to implant dentistry. In addition, patients should pay more attention to oral and dental hygiene (Misch, 2015; Resnik, 2020).

There is gradually growing for the need to perform economic evaluations of missing tooth replacement. Economic evaluations analyze comparing the cost and outcome of alternative treatment/healthcare interventions. Cost-effectiveness and cost-utility analysis are the most widely used. (Drummond, 2015). Health outcome are usually measured as quality-adjusted life-years (QALYs), accounting also for the quality-of-life outcomes. In dentistry, special concepts such as QAPY and QATY have been developed. In the cost-effectiveness analysis (CEA) are used is often referred to as with its parameters of interest being called incremental cost-effectiveness ratio (ICER), whereas an analysis in which QALYs are used is often called cost-utility analysis (CUA). QALY takes a value between 0 (death) and 1 (perfect health). In QAPY and QATY it can have values between "0" (missing tooth) and "1" (a tooth that remains in perfect condition). ICER calculated by the difference in costs between two health care interventions/programs divided by the difference in outcomes between the interventions/programs (Fox, 2005; Oscarson, 2006; Fyffe and Kay, 1992).

2. Research Methodology

Literature searches were conducted by using the PubMed, Web of Science, Cochrane and EBSCO databases from their inception to 2019, and were limited to articles written in English. The search term combinations used to search the knowledge included dental implant, dental prosthesis, cost-effectiveness AND dental implant, cost-effectiveness AND dental prosthesis,

cost-utility AND dental implant, cost-utility AND dental prosthesis. In this study excluded studies that are not original and research article.

Studies that met the following criteria were considered eligible for this systematic review: (1) designed about tooth replacement (single, partially or completely); (2) comparison prosthesis versus dental implant or, comparison within themselves either implant strategies or prosthetic strategies ; and (3) the studies reporting data about the costs (initial costs of treatment, total costs, or long-term maintenance costs etc.), outcomes and cost-effectiveness of missing tooth treatment, (4) published in English language.

For study selection primarily the search results from all databases were merged, and duplicates removed. It started with reviewing the abstracts of these articles published to find out which of the studies met our inclusion criteria, and then reviewed dental health-economics full text articles. 15 CEA articles were included. Also additional to it included cost-utility and Health Technology Assessment (HTA) studies that fulfilled all the selection criteria. These 17 articles reviewed in detail. LT and NM assessed the risk of bias and the quality for each included study using the CHEC (Consensus Health Economic Criteria) extended checklist. CHEC is an internationally accepted criteria list for quality assessment of economic evaluations that could be used in systematic reviews (Evers, Goossens, de Vet, van Tulder, & Ament, 2005; Sagili et al., 2018). The 20-items in checklist scored as having met the criteria in full (“1”) and not at all (“0”). The total score for each item converted to a percentage (<50; low, 51–75; moderate, 76–95; good and >95; excellent) with the range of scores ranging from zero to 100. Selected 17 articles were analyzed and, gathered that information such as study country, perspective, intervention area, time horizon, discount rate, report of ICER (Incremental Cost-Effectiveness Ratio) state, alternative treatments. Article selection process in accordance with the PRISMA Guidelines was given in Figure 1.

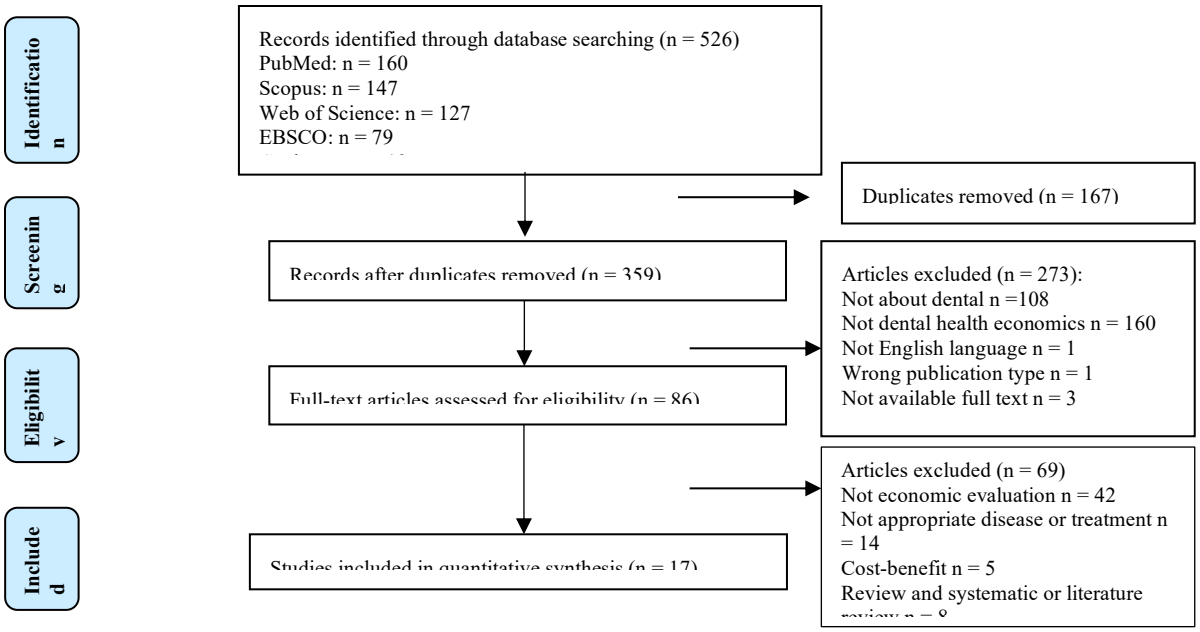

Figure 1. PRISMA diagram depicting the systematic review strategy

3. Analysis

Initially 526 studies were found with keywords. A total of 86 studies were read in full, 17 articles were included in the systematic review (Figure 1). CHEC scores of 17 studies included in the review, quality of nine studies were moderate, quality of eight studies were good, showing lower risk of bias. When looking at common negativities, it is remarkable that there are only two studies discussing ethical and distributional issues (Della Vecchia et al., 2018; Y. Kim et al., 2014). Nine studies did not clearly structural of the model. Eight studies did not mention discount.

3.1.Characteristics of included studies

Among the seventeen articles, fifteen of them were cost-effectiveness studies, one cost-utility study and one HTA report were included in the review. Descriptions of the included articles are provided in Table 1. The number of CEAs articles of dental implant and prosthesis treatment has increased from three articles (17.6%) from 2005 to 2010, to eight CEAs (47.1%) from 2016 to 2019. The majority of studies were conducted in the European; (n = 7; 41.2%) and American Countries (n = 6; 35.3%). The studies reported from the Asian region were four (23.5%). The studies reported from the European region were conducted in Germany (n = 1), Switzerland (n =

3), France (n = 1), Holland (n = 1) and İreland (n = 1). The studies reported from the America region were conducted in U.S. (n = 3), Canada (n = 1) and Brazil (n = 2). The studies reported from the Asian region were conducted in Japan (n = 2) and Korea (n = 2). Most of articles were on single missing tooth treatment; (n = 8; 47.1%). 17 studies' perspectives included provider, health services or treatment, public health, patient, societal, and health insurances, and whereas two studies did not explicitly state the perspective used in their analysis.

Five of the studies used ten years' time horizon. Three of the studies used twenty years' time horizon and two studies thirty years' time horizon, and two studies not explicitly stated time horizon. Most of the studies (n = 8) did not report the discount rate. Five studies used 3% to discount both costs and outcome. Few studies have not reported an ICER (n = 6) and sensitivity analysis (n = 4). Two studies provided values for the cost-effectiveness rate. The health outcome included in the analyses showed marked differences in their scope and categorization. The health outcomes had significantly difference such as survival rate, success rate, QAPY (Quality-Adjusted Prosthesis Years), QATY (Quality-Adjusted Tooth Years), QALY (Quality-Adjusted Life Year), TTO (Time Trade-off), WTP (Willingness-to-Pay), MID (Minimally Important Clinical Difference), OHIP-EDENT (Oral Health Impact Profile for Edentulous) and OHIP-20. Ten studies have able to identify the most cost-effective intervention among the compared replacements.

Table 1: Characteristics of the cost-effectiveness analysis articles in dental implant and prosthesis interventions

Characteristic			Characteristic		
Year of publication	**N**	**%**	**Study country**	**N**	**%**
2005-2010	3	17.6	European Countries	7	41.2
2011-2015	6	35.3	American Countries	6	35.3
2016-2019	8	47.1	Asian Countries	4	23.5
Intervention			**Discount rate****		
Mandibular edentulism	4	23.5	%2	2	11.1
Single missing tooth	8	47.1	%3	5	27.8
Partially dentate	4	23.5	%5	3	16.7
Maxillary edentulism	1	5.9	Not discounting	8	44.4
Study perspective*			**Time Horizon**		
Public health	3	15.8	10 years	5	29.4
Patient	3	15.8	20 years	3	17.6
Societal	3	15.8	30 years	2	11.8
Provider	4	21.1	Other	5	29.4
Treatment	3	15.8	Not explicitly stated	2	11.8
Health insurances	1	5.3			
Sensitivity analysis			**Reporting of cost-effectiveness ratio**		
Used	13	76.5	ICER reported	11	64.7
Not used	4	23.5	Not reported	4	23.5
			Cost-effectiveness rate reported	2	11.8

* Two studies used more than one perspective ** One studies used more than one discounting

Since the identified studies are heterogenic, it was divided into those assessing the CEA in single-tooth replacement, mandibular, maxillary and partial edentulism. Also it should be considered that in the present systematic review, limited the scope for synthesizing the data due to the heterogeneity in terms of the patient populations under investigation, the study designs, outcome measures and alternative treatment, therefore were not carry out meta-analysis.

A total of eight studies focusing on the CEA for single-tooth replacement was identified (Table 1). These studies compared different treatment modalities; four studies are of implants versus fixed dental prostheses (Chun et al., 2016; Kim et al., 2014; Korenori et al., 2018; Teranishi, Arai and Baba, 2019), two studies are of implant-support crown versus fixed dental prostheses (G. Antonarakis, Prevezanos, Gavric, & Christou, 2014; Bouchard et al., 2009), one study is fixed partial denture versus three different modalities including implant-support restoration (Kim and Solomon, 2011), one study is implant versus bridge strategy (Bouchard et al., 2009).

In the studies comparing implants and fixed prostheses is a common point that the implant is a more effective method. A total of two studies focusing on the CEA of fixed prosthesis versus ISC (Implant-Supported Crowns) for single-missing teeth replacement were identified (Antonarakis et al., 2014; Zitzmann, Krastl, Weiger, Kühl and Sendi, 2013). These studies reported inconsistent findings. In the study conducted by Antonarakis et al (2014) the five different treatment modalities were ranked according to their cost-effectiveness ratio: The most cost-effective treatment modality was auto-transplantation, while the least cost-effective was full-coverage FPDs (Fixed Partial Denture), and as for ISC is in fourth place. As for in the study conducted by Zitzmann et al., ISC is the dominant strategy (Zitzmann et al., 2013). Bouchard et al., reported that the dental implant is the dominant strategy as less costly and more efficient over time than bridge therapy (Bouchard et al., 2009). In the study conducted by Kim & Solomon et al., endodontic microsurgery was the most cost-effective approach, and a single implant-supported restoration, despite its high survival rate, was shown to be the least cost-effective treatment option (Kim and Solomon, 2011).

When studies investigating treatments in mandibular edentulism were examined, it was found that implant strategies in general were more cost-effective (Heydecke et al., 2005; Probst et al., 2019; Zitzmann, Marinello and Sendi, 2006). When comparing standard implants and mini-

implants, mini-implants were found to be more cost-effective (Della Vecchia et al., 2018). One studies focusing on the cost-effectiveness for maxillary edentulism treatment was identified (Listl, Fischer and Giannakopoulos, 2014). The results of relevant study demonstrate that bar-retained maxillary overdentures based on six implants compared four implant provide better patient satisfaction but are a lot more expensive.

There are four studies on cost effectiveness that are identified in the literature review partial edentulism treatment alternatives (Jensen et al., 2017; McKenna et al., 2014; Ramamoorthi & Esfandiari, 2016; Ravidà et al., 2019). In the study conducted by Ravidà et al. (2019) survival rates in rehabilitating a 3-unit edentulous area were 100% in the ISB (Implant-Supported Bridge), 92.5% in the NSC (Non-Splinted crowns), and 88.5% in the SC. Besides has been found out that the total cost of the ISB group is lower. Jensen et al. (2017) have performed a CEA comparing RPD and ISRPD (Implant-Supported Removable Partial Dentures) in patients with a bilateral free-ending situation (Kennedy class I). Their results demonstrate that the ISRPD came at substantial additional costs though incremental benefits. In another a study has been conducted a CEA of RDP (Removable Dental Prostheses) and SDA (Shortened Dental Arch) in partially dentate older patients. SDA is remarkable lower than the total cost for the RDP group, also in terms of impact on oral health-related quality of life, SDA is more cost-effective than RDP treatment (McKenna et al., 2014).

4. Conclusions and Recommendations

Previous studies have not focused on implant and fixed prosthetic interventions. In general, they only compared implant options (Mainkar, 2017; Zhang et al., 2017; Vogel, Smith-Palmer and Valentine, 2013). This study, unlike the others, dealt with tooth deficiencies as a whole. It included studies that analyzed the cost-effectiveness of implant and fixed prosthesis intervention, which are different technologies. Whereas among reviewed 17 studies are reported inconsistent findings, there are findings of that support each other also. These studies are pretty complicated by heterogeneity in terms of outcome parameters, perspective, included costs, patient population, discount rate and time horizon. In addition, findings are incomparable in terms of toward the replacement modalities of missing teeth, affordability of dental treatment, pricing policy, insurance state, level of reimbursement. In the literature review conducted by Vogel, Smith-

Palmer, and Valentine (2013) have been determined similarly findings. Additional, the details of treatment strategies are not expressed in most of the studies we have reviewed.

CEA of dental implant and prosthesis interventions started to be carried out after 2005 and has increased gradually. Most of the studies reviewed, it demonstrates that CEA is used in missing tooth interventions in developed countries. Though implant overdentures are now recommended as the standard of care for patients with edentulous, it was increased CEA studies particularly after 2000. CEA can be performed from different perspectives such as those of a healthcare provider, a health system, patients, insurance institution or society (Drummond, Sculpher, Claxton, Stoddart and Torrance, 2015). Reviewed studies included very different perspectives and whereas only two studies did not explicitly state the perspective used in their analysis. The perspective chosen affects the types of costs included in the analysis.

The provide an effective intervention may offer some immediately health benefits but, in many conditions, the health benefits will occur in future periods. Similarly, intervention will impose costs or offer cost savings in future periods as well. During economic evaluation like CEA, in order to compare costs and outcomes in different time periods, discounting is used (Drummond et al., 2015; Kobelt, 2013). It is noteworthy that almost half of the studies reviewed did not discounted. There are guidelines in CHEC extended checklist for the reporting of the CEA studies. In the present review, scanning was carried out without time limitation, it revealed high-quality reporting associated with CEAs for dental implant and prosthesis interventions published during the years 2005-2019. The reporting quality of studies appraised by the CHEC are varied from 55% to 90% (median 74%).

A CEA that perform in a recent in Japan for treatment for a single-tooth missing was reported that implant-to-insurance fixed dental prostheses ICER was €2,454.37 (Teranishi et al., 2019). Another study in Japan was reported ICER on the implant versus insurance FDP (Fixed Dental Prosthesis) for treatment for a single-tooth missing was €1423.00 (Korenori et al., 2018). A study in Korea for treatment for a single-tooth missing was stated implants cost more than three-unit FPDs, and implant survival rates were 10.4% higher, therefore the ICER was reported that was $2,514 in a clinic and $3,290 a hospital.(Kim et al., 2014) Another study in Korea for treatment for a single-tooth missing was reported that the tendency of being more-effective changed from conventional FDP to implant in the course of time (Chun et al., 2016).

In a recent study in Brazil to perform for mandibular edentulism was reported that compared to conventional total prosthesis, implant-supported total prosthesis is more cost-effective (ICER of BRL 464.22 per QAPY) (Probst et al., 2019). In a study conducted Canadian were OHIP mean score was approximately 33% better in the two-implant overdentures group than compared complete dentures (cost $14.41 per OHIP-20) (Heydecke et al., 2005). Another study in Brazil for mandibular edentulism was reported that mini-implants are more cost-effective compared to those retained by 2 standard implants (Della Vecchia et al., 2018). In the past a study that in edentulous patients comparing implant-supported overdenture (4 implants), implant-retained overdentures (2 implants), and complete dentures, was reported that implant-retained overdentures are the most cost-effective, in the time horizon 10 years (Zitzmann et al., 2006). In a systematic review conducted by Zhang et al., (2017) have been showed that implant-supported overdentures are a cost-effective treatment.

The majority of reviewed 17 CEA articles were of moderate quality as assessed by the CHEC extended checklist. Mostly are focused on the economic evaluation of tooth loss in developed countries (Switzerland, Germany, France, Holland, İreland, Canada, Brazil, Japan, Korea). Because in almost all the studies used different variables to estimate the effectiveness, it should be improving of the methodologic related to reporting of CEA studies. An evaluation form with a special scale for missing-tooth effect related aspects needs to be developed. Health outcome measures as QAPY and QATY should use integrating in economics evaluation of tooth loss.

Dental care costs are considerably great. Given resource scarcity, results from such a review are highly relevant not only to patients but also to health care decision makers who need to decide how resources are best spent in order to increase population wellbeing. This study suggests that implant strategies are generally a more effective but costlier method for edentulous patients. However, there is much evidence that implant strategies are more cost-effective. On the other hand, to better economic evaluation should be more deal ethical, equality of opportunity and distributional issues.

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THE EFFECT OF SOCIAL MEDIA ON IMPULSE BUYING BEHAVIOR DURING THE COVID 19 PANDEMIC

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Abstract

Aim: In the Covid-19 pandemic process, the absence of a "new normal" has also reflected on the purchasing behaviour of consumers, encouraging impulse purchasing behaviour instead of rationally and consistently choosing the best. In parallel with this change in purchasing behaviour, the purpose of this study is to determine the effect of social media on impulse purchasing behaviours during the Covid-19 pandemic process.

Methods: For this purpose, the study applied an online questionnaire to 518 people by using the snowball sampling method, which is one of the non-random sampling methods. Apart from demographic variables, the study used three sub-dimensions, namely social media, social impact source, and social platform activities, as well as “Social Media Impact Scale” consisting of eleven questions and “Impulse Purchase Scale” consisting of nine questions.

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Results: The study analysed the data obtained from the survey using the structural equation model and determined that the social impact source and social platform activities significantly affect the social media effect.

Conclusion: The study additionally observed that the social media effect significantly affects the impulse purchases of consumers.

Keywords: Social Media, Impulsive Buying, Covid-19, Consumer Behavior

Introduction

Revolutionary developments in communication technology have caused an increase in the number of internets and social media users worldwide and the changes brought about by this process required the reshaping of business life.

Social networks have existed since the day people started interacting with each other. Indeed, the gathering of family members, close friends and colleagues creates the foundation of a social network. Therefore, in today's internet world, it is not surprising that online social networks exist completely everywhere. Since social media is a platform that enables businesses to communicate with both existing and potential customers much faster than old technologies, businesses in the recent years started to develop their marketing strategies in this area. Today, the e-commerce process has become more active due to the marketing activities carried out through social media, and consumer behavior has also changed in this new order. Social media channels are used not only in the field of trade but also as an important e-word-of-mouth communication tool, as well as a source of information for consumer empowerment on many issues. On social media platforms, consumers not only share their thoughts and experiences about products and services but also their thoughts and experiences on many issues they encounter in social life.

The Covid-19 outbreak, which was seen in Wuhan, China in 2019 and caused a global social crisis and economic recession, has quickly become the most talked about topic on social media. It is inevitable that individuals living in a society will be affected by the economic, social, cultural events and changes taking place in society. Ideas, beliefs, values, habits and behaviors develop from both positive and negative experiences. In this sense, it is expected that the Covid-19 outbreak will have a deep impact on all of this (He and Harris, 2020). At this point, it is

necessary to seek answers to the questions of how social media is used in the Covid-19 outbreak process and what effect this has on the purchasing behavior of consumers.

It is obvious that there will be changes in both economic life and social life during the global pandemic process. In addition to the developing technology, the change in consumer habits caused by the pandemic also creates the transformation needs for the goods and services offered by the businesses. Physical stores are negatively affected both by changing customer demands and preferences and by the measures taken due to the outbreak. On the other hand, online stores increase their sales volume rapidly and their customer potential increases day by day. After the pandemic, social relations will need to be reorganized, investment in health will increase, and digitalization will become even more widespread. Although digitalization was part of our lives before this process, virtual work from home and online shopping gained importance during the pandemic process. Since the World Health Organization (WHO) first announced Covid-19 as a pandemic, and the remote work, distance education, and the desire to adopt a healthier lifestyle became more prevalent, consumers with no prior online shopping experience switched to e-commerce due to its contactless, convenient, fast, and secure nature in many different sectors, including food, cleaning materials, and health. It is inevitable for information transfer and shopping habits to change in the new world order. In this process, social media platforms have become more reliable sales agents for consumers and businesses compared to traditional marketing practices (Rehman et al. 2014). Therefore, it is necessary to investigate how consumers benefit from social media platforms in the purchasing process during the Covid-19 pandemic process. Social media platforms offer consumers different opportunities as well as threats. These different opportunities and threats presented by social media platforms also diversify consumers' information, purchasing behavior and preferences. This new situation necessitates the re-discussion of consumer behavior in the digital environment theories. Based on this necessity, this study attempted to reveal the effect of social media on impulse purchasing behavior during the Covid-19 pandemic process.

Although DuPont was the first to define the concept of impulse purchasing in the 1950s, Stern’s definition in 1962 is the one that still maintains its validity. According to Stern, impulse

buying behavior is any unplanned purchasing action by the consumer that creates an immediate urge to buy with an inherent impulse (Stern, 1962).

In other words, there is no pre-planned intention of the consumer to meet any specified need or to purchase any specified product (Beatty and Ferrel, 1998). This study attempts to answer the questions of how the impulse purchasing behavior is shaped on the social media platform and how social media platforms are used in the Covid-19 pandemic process.

Covid-19 has become one of the most serious challenges facing governments and businesses (Hall et al., 2020). Covid-19 has brought many important psychological, social, and professional changes such as lost jobs, low savings, fear and stress in outside visits, uncertain future, physical and mental health problems (Bradbury-Jones and Isham, 2020). As a result of the Covid-19 outbreak, social distancing and compulsory staying at home have completely changed the consumption habits as well as the purchasing and shopping habits of the consumers (Donthu and Gustafsson, 2020; Sheth, 2020; Kim, 2020). In these uncertain times, changes in priorities, attitudes, and behaviors due to panic reflect the new reality in the changing nature of the individual. New ways of spreading or confronting perceived fear and risk, changing demographics, and advancement in technology also lead to the emergence of new habits in consumers. Slickdeals (2020) surveyed nearly 2,000 Americans through leading online shopping platforms and noted that consumers did more impulse shopping during the Covid-19 outbreak than they did before the pandemic. As a result of the research in question, it was determined that before the Covid-19 outbreak in January 2020, an American's average spending on instinctual purchases was about 155.03 USD per month, while in April 2020, the average spending with an impulse purchase increased by 18% to 182.98 USD. This result shows that during the pandemic, customer impulse purchasing behavior increased. The biggest reason for this result is that consumers spend more time on the internet during their stay at home due to curfew restrictions or fear of getting sick during the pandemic process (Thakur et al. 2020).

1. Background

1.1. The New Face of the Changing World: Social Media and its Importance

Social media is defined by Kaplan and Haenlein (2010) as "an Internet-based application group that is based on the ideological and technological foundations of Web 2.0 and allows user-generated content to be created and shared."

Social media is used by billions of people around the world and has quickly become one of the defining technologies of our age, and an indispensable part of daily life for people all over the world. Currently, more than 4.5 billion people are using the Internet and the number of social media users has exceeded 3.8 billion according to the 2020 Global Digital Report. This increase continues at approximately 9.2% annually (Table.1). Social media and customer forums are an important element in the minds of consumers that have the potential to both build and destroy brands. For consumers, the reputation of the brand can rise to the highest level based on communication on social media, or it can be destroyed overnight. It would not be surprising for marketers to embrace social media as a marketing channel, given the huge potential audience available that spends most of their time using social media on various platforms (Appel et al. 2020).

Table 1. Use of Social Media Worldwide

Total Number of Active Social Media Users	Ratio of Social Media Users to the World Population	Annual Growth in Total Social Media Users	Number of People Using Social Media Through Mobile Phones	The Ratio of the Number of Users Accessing Social Media Via Mobile Phone to the General Number of Social Media Users
3.80 Billion People	%49	%9,2	3.75 Billion People	%99

Source: Digital 2020 Global Overview Report.

It is reported that more than 2.6 billion active Facebook users (Statista, 2020) spend an average of 20 minutes a day on Facebook (Brandwatch, 2019), and 330 million active Twitter users post 500 million tweets per day (Omnicore, 2020). The third most prominent social media platform is

Instagram, which has approximately one billion active users with approximately 4.2 billion clicks a day (Adespresso, 2019).

Today's order, which can be referred to as 'new economy' or 'digital economy', is defined by innovative and creative ideas. It is very important for business managers to focus more on social media, as the intensity of users' social relationships and their commitment to social media tend to have large impact on their behavior. It is seen that digital consumers have the potential to distort existing competition as well as affecting the inclusion of new actors in existing markets. The use of the internet and social media has changed consumer behavior and the way businesses run their business. Digital and social media marketing offers significant opportunities to businesses through lower costs, improved brand awareness and increased sales (Dwivedi et al., 2020; Ajina, 2019).

Some commerce sites started to offer social networking services to improve user interaction and increase active user participation, considering that user interaction can lead to more transactions. In a social network, users interact with and receive information from each other. When a user wants to buy a product online, they can request and get more information about the product through their social network. Therefore, social media has served as a new form of word-of-mouth for products/services or providers and has proved to be critical to consumer decision making in e-commerce environments (Ye et al.,2011).

It is possible to see the reflections of this global transformation in people's lives and on social networks. People communicate with other consumers about their experiences and interact with businesses. They also spend more time online searching for information about products and services. Therefore, businesses try to respond to this change in consumer behavior by making digital and social media an important and integral part of their commercial marketing plans (Stephen, 2016). A study conducted on Facebook, one of the most commonly used social media platforms, showed that 75% of American consumers were influenced by comments on Facebook before buying a branded product they had never experienced before, and purchased the branded product in question (Wang, 2015).

In today's digital economy, it is not enough to set up a physical or virtual business and wait for customers to come. Instead, businesses should look for alternative ways to reach customers and interact with them through common communication platforms (Lai, 2010). Since many people

use social media, we can expect to see that the stronger the users' loyalty to the product and the brand, the stronger the purchasing behavior. In trade activities, social media has been used to affect both attitudes and future purchase intention (Wetzel et.al. 1998).

Businesses benefit significantly from making social media marketing an integral element of their overall business strategy. Social media allows businesses to connect with their customers, increase brand awareness, influence consumers' attitudes, receive feedback, improve existing products and services, and increase sales (Lal et al. 2020; Kaur et al. 2018; Kapoor et al. 2018; Algharabat et al. 2018). With some companies collecting social media user data, information about what people like, don't like, and they need or not is created. The main purpose of collecting data directly from the user is to determine the needs of the user and raise the user's living standards.

However, the increasing use of social media has not only increased consumers' participation in information sharing but has also influenced the purchasing behavior of customers (Brough and Martin, 2020; Carlson et al., 2018). Especially in the Covid-19 period, brands had to implement significant changes in management and communication approaches. In this period, the common motto of businesses, as well as public institutions and organizations around the world was, "Stay at Home". Social media and written and visual media for this message, as well as social message sharing, have made a positive contribution to reducing competition and directing brands and consumer preferences (Sayın, 2020).

In a study conducted by Ahmed et al. (2020) based on the theory of fear within the framework of the model in Figure 1 below, US citizens' impulse buying behaviors and antecedents during the Covid-19 outbreak were examined. In the study, data were collected from 889 US consumers and the model (Figure 1) created by making use of previous studies on the subject was confirmed.

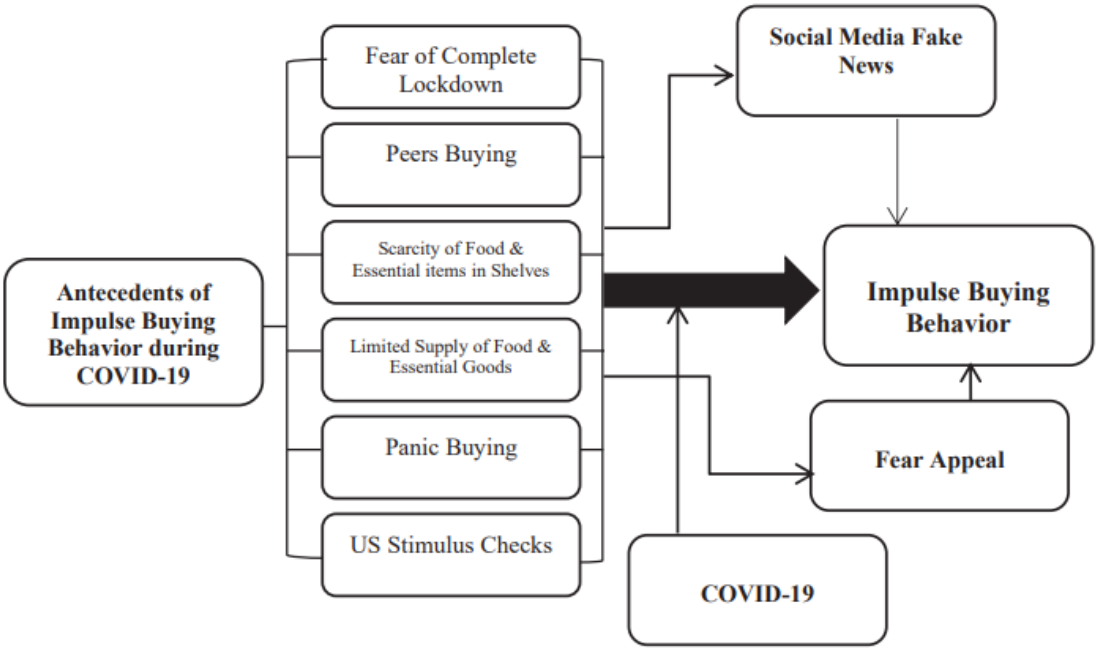

Figure 1. Antecedents of Impulse Buying Behavior During Covid-19

Source: Ahmed et al.(2020)

As can be seen in Figure 1 above, the variables of fear of complete lockdown, peers buying, scarcity of food & essential items on shelves, limited supply of food & essential goods, panic buying and US stimulus checks were determined as the antecedents of impulse purchasing behaviors during Covid-19. In the model, the social media fake news is included as an intermediary variable and Covid-19 as a regulatory variable. The research showed that negative and fake news on social media has an intermediary effect on impulse purchasing. The news and the resulting fear/anxiety seem to be a powerful factor influencing the impulse buying behavior of US citizens. In addition, the research concluded that the fear of complete lockdown due to the outbreak, the purchasing behavior of other people, the scarcity of food&essential items in shelves and the emergence of panic buying behavior affect impulse purchasing. As a result, the research determined that the Covid-19 pandemic process has a regulatory effect on all these variables and the fear created by the pandemic triggers impulse buying. The findings of this research allow researchers to understand the dynamics of impulse purchasing behavior for future studies involving situations such as natural disasters and crises and it reveals the necessary components in order to form various paradigms related to the subject. It also emphasizes the need for marketing

and brand managers to develop new strategies on social media in order to increase the market share of their brands in order to gain a competitive advantage in case of Covid-19 or similar pandemics or panic in the future.

1.2. Impulse Buying Behavior

The impulse buying phenomenon emerged in the 1940s and was considered an irrational behavior (Luna and Quintanilla, 2000). Faced with the difficulty of measuring, this concept attracted the attention of many authors later. Although there is still no consensus on the definition of the concept in the literature, some authors have tried to clarify this concept. Sharma et al. (2010) define impulse buying as "a hedonically complex purchasing behavior in which the speed of the impulse purchase decision precludes any thoughtful, deliberate consideration of alternatives or future implications". This definition has emerged from decades of research on impulse purchasing. In a study, Rook (1987) defined impulse buying as a strong and persistent urge to buy something right away. Previous research has sometimes referred to impulse purchasing as an unplanned purchase and used the action of "unplanned purchase" as a synonym in the literature (Stern,1962). It is also stated, however, that impulse purchasing behavior can typically be categorized as ad hoc, but unplanned purchases cannot always be categorized as impulse purchases. The rationale behind this distinction lies in the fact that an unplanned purchase can occur because a consumer needs the product but couldn't place the item on a structured shopping list. Unplanned purchases may not be accompanied by a strong impulse or strong positive emotions often associated with an impulse purchase. Previous research in both academic and professional fields has also shown that impulse purchasing represents 40 to 80 percent of all purchases depending on the type of product (Amos et al. 2014).

The term "impulse purchase" refers to a narrower and more specific range of phenomena than "unplanned purchase". More importantly, it identifies a psychologically different type of behavior that is strikingly different from consumer choice thinking about buying. Impulse purchasing is often known as the unplanned purchase of the consumer, and this has become an important part of purchasing behavior. Unplanned buying behavior accounts for 62% of supermarket sales and 80% of sales of some product categories (Pawar et al. 2016).

A market report by Creditcards.com estimates that 84% of all consumers buy instinctively and their impulse purchases account for around 40% of consumer spending on e-commerce (Chan et al. 2017). Given impulse purchases, the online shopping environment is believed to be easier and more effective for the consumer than offline shopping. Because the online marketplace removes restrictions such as remote store location and limited opening hours. Online consumers often seem to make spontaneous and intuitive impulse purchases after being exposed to stimulating cues initiated by online stores, such as price discounts, limited advertising offers, and attractive product appearance (Liu et al. 2013). Online retailers heavily use two strategies that cover a limited amount and time to entice consumers to buy suddenly (Wu et al. 2020).

In a study conducted by Jarboe and McDaniel (1987), it was found that those who travel longer in a shopping center shop in a more unplanned way than those who spend a short time. The reason behind this is that people who roam longer experienced more stimulation that led to their instinctive purchase impulse tendency.

1.3. The Effect of Social Media on Impulse Buying

65 percent of social media users admit that social networks affect their shopping processes, and almost half say that social media inspires online shopping (Aragoncillo and Orus, 2018). Studies have shown that consumers are impressed by others when purchasing a product, and this impact may be higher than offline (Riegner, 2007). Therefore, social media can be a powerful tool to increase impulse purchasing (Aragoncillo and Orus, 2018).

The dominance of information technology and online channels has increased impulse buying behavior among consumers. Because this dominance not only facilitates consumers' access to view goods and services by staying at home but also facilitates the payment process with secure online transactions (Chen et al. 2016). In this process, social media has become a fundamental platform for businesses and consumers to trade and connect with each other in a beneficial and mutually valuable way (Kumar et al. 2016).

Today's businesses aim to be closer to their customers by successfully leveraging the potential of social media. With the worldwide explosion of social media use, businesses are increasingly engaging with their customers through this platform (Baird and Parasnis, 2011).

A strong and persistent urge to buy something that is not planned by the influence of different stimuli can lead to impulse buying. Users are sometimes able to purchase products and services with the impulse purchasing caused by the suggestions and recommendations they encounter while interacting with other users on social media. Product recommendations are considered as one of the most important factors that can lead to impulse purchasing. Social media users can actively search for information about the products they want to buy, receive suggestions and comments from other users, and make a purchasing decision based on this information (Chen et al. 2019).

Besides, rhetoric or news especially spread on social media and circulating by word of mouth, is also seen as an important element that guides consumers ' buying behavior in a psychological sense. Two important cognitive concepts draw attention here, which are fear of missing out and Bandwagon - follow the crowd. For example, a consumer who thinks that he can go to the market in a normal period, observes or becomes aware of the majority going to the market and purchasing many things on social media especially during the Covid-19 pandemic process and they may fall into the idea of missing something or stocking something and show panic buying behavior. This situation directly reveals the relationship between social media and impulse purchasing behavior (Genç, 2020).

Businesses can take advantage of this dynamic by designing social media programs to emotionally touch customers and motivate them to share their experiences with others. In the purchases made by consumers through social media, suggestions, reviews and opinions they receive from friends, families, experts and collective social communities play an important role in impulse purchasing. Content with positive comments from acquaintances creates a very strong instinctive buying impulse in the user (Baird and Parasnis, 2011).

1.4. Literature Review

Researchers conducted many different studies on “the effect of social media and the impulsive buying behavior of consumers”, “social influence source and social media impact”, and “social platform activities and social media impact”.

Aragoncillo and Orús (2018) examine the effect of social media influence on impulse buying behavior in their online-offline comparative studies. The findings of their study show that

the offline channel is slightly more encouraging of impulse buying than the online channel and social networks can have a big impact on impulse buying.

Dodoo and Wu (2019) determine the power of social media ads on online impulse buying tendency in their study and conclude that social media ads have a positive effect on customer relevance, increasing the online impulse buying tendency. Results also indicate the impact of perceived personalization on perceptions of value, relevance and novelty of social media ads.

Kazi et al. (2019) studied the impact of social media on impulse buying behavior by conducting a study with 196 customers in Pakistan. The results showed that social media does have a positive and significant impact on the impulsive buying behavior of the customers. Therefore, online retailers and marketers should understand the importance of social media for encouraging the online impulsive buying of the consumers.

Focusing on the effect of social influence on impulse buying, Kusmaharani and Halim (2020) studied how Indonesian cosmetic products can generate online impulse buying. The results showed that online reviews have influence on browsing and then encourage urge to buy impulsively that stimulates impulse buying behavior.

Verhagen and Dolen (2011) studied the influence of online store beliefs on consumer online impulse buying. The result of this study indicated that there is a significant and positive relationship between the urge to buy impulsively and actually buying impulsively. The authors discussed and proved the positive influence of browsing activities on the online impulse buying urge.

Examining the influence of social media in creating impulse buying tendencies, Nuseir (2020) developed two hypotheses in his study: "There are no factors affecting impulsive buying behavior" and "Social media has no effect on impulse buying behavior". The results of the study rejected these hypotheses and revealed that there is a relationship between social media platforms and impulse buying behavior. In addition, this study examined the features and roles of Facebook as a social media platform that encouraged and created impulse buying opportunities.

Studying the social influence source and social media impact, Kwahk and Ge (2012) examined user behavior in the context of social media and e-commerce and tried to identify the

impact of social media on e-commerce through the perspective of social impact theory. They also examined how social media sources affect e-commerce through social impact transfer. The study concluded that social media affects e-commerce by means of transferring the social impact. Also developing a research model in terms of both social media and e-commerce, Kwahk and Ge investigated the influence of social media based on normative social influence and informational social influence in the context of Chinese e-commerce from the social impact theory perspective.

2. Research Methodology

2.1. Research Method

The study used the descriptive research method, whose main purpose was to examine the effect of social media on the instinctive purchasing action of consumers during the Covid-19 pandemic process. If the event, individual, or object subject to research is to be defined in its own conditions and as it is, it is necessary to observe and determine them as they are, without any effort to change or influence them. Descriptive research methods are suitable for such situations (Islamoğlu & Alnıaçık, 2014).

The research hypotheses are as follows:

H1: Social impact source significantly affects social media influence.

H2: Social platform activities significantly affect the social media influence.

H3: Social media influence significantly affects consumers' impulse purchases.

2.2. Universe and Sample

Designed in a descriptive type, the universe of the research is composed of people who reside in Ankara province and participate in the social media network connections of the researchers. The study decided to use the snowball sampling method among non-random sampling methods, taking into account time and budget constraints in obtaining the data. Snowball sampling method is one of the most appropriate methods in terms of the effectiveness of the research, delivery of the survey questions to the relevant people, and saving time and budget for the researchers, especially in the studies on social media (Brickman Bhutta, 2012). Accordingly, the study collected the data using the Instagram and WhatsApp accounts of the researchers and by making an announcement to those who wanted to participate in the research voluntarily. Thus, participants were asked to share the

questionnaire form created on Google Forms with their own links. As a result of the survey conducted within the scope of the research, 518 people were reached. The data were collected between September 10- October 01, 2020, from those who accepted to participate in the study.

2.3. Data Collection Tool Used in the Study

The study collected the data using a questionnaire consisting of three parts. In the first part of the questionnaire, there is a "Social Media Impact Scale", which consists of three sub-dimensions grouped as social influence, social influence source, and social platform activities, adapted from the studies made by Chung et al. (2013), Mäntymäki and Riemer (2014), Park and Lessig (1977), Venkatesh and Brown (2001), Venkatesh and Davis (2000), Yang (2011) with this used and adapted the scales into Turkish by Akar et al (2015). The results of the analysis showed that the Cronch Bach Alpha coefficient of the social influence dimension was 0.847; 0.739 of the social influence source; social platform activity was determined as 0.797. In the second part, there is the “Impulse Purchasing Scale” consisting of nine questions developed by Rook and Fisher (1995) to measure consumers' impulse purchasing behavior.

Gödelek and Akalın (2008) and Yıldırım (2011) translated Rook and Fisher's (1995) impulsive buying scale into Turkish and examined the scale's validity through Cronbach's Alpha coefficient, and reliability with exploratory factor analysis. As a result, they stated that the nine-item, one-dimensional scale that we used in our research was valid and reliable, and they determined that instinctive buying could be used to determine consumer purchasing tendency.

In the third part, there are questions about gender, marital status, age, education level, demographic characteristics, as well as the social media tool most frequently used by the participants and the way they obtain information about Covid-19. Necessary permissions were obtained from Ankara Hacı Bayram Veli University Ethics Committee in order to conduct the study.

Confirmatory Factor Analysis (CFA) was performed with the Analysis of Moment Structures (AMOS) 24.0 program to determine the structural validity of the scales with the data made ready for analysis with the Statistical Package for the Social Sciences (SPSS) 23.0 statistical package program. The reliability of the scales was evaluated with the Cronbach Alpha (CA) and composite reliability (KG) coefficients. The hypotheses of the research were tested with the

structural equation model (SEM). Statistical significance level in the analyzes was accepted as p <0.05.

The Unweighted Least Squares (ULS) method was used with the Bootstrap method as the estimation method since it was determined that the data did not meet the multivariate normality assumption in the CFA and SEM analyzes performed in the AMOS program. Good fit and acceptable fit values regarding fit indices used in the analyzes are presented in Table 2 (Bayram, 2010; Gürbüz, 2019; Karagöz, 2016; Meydan & Şeşen, 2011).

Table 2. Fit Indices

Fit Indices	Good Fit	Acceptable Fit Values
χ2/df	≤ 3	≤ 5
GFI	0,95 ≤ GFI ≤1,00	0,90≤ GFI ≤ 0,95
AGFI	0,90 ≤ AGFI ≤1,00	0,85≤ AGFI ≤ 0,90
NFI	0,95 ≤ NFI ≤1,00	0,90≤ NFI ≤ 0,95
RMR	0< RMR ≤0.05	0,05< RMR ≤ 0,08
SRMR	0< SRMR ≤0.05	0,05< SRMR ≤ 0,08

2. Analysis

Descriptive findings regarding the participants of the study are presented in Table 3. According to these findings, it is seen that the average age of the participants is 34.53 ± 10.41. It is seen that 56.9% of the participants are women, 51.5% are bachelor's degrees, 44.8% are public employees, 34.9% have an income of 6001 TL and above, 63.7% of the participants do not find their income sufficient, 52.3% have 4-6 members in their family, and 86.1% live in provinces. 62.0% of the participants use Instagram and 72.4% use social media 1-3 hours a day. It was determined that participants answered a total of 705 answers to a multi-option question asked about how they received information about Covid-19, and 37.6% of these answers were all options.

Table 3. Descriptive Findings Regarding Participants

Descriptive Features		n	%
Age	Mean: 34,53±10,41		
Gender	Male	223	43,1
	Female	295	56,9
Education Status	Primary	11	2,1
	High school	58	11,2
	Associate Degree	110	21,2
	License	267	51,5
	Postgraduate	72	13,9
Profession	Public	232	44,8
	Private sector	124	23,9
	Self-employment	18	3,5
	Retired	21	4,1
	Not working	123	23,7
Income	2324-3000 TL	117	22,6
	3001-4000 TL	63	12,2
	4001-5000 TL	86	16,6
	5001-6000 TL	71	13,7
	6001 and above	181	34,9
Income Sufficiency	Yes	188	36,3
	No	330	63,7
Number of Family Members	1-3	236	45,6
	4-6	271	52,3
	7 and above	11	2,1
Residential area	State	446	86,1
	County	60	11,6
	Village	12	2,3
Social Media Tool	Facebook	73	14,1
	Instagram	321	62,0
	Twitter	55	10,6
	Other	30	5,8
	No account	39	7,5
Social Media Usage Time	1-3 Hour	375	72,4
	4-6 Hour	114	22,0
	7-9 Hour	22	4,2
	10 Hour and above	7	1,4
How to get information about Covid-19*	News Programs	140	19,9
	Announcements of Public Institutions (eg; Ministry of Health etc.)	136	19,3
	Social Media (Instagram, Facebook, Twitter etc.)	89	12,6
	Internet Sites	41	5,8
	Family or Friendship Circle	34	4,8
	All	265	37,6

* Since there are multiple choice questions, the number of answers is higher than the number of participants.

The construct validity of "Social Media Impact Scale" and "Impulse Purchase Scale" used in the study was evaluated with the first level CFA model in Figure 2. When the fit indexes of the model in Figure 1 are examined, it is seen that the CFA model is compatible and valid with the research data. It was determined that the factor loads of the items related to the "Social Impact Source"

dimension of the "Social Media Impact Scale" were 0.784 and 0.895, and the factor loads of the items related to the "Social Platform Activities" dimension ranged from 0.815 to 0.876. The factor loads of the items related to the "Social Media Effect" dimension were found to be 0.789 and 0.851. In addition, it was determined that the factor loads of the items of the "Impulse Purchase Scale" ranged from 0.442 to 0.844 and the factor loads of the items of both scales were statistically significant ($p < 0.05$).

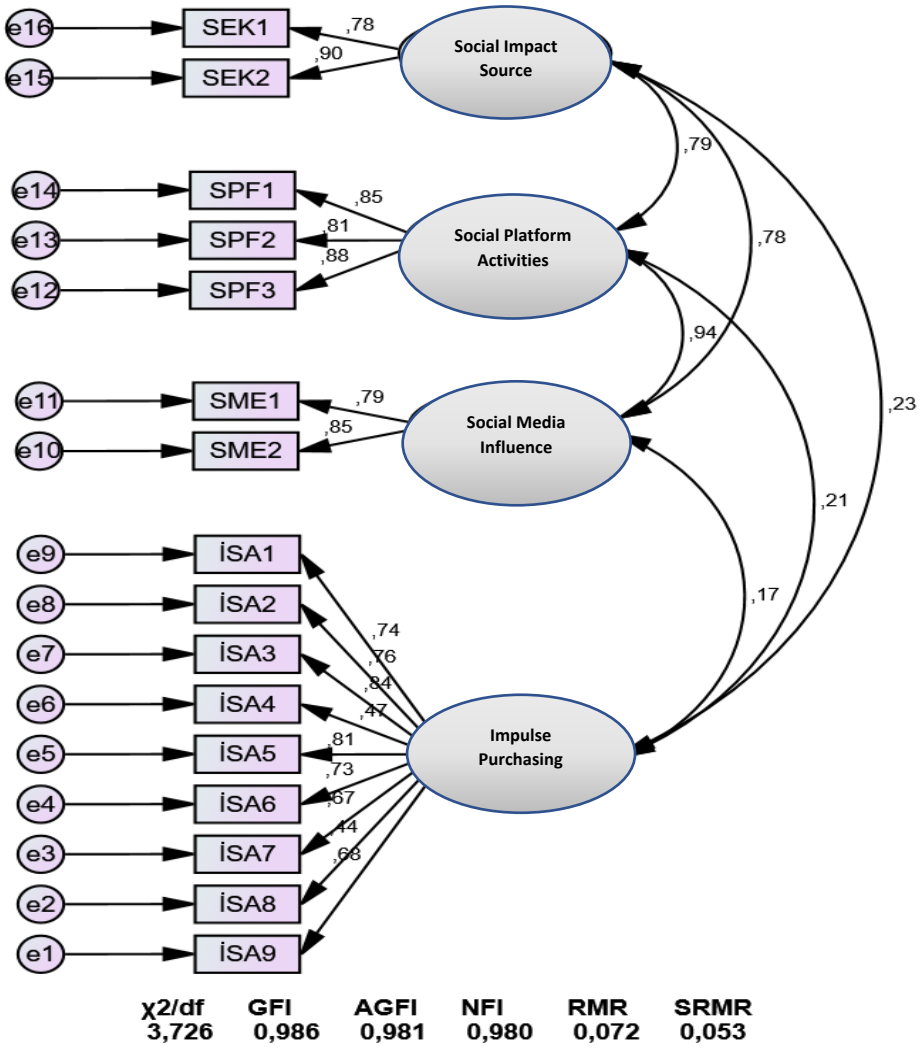

Figure 2. Confirmatory Factor Analysis Model

For the "Social Impact Source" dimension of the CA and CG values of the research scales, 0.825 and 0.828 were found and the dimension of "Social Platform Activities" was 0.882 and 0.883. 0.803 and 0.804 appeared for the dimension "Social Media Influence" and 0.918 and 0.942

appeared for the "Social Media Impact Scale". It turned out to be 0.885 – 0.890 for the "impulse purchase scale", and both scales were found to have high reliability.

SEM model in which the analysis of research hypotheses is made is presented in Figure 3. When the fit indexes of the model in Figure 3 are examined, it is seen that the SEM model is compatible and valid with the research data.

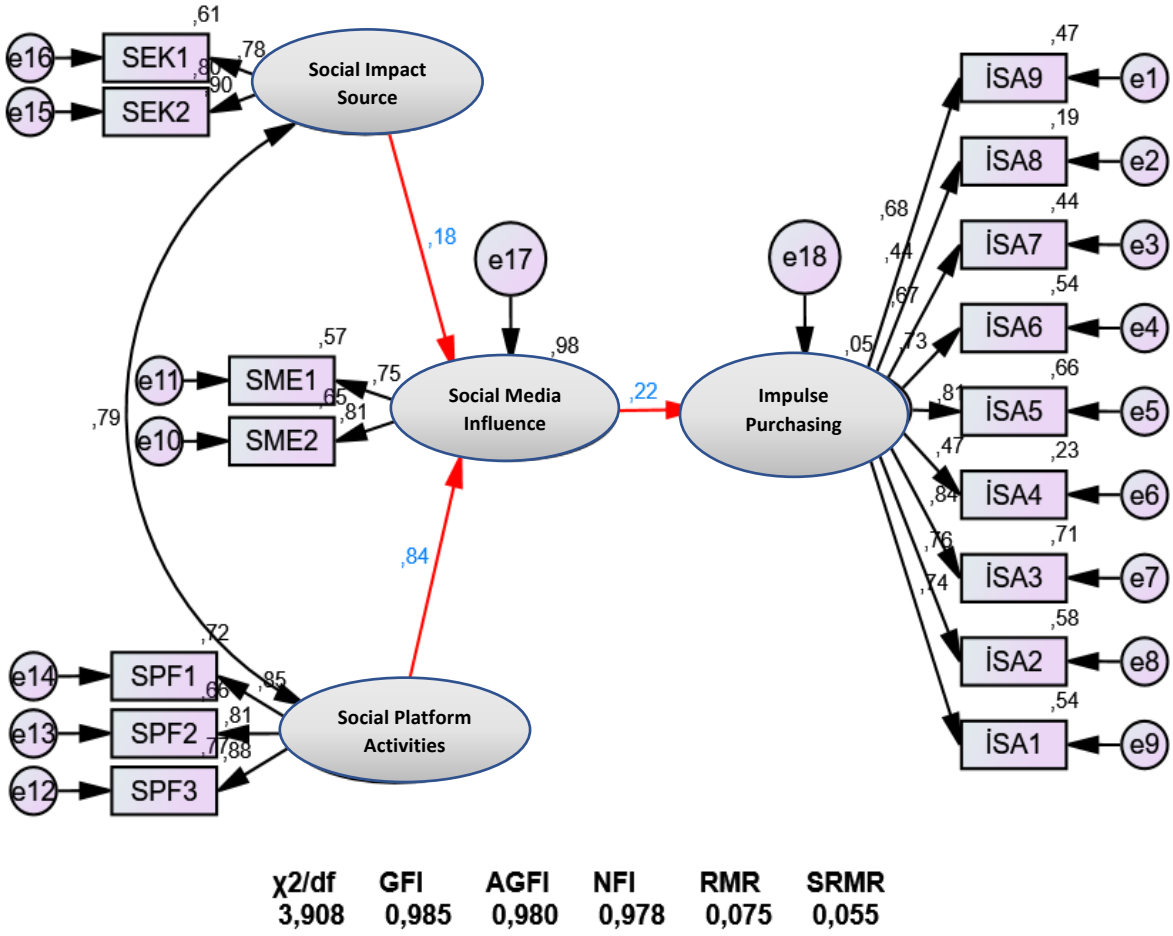

Figure 3. Structural Equation Model

Findings regarding the SEM model are presented in Table 4. According to SEM findings, it was determined that the effect of "Social Impact Source" on "Social Media Effect" (β = 0.176; p = 0.045), effect of "Social Platform Activities" on "Social Media Effect" (β = 0.844; p = 0.001) and the effect of “Social Media Effect” on “Impulse Purchasing” (β = 0.217; p = 0.002) were significant. As seen in Figure 2, it was determined that "Social Impact Source" explains 98% (R2 = 0.980) of the variance in "Social Media Effect" together with "Social Platform Activities". In

addition, it was determined that "Social Media Effect" explains 4.7% (R2 = 0.047) of the variance in "Impulse Buying".

Table 4. Structural Equation Model Analysis Findings

			Regression Coefficient	Standardized Regression Coefficient (β)	Standard Error	95% Confidence Interval (β)		p
						Min.	Max.	
Social Media Influence	<---	Social Impact Source	0,144	0,176	0,095	0,004	0,374	**0,045**
Social Media Influence	<---	Socail Platform Activities	0,765	0,844	0,082	0,672	0,998	**0,001**
Impulse Purchasing	<---	Social Media Influence	0,170	0,217	0,050	0,114	0,310	**0,002**

According to these findings;

“H1: Social impact source significantly affects social media influence”,

“H2: Social platform activities significantly affect the social media influence”,

“H3: Social media influence significantly affects consumers' impulse purchases” hypotheses are accepted.

3. Conclusions and Recommendations

H The main purpose of this study is to determine the effect of social media on impulse buying behavior. The model presented in the research conducted for this purpose was tested with its variables. The study determined that social influence source and social platform activities have meaningful influence on social media effect, and that social media effect has meaningful influence on the impulse purchases of consumers. Accordingly, the participants in the study were unwittingly, thoughtlessly and suddenly engaged in buying behavior. In demonstrating these behaviors, the study determined that they were influenced by the shares, likes, and comments on social media platforms. The participants believed that the shares, comments, and likes contained the correct information in the purchasing decision-making process, and that they should have an effective presence in these online platforms. As a result, it is seen that social media platforms are effective in impulse purchases in times of crisis, especially in the Covid-19 pandemic.

During the Covid-19 pandemic, individuals started to spend more time at home as a result of curfews and increased social isolation in order to control the spread of the disease, and this has led to the increasing use of social media. It was emphasized in Erkan and Evans (2016), Zhu et al. (2016), Hamilton et al. (2016) studies that the social media platform, which has the potential to change many areas from economy to politics, from education to health, has an increasing impact on the purchasing behavior of consumers. In addition, Nuseir (2020) showed in his study that the communication between social media users is effective in the formation of impulse purchasing behavior. The findings of the study show that factors such as the popularity of the product brand, page likes and comments from friends have a great influence on persuasion. Images used to help create a convincing situation that the consumer needs the product and the likes of close friends play a powerful role in impulse purchasing.

Shahpsandi et al. (2020) confirmed the strong influence of social media in the formation of impulse purchase intention in Instagram. The findings of this study showed that Instagram page managers can help them use their resources and marketing skills appropriately to achieve the desired result on consumer behavior. Wu et al. (2020b) stated that social media platforms provide a unique experience by interacting with different communication channels while shopping online and they stressed that such platforms play an important role in motivating impulse purchasing beyond individual and product concerns. Besides, the same study found that consumers often make unplanned purchases in the social media environment after being exposed to stimulating cues such as price discounts, limited product advertising, and attractive product appearance. The trend of online consumers using the social media platform to buy unplanned is creating lucrative opportunities for businesses. Therefore, it is important to identify factors that drive consumers to buy unplanned in the process of using social media and it is also important that these factors are designed to increase confidence in those who conduct online marketing practices and develop appropriate strategies.

Consumer behavior is difficult to understand and explain, and the main reason for this is that many variables affect consumer behavior. It is obvious that the Covid-19 pandemic will also have an effect in this sense, and the role of social media in the Covid-19 pandemic stands out. For this reason, it is of great importance that business managers who want to reach out to consumers should take into account the social media factor, which has an intensive effect on consumer

purchasing behavior. In addition to the efforts to adapt to radical changes in social life in this changing new world order and post-pandemic era, the study of consumer purchasing behavior reinforced through social media should be considered as one of the main responsibilities of marketing managers. Considering this situation, our study also achieved results consistent with the studies we have mentioned above. Especially in times of crisis such as a pandemic, it is a necessity for business management to act more proactively and develop strategies that will turn the encountered crisis into an opportunity. Since the study was conducted by associating it with the pandemic, the outputs also provide clues to marketing managers on how to use the social media environment to influence the purchasing impulse, especially in times of crisis.

The most important limitation of this study is that the research was conducted on a relatively small sample group with the same cultural values in connection with the Covid-19 pandemic process. Cross-studies taking into account cultural differences will increase the generalizability of the effects of social media on consumers' purchasing behavior during the pandemic process.

Conflict of Interest: The authors have no conflicts of interest to declare.

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EXAMINING THE EFFECTS OF COVID-19 ON HEALTH SERVICES MARKETING RESEARCH WITH A BIBLIOMETRIC ANALYSIS

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Abstract

Aim: The Covid-19 pandemic has triggered serious socio-economic, social, and political crises as well as an important public health crisis in infected countries. The studies in the literature before and after the Covid-19 pandemic were examined with bibliometric analysis method by considering the Coronavirus from the perspective of health services marketing. Thus, the articles written in the field of health care marketing from the past to the present were examined in detail, and it is aimed to contribute to the development of the field and further research

Methods: The bibliometric analysis method was used to uncover the current situation in health care marketing and to determine research gaps.

Findings: A total of 1669 studies were identified using the keywords "health service and marketing," "health management and marketing," "health marketing," and "healthcare and marketing".

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This research examines studies published since 1981, when the first study in health marketing was conducted. Before the Covid-19 pandemic, medical tourism, social marketing, and pharmacovigilance were among the most common keywords used by authors.

Conclusion: In the studies carried out during the Covid-19 pandemic, it is seen that the keywords 'hospitals, marketing communication, machine learning, and artificial intelligence' are preferred, respectively.

Keywords: Health Marketing, Health services marketing, Covid-19, Bibliometric analysis

Introduction

The development of health care marketing shows parallelism with the political, social, and economic structural changes in the world and with marketing development. Health care marketing refers to the systematic implementation of marketing principles in the field of heterogeneous and complex health (Crié and Chebat, 2013). Healthcare marketing is a concept directly linked to the management of any health institution or service to ensure quality and effectiveness. It determines the needs of patients and healthy people to reach the desired level of satisfaction in a particular health service. In addition, the pharmaceutical, biotechnology, and medical device industries are the main area of healthcare marketing (Stremersch, 2008). Health marketing uses commercial marketing and strategies to promote products such as evidence-based health information and treatments. The ultimate goal of health marketing is to benefit consumers and the public, while the eventual aim of commercial marketing is to advantage the product sellers and shareholders (Bernhardt, 2006). Health marketing mainly developed from two disciplines, which are social marketing and health improvement. Social marketing, which uses commercial marketing principles and techniques to influence an audience, is a consumer-oriented health marketing component. Thus, individuals can voluntarily accept, reject, modify or abandon an act of their interests, groups, or society (Pralea, 2011; Chichirez and Purcărea, 2018).

The Covid-19 outbreak caused by the SARS-Cov-2 coronavirus was declared a pandemic by the World Health Organization on March 11, 2020 (WHO, 2020). Covid-19 can be thought to be a global health crisis that affected the world after World War II, such as economy, society, culture, politics, education, tourism, and security (Arslan and Karagül, 2020). In other words, the

Covid-19 pandemic is considered the most important global health disaster of the century and the biggest challenge facing humanity since World War II. (Chakraborty and Maity, 2020).

The Covid-19 pandemic is still being fought worldwide, and approximately 240 million people worldwide have been infected, 5 millions of whom have died since October 2021 (WHO, 2021). Although it is known that the main transmission source of Covid-19 is the droplet pathway, contact of infected objects with the mouth, nose, and eyes after manual contact is also considered transmission (Evren and Us, 2020). The most effective way to protect against Covid-19 is not to be exposed to the virus. Therefore, the use of personal protective equipment such as masks, social distancing, and isolation measures have been adopted. Accordingly, countries have developed various policies that create radical changes in social life and business life to fight against the pandemic (Deb et al., 2020). These measures include mandatory and voluntary quarantine practices, flight restrictions, closing borders, working online at home for appropriate sectors, flexible working, suspension of education or distance education, suspension of artistic and sports activities, closure of public areas such as shopping malls, restaurants, etc. (Çöl and Güneş, 2020). In addition, some hospitals have been converted into pandemic hospitals to use health resources effectively, elective procedures and non-emergency surgeries have been postponed, and the number of outpatient clinics has been reduced to reduce the crowds in hospitals (Diaz et al., 2020; Hacıkerim Karşıdağ et al., 2020). Maintaining physical distance, isolation, and stay-at-home measures are important in keeping the health system's capacity (Gostin and Wiley, 2020). In the effective fight against the pandemic, citizens must comply with Covid-19 precaution, be trained and informed. At this point, public spotlights used as a tool in social marketing activities have played an important role in informing the community and adapting to pandemic conditions. In the Covid-19 pandemic, it has been observed that public spotlights are used in areas such as awareness, compliance with hygiene rules, home care, disease monitoring of national and international institutions such as WHO, CDC, Ministry of Health (Yeşilyurt, 2021).

With an introduced product, intensive promotional work is carried out to counter customers' doubts about the quality of the product. Covid-19 vaccines are new brands of consumer health technology that have been introduced to the market. From a marketing perspective, these are new products designed and purchased by various governments around the

world. Currently, it is known that there are various concerns and anti-vaccination concerns about vaccines around the world (Erkekoğlu et al., 2020). Like other consumer health products launched, pharmaceutical companies, healthcare organizations, and even policymakers should communicate and position the vaccine as an effective option to normalize the ideas about vaccines. In other words, vaccines should be marketed (Mogaji, 2021). In line with this information, the studies in the literature before and after the Covid-19 pandemic were examined with bibliometric analysis method by considering the coronavirus from the perspective of health services marketing. Thus, the articles written in the field of health care marketing from the past to the present were examined in detail, and it is aimed to contribute to the development of the field and further research. There are few bibliometric analyses on health care in the literature. A study conducted by Butt, Iqbal, & Zohaib (2019) identified the most prolific cited journals and authors who published in these journals. Therefore, this study will address the gap in this field in the literature, thus providing a broad overview of the field and guiding potential researchers in the same field.

1. Research Methodology

Literature reviews aim to show the current status of the subject by identifying the studies on the subject and highlighting the research gaps for subsequent studies (Tranfield, Denyer, and Smart, 2003). The bibliometric analysis method was used in this study to emphasize the current situation in health care marketing and to determine research gaps. Bibliometric analyses as quantitative analysis (Broadus, 1987) offer the opportunity to synthesize literature in detail in all areas (Zupic and Cater, 2015). Accordingly, studies published in the Journals of the Social Science Citation Index (SSCI) in the Web of Science database have been examined. A total of 1669 studies were reached using the keywords "health service and marketing," "health management and marketing," "health marketing," and "healthcare and marketing" in this research, which examined the studies published in the 40 years since the first study on health care marketing was conducted in 1981.

In the Web of Science database, searches were done under the heading "topic" for the Social Science Citation Index studies. A total of 1669 studies were reached by selecting the "article" option (excluding congress papers, books, book chapters, etc.) for predetermined

keywords. Search results are stored to include all basic article information such as title, abstract, author(s), keywords, references, and more.

2. Analysis

Studies on health care marketing published in the Web of Science database journals and scanned in the SSCI index have been examined. First, the distribution of these studies by year is shown in Figure 1.

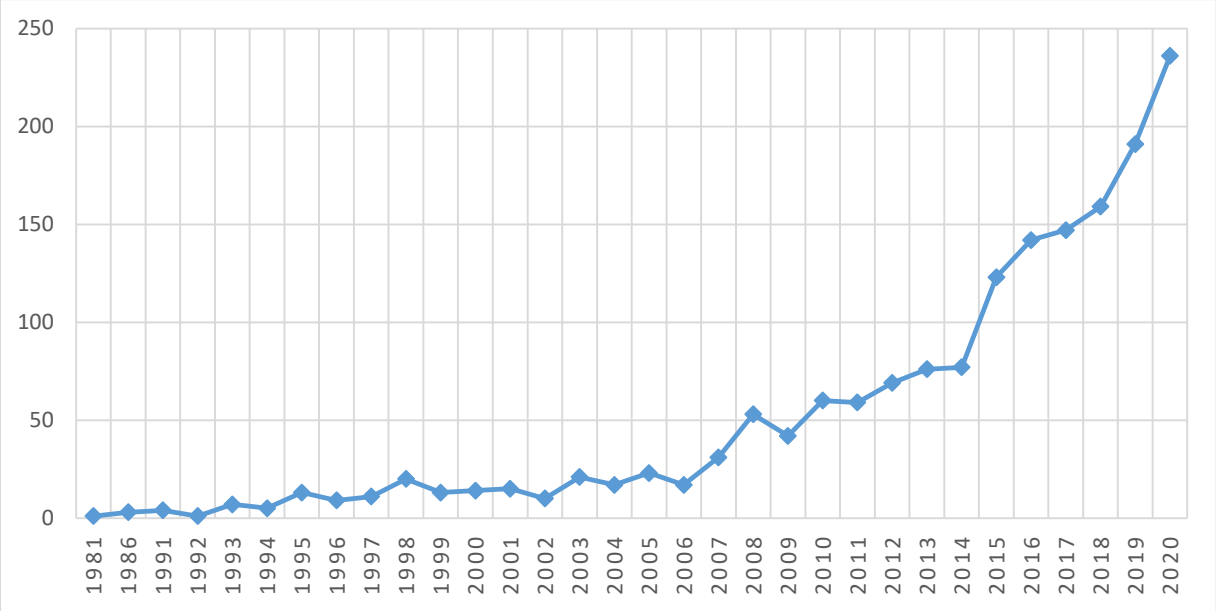
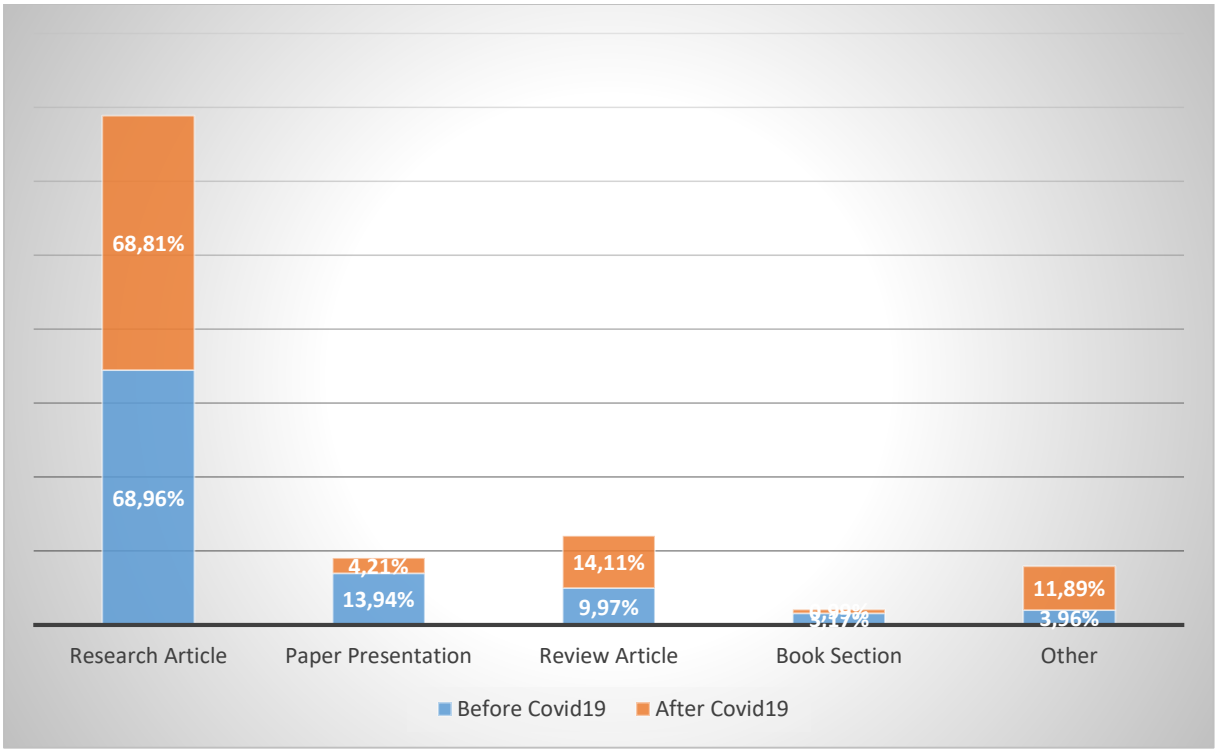


Figure 1. Yearly representation of studies on health care marketing

When the data in X are examined, it is seen that studies on health care marketing have been in the literature since 1981. Health care marketing studies, which have been increasing in general since the early 2000s, have gained a very high momentum since 2015 and reached the highest number with 236 studies in 2020. As of October 1, 2021, the Web of Science database contains 127 studies on healthcare marketing.

The types of studies carried out before and after March 11, 2020, which were declared a pandemic by the World Health Organization to determine how the Covid-19 outbreak caused by the SARS-CoV-2 virus affected the literature of health care marketing, were examined and shown in Figure 2.



Graphic 1. Comparison of studies before and during Covid19

The bar chart in Graphic 1 shows percentage comparisons of studies conducted from 1981 to March 2020 and from March 2020 to October 1, 2021. According to this graph, it is noted that research articles before and after Covid-19 remain at the same rate (the number of research articles is divided by the total number of publications). In post-epidemic studies, although the number of paper presentation decreased by about 1/3, review articles showed an increase of about 50%.

Bibliometric analysis was carried out on healthcare marketing to determine the keywords used in the publications made before the Covid-19 pandemic. A bibliometric map showing the frequency of keywords used at least three times is shown in Figure 3.

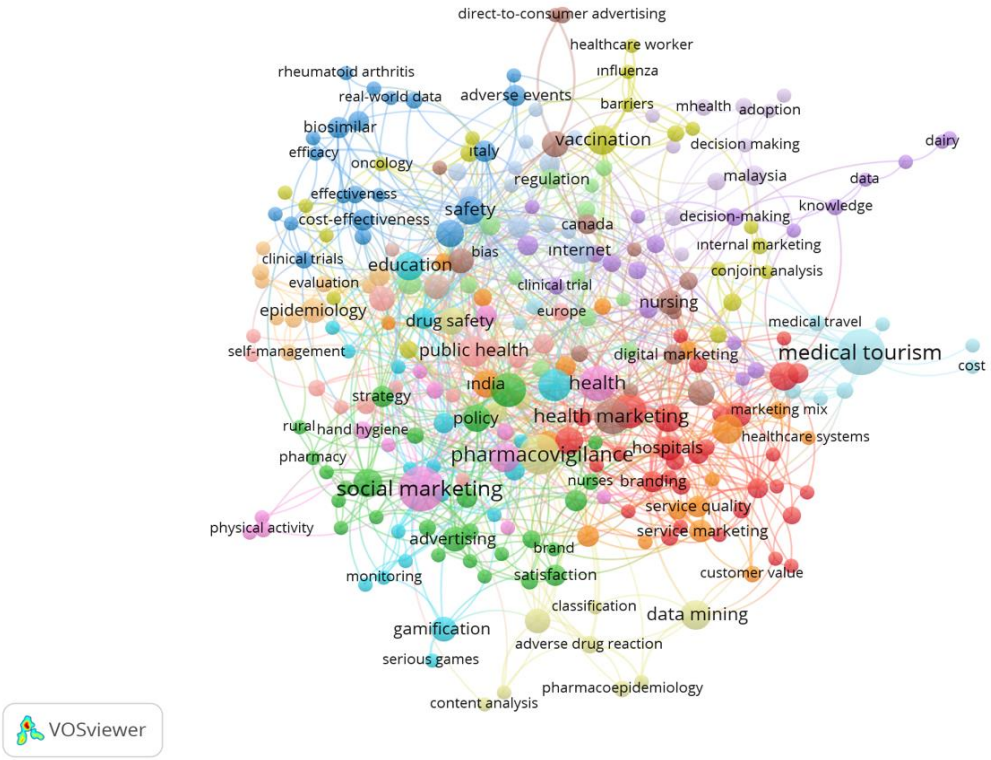


Figure 2. Keywords used in studies before the Covid-19 pandemic was declared

When the map in Figure 2 Keywords used in studies before the Covid-19 pandemic was declared is examined, it is seen that the most commonly used keywords are medical tourism, social marketing, and pharmacovigilance.

The keywords used in the studies carried out by the World Health Organization after 11 March 2020, when the pandemic was declared, were mapped by bibliometric analysis and shown in Figure 3.

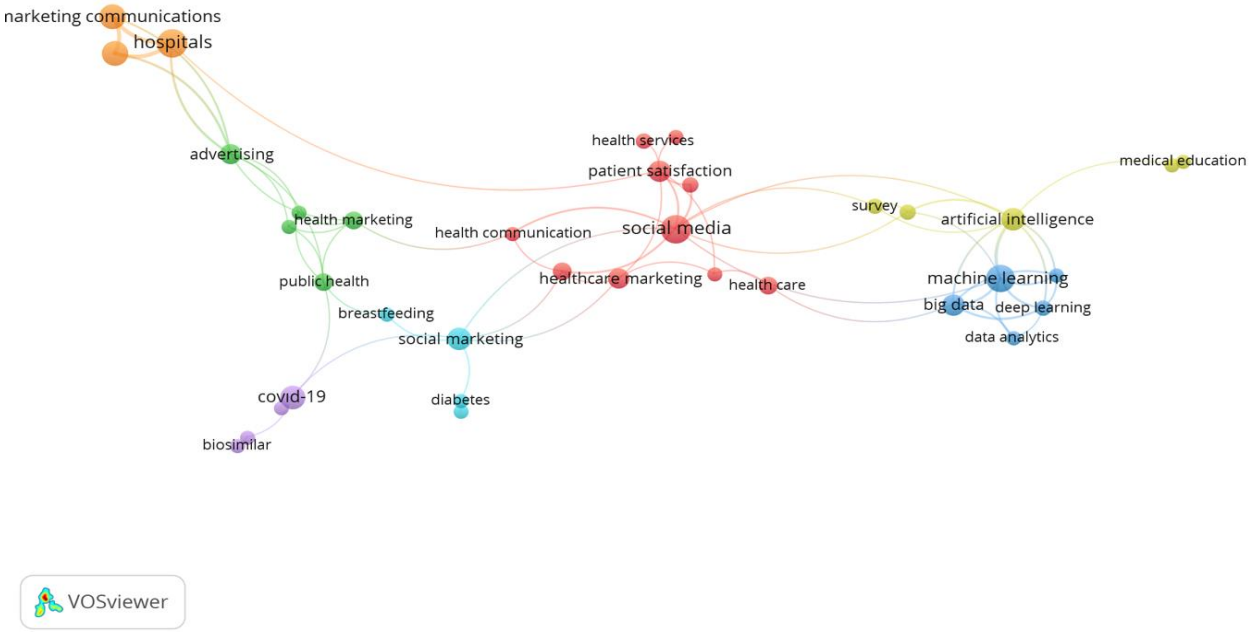


Figure 3. Keywords used in studies after the Covid-19 pandemic was declared

Looking at the bibliometric map in Figure 3, it is seen that the most commonly used keywords in the post-Covid-19 pandemic are hospitals, marketing communication, machine learning, and artificial intelligence, respectively.

In the nearly 40 years from 1981 until October 1, 2021, when the data was collected, the keywords used in the studies on health care marketing were determined and shown in Figure 4.

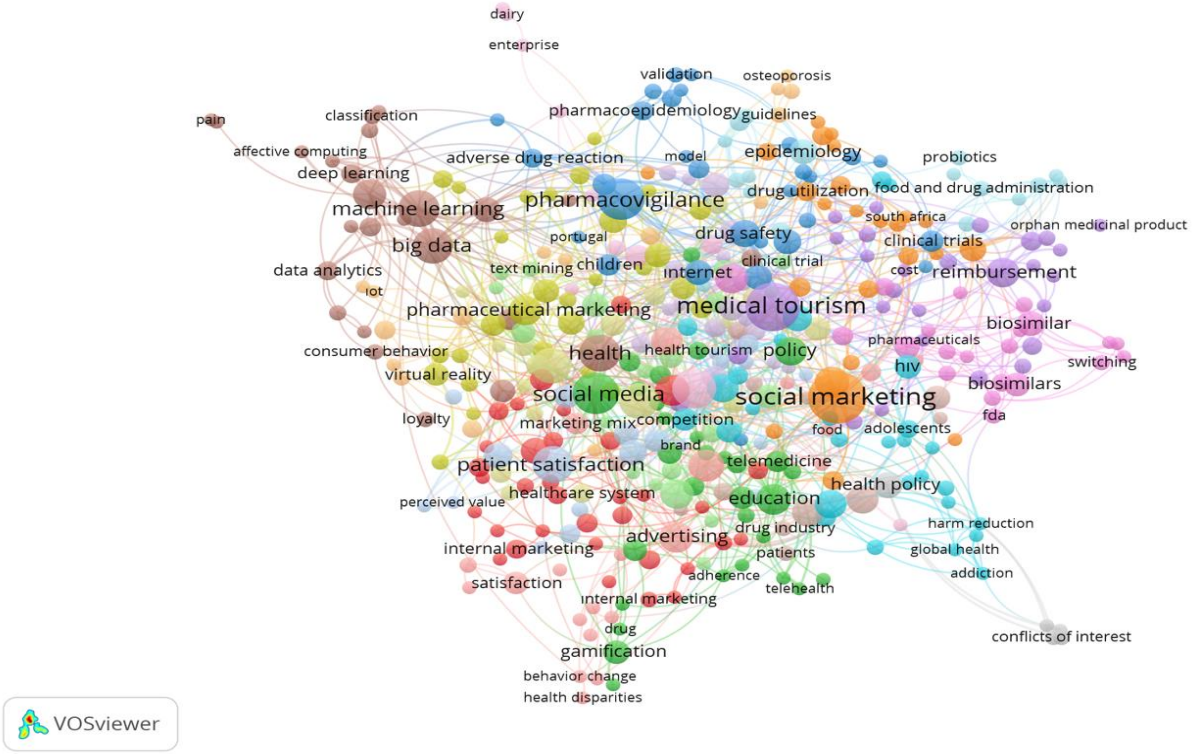


Figure 54 Keywords used in studies since 1981

In the last 40 years leading up to October 1, 2021, keywords used in academic journals in healthcare marketing and scanned in the SSCI index were filtered at least three times, subject to the requirement to repeat. In these studies, it is seen that the most commonly used keywords are social media, social marketing, medical tourism, and pharmacovigilance, respectively.

In the 40 years to October 1, 2021, a bibliometric analysis of the countries in which the studies in the field of health care marketing were carried out was performed and shown in Figure 5.

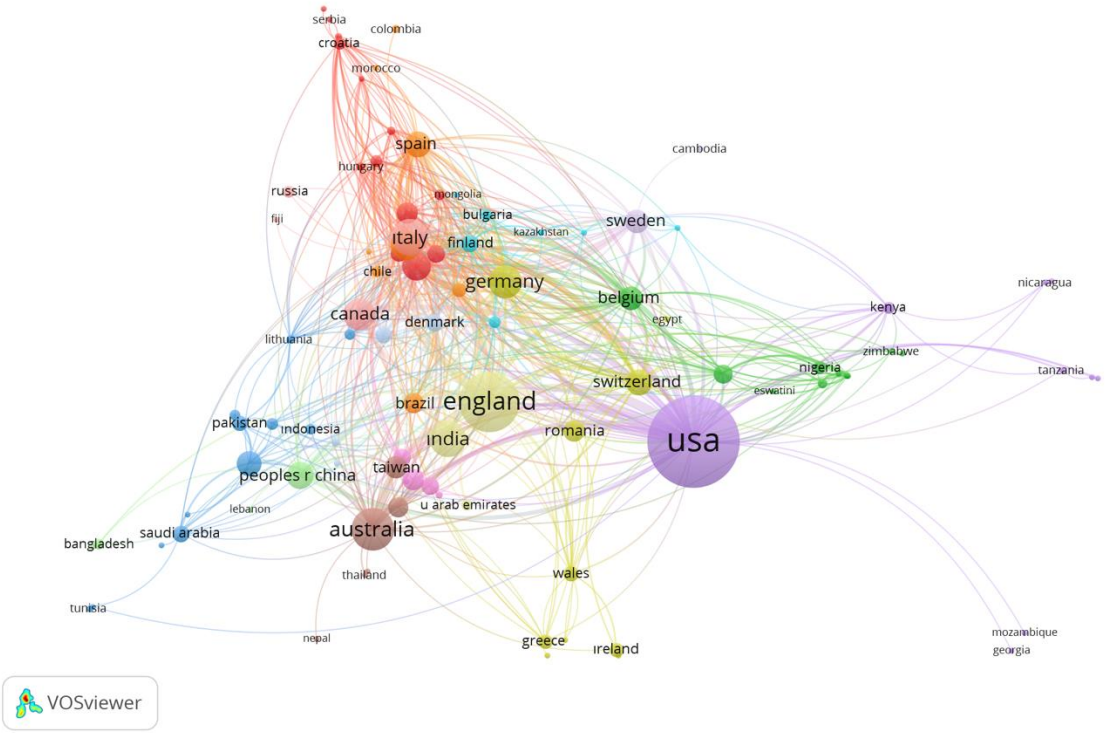


Figure 5. Countries where studies have been carried out since 1981

When looking at Figure 5, which includes mapping for countries, there are studies in health care marketing in a total of 110 different countries. The United States ranks first among these countries, with 587 publications. Following the US, the UK is second with 255 broadcasts, and Australia is third with 124 broadcasts. India with 95 publications and Italy with 93 publications follow the top three countries. Turkey hosted 24 articles published in the Web of Science database and published in journals scanned in SSCI indexes.

Finally, the results of the bibliometric analysis to determine the universities where the researches were carried out are shown in Figure 6.

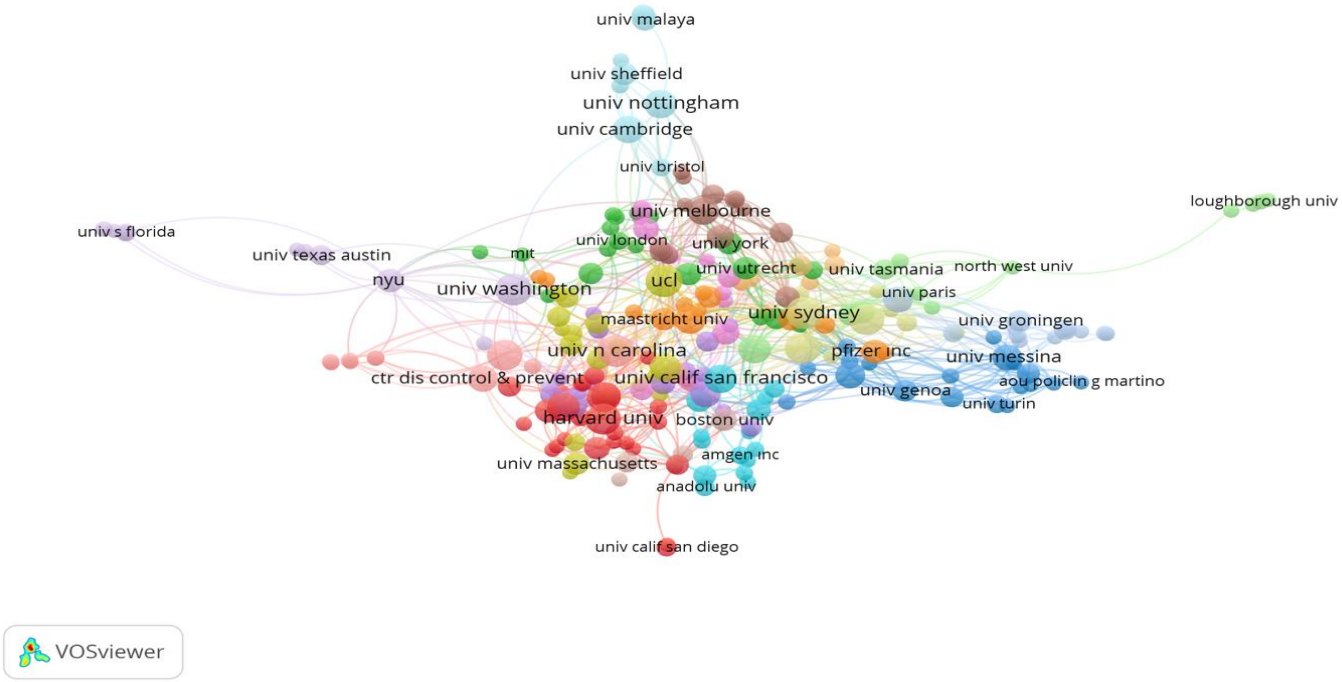


Figure 6. Institutions where studies have been carried out since 1981

Bibliometric map Figure 6 shows which institutions carried out the studies in the nearly 40 years since health care marketing studies began to appear in the literature in 1981. Articles published in the Web of Science database in health care marketing and published in academic journals scanned in the SSCI index were conducted in a total of 2706 different institutions. 287 different institutions are involved in mapping, subject to the requirement to repeat at least three times. The top 4 (The University of North Carolina, University of Washington, Louisiana State University in Shreveport, Willis-Knighton Medical Center) are located in the United States, where the most studies are conducted. At the same time, the University of Sydney from Australia ranks fifth.

3. Conclusions and Recommendations

Health care marketing has evolved conceptually since the second half of the 1970s and has made significant progress over the past fifty years (Corbin, Kelleye Schwartz, 2001). Health marketing is a customer-centered process to protect and improve the health of various populations, using

science-based strategies to create, communicate and present health information and interventions (Lovelock and Jochen, 2004). To pioneer in the market share of patients in the health sector, it is becoming increasingly important for health professionals to provide high-quality healthcare experiences. As the quality of service improves, patient satisfaction will also tend to increase, followed by behavioral intentions (Platonova, Kennedy, and Shewchuk, 2008). Over time, patient and customer concepts have been discussed, and the topics of patient satisfaction in the health sector (Gill and White, 2009; Tosun and Söyük, 2019), patient experience (LaVela and Gallan, 2014; Çamlıdere and Söyük,2019), patient loyalty (Ramli and Sjahruddin, 2015), customer relationship management (Chahal, 2010), public relations (Valjak and Draskovic, 2011) service improvement (Schweikhart, Strasser and Kennedy, 1993) and brand (Chahal and Bala, 2012) have received attention. In addition, social marketing is an important tool in the delivery of health services. This tool aims to help people change their behavior to be healthier or to improve society in some way. Community and consumer solidarity are necessary for health programs or projects to be successful. The four principles of social marketing lead policymakers and healthcare providers to successfully plan and implement health programs (Aras, 2011). One of the issues closely related to health care marketing is health tourism because the foundations of health tourism are based on target market determination, promotion, branding, and, in fact, marketing of health services (Tontuş, 2018; Tosun et al., 2020).

Since 1981, studies on health care marketing, which entered the international literature, have been encountering increasing interest in the nearly 40-year period. In this study, studies in the Social Science Citation Index Journals were examined in the Web of Science database during the 40 years. In this way, it is aimed to make a general map of international studies on healthcare marketing. A total of 1669 studies using the keywords "health service and marketing," "health management and marketing," "health marketing," and "healthcare and marketing" were distributed by year, comparison of research types before and during Covid19, keyword grouping, country grouping, and university grouping were performed.

As a result of the research, it can be said that health care marketing studies, which have a place in the international literature since 1981, gained a very high momentum as of 2015 and reached the highest number with a total of 236 studies in 2020. The comparison of research types

before and during Covid-19 and the ratio of articles prepared by academics remains almost the same rate. In contrast, the difference seen in the congress papers and review articles is noted. Due to the impact of the SARS-Cov-2 outbreak, scientific congresses could not be held in the first moments of the pandemic, so the number of congress papers can be considered a result that is expected to decrease by about 1/3. Another noteworthy point in this comparison is the approximately 50% increase in the number of research articles. It can be said that this situation is related to the fact that academics who had to work at home at the time of the epidemic turn to secondary data.

Before the Covid-19 pandemic, medical tourism, social marketing, and pharmacovigilance were among the most common keywords used by authors. Medical tourism is one of the most important issues in health care marketing. When the studies in this field are examined, the importance of developing marketing strategies that will effectively ensure the competitive advantage of countries is emphasized (Rerkrujipimol and Assenov, 2011; Sousa and Alves, 2019; Zarei et al., 2019). As part of social marketing, healthcare marketing should voluntarily influence individuals through various social programs in a way that prompts them to accept, reject, change or abandon a behavior to create a healthier lifestyle. In this respect, social marketers are primarily focused on reducing obesity in individuals, encouraging smoking cessation, walking, and cycling, while in Africa, the focus is on solving some important health problems such as malaria prevention, poliomyelitis eradication, reducing infant mortality, and stopping the spread of HIV/AIDS. Social marketing, which acts according to individual behavior change, can also affect those who decide public policies with positive effects on social change (Chichirez and Purcărea, 2018). Another area that often works in healthcare marketing is pharmacovigilance (Mammì et al., 2013; Nwaiwu et al., 2016; Beninger, 2018). The pharmaceutical industry is under pressure to improve the scientific quality of its decisions regarding the benefits and risks of its products while ensuring compliance with acceptable marketing standards (Edwards, 2004). Pharmacovigilance has been defined as the process of identifying and responding to drug safety issues and has grown significantly as a discipline in the last 30-40 years (Talbot and Nilsson, 1998). Pharmacovigilance plays an important role in the health system by evaluating, monitoring, and discovering interactions between drugs and their effects on humans. Pharmaceutical and biotechnological drugs are designed to cure, prevent or

treat diseases; however, adverse drug reactions, in particular, have risks of causing serious harm to patients (Suke et al., 2015). The increase has influenced increased interest in this field at the rate at which serious adverse drug reactions are discovered after marketing a medical product. This point is also important that pharmacovigilance studies are carried out after the product is marketed.

In the studies carried out in the Covid-19 pandemic, it is seen that the keywords hospitals, marketing communication, machine learning, and artificial intelligence are preferred, respectively. This difference between keyword analyses and the results reached in this study is also reciprocated in the literature. The studies on hospitals in the Covid-19 pandemic are among the leading studies in health care marketing. When these studies are examined, it is seen that the expanded marketing mix (7p) is focused on its application and effects in hospitals (Ravangard et al., 2020; Kusumapradja, 2020; Djawoto and Soekotjo, 2020; Siripipatthanakul and Puttharak, 2021). Another of the studies carried out in recent years is that effective communication with existing and potential patients is an absolute necessity for healthcare organizations and that health organizations must work hard to succeed in marketing communication (Elrod and Fortenberry, 2020). With the Covid-19 process, the number of studies using artificial intelligence and machine learning methods in health care studies is increasing (Kern, et al., 2020; Faes, et al. 2020; Verhaar, et al., 2020; Turner, et al. 2021; Wang, et al., 2021; Sheikh, et al., 2021). Artificial intelligence (AI) and machine learning (ML), especially its subcomponent, can improve healthcare systems worldwide by optimizing workflows in hospitals, providing more accurate diagnoses, and delivering better medical treatments to patients. In recent years, it has been important to use machine learning (Chatterjee et al., 2021) and artificial intelligence (Khanna et al., 2020) in healthcare marketing because it is seen that artificial intelligence technologies and machine learning methods play an important role in eliminating undesirable situations such as pandemics (Sheikh et al., 2021) and are vital in the detection, classification, and interpretation of SARS-Cov-2 virus in this process (Wang et al., 2021).

As with any research, this research has limitations. The first winter of the study is related to the data collection process. The research data covers the period from 1981, when the first study on health care marketing was carried out, to October 1, 2021. The second limitation is the

keywords used in the research process. The keywords "health service and marketing," "health management and marketing," "health marketing," and "healthcare and marketing" were used during the research. Another limitation is the database used. During the data collection process, studies published in the Journals of the Social Science Citation Index (SSCI) were examined in the Web of Science database. The last limitation of the research is the type of data examined. Only the type of article for the keywords used is included in the review. Differentiation of keywords to be used in further studies, diversity in databases, and reviews of different types of data will contribute to the expansion and generalization of the research.

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