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The Effect of Patient Expectations and Satisfaction on Regional Trust in Health Tourism: A Private Hospital Example

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ABSTRACT

In this study, the effect of health tourists' expectations and satisfaction on regional feelings of trust was examined. In line with the purpose of the research, the sample of the research consists of 178 patients whose structure was determined by simple random sampling method among the patients who were in the institution to receive health services. The data were analyzed with the SPSS program. Of the 178 tourists who participated in the research, 52.8 percent were women and 47.2 percent were men. According to the age variable, 41.6 percent of the tourists were between the ages of 18-30, 36.5 percent were between the ages of 31-45, and 21.9 percent were aged 46 and over. When the educational status of the tourists was examined, it was determined that 42.7 percent were primary school graduates, 14.6 percent were high school graduates, 33.1 percent were university graduates, and 9.6 percent were master's and doctorate graduates. As a result of the analysis, it was determined that meeting the expectations and satisfaction of the participating health tourists had a statistically significant and positive effect on the sense of regional trust. In line with these results, as patients' expectations are met and their satisfaction increases, their trust in the region and country also increases.

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1.INTRODUCTION

Health has a feature that individuals have and that closely affects their quality of life. For this reason, high-level investments are made in health-related research and technological development activities today (Shehawy, 2021; Zhang et al., 2021). Health services, which have become widespread throughout the world, serve patients by public and private institutions. Sick individuals receive treatments with or without medical intervention for purposes such as being healthy and staying fit (Rahman et al., 2021). Thanks to the developing technology and communication opportunities, patients search for the institutions that provide the most successful treatments for their disease conditions, even in any part of the world, and they want to receive treatment there (Puczkó & Smith, 2022; Utama et al., 2021). Therefore, tourism activities are carried out to receive health services.

Health tourism, which is spreading rapidly in the world, has shown a significant increase in recent years due to the development of health services in Turkey (Büyüközkan et al., 2021). According to the data of the Turkish Statistical Institute, the number of visitors, which was 267 thousand in 2013, has increased continuously and exceeded 662 thousand in 2019. Despite the decrease in the negative impact of the pandemic process, a total of 642,644 people from various countries of the world came to Turkey in 2021 to receive health services. With these people benefiting from health services, an income of over 1 billion dollars has been provided. It is observed that diseases belonging to patients coming from abroad are generally gynecological diseases, general surgery, dental, infectious diseases, eye, ear, nose and throat (Turkish Statistical Institute, 2022).

Health tourism can be generally classified as medical tourism, thermal tourism, tourism for the elderly and disabled (Shehawy, 2021). Health tourism is generally carried out for reasons such as benefiting from professional health services, receiving health services at more affordable costs, vacationing with treatment, and insufficient development of health services in the country where they are located (Anaya-Aguilar et al., 2021; Zhang et al., 2021). Within the scope of health tourism, there are also applications such as spa tourism, disabled tourism, medical tourism, spa-wellness and elderly tourism. Spa tourism, which has an important place in health tourism, includes applications such as thermal water bath, mud bath, drinking water, inhalation, physical therapy, exercise, diet and psychotherapy. These can also be expressed as uvalism, climatism, and thermalism in general (Utama et al., 2021; Vega-Vázquez et al., 2020).

Turkey has some advantages in terms of medical tourism, which is effective in meeting the satisfaction and expectations of patients coming from abroad. Examples of these are the provision of services at the standards in western countries, the high number of institutions accredited with the Joint Commission International (JCI), the cheaper health services compared to other countries, and the quality of human resources. It can also be added that the country's historical, touristic and climatic features are preferable and it is in the first place in Europe in terms of thermal resources. In terms of thermal resources, it is in the first place in Europe(Edinsel & Adıgüzel, 2014; Yılmaz et al., 2020). Among these features, providing health services at affordable costs is considered to be the most important reason for preference. These features ensure satisfaction and fulfillment of expectations in patients (Joseph et al., 2021). Therefore, the satisfaction of patients visiting Turkey for various reasons is an important factor that affects other patients who may come from their home countries to visit Turkey for the health services they plan to receive (Özsarı & Karatana, 2013). In addition, it is possible for patients who are satisfied with the visit to repeat health tourism in the same region/institution in case of need.

Despite these advantages, it can be said that there are weaknesses in terms of health tourism. Some of these can be expressed as negative image perception, low number of accredited hospitals compared to the general number, lack of emphasis on marketing, coordination problems with foreign insurance companies, staff not speaking a foreign language, lack of information about patient rights, coordination problems between the private sector and the Ministry of Health (Edinsel & Adıgüzel, 2014; Özsarı & Karatana, 2013).

As a result, health tourism focuses on the organizational and operational aspects of business trips for the treatment of individuals (Hashemi & Derakhsh, 2021). In parallel with economic growth, there have been significant developments in the health industry in recent years (Puczkó & Smith, 2022; Utama et al., 2021; Vega-Vázquez et al., 2020). The expansion and improvement of accommodation services, trained and equipped personnel, and the use of technological opportunities are among all developments (Yılmaz et al., 2020). Turkey is considered as one of the most suitable markets in the region due to its thermal resources, mild climate, geographical accessibility and natural resources. Along with other development features, this contributes to meeting the expectations of patients and increasing their satisfaction(Utama et al., 2021; Yılmaz et al., 2020). Therefore, in terms of health tourism, it is considered in terms of the important

accommodation centers that can be preferred for patients among various countries of the world as well as in the region.

1.1. Customer Satisfaction in Health Tourism

Customer satisfaction is extremely important in health tourism. The reason is that individuals visit the region or institution within the scope of health tourism according to their various disease states (Ridderstaat et al., 2019). During this visit, they make an effort in terms of time and financial opportunities. It is possible for patients to be satisfied with the health services and additional services provided, increasing the possibility of re-visiting in the future, and recommending them to other patients in their environment (Kılıçarslan, 2019). Therefore, the satisfaction of patients from an individual point of view is important in terms of both the success of the treatment of the patients and the continuation of the existence of the institutions.

There are many factors that affect health tourism. These factors are that advertising activities within the scope of tourism, the availability of tourism venues and permanent means of transportation, communication features such as internet and telephone, the provision of accommodation services such as nutrition and accommodation in addition to the health services provided, the satisfaction of patients who have visited the institution before, and the equipment of service personnel can be given as examples.

Features such as being close to other tourism areas, not containing overcrowded or overly desolate environments, having social opportunities, being economically suitable for patients' budgets, having enriched websites that can answer all potential questions of intermediary institutions affect the quality and sustainability of health tourism(Göde et al., 2021; Tontus & Nebioglu, 2018). In addition, it is important that the payments made for the service are consistent with each other, the level of influence of the individuals from the institution, the treatment period is practical and effective, and the advanced services are provided at international standards.

Therefore, it is seen that there are many factors that affect health tourism and almost all of them are manageable factors (Zekavati & Naami, 2020).
In addition to these factors affecting health tourism, there are also some restrictive factors for health tourism. These can be expressed as(J. Han et al., 2021; Yavuz, 2018):

- Lack of accreditation to national and international standards,
- The services provided are not legal,
- Infrastructure services within the organization are not sufficiently developed,
- Inadequate customer relations, language and communicative characteristics of the personnel providing service,
- Incomplete or complete treatments,
- Customer dissatisfaction,
- Failure to advertise the services offered at a realistic level.

1.2. Regional Trust

Trust is a key factor in building long-term relationships between service providers and customers. It is a vital part of any customer relationship and brand loyalty is one of the results of this relationship. Consumers are more likely to prefer countries, regions, institutions, brands and/or products they trust, as perceived trust reduces or eliminates risks and uncertainty(Gounaris & Stathakopoulos, 2004; Morgan & Hunt, 1994; Power et al., 2008). For this reason, it can be thought that the first step is to gain the trust of the consumer in order to establish a long-term bond between the product/service provider and the buyer. This concept is influenced by both 'personal' (e.g. empathy, courtesy, and customer/service representative affinity) and 'corporate/brand-related' (customization, competence, reliability, and promptness) service representative characteristics(Coulter & Coulter, 2002). One of the first things sought before health tourism is the sense of trust that can be felt about the place where the service will be received. Regional trust is defined as “the willingness of the average consumer to trust the region's ability to perform its promised function”. Often, trust is associated with or identified with beliefs such as competence, honesty, and helpfulness(Chaudhuri & Holbrook, 2001).

Health care is vital and risky in some cases. Therefore, the ability to build customer trust is important. Trust in a healthcare brand or country is driven by a variety of factors, including consumer attitudes towards the brand or country, perceived quality, prestige, and customer-oriented behavior of staff (Kemp et al., 2014). The importance of the sense of trust to be felt is increasing due to the complex and unique features of health services. Individuals want to entrust their health only to the institution or health workers they trust enough. This request is becoming more dominant among health tourists due to reside in a foreign country. Maintaining confidence in health depends on a variety of quantitative and qualitative factors, such as performance, highly skilled staff, technical and behavioral interactions, treatment, type of patient, general and specialized services at a competitive price (Thantry et al., 2006).

Trust in an institution, region or country enables consumers to believe in the quality of the service/product to be offered and helps consumers make a choice and feel comfortable while purchasing their service/product (Chih-Chung et al., 2012). This feeling, which is created by customer satisfaction, ensures that it is preferred again.

2. MATERIALS AND METHOD

2.1. Type of Research

This research is exploratory in accordance with the quantitative research design.

2.2. Universe and sample

The population of the research consists of adult patients who come to Turkey to receive treatment within the scope of health tourism. Scale questions were administered to patients face-to-face, on a voluntary basis, and by simple random sampling method. In the research conducted between 08.04.2022 and 08.05.2022, the applications of 298 health tourists from Syria and Iraq were recorded to receive treatment at a private hospital in Gaziantep. In our study, the population was accepted as 298, and when the sample was calculated within the 95 percent confidence interval, it was determined that it was sufficient to reach 169 health tourists (Yazıcıoğlu and Erdoğan, 2004). 178 health tourists were reached between the specified dates. It was concluded that this number was sufficient as a sample.

2.3. Data Collection Tools

"Personal Information Form", "Service Satisfaction Scale" and "Regional Trust Scale" were used to collect data in the research.

Personal Information Form; It is a questionnaire form consisting of 4 statements about the age, gender, educational status and first visit to the health institution of health tourists.

Service Satisfaction Scale; The scale developed by Çakır (Çakır, 2019) has 4 sub-dimensions; It consists of 18 questions in total, including the physician dimension (4 md), the hospital dimension (6 md), the nurse dimension (4 md), and the accessibility dimension (4 md). The scoring range in the Likert-type scale ranges between 1-5, between "I strongly disagree" and "I totally agree". There is no reverse coding in the scale. The Cronbach's Alpha of the research conducted by Çakır was calculated as 0.910 (Çakır, 2019). In our research, Cronbach's Alpha was determined as 0.992. This value shows that the Service Satisfaction Scale is highly reliable (Kalaycı, 2017).

Regional Trust Scale; "Regional Trust Scale" developed by Abubakar (Abubakar, 2016) would be used. Permission was obtained to use the scale. The scale consists of one dimension and eight items. These scale items were also scored with a five-point Likert scale ranging from 5 "strongly agree" to 1 "strongly disagree". There is no reverse coding in the scale. The Cronbach's Alpha of the research by Abubakar was calculated as 0.831 (Abubakar, 2016). In our research, Cronbach's Alpha was determined as 0.991. This value shows that the Regional Confidence Scale is highly reliable (Kalaycı, 2017).

2.4. Data collection and analysis

After obtaining the necessary permissions from the scale owners and the ethics committee, the scale questions were sent to the participants online and asked to answer them, and it was carried out on a voluntary basis. The data obtained as a result of the applied scales were analyzed through the SPSS program. Frequency and percentage calculations were made in order to determine the demographic and descriptive data of the participants (such as age, gender, educational status and the sector they worked in).

Since it was determined that the data did not show a normal distribution, arithmetic median, IQR, Man Whitney U and Kruskall Wallis tests were applied to determine the effects of the health tourists participating in the research on the perception of service satisfaction and regional trust. In addition, Spearman correlation analysis was performed to evaluate the relationship between patients' satisfaction with service and their sense of regional trust.

3. RESULTS

In the findings part of the study, firstly, the demographic and descriptive data of the participants were included (Table 1).

Table 1. Data On Demographic Characteristics Of The Research Group

Demographic Characteristics	Groups	Sample	%
Gender	Female	94	52.8
	Male	84	47.2
Age	18-30 years old	74	41.6
	31-45 years old	65	36.5
	46 years and older	39	21.9
Educational Status	Primary education	76	42.7
	High school	26	14.6
	University	59	33.1
	MSc and PhD	17	9.6
First Coming to This Health Group?	Yes	114	64
	No	64	36
TOTAL		**178**	**100.00**

In Table 1, 52.8% of the 178 tourists participating in the research were female and 47.2% were male. In terms of the age variable, 41.6% of the tourists were between the ages of 18-30, 36.5% were between the ages of 31-45, and 21.9% were aged 46 and over. When the educational status variable of the tourists is examined, it was determined that 42.7% of them are primary school graduates, 14.6% were high school graduates, 33.1% were university graduates, and 9.6% were master's and doctorate degrees.

The results of the normality test examination for the scale and its dimensions used in the study are presented in Table 2.

Table 2. Normality Test Analysis Data

SCALES AND DIMENSIONS	Median	IQR	Skewness	Kurtosis	Kolmogorow-Smirnow	
					Statistic	p
SERVICE SATISFACTION SCALE	4.83	1.00	-2,650	9,346	,666	,000
Accessibility	5.00	0.75	-2,530	8,618	,639	,000
Doctors	5.00	1.00	-2,523	8,739	,654	,000
Nurses	5.00	0.76	-2,341	7,146	,662	,000
Hospital	5.00	1.00	-2,522	8,581	,649	,000
TURKEY TRUST	2.46	0.67	-2,691	9,656	,630	,000

In the light of the results obtained from the participants in Table 2, it was concluded that the data were not normally distributed, since the Skewness and Kurtosis values of the data were between "-1.5 and +1.5" (Tabachnick & Fidell, 2013). When Kolmogorow-Smirnow values were also examined, it was observed that the data were not normally distributed (Kalaycı, 2017). In the light of these findings, non-parametric analyzes were applied in the further analyzes.

In order to determine whether there is a statistically significant difference between the socio-demographic characteristics of the participants and the mean scores of the Satisfaction with Service Scale and the Turkish Confidence scale, the Mann-Whitney U test and Kruskal Wallis-H test, which are nonparametric analysis methods, were used and the analysis results are presented below.

Table 3. The Results of The Analysis Between The Demographic Characteristics of The Participants and The Satisfaction with The Service

Demographic Characteristics	Groups	Sample	Median	IQR	Mean Rank	K-W or MW-U Value	p
Gender	Female[1]	94	4.66	1.00	82.59	-2.002	**0.045*** 2>1
	Male[2]	84	5.00	0.49	97.23		
Age	18-30 years old[1]	74	4.72	1.00	84.32	3.525	0.172
	31-45 years old[2]	65	5.00	0.42	98.54		
	46 years and older[3]	39	4.66	1.00	84.27		
Educational Status	Primary education[1]	76	4.97	0.49	96.70	3.372	0.338
	High school[2]	26	4.80	1.00	87.13		
	University[3]	59	4.77	1.00	84.87		
	MSc and PhD[4]	17	4.61	1.17	77.00		
First Coming to This Health Group?	Yes[1]	114	4.72	1.00	84.13	-1.962	**0.049*** 2>1
	No[2]	64	5.00	0.39	99.06		

***p<0,05**

In Table 3, a statistically significant difference was determined between the gender and health group of tourists when they first arrived and the Service Satisfaction Scale ($p<0.05$), while no significant difference was found between the age and education status and the Service Satisfaction Scale ($p>0.05$). When the gender variable was examined, it was found that the group score median was higher for men than for women, and when the first visit to the health group was examined, the median score for those who had come before was found to be higher than for those who came for the first time.

Table 4. Results of The Analysis Between The Demographic Characteristics of The Participants and The Accessibility Sub-Dimension of The Service Satisfaction Scale

Demographic Characteristics	Groups	Sample	Median	IQR	Mean Rank	K-W or MW-U Value	p
Gender	Female[1]	94	5.00	1.00	84.09	-1.669	0.095
	Male[2]	84	5.00	0.94	95.56		
Age	18-30 years old[1]	74	5.00	1.00	84.75	4.427	0.109
	31-45 years old[2]	65	5.00	0.50	98.97		
	46 years and older[3]	39	4.75	1.00	82.73		
Educational Status	Primary education[1]	76	5.00	0.69	98.13	5.739	0.125
	High school[2]	26	5.00	1.00	87.65		
	University[3]	59	5.00	1.00	83.82		
	MSc and PhD[4]	17	4.50	1.25	73.44		
First Coming to This Health Group?	Yes[1]	114	5.00	1.00	83.75	-2.234	**0.025* 2>1**
	No[2]	64	5.00	0.50	99.73		
***p<0,05**							

In Table 4, a significant difference was found between the demographic characteristics of the participants and the accessibility sub-dimension of the service satisfaction scale and the first visit to the health group. The mean rank scores of the tourists who had applied to the institution before are higher than those who came for the first time.

Table 5. Results of The Analysis Between The Demographic Characteristics of The Participants and The Physicians Sub-Dimension of The Service Satisfaction Scale

Demographic Characteristics	Groups	Sample	Median	IQR	Mean Rank	K-W or MW-U Value	p
Gender	Female[1]	94	5.00	1.00	86.54	-0.893	0.372
	Male[2]	84	5.00	1.00	92.82		
Age	18-30 years old[1]	74	4.87	1.00	84.04	3.712	0.156
	31-45 years old[2]	65	5.00	0.50	98.40		
	46 years and older[3]	39	4.75	1.00	85.03		
Educational Status	Primary education[1]	76	5.00	0.75	97.93	4.411	0.220
	High school[2]	26	4.87	1.00	84.38		
	University[3]	59	4.75	1.00	83.69		
	MSc and PhD[4]	17	4.75	1.00	79.79		
First Coming to This Health Group?	Yes[1]	114	5.00	1.00	84.97	-1.723	0.085
	No[2]	64	5.00	0.50	97.57		

In Table 5, no significant difference was found between the demographic characteristics of the participants and the doctor's sub-dimension of the service satisfaction scale and the first visit to the health group.

Table 6. Results of The Analysis Between The Demographic Characteristics of The Participants and The Nurses Sub-Dimension of The Service Satisfaction Scale

Demographic Characteristics	Groups	Sample	Median	IQR	Mean Rank	K-W or MW-U Value	p
Gender	Female[1]	94	4.75	1.00	81.84	-2.323	**0.020* 2>1**
	Male[2]	84	5.00	0.69	98.08		
Age	18-30 years old[1]	74	5.00	1.00	86.62	1.605	0.448
	31-45 years old[2]	65	5.00	0.75	95.29		
	46 years and older[3]	39	5.00	1.00	58.31		
Educational Status	Primary education[1]	76	5.00	0.75	95.95	2.888	0.409
	High school[2]	26	5.00	1.00	86.04		
	University[3]	59	5.00	1.00	85.83		
	MSc and PhD[4]	17	5.00	1.50	78.68		

First Coming to This Health Group?	Yes[1]	114	5.00	1.00	85.75	-1.434	0.152
	No[2]	64	5.00	0.69	96.18		
***p<0,05**							

According to the test results between the demographic characteristics of the participants and the nurse sub-dimension of the service satisfaction scale in Table 6, a significant difference was found in the gender variable. The mean rank of male tourists were significantly higher than that of females.

Table 7. Results of The Analysis Between The Demographic Characteristics of The Participants and The Hospital Sub-Dimension of The Service Satisfaction Scale

Demographic Characteristics	Groups	Sample	Median	IQR	Mean Rank	K-W or MW-U Value	p
Gender	Female[1]	94	5.00	1.00	84.68	-1.464	0.143
	Male[2]	84	5.00	0.67	94.90		
Age	18-30 years old[1]	74	4.83	1.00	81.36	6.408	**0.041*** **2>1**
	31-45 years old[2]	65	5.00	0.42	100.91		
	46 years and older[3]	39	5.00	1.00	85.94		
Educational Status	Primary education[1]	76	5.00	0.79	96.35	3.350	0.341
	High school[2]	26	5.00	1.00	86.79		
	University[3]	59	5.00	1.00	85.35		
	MSc and PhD[4]	17	4.83	1.00	77.44		
First Coming to This Health Group?	Yes[1]	114	5.00	1.00	88.04	-2.092	**0.036*** 2>1
	No[2]	64	5.00	0.50	99.23		
***p<0,05**							

In Table 7, in the hospital sub-dimension of the service satisfaction scale, a significant difference was determined between the age and the medians of the answers given to the first visit to this health group. In the age variable, mean rank values of those aged 31-45 were significantly higher than the relevant values of those aged 18-30. In the case of first coming to the health group, mean rank values of those who had come before were significantly higher than the relevant values of those who came for the first time.

Table 8. The Results of The Analysis Between The Demographic Characteristics of The Participants and The Regional Trust

Demographic Characteristics	Groups	Sample	Median	IQR	Mean Rank	K-W or MW-U Value	p
Gender	Female[1]	94	4.93	1.00	84.44	-1.537	0.124
	Male[2]	84	5.00	0.84	97.23		
Age	18-30 years old[1]	74	4.75	1.00	81.28	5.617	0.060
	31-45 years old[2]	65	5.00	0.50	99.90		
	46 years and older[3]	39	5.00	1.00	87.77		
Educational Status	Primary education[1]	76	5.00	0.75	96.75	7.422	0.060
	High school[2]	26	5.00	1.00	89.96		
	University[3]	59	5.00	1.00	87.56		
	MSc and PhD[4]	17	4.50	1.50	63.12		
First Coming to This Health Group?	Yes[1]	114	4.93	1.00	83.37	-2.347	**0.019*** 2>1
	No[2]	64	5.00	0.50	100.42		
***p<0,05**							

In Table 8, a statistically significant difference was determined between the first arrival of the tourists to the health group and the Turkish confidence scale ($p<0.05$). No significant difference was found between gender, age and education level and Turkish confidence scale($p>0.05$). When the first arrival of the tourists to the health institution was examined, it was determined that the median of the trust score in Turkey was higher than the relevant values of those who came before the first time.

Table 9. Correlation Analysis Findings Between Service Satisfaction Scale and Its Sub-Dimensions and Regional Trust

		1	2	3	4	5
1- PATIENT EXPECTATIONS AND SATISFACTION	r	1				
2- Accessibility	r	,928**	1			
	p	0				
3- Doctors	r	,922**	,865**	1		
	p	0	0			
4- Nurses	r	,928**	,881**	,806**	1	
	p	0	0	0		
5- Hospital	r	,931**	,857**	,854**	,858**	1
	p	0	0	0	0	
6- TURKEY TRUST	r	,870**	,831**	,828*	,823**	,862**
	p	0	0	0	0	0
****p<0,001 *p<0,05**						

In Table 9, Spearman correlation analysis was made between the scale and sub-dimensions of tourists' satisfaction with the service and their confidence in Turkey. According to the results of the analysis, it was determined that there is a positive and significant relationship between the Service Satisfaction Scale and its sub-dimensions and the level of trust in Turkey ($p<0.001$). As the satisfaction level of tourists increases, their confidence in Turkey also increases. ($p<0.001$, $r=0.870$).

Table 10. The Effect of Service Satisfaction on Turkish Confidence

Variable	Unstandardized Coefficients		Standardized Coefficients	t	p	F	Model (p)
	B	Std. Error	β				
Stable	0.812	0.205		3.957	0.000	338.358	0.000*
Service Satisfaction	0.825	0.045	0.811	18.395	0.000		
R^2: 0.658, R: 0.811, *p<0.001, Regression Equation of the Model: Y=0.812+ (0.825X)							

In Table 10, it is seen that there is a significant positive correlation between Service Satisfaction Scale and Turkey Confidence Scale ($R=0.811$, $R2=0.658$, $p<0.01$). Service Satisfaction Scale explains 65% of Turkey Confidence Scale ($R2=0.658$).

When the p value of the regression analysis of the Satisfaction with Service scale in explaining the level of confidence in Turkey is examined, it is seen that the Satisfaction with Service scale is a significant predictor in explaining the opinion on the confidence in Turkey. When the standardized regression coefficient was examined, the relative predictive level of service satisfaction and trust in Turkey was found to be 81% (Standardized $\beta= 0.811$).

It is observed that a one-unit increase in the Service Satisfaction Scale independent variable will increase the Turkish Confidence dependent variable score by a coefficient of 0.811.

4. DISCUSSION

People traveling for the purpose of health tourism have some expectations from the destination they go to. These expectations start with the accessibility of the institution and continue with the equipment and behaviors of the health workers, the physical equipment of the hospital, and all kinds of facilities. If these conditions, and the needs of the individuals are satisfied, it is possible for them to come back to receive service when necessary, and to praise the institution to their close circles with a sense of satisfaction, even if it is not for themselves. Thus, with the application of individuals who want to purchase services, the number of people to whom the institution provides services will increase, and the sustainability of the institution will be ensured. It is important for people to receive service from the institution and leave with satisfaction in terms of trusting the institution, country and region within the scope of health tourism. In this research, it is aimed to determine whether the satisfaction of health tourists from the service has an effect on their trust in Turkey.

While a significant difference was determined between the service satisfaction scale of the tourists participating in the research and the status of their first visit to the same health institution, there was no statistically significant difference between gender, age and educational status. Those who have previously received service from the same institution have a higher median satisfaction score than those who have received service for the first time. This can be explained by the fact that those who purchased the service before experienced the service compared to those who came for the first time and that they applied again because they were satisfied.

In the study conducted by Ünal and Demirel (2011) with the guests benefiting from the health tourism establishments of Bolu province, there was no significant difference between satisfaction and gender, yet a significant difference was found between the age variables. This difference is that the satisfaction rates of those aged 26-30 are significantly different compared to those aged 25 and under. In Çelik's (2009) master's thesis, a significant difference was found between the perception of service satisfaction and age variable among individuals who received service from thermal enterprises, yet no significant difference was found between gender, educational status and nationality of individuals. In the study conducted by Devebakan and Aksaraylı (2003) on patients, a significant difference was found between the age and education level of the patients and their perceptions of service satisfaction. In the study conducted by Çatı and Yılmaz (2002) on patients, a significant difference was found between the perception of service satisfaction and gender, whether the patient had applied to the institution before, and education levels. In the research conducted by Yavuz (2018) on 216 patients who applied to hospitals providing health tourism services in the Central Anatolia Region, it was determined that the physical structure of the institution did not have a significant effect on patient satisfaction, while the trust in the institution staff had a significant effect on patient satisfaction. In Demirci's (2018) research on 402 health tourists in Muğla, a significant difference was found between service satisfaction and first visit to the institution. In Çakır's (2019) research, no significant difference was found between service satisfaction scale and gender and educational status.

In our study, a statistically significant difference was found between the Turkish Confidence scale and the first visit only to the health group, while no significant difference was found in the responses given to other demographic variables. The reason for this may arise from the fact that the satisfaction obtained from the service received previously gives a guarantee, even partially, about the services to be received in the future. If a product or service is to be purchased again, relying on experience is the most likely option. In the study of Iranmanesh et al., no significant difference was found between age and gender variables and confidence, while a statistically significant difference was found between education variable and trust (Iranmanesh et al., 2018). In the study conducted by İbiş and Batman (2018) on 131 Chinese tourists, no significant difference was found between gender and education demographic variables and regional trust. In the study conducted by Kılınç and Koçarslan (2022) with 286 tourist patients, no significant difference was found between regional trust, gender and educational status, while a significant difference was found with the age variable. In Abubakar's (2016) research on health tourists, a significant difference was found between gender and regional trust.

In line with the purpose of the research, it has been determined that there is a positive and significant relationship between the satisfaction level and sub-dimensions of health tourists and their level of trust in Turkey. In the research of Al-Ansi and Han and Melián-Alzola and Martín-Santana, it has been determined that customer satisfaction has a positive relationship with on rüşt (Al-Ansi & Han, 2019; Melián-Alzola & Martín-Santana, 2020). In some other studies, it has been determined that customers' positive perception of trust and service increases their satisfaction (Amoako et al., 2019; Chang, 2014; Wu et al., 2016).

In this study, it was concluded that the satisfaction level of health tourists has a significant and positive effect on their level of trust in Turkey. Iranmanesh et al. reported in their research that trust has a significant impact on Muslim medical tourists' attitudes towards Islamic medical treatment (Iranmanesh et al., 2018). According to Han and Hyun's research finding, in a competitive medical tourism market, trust in staff and clinic significantly influences tourists' intention to revisit clinics and destination country (H. Han & Hyun, 2015). In the study of Jeaheng, Al-Ansi, and Han, a positive relationship was observed between service quality and tourist trust, similar to our research (Jeaheng et al., 2020).

5. CONCLUSION AND RECOMMENDATIONS

In this study, it was determined that there is a positive and significant relationship between the satisfaction level and sub-dimensions of health tourists and their level of trust in Turkey. In addition, it has been concluded that the satisfaction level of health tourists has a significant and positive effect on the level of trust in Turkey.

In all types of tourism, especially in medical tourism, satisfaction and trust are interrelated and very important concepts. Tourists are very likely to feel anxiety about the quality of health services they will receive, possible malpractice, and being in a different geography and culture. At this point, it is a feeling that does not cost money to make the patient feel in safe hands by gaining a sense of satisfaction and trust. Confidence, in its clearest form, is an emotion that can be gained after satisfaction and is often the explanatory of the tourist's repetitive travel behaviors. Therefore, destinations aim to create satisfaction due to their strong relationship with loyalty. It is critical for all healthcare providers to understand and articulate how they can customize service delivery to create and increase satisfaction. In reality, tourists from different

countries may have various needs and expectations from the same healthcare provider, which leads to different levels of satisfaction. In line with this information, the following suggestions can be made to improve the satisfaction and trust levels of health tourists:

- At this key point, service delivery should be in a structure that can be customized within certain limits in line with a wide range of demands. Demands, requests and complaints from health tourists should be dealt with closely, and these applications should be carefully considered and resolved.

- In order to ensure satisfaction and continuity, health service providers should constantly improve themselves, give importance to research and development activities, and optimize service results.
- In order to increase satisfaction, the number of active intermediary institutions should be increased in all transactions of health tourists from their arrival to the country and they should be able to provide personal service without sacrificing quality.

- In order to increase the trust level of health tourists receiving service from the institution, the patient follow-up process should be continued very actively in cross-border conditions, even after the service.

- In order to convey the operations and successes of the institution within the scope of the current technological possibilities, it should communicate with the patients or candidates by conducting interviews on online platforms.
- Institutions should open branches in the countries where patients live, if possible, or if not, they should make an agreement with an institution of that country and provide faster and simultaneous assistance in case patients feel the need, and a solution should be produced without the need to travel.

- There should be information on the web page for every question that patients may seek answers to, and the live support line should be used actively and serially.
- If the institutions do not include any transactions that have not been performed on their patient invoices or do not show the transaction prices different from what they actually are, the patient will be satisfied with the trust of the institution and the country in terms of price, that they are not exploited.

The research is limited to the number of patients that can be reached. Future studies could be conducted over longer periods of time and attempt to reach more patients from a wider range of nationalities. It is also limited by the fact that the research was conducted in a private hospital in Gaziantep in one month on patients coming from Syria and Iraq. Another limitation is that the translator is required to participate in the survey. In future studies, it may be recommended to prepare a Google Form that can be translated into any language so that the patient can easily understand it.

Conflict of Interest:
The authors declare that they have no conflicts of interest

Ethical Approval:
Before applying the data collection form in the study, ethics committee approval was obtained with the Hatay Mustafa Kemal University Social and Human Sciences Scientific Research and Publication Ethics Committee's decision dated 07.04.2022 and numbered 33.

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Validity and Reliability of the Nurse Manager Performance Assessment Scale

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ABSTRACT

Background: The performance of nurse managers is significantly important in providing quality and safe patient care services in hospitals, as well as in retaining the nurse workforce.

There are limited number of measurement instruments for which validity and reliability have been tested in order to assess nurse managers' level of performance.

Objective: This study was conducted to examine the psychometric testing of the "Nurse Manager Performance Assessment Scale," which is used to assess the annual performance of nurse managers working in a private chain hospital group in Turkey.

Method: The sample of this methodological study was composed of 165 nurse managers. The data were obtained from the Hospital Information Management System, retrospectively. Results: The average score of the eight-item scale items ranged between 3.3 (0.8) and 3.7 (0.8). The Cronbach's alpha coefficient, indicating the internal consistency, was found to be 0.943, while the Spearman-Brown coefficient, indicating intraclass consistency, was found to be 0.910. The two-factor scale obtained using exploratory factor analysis was examined using confirmatory factor analysis and the model was found to be significant.

Conclusion: In this study, the results of psychometric analysis of the "Nurse Manager Performance Assessment Scale," which is used to assess the annual performance of nurse managers, indicated that the scale is a valid and reliable instrument. It is recommended that the scale be applied in different institutions and that it be tested in practice based on pilot application results.

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1.INTRODUCTION

Today, competition is increasing in healthcare services, as in other sectors. In this context, the delivery of quality and safe services in hospitals is a high priority issue (Gunawan & Aungsuroch, 2017; Güdük & Önder, 2020; Sivey & Chen, 2019). Employees of the department of nursing services, who constitute approximately half of the medical team members providing direct service for patients in hospitals, are the backbone of the organization in ensuring the achievement of corporate quality and patient safety goals (Ekici & Türkmen, 2020; Needleman & Hassmiller, 2009; Phillips et al., 2021). Previous studies emphasize the critical importance of the roles of unit nurse managers in the effective and efficient provision of health services (El Haddad et al., 2022; Giesbers et al., 2021; Nurmeksela et al., 2021).

Unit nurse managers play a key role in the training and professional development of employees, workforce retainment, employee motivation, giving of feedback, employees' approach to corporate goals, and thus the achievement of both institutional outcomes and increase in employee and patient satisfaction (Alsadaan et al., 2023; Giesbers et al., 2021; McConnell et al., 2014; Needleman & Hassmiller, 2009). A systematic review study, which is on impact of nurse leaders behaviours related to nursing staff performance, showed that factors influencing nurses' motivation to perform better were found including autonomy, competencies, relatedness, individual nursing characteristics, relationships and support, and leadership styles/practices of nurse managers (Alsadaan et al., 2023). In another study, it is emphasized that there is a relationship between positive nurse manager style and the work engagement of staff nurses (Alluhaybi et al., 2023). However, in order to ensure that nurse managers carry out this role effectively, they are also required to have the necessary competencies and a high level of job performance. Therefore, measurement of their level of performance is considered necessary (Liou et al., 2021; Liou et al., 2022).

Along with other health managers, nurse managers are expected to integrate modern business management knowledge and applications through professional practices (AONE, AONL, 2015a, 2015b). Because the role of nurse managers changed from clinical focus to managerial focus in healthcare organizations. There is a need to apply their managerial functions by nurse managers (Gunawan & Aungsuroch, 2017). Several studies in the literature define nursing competency areas (AONE, AONL, 2015a, 2015b; McConnell et al., 2014), and some researchers have developed instruments in order to identify these areas (Liou et al., 2021; Sökmen, 2005).

The American Organization of Nurse Executives (AONE) defined necessary nursing competencies in 2005, updated these competencies in 2015, and classified them under three main headings regarding unit nurse managers and five regarding nurse executives (AONE, AONL, 2015a, 2015b). The competencies for unit nurse managers are listed as follows: “The Science: Managing the Business,” “The Art: Leading the People,” and “The Leader Within: Creating the Leader in Yourself" (AONE, AONL, 2015a). These competencies, which is updated by AONE-AONL in 2022, and provide the framework for making effective leadership across all level nurse managers (AONE, AONL, 2022).
A study by Liou et al. (2021) divided the essential competencies of nurse managers into four groups: “leadership,” “business management,” “integrative skills,” and “communication and relationships.” Gunawan & Aungsuroch (2017) identified managerial competence of first-line nurse managers which are developing self, planning, organizing, leading, managing legal issues, managing ethical issues, and delivering health care as in internal and external factors. A study by Sökmen (2005) divided these competencies into three groups: "general unit management,” “personnel management,” and care management.” Additional studies have been conducted with the aim of improving the managerial competencies of nurse managers or those who are candidates for management positions (Goktepe et al., 2018; Kim & Lim, 2022; Patton et al., 2013; Titzer et al., 2014).

The performance of nurse managers in health institutions is measured and assessed by executive nurses. However, previous studies have shown that measurement instruments designed to assess nurse managers' competencies were based on self-assessment (Sökmen, 2005) or were used in order to identify areas of competency (Liou et al., 2021). To the best of our knowledge, there are no empirical studies that have longitudinally examined the measurement and assessment of nurse managers' level of performance.

This study was conducted in order to examine the psychometric testing of the measurement instrument prepared by the Human Resources Department in a private hospital chain; the instrument was designed to measure and assess the managerial performance of department/unit managers. The effective measurement of nurse managers' level of performance using a valid and reliable instrument may contribute to the functioning of the institution and nursing services by improving job motivation and performance through determining the requirements related to employee training and development, providing feedback, and ensuring the achievement of corporate goals.

2. MATERIALS AND METHOD

Study design and setting

This methodological study was conducted in a private chain hospital group in Turkey. In the institution, with which 16 hospitals are affiliated, there were total 16 executive nurses. Executive nurses had received training in the use of the managerial performance assessment tool designed by the Human Resources Department. The performance assessment process of the each hospital's unit nurse managers was carried out by an executive nurse. For this purpose, a comprehensive performance assessment interviews using the "Nurse Manager Performance Assessment Scale" were held every three months and at the end of the year by the executive nurses with the unit nurse managers. In the interview held at the end of the year, the performance score was obtained using the hospital information system (a five-point Likert-type scale) for each unit nurse manager. During the regular and end-of-year performance interviews, the executive nurses gave feedback to their unit nurse managers based on the criteria in each performance area, discusses strengths and areas for potential improvement, and supports to create their action plan. Necessary measures were taken to conduct an efficient performance interview. Such measures included scheduling an appropriate time for the interview, providing an environment suitable for open communication, giving behavior-focused feedback, adopting a constructive and supportive approach, providing learning and development opportunities, preparing an action plan for behaviors that could be improved, and setting clear goals. Executive nurses followed up each action plan established during the performance interviews and perform assessments by conducting midterm interviews as necessary.

Population and sampling

The data were collected retrospectively. The research universe was composed of unit nurse managers (N: 269) working in the inpatient or outpatient units of 16 hospitals affiliated with the Acıbadem Health Group, where the study was conducted. In scale development studies, it is recommended that the sample number be at least 3 to 20 times the number of items (Gunawan, et al., 2021). In this study, the scale contained eight items, and the sample size was more than 20 times that number. Those who (a) had worked at least one year in inpatient or outpatient units/departments between 2017 and 2018, and (b) had been assessed for the first time by the executive nurses, were included in the sample. The study was conducted with a total number of 165 unit nurse managers.

Data collection tool and ethical considerations

Ethical approval was granted by the Medical Research Evaluation Committee of a university (2022-01/43), and institutional permission was obtained from the X Group. The data were obtained retrospectively using the Hospital Information Management System. No personally identifiable data were included in the data collection form, and the data were obtained by processing it into an Excel database prepared by two researchers. The data collection form consisted of two parts: the demographic and professional characteristics of the nurse managers, and the managerial performance assessment scale. The former included age, gender, retirement status, marital status, educational background, location of the hospital they were currently working in, duration of professional experience before the current hospital, and duration of professional experience in the current hospital.

Nurse Manager Performance Assessment Scale: This instrument was prepared by the "Expert Group" in the Human Resources Department in order to be used by a senior manager to assess all unit managers, including nurses working in the chain hospital group. The instrument consists of eight items and 43 criteria. These items are: "Setting a goal (Determination of department objectives that will support the achievement of the institution's vision, 6 criteria)," "Determining the method (Planning the tasks that need to be performed in order to achieve the department's goals, taking into account the priorities of the institution, 7 criteria)," "Preparing required resources (Creating the necessary arrangement and preparing the necessary resources with which to execute the plan, 4 criteria)," "Track and control (Providing the necessary guidance and support with which to achieve the goals, 4 criteria)," "Improving efficiency and productivity (Regular evaluation of the effectiveness and efficiency of practices and creating development opportunities (3 criteria)," "Management of external partners' relations (Working with partners outside of the team, including the first manager, managers of cooperating teams, key customers to whom services are offered, and key suppliers from which services are received; establishment and effective management of relationships, 5 criteria)," "Team management (Effective management of relationships with team members, 5 criteria)," and "Self-management (Effective management of personal impact and image by demonstrating and developing the necessary knowledge/skills, 9 criteria)." Exce use the 5-point Likert-type scale based on scores ranging from "1-Extremely below expectations," "2-Needs improvement," "3-Successful/fulfilling the tasks properly," "4-Very successful," and "5-High-achieving." A single performance score ranging between 1 and 5 is obtained by averaging all the items.

Data Analysis

The Statistical Package for Social Science Version 26.0 (SPSS) and AMOS 22 were used for data analysis. The demographic and professional characteristics of the participants and average scale scores were analyzed using descriptive statistics (number, percentage, mean, and standard deviation). The Cronbach's alpha was used for internal consistency, and the Spearman-Brown correlation and Split-half method were used for intraclass correlation. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were performed to achieve construct validity.

3. RESULTS

Descriptive characteristics of the participants

The data obtained from 165 participants, who were selected among unit nurse managers in the hospital information management system and who met the sampling criteria, were analysed. The demographic and professional characteristics of the participants are shown in Table 1..

Table 1. Participants' demographics and professional characteristics

Variables		Mean	SD
Age		38.6	6.4
		n	**%**
Gender	Male	25	15.2
	Female	140	84.8
Retirement status	Employed	160	97.0
	Retired	5	3.0
Marital status	Single	63	38.2
	Married	102	61.8
Educational background	Postgraduate	36	21.8
	Bachelor's degree	71	43.0
	Associate degree	11	6.7
	High school	47	28.5
Location of the hospital	Istanbul	107	64.9
	Other cities	58	35.1
Duration of employment before the current hospital	<1 year	30	18.2
	1-3 years	20	12.1
	>3 years - ≤ 5 years	17	10.3
	> 5 years	43	26.1
	None	55	33.3
Duration of employment in the current hospital	<1 year	3	1.8
	1-3 years	10	6.1
	>3 years - ≤ 5 years	26	15.8
	> 5 years	126	76.4

Scale scores

The mean and median values of the scores obtained from the annual assessments of unit nurse managers conducted by a executive nurse are shown in Table 2. As shown, the highest score was obtained from "Team Management."

Table 2. Nurse Manager Performance Assessment Scale: Descriptive statistics

Items	Mean (SD)	Median (Min.-Max.)
1. Setting a goal	3.3 (0.9)	3.0 (2-5)
2.Determining the method	3.3 (0.8)	3.0 (2-5)
3.Preparing required resources	3.4 (0.8)	3.0 (2-5)
4. Track and control	3.6 (0.8)	3.7 (2-5)
5. Improving efficiency and productivity	3.3 (0.8)	3.0 (2-5)
6. Management of external partners' relations	3.5 (0.8)	3.7 (1-5)
7. Team management	3.7 (0.8)	4.0 (2-5)
8. Self-management	3.5 (0.8)	3.0 (1-5)

Construct validity results

EFA and then CFA were first applied for the construct validity of the Nurse Manager Performance Assessment Scale. Prior to conducting the EFA, the Kaiser-Meyer-Olkin (KMO) index and Barlett's test were performed in order to determine whether the sample size was adequate. The KMO index is used to compare observed correlation coefficients and partial correlation coefficients. In this study, the KMO criterion was found to be 0.929, and the Barlett's test was found to be significant at the p<0.001 level. These

results showed that the data were suitable for factor analysis (Li et al., 2020).

"Rotation of principal components analysis" and EFA were used to examine the factor structure of the scale. The scale was found to show a two-factor structure, and the results were shown in Table 3. It was determined that the first five items included in the scale were included in Factor 1, and the last three items were included in Factor 2. It was found that Factor 1 explained 47.6% of the total variance, while Factor 2 explained 33.17%. Based on the content of items included in the scope of each factor and in the literature, Factor 1 was titled "Business management and organization in the unit," and Factor 2 was titled "Relationships management.

Table 3. Nurse Manager Performance Assessment Scale: Exploratory factor analysis results

Items	Factor 1	Factor 2
1. Setting a goal	0.884	
2. Determining the method	0.887	
3. Preparing required resources	0.793	
4. Track and control	0.691	
5. Improving efficiency and productivity	0.787	
6. Management of external partners' relations		0.857
7. Team management		0.665
8. Self-management		0.826
Variance	47.66%	33.17%
Total variance explained	80.83%	

The two-factor scale structure obtained as a result of EFA was examined using CFA, and the model results are shown in Figure 1. In the model, rectangles represent the observed variables (scale items), ovals represent the latent variables (subscales), and the letter "e" indicates an error or unexplained variance (Pugesek et al., 2003). The model fit indices are shown in Table 4, and it was determined that the model had good fit indices (Çokluk et al., 2021; Steiger, 2007).

Internal and intraclass consistency results

The internal consistency of the Nurse Manager Performance Assessment Scale was examined using the Cronbach's alpha. The Cronbach's alpha coefficient of the overall scale was 0.943. The Split half method Spearman-Brown correlation coefficient was used to evaluate intraclass consistency, and the Spearman-Brown coefficient was found to be "r:.910."

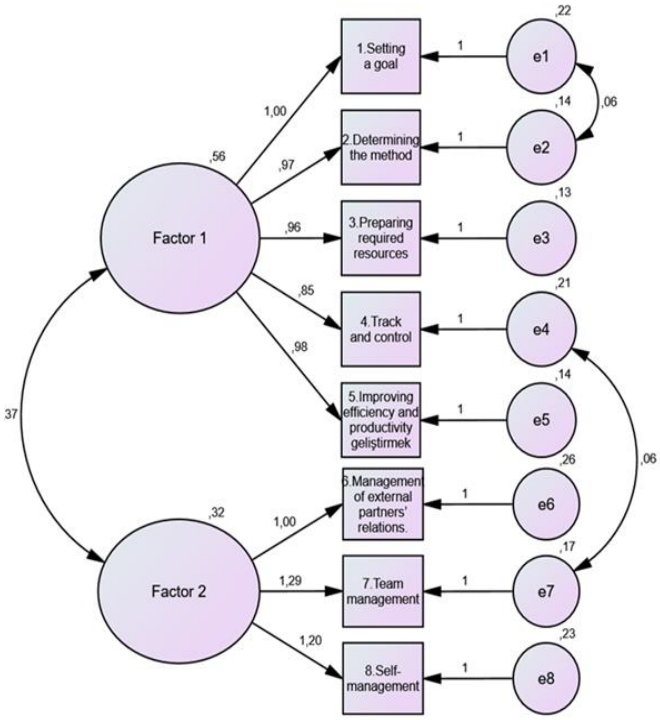

Figure 1. The results of confirmatory factor analysis on the Nurse Manager Performance Assessment Scale: Error variations and path difficulties

Table 4. Nurse Manager Performance Assessment Scale: Fit indices of the model in CFA

Fit indices	Model	Good fit indices
Chi-square: Degrees of freedom ($\chi 2$ /df)	1.804	$0 \leq \chi 2/df \leq 5$
RMSEA	0.070	$0 \leq$ RMSEA ≤ 0.08
RMR	0.019	RMR ≤ 0.05
NFI	0.974	$0.90 \leq$ NFI ≤ 1.00
GFI	0.955	$0.90 \leq$ GFI ≤ 1.00
CFI	0.988	$0.90 \leq$ CFI ≤ 1.00
TLI	0.980	$0.90 \leq$ TLI ≤ 1.00

4. DISCUSSION

In this study, the validity and reliability of the Nurse Manager Performance Assessment Scale was tested based on the longitudinal monitoring of 165 unit nurse managers by their executive nurse for a period of one year, and performance assessment results were obtained at the end of the year. Results showed that the

scale was a valid and reliable instrument (Bolarinwa et al., 2015; Çokluk et al., 2021; DeVon et al., 2007; Pugesek et al., 2003; Steiger, 2007) that can be used to evaluate the managerial performance of unit nurse managers.

This study revealed that the managerial performance of unit nurse managers can be evaluated in two areas (two subscales/two factors) with eight items. Based on the three main areas of competency reported in AONE's AONL (2015), the first factor in this scale includes "The Science: Business Management," and the second factor includes "The Art: Leading the People" and "The Leader Within: Creating the Leader in Yourself." AONE's AONL (2022) announced these nurse leader core competencies in five areas, which are business skills and principles, communication and relationship building, knowledge of the health care environment, professionalism, and leadership, for from first time leaders to experienced executives. A study by Liou et al. (2021) found that managerial competencies were examined in four subscales, and although the main headings were different, the majority of the items included in the subscales were similar to the scope of the criteria included in this scale. In the current study, these categories are expressed more implicitly under the criteria of "preparing required resources," "improving efficiency and productivity," and "self-management" (for example: determines the resources required for the tasks and ensures that resources are provided, ensures that developments are regularly monitored and evaluates how these developments can be utilized in order to provide efficient practices, and establishes creative skills). Consequently, it can be concluded that the scope of these scale items and criteria is largely compatible with the nurse competencies proposed in international studies.

In this study, the Cronbach's alpha and intraclass coefficient of the Nurse Manager Performance Assessment Scale were found to be higher than 0.70. The Cronbach's alpha reliability coefficient is used to evaluate the internal consistency of Likert-type scales. It is noted that a higher Cronbach's alpha coefficient (the closer it is to 1) indicates a higher level of consistency among the items included in the scale, predicting the same property. The Cronbach's alpha coefficient is should ideally be at least 0.70, and it is also indicated that values between 0.80 and 1.00 show a high level of reliability. The Split half method Spearman-Brown correction can also be applied for this purpose. In this study, and as a result of both analyses, reliability coefficients close to 1 indicated that the scale was highly reliable (Bolarinwa, 2015; DeVon et al., 2007).

5. CONCLUSIONS

In this study, the results of the psychometric analysis of the "Nurse Manager Performance Assessment Scale" showed that the scale was valid and reliable. The scale had 2- subdimension which are business management and organization in the unit, relationships management. The fact that this research was conducted using the results obtained based on a longitudinal study offers a significant contribution to the literature. It is recommended that the scale be applied in different institutions for the unit nurse managers' performance assessment. In addition, it is also recommended that the scale be applied in human resources departments for candidate selection, placement, employee training and development, career planning, disemployment, and wage distribution, rather than solely in performance assessment of unit nurse managers.

Conflict of Interest:
The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethical Approval:
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A National Minimum Health Log Standard; SAMILOG

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ABSTRACT

Aim: Health data is considered to be highly sensitive and the protection of health data is an ethical and legal responsibility for all health data managing structures. Healthcare organizations use various security measures and techniques to adopt a secure electronic health data recording system in which, in addition, they keep log data. Hospital Information System (HIS) developers had been keeping the log records according to their needs by making the necessary coding for the "change-delete" triggers. Therefore, there was a dire need to develop a common standard for keeping diaries in health information systems. This new standard was considered to be a guide for software developers and was named as Minimum Log Standards in Health (SAMILOG). This study explains the development process of SAMILOG. Method: Focus group meetings were held with seven developer companies. Several scenarios of unauthorized access or data breaches in a health information system were created. The participants discussed each scenario and they evaluated the best methods for keeping logs and which data should be kept as log in each case. Previously, a standard called Minimum Data Model- Minimum Veri Modeli (VEM) was developed to assist data migration to a new HIS software when the hospital administration decides to go for a change. The data field names of VEM standard were also used in this new SAMILOG standard. Results: In SAMILOG 1.0, which of the data elements in each VEM set should be logged was determined, it required an update for SAMILOG as the VEM was updated. Conclusion: SAMILOG v1.0 was announced in 2016 and since then in case of a security breach of health data of public hospitals in Turkey, it is primarily the data logged within the scope of SAMILOG which is examined.

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1.INTRODUCTION

Health information is seen as being extremely sensitive, and it is both ethically and legally required to be protected. To establish a safe electronic health record system, healthcare institutions use a variety of security strategies and measures. It is necessary to keep track of all details relating to e-health data including generation time, owner, access records, and usage history (manipulation, update). Accountability can be achieved by locating the person in charge when security incidents happen using recorded data (i.e., an audit trail) (Oh et al., 2021). Log data gives the chance to identify the offender who misused patient data and, in certain cases, results in the professional being disciplined (Kuo et al., 2021). However, a major issue is that health information systems sometimes lack the data required to identify infractions (Malin & Airoldi, 2007). Healthcare is a complex field that includes the possibility of human error (Sameera et al., 2021). Keeping a log ensures that transactions and decisions are traceable. This makes it possible to quickly detect and fix errors. For example, when an incorrect dose of medication is administered or a test result is misinterpreted, logs can help identify the source of these errors. Log records provide a detailed record of events and activities in an information system. Analysis of log records can detect suspicious or malicious activities, identify potential security threats, and provide immediate response to security incidents (Das et al., 2017). Keeping logs in healthcare systems is an essential part of maintaining accurate and comprehensive patient records. These logs serve as a record of all actions taken by healthcare professionals and the systems used in patient care. Healthcare systems must comply with various legal requirements and regulations. Accurate logs can provide evidence of compliance with these requirements and regulations, protecting healthcare organizations from legal and financial liabilities.

Turkey, as a candidate for European Union (EU) membership, has committed itself to harmonizing its domestic law with EU rules and regulations. While working on the draft of Law No. 6698 (Personal Data Protection Law), (Resmi Gazete, 2016) which was published in 2016, the Turkish legislator was inspired by the principles and rules set out in The Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data (CETS No. 108) and specifically the Data Protection Directive 95/46 (European Union, 1995), which is superseded by the General Data Protection Regulation. Additionally, the Personal Health Data Regulation (Resmi Gazete, 2019) was published in 2019. Because of this legal framework, health information systems are expected to keep a log of user transactions. It is known that logging of health data is a critical element to ensure the security of this data and to protect against unauthorized access. Information such as which user accessed which data and when is important for data security, and logs make it easier to detect such situations. However, there are over 300 companies producing health information systems. There was no standard for keeping logs of health data in Turkey back then. HIS developers kept the log records according to their needs by making the necessary coding for the "change-delete" triggers. Every developer can interpret the need to keep a log according to their subjective point of view. For example, a log can record the activities made through the interface or database. In cases where interface activities are recorded, direct transactions on the database are not recorded. Therefore, the need to develop a common standard for keeping diaries in health information systems was felt. This standard was considered a guide for software producers, and it was expected to constitute a legal basis for future legal problems. This standard was named SAMILOG (Minimum Log Standards in Health). The purpose of this study is to explain the development process of the SAMILOG standard and to provide technical information about the standard.

2. MATERIALS AND METHOD

The development of SAMILOG was the idea of the Ministry of Health (MoH), but the users of this standard are health information system developers. It was decided to work with developer companies, with the help of the data collected through focus group interviews. In Turkey, the MoH determines the standards for HIS software and controls software for compliance with these standards. Additionally, the MoH lists HIS software that conforms to their standards on a website, and only these software companies can provide services in healthcare facilities in Turkey.

SAMILOG is a national level standard study developed to solve two problems. Firstly, which health data should be logged and secondly what method log records should be kept. SAMILOG development studies started in 2015. To determine the participants of the focus group study, health information software companies were contacted, the SAMILOG study was explained, and they were asked whether they would like to participate in the study. Since the ideal number of focus groups is suggested to be between five and eight (Krueger & Casey 2015), seven of the software companies registered on the MoH website were found suitable for our study. These seven software companies, selected according to our records, were serving in 80% of the hospitals in Turkey, and they voluntarily participated in the study. All participants were data migration specialists who had previously participated in the Minimum Data Model (VEM, Minimum Veri Modeli) study. The SAMILOG

standard specifies the name of the data to be logged and does not specify which standard is used. It defines the format of logging, and it is not about the communication standard of log file.VEM is a model developed by the MoH to be used as a standard for data transfers to be made in hospitals in Turkey during hospital information system vendor changes (Isleyen & Ulgu 2020). In this model, a minimum dataset and data model were determined. It is obligatory for every HIS software in in Turkey to be able to create views according to this model from their own databases. For software developers to be "successful" in the audits conducted by the MoH, they must create views from their own databases according to the VEM model.

Several scenarios of unauthorized access or data breaches in a health information system were created. The participants discussed each scenario and evaluated the best methods for keeping logs in each case. Some of the scenarios involved identifying data that should be logged and were based on the experiences of the participants. For example, according to the scenario of one of the participants, within the scope of a legal event, the judicial authorities gave a certain date range and wanted to learn the procedure information applied to the patient in the patient's health records. In SAMILOG, the diagnostic codes of the patients are important, and the activities in the health information systems related to these codes must be logged. Additionally, it has been decided to include the doctor's notes about the patient or the data of the procedures applied to the patient within the scope of SAMILOG. Thus, in the event of any change in these data, it will be known through log records. One of the important questions in the focus group meetings was, "Should log operations be handled and recorded over the application or at the database level". We held four meetings until a consensus was reached. At the end of the meetings, the group decided to keep the log at the database level, in a separate database from the health information system, and they determined the required data components of the log. The draft standard created with the focus group was sent to all companies registered on the MoH website for review. The results of these meetings and the reviews were converted to an official standard, and SAMILOG v1.0 was announced in 2016.

Within the scope of SAMILOG 1.0, only the logs of modifications and deletions were kept. However, it was thought that it was necessary to keep log records in order to add and display data in the retrospective examination processes. For this reason, re-meetings were held with software companies in Turkey, and two sounding questions were determined for SAMILOG 1.1. The first one is, "Should a log be kept for the process of adding and viewing the data?" The second is, "Should the log record be kept in a single table?" Studies on this subject are ongoing, and there is no consensus on the answers to the questions yet.

3. RESULTS

SAMILOG v1.0 is accessible on the web and used by software companies in Turkey (https://sbsgm.saglik.gov.tr/Eklenti/5879/0/samilog-v-10pdf.pdf?_tag1=1250F269EB27F39B914480BEBE1C74A761793DA5). The details of the required data fields are presented in Table I and II.

As of August 2023, there were 205 health information software companies in Turkey. These software companies use various database systems, architectures, and programming languages. Although similar data are kept for each information system, the names given to data fields may be different. Previously, a standard called VEM was developed to assist data migration, when Hospital Information System (HIS) software of a hospital changes. The data field names of VEM standard were also used in this new standard.

Table 1. Log in data that will be kept in the log

Log-in data	
OTURUM_KODU	Session code
KULLANICI_KODU	User code
OTURUM_ACMA ZAMANI	Time of log-in
TERMINAL_ADI	Client name
IP_ADRESI	IP address
MAC_ADRESI	MAC address
UYGULAMA_TURU	Type of application (mobile, web, exe etc.)

Table 2. Update data that will be kept in the log.

Update data	
OTURUM_KODU	Session code
LOG_TABLO_ADI	Table name
LOG_ISLEM_TURU	Transaction type: View (0), Update (1), Delete (2)
ALAN_ADI	Column name (if transaction is 1 or 2)
ESKI_DEGER	Old value (if transaction is 1)
YENI_DEGER	New value (in JSON format) (if transaction is 1 or 3)
SILINEN_KAYIT	Deleted record (in JSON format) (if transaction is 2)
ISLEM_ZAMANI	Time of transaction

In SAMILOG 1.0, it was defined which of the data elements in each VEM set should be logged, and it required an update for SAMILOG as the VEM was updated. VEM sets named in the Table 3, include health data such as patient information, diagnosis and treatment information, medication information and financial information such as invoices issued for transactions applied to the patient.

The Turkish Ministry of Health has a unit that tests and accredits health information systems. The

accredited health information systems are published on our web page, https://kayittescil.saglik.gov.tr/. All currently accredited health information systems must have the ISO 27001 Information Security Management System standard and comply with SAMILOG standards. This international standard has been prepared to provide requirements for the establishment, implementation, maintenance, and continuous improvement of an information security management system (ISO, 2013). All of the currently accredited health information systems comply with SAMILOG standards. Non-accredited health information systems have a very low chance of being marketed in Turkey.

Table 3. Names of the VEM sets.

Names of the VEM sets		
VEM_SURGERY	VEM_PATIENT	VEM_ BOARD_PHYSICIAN
VEM_ SURGERY_TEAM	VEM_PATIENT_ARCHIVE	VEM_ BOARD_REPORT
VEM_SURGERY _PROCESS	VEM_PATIENT_APPLICATION	VEM_REIMBURSEMENT_TRACKING
VEM_ANTIBIOTIC_RESULT	VEM_PATIENT_DENTAL	VEM_PATHOLOGY
VEM_BACTERIAL_RESULT	VEM_PATIENT_EPICRISIS_INFORMATION	VEM_STAFF
VEM_APPLICATION_DIAGNOSIS	VEM_PATIENT_PROCEDURES	VEM_ STAFF_ PAYROLL
VEM_ BUILDING_INFORMATION	VEM_PATIENT_COMMUNICATION	VEM_PERSONEL_PERMISSION_ INFO
VEM_UNIT	VEM_PATIENT_SUPPLIES	VEM_RADIOLOGY_SAMPLE
VEM_DEVICE	VEM_PATIENT_DEATH_ INFORMATION	VEM_ RADIOLOGY_RESULTS
VEM_ WAREHOUSE	VEM_PATIENT_DISPATCH_ INFORMATION	VEM_APPOINTMENT
VEM_DENTAL_ PROSTHESIS	VEM_ PROCEDURES	VEM_PRESCRIPTION
VEM_DENTAL_ PROSTHESIS_DETAIL	VEM_BLOOD_DONOR_ INFORMATION	VEM_PRESCRIPTION_MEDICINES
VEM_DENTAL_ COMMITMENT	VEM_BLOOD_EXIT_ INFORMATION	VEM_ REFERENCE_CODE
VEM_DENTAL_ COMMITMENT_ DETAIL	VEM_ BLOOD_STOCK	VEM_STERILIZATION
VEM_BIRTH	VEM_BLOOD_REQUEST_ INFORMATION	VEM_STOCK
VEM_ BIRTH_DETAIL	VEM_BOARD_ACTIVEINGREDIENT	VEM_EXAMINATION
VEM_ADDITIONAL PAYMENT	VEM_ BLOOD_ PRODUCT	VEM_EXAMINATION_DEVICE_ MATCH
VEM_ADDITIONAL_PAYMENT_ DETAIL	VEM_BLOOD_PRODUCT_ DISPOSAL	VEM_EXAMINATION _SAMPLE
VEM_ADDITIONAL	VEM_CONSULTATION	VEM_EXAMINATION_PARAMETER
PAYMENT_PERIOT		
VEM_INVOICE	VEM_USER	VEM_EXAMINATION_RESULTS
VEM_INVOICE_ DETAIL	VEM_BOARD_DIAGNOSIS	VEM_BED
VEM_FIRM	VEM_USER_GROUP	VEM_CURRENT _INPATIENT
VEM_ BOARD	VEM_GROUP_ MEMBERSHIP	VEM_STAFF_OFFDAYS_STATUS

4. DISCUSSION

In Turkey, at all stages of health service delivery, patient and treatment data is processed and recorded through health information systems used by healthcare institutions, and the MoH centrally regulates these systems. The authorization mechanisms in health information systems may be sufficient for the security of some records, but more effective measures should be taken for sensitive data such as health data. In other words, simply blocking access to data may not be sufficient for its security. When health data is accessed in some way, keeping log records of this access may not be the first access, but it can be a useful method to prevent subsequent accesses. The inadequacy of authorization mechanisms in information systems can be supplemented with log functions (Ross, 2018). While log files were originally used to record information for debugging and diagnostic purposes, they have evolved into recording events and information that is useful for audit trials and forensics in the event of malicious activities or system attacks.

Health data is within the scope of special categories of personal data (Resmi Gazete, 2016; European Union, 1995). Many studies have been carried out on the confidentiality and privacy of this data (Gostin et al., 2009; Moore et al., 2007; Tariq & Hackert, 2018). However, we have not found a study that we can accept as a standard regarding which health data should be more confidential or how access records to these data should be kept. For this reason, we have determined the health records that need to be kept nationally, and standardized them with SAMILOG. Although the scope of SAMILOG is wide, it can be said that it covers all data from a patient's entrance to a health facility until his exit.

Within the scope of ethical and legal requirements, measures should be taken to ensure the security of health data. The fact that a health information system uses a firewall, an antivirus program, or meets the 27001 Information Security Management System Standard does not always mean that health data is safe and cannot be accessed by unauthorized persons. There may also be situations where health data should also be protected from the users of the system, and even though keeping a log record for changing, deleting, or viewing the data does not prevent misuse of health data, it can be a deterrent. Log management in information security

is very important for monitoring and recording user activities, which may be the weakest link in security. The integrity, accessibility, and confidentiality of the data can be ensured by monitoring the operations performed on the data to prevent information leaks and security breaches, which can occur consciously and often unconsciously. Leaving log requirements to hospitals or information system developers without determining the standards would result in keeping logs of different data in every hospital or every health information software. Although health information software (systems) in in Turkey have the 27001 Information Security Management System Standard implemented, SAMILOG has been developed with the need for a common language for such software and has been used since 2016. In case of any security breach, SAMILOG records are first examined by the hospital authorities.

Developing logging standards for health data is also a requirement for the international community. However, SAMILOG is based on VEM, and the international community has not developed a widely accepted database standard for hospital information systems. We hope that our national standards will be an inspiration for developing HIS and health logging standards at the international level. The importance of the SAMILOG study is not only to determine the method for keeping log records but also to be the first study on which health data log records should be kept. Although there are many studies on how to keep log records, there is no study on health data that needs to be logged at the national level. SAMILOG is a standardization study developed for Turkey. VEM was developed to determine the data to be transferred between HIS. SAMILOG, on the other hand, is a standard study that answers the question of which of these data should be logged and technically includes the method for this.

A limitation of SAMILOG is its dependence on another national standard, VEM. As VEM sets are updated, SAMILOG should also be updated. To eliminate this dependency situation and improve SAMILOG, it is considered necessary to carry out additional workshops with software developers.

Conflict of Interest:
The authors declare that they have no known competing financial interests.
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Examination of the Psychological Effects of The Covid-19 Pandemic on Medical Personnel Working in The Filiation Team: A Mixed Method Study

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Covid-19, Pandemic, Filiation, Medical personnel, Psychological effects, Nursing

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ABSTRACT

Objective: This study was conducted to determine the psychological effects of the Covid-19 pandemic on medical personnel working in the filiation team, and to examine the possible effects in depth.

Methods: The research was conducted using the exploratory sequential mixed pattern between February 2022 and February 2023 on the medical personnel working in the filiation team in a District Health Directorate. In the quantitative stage of the research, the population consisted of 248 medical personnel working in the filiation team, and the sample consisted of 181 participants who met the inclusion criteria and agreed to participate in the study. The quantitative data of the research were collected using the "Personal Information Form" and the "Impact of Event Scale", and the qualitative data were collected using the "Semi-Structured Interview Form".

Results: In the study, it was found that 30.4% of the medical personnel working during the filiation process were psychologically affected. In the in-depth interviews, it was determined that there were categories of fear, anxiety, loneliness, sleep problems, stigma, trauma, changes in affectivity, stress, deterioration in social relationships, fatigue and strain under the theme of psychological effects.

Conclusions: The study found that about a third of the medical personnel working in the filiation process were psychologically affected by the pandemic, and they experienced psychological effects such as fear, anxiety, loneliness, sleep problems, stigma, trauma, changes in affectivity, stress, deterioration in social relationships, fatigue and strain.

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1.INTRODUCTION

The Covid-19 pandemic has caused a significant public health crisis in the world and in Türkiye, and many people have lost their lives due to the disease (WHO, 2023). Since March 11, 2020, when the first case was detected in Türkiye, all institutions have started to provide coordinated services in the fight against Covid-19 (Erdem, 2020). A scientific committee has been established and Covid-19 guidelines have been prepared, which describe general information about the disease and the causes of transmission (Ministry of Health, 2023). In order to manage the pandemic, filiation studies have been planned and started to be implemented for the detection and contact tracing of cases (Çetin et al., 2021). The filiation team included medical personnel from different professions such as physicians, dentists, nurses, midwifes, technicians, dietitians, physiotherapists, social workers and psychologists (Ilgaz et al., 2022).

Filiation covers the identification of the source in infectious diseases, contact detection, follow-up of contacts, transmission of the disease and studies aimed at ensuring the management of the disease (Shi et al., 2021; Ministry of Health, 2023). Determining the source is important in filiation for the detection of carriers who can transmit the disease to more than one person (Önal & Kalaycı, 2021). Contact tracing, on the other hand, involves monitoring the individual who is the source of infection and those who have contact with these individuals for symptoms, and supporting individuals throughout this process (WHO, 2022).

Filiation studies conducted according to the methods and guidelines prepared by the Ministry of Health play an important role in on-site detection and isolation of patients by medical personnel, identification of contacts, and detection of carriers that can transmit the disease (Önal & Kalaycı, 2021; Ministry of Health, 2022). The filiation process started with individuals giving tests and included home visits made by filiation teams consisting of medical personnel of cases detected via mobile applications and phone according to the test result, as well as procedures such as taking tests, supplying medicines, seeing cases on site and informing about everything related to the process (Ministry of Health, 2022; Erdem et al., 2021). The medical personnel working in filiation have successfully carried out public health studies despite all the life risks. Healthcare workers experienced many physical, mental and social problems during this process (Parıldar, 2021).

They have encountered problems during this period due to reasons such as uncertainty of the disease process, heavy workload, intensive working conditions, lack of information and change of duty location (Al Sulais et al., 2020; Kaya, 2020; Öner, 2021). It is stated that medical personnel have experienced more physical problems at the beginning of the pandemic process; and it is stated that psychological effects come to the fore over time and will continue for years even when people return to their normal lives (Arıcı Özcan, 2019). It is reported that psychological problems are experienced more often than physical problems after events such as the pandemic, which have a traumatic effect, lasting for many years. During the Covid-19 pandemic, medical personnel were more psychologically affected by direct exposure to the pandemic than other occupational groups (Kaya, 2020). It is stated that healthcare workers experience psychological problems such as fear of getting sick and transmitting the disease, anxiety, worry, distress, stress, depression, burnout, restlessness, helplessness, sadness, anger, sleep problems, loneliness, post-traumatic stress disorder, suicidal ideation, feeling under pressure and stigma during the pandemic process (Alsubaie et al., 2019; Bohlken et al., 2020; Saladino et al., 2020).

When the literature is examined, it is seen that the studies that examine in depth the state of medical personnel affected by the pandemic, particularly those working in the filiation process, are quite inadequate. Determining how medical personnel working during the filiation process are psychologically affected by this process through in-depth examination using quantitative and supportive qualitative methods is very important in terms of evaluating the mental health effects, in addition to measures to be taken and intervention studies to be planned. Interventions to be made to protect mental health of medical personnel, who are in constant contact with patients and who are at high risk of contracting the disease, through evaluating the psychological effects are important in terms of the quality and adequacy of the healthcare provided (Pala & Metintaş, 2020). This study was conducted to determine the psychological effects of the Covid-19 pandemic on the medical personnel working in the filiation team and to examine the possible effects in depth.

Research Questions

1. What are the psychological effects of the pandemic process on the medical personnel working in the filiation team?

2. Do the socio-demographic characteristics of the medical personnel working in the filiation team affect their psychological state?

3. What are the opinions of the medical personnel working in the filiation team on the psychological effects of the pandemic?

2. MATERIALS AND METHOD

Type and Pattern of the Research

This research employed an explanatory sequential mixed pattern, which is one of the mixed methods.

Time and Place of the Research

The research was conducted between February 15, 2022 and February 15, 2023 on the medical personnel working in the filiation team in a District Health Directorate.

Quantitative Stage of the Research Population and Sample

In the quantitative stage of the research, 248 medical personnel working in a filiation team in a District Health Directorate during the Covid-19 pandemic constituted the population. For the sample size, sample size calculation was performed in OpenEpi Version 3 program. The sample size was determined as 181 people in the statistical power of 80% and confidence interval of 99%. Since the medical personnel, who were members of different professions, worked in the filiation process, stratified proportional sampling method was used to determine the psychological effects in different occupational groups. 181 people, determined as the sample size, were divided into layers according to their occupations and the occupational groups were studied according to the proportional calculation results.

Criteria for inclusion in the research: Medical personnel who worked in the filiation team during the pandemic, were open to communication and cooperation and agreed to participate in the research were included.

Exclusion criteria from research: Medical personnel who worked during the filiation process yet resigned due to various reasons, such as retirement, were excluded from the research.

Determination of the Participants in the Qualitative Stage of the Research

In the research, the participants of the qualitative stage were determined using the maximum diversity sampling method, one of the purposeful sampling methods, from the medical personnel in the filiation team participating in the quantitative stage. In this context, since the medical personnel working in the filiation process were from different occupational groups, the qualitative stage of the research was conducted on a total of 9 medical personnel, including 1 from each occupational group in terms of equal representation. The medical personnel who participated in the quantitative stage of the research, worked actively in the filiation team, received the highest score in each occupational group on the Impact of Event Scale, were open to communication and cooperation, and agreed to participate in the research were included in the research. Those who did not consent for voice recording were excluded from the research.

Research Variables

Dependent variable: The mean score of the Impact of Event Scale

Independent variable: Socio-demographic characteristics of medical personnel.

Data Collection Tools

The quantitative data of the research were collected using the “Personal Information Form” and the “Impact of Event Scale”.

Personal Information Form

The "Personal Information Form" was created by the researcher in accordance with the literature (Bayramoğlu, 2022; Elagöz, 2022; Yılmaz & Karakuş, 2022). This form consists of 17 questions and includes the socio-demographic characteristics of medical personnel.

The Impact of Event Scale

The scale developed by Weiss and Marmar (1997), was adapted to Turkish by Çorapçıoğlu et al. (2006). The scale measures the subjective stress levels of individuals exposed to traumatic life events. It consists of 22 items and each item is evaluated as (0) never, (1) rarely, (2) occasionally, (3) frequently and (4) very frequently in the 5-point likert type. Respondents obtain a score between 0 and 88 from the scale, and a high score indicates that the person has a high level of post-traumatic stress disorder. The scale consists of three subscales: hyperarousal, avoidance and intrusion. The Intrusion subscale includes items 1, 2, 3, 6, 9, 14, 16 and 20, the Avoidance subscale includes items 5, 7, 8, 11, 12, 13, 17, and 22, and the Hyperarousal subscale includes items 4, 10, 15, 18, 19, and 21. It has been found that the diagnostic performance is good between the cut values of 24 and 33. Cronbach's alpha coefficient of the scale was found to be 0.94 (Weiss & Marmar, 1997). In this research, Cronbach's alpha coefficient was 0.92.”

Qualitative Data Collection Tool

The “Semi-Structured Interview Form” prepared by the researcher was used in the collection of qualitative data of the research. In order to ensure the validity of the semi-structured interview questions prepared, the opinions of field experts were taken and whether the interview questions were prepared in accordance with the purpose of the research was evaluated in terms of content validity. In the content validity, 5 expert opinions were taken, including 3 field experts (2 specialists in Public Health Nursing and 1 specialist in Psychiatric Nursing), 1 methodologist and 1 language specialist, and the Content Validity Index (CVI) was

calculated as 0.95. A pilot interview was conducted using prepared interview questions with a healthcare professional working in the filiation team outside the study group. As a result of the analysis of this interview, the final version of the interview form was created.

Validity of Qualitative Data Collection Tool

Validity in qualitative research, by its most general definition, is that the data collection tools used in a research can accurately measure the variables to be measured. According to Guba (1981), it is necessary to ensure reliability (trustworthiness) first in order to ensure validity in qualitative research. In this context, it is stated that the criteria of (1) credibility, (2) transferability, (3) dependability, and (4) confirmability should be met to ensure reliability in qualitative research. In this research, the following actions were taken to meet the criteria listed above; the researcher took an active role in the whole implementation process, the research data were collected using the semi-structured interview technique and semi-structured interview questions were prepared by experts in the field. Qualitative research questions were checked by an expert and a language specialist. The interview was recorded on audio with the permission of the participants. The opinions of the participants were confirmed and written. In the analysis process of the data, necessary evaluations were made by the responsible researcher and it was tried to ensure consistency between the data. While the findings were being presented, direct citations were made for remarkable data.

Data Collection

Collection of Quantitative Data

The quantitative data of the study were collected by the researcher through face-to-face interviews from medical personnel at their workplace. For quantitative data, the “Personal Information Form” and the “Impact of Event Scale” were applied to the medical personnel, lasting between 15 to 20 minutes.

Collection of Qualitative Data

The qualitative data of the research were collected lasting between 40 to 50 minutes with the participants selected from the quantitative data in their institutions, in environments suitable for qualitative data collection. During the interviews, a quiet and calm environment was provided to ensure that participants could be comfortable. The “Semi-Structured Interview Method” was used when collecting qualitative data. The experienced researcher acted as a mentor during the interview conducted with two participants. The interview was continued to the point where the individual used the same concepts and no new information and concepts were obtained. The sessions were recorded with a voice recorder.

Ethical Considerations

Permission to use the scale was obtained via email. Institutional permission was obtained from the Ministry of Health and the Provincial Health Directorate, and Ethics Committee approval was obtained from the Clinical Research Ethics Committee (Decision No: 2021/256). The purpose and benefits of the study were explained to those who agreed to participate, and their written and verbal consents were obtained. Participation in the semi-structured interview was based on volunteerism, and it was stated from the beginning that participants would be allowed to withdraw from the research. No questions were asked about the attitudes and behaviors of the participants that would cause discomfort. In the study, code names were used instead of the real names of the participants.

Data Analysis

Analysis of Quantitative Data

The quantitative data of the research were analyzed using the IBM SPSS V23 program. The conformity of the data to normal distribution was examined using Kolmogorov-Smirnov test and Shapiro-Wilk test. Descriptive statistics, independent sample t-test, Mann Whitney U-test, one-way analysis of variance, Duncan test, Kruskall Wallis H test, Spearman's rho correlation coefficient, Pearson chi-square test, Yates correction test, Fisher's exact test and linear regression model were used in the evaluation of the data. The significance level was set at $p<0.05$.

Analysis of Qualitative Data

In the analysis of qualitative data, the interviews with the medical personnel were first transferred to the computer environment as an audio file. Then, these audio recordings were listened to and transcribed into a 142-page written document. After the interview with the first participant, the data analysis was started. Content analysis technique was used in the analysis of qualitative data. In order to encode the data in the research, all the interview data were read repeatedly and encoded taking into account the purpose of the research. During the encoding process, all the opinions that were considered to answer the research question were combined under the same code. The data were coded by both the researcher and the consultant for encoder reliability. The codes were then compared. In order to calculate the reliability between encoders, the Reliability = (Consensus) / (Agreement) + (Disagreement) formula was used. In the research, the same codes were evaluated as consensus and different codes were evaluated as disagreement. In this context, the reliability between the encoders was found to be 100%.

3. RESULTS

Quantitative Findings of the Research

The average age of the medical personnel was 37.75 ± 9.51 (Min:20; Max:62), the average working year was 13.7 ± 10.22 (Min:1; Max:39), and the average working month in filiation was 8.25 ± 7.35 (Min:1; Max:24). It was determined that 55.8% of the medical personnel were female, 72.4% were married, 51.9% were bachelor's graduates, 93.9% had a nuclear family, 21.5% were technicians and 74% had changed institutions during the filiation process. It was found that 19.3% had a chronic disease, while 7.2% had a psychiatric illness and were taking psychiatric medication. In addition, 37.6% had Covid-19, 38.1% were quarantined due to contact tracing, 51.9% had family members infected with Covid-19, and family members of 5.52% and relatives or friends of 43.1% passed due to Covid-19. It was found that 30.4% of medical personnel were affected by the event (Table 1). A very weak and statistically significantly positive correlation was found between the working year of the medical personnel and the score of the "Intrusion Subscale" of the scale (r=0.172; p=0.021). A statistically significant difference was found between the mean "Intrusion Subscale" scores according to gender (p=0.017). While the mean score of females was 10.72 ± 6.39, males obtained a mean score of 8.5±5.82. A statistically significant difference was found between the median values of the "Intrusion Subscale" according to the status of having a relative or friend passed due to Covid-19 (p=0.029). The median of those whose relatives or friends passed due to Covid-19 was 11, while the median of those who did not was 9. There was no statistically significant difference between the median values of the "Intrusion Subscale" according to other socio-demographic characteristics of the medical personnel (p>0.05) (Table 1).

A very weak and statistically significantly positive relationship was found between the age of the medical personnel and the "Avoidance Subscale" score (r=0.165; p=0.026). Increased age was associated with increased level of avoidance. A statistically significant difference was found between the mean values of the "Avoidance Subscale" according to the family type (p=0.004). The mean score of those living in a nuclear family was 11.86 ± 5.49, while those living with an extended family had a mean score of 6.91 ± 4.87. A statistically significant difference was found between the mean values of the "Avoidance Subscale" according to occupations (p=0.006). This finding was associated with the difference between psychologists and drivers and nurses, midwives, physicians, psychologists, dentists, social workers, technicians and others. The highest avoidance mean score was 13.30 ± 5.81 in the other occupational group, while the lowest mean score was 7.31 ± 3.79, obtained by psychologists. A statistically significant difference was found between the median values of the "Avoidance Subscale" according to the status of changing the institution during the filiation process (p=0.018). During the filiation process, the median of those who changed institutions was 11, while the median of those who did not change institutions was 13. There was no statistically significant difference between the mean values of "Avoidance" scores of the medical personnel according to other socio-demographic characteristics (p>0.05) (Table 1).

A statistically significant difference was found between the median values of the "Hyperarousal Subscale" according to gender (p=0.004). The median score of the "Hyperarousal Subscale" in females was obtained as 8, while it was 5 in males. A statistically significant difference was found between the median values of the "Hyperarousal Subscale" according to presence of chronic disease (p=0.012). The median hyperarousal score of those with chronic diseases was 9, while the median arousal score of those without was 6. There was no statistically significant difference between the mean values of the "Hyperarousal Subscale" score according to other socio-demographic characteristics of the medical personnel (p>0.05) (Table 1).

A very weak and statistically significantly positive relationship was found between the working year of the medical personnel and the overall "Impact of Event Scale" score (r=0.178; p=0.016). It was found that as the working year increased, the impact of the Covid-19 pandemic increased. A statistically significant difference was found between the overall mean scores of the "Impact of Event Scale" according to gender (p=0.006). The overall mean score of females was 28.56±14.46, while the overall mean score of males was 22.75±13.23. A statistically significant difference was found between the overall mean values of the "Impact of Event Scale" according to the family type (p=0.033). The overall mean score of those with a nuclear family was 26.56± 14.20, while those with an extended family had an overall mean score of 17.18±11.21. A statistically significant difference was found between the overall mean scores of the "Impact of Event Scale" according to presence of chronic disease (p=0.036).

The overall mean score of those with chronic disease was 30.51±15.68, while the overall mean score of those without was 24.91±13.65. A statistically significant difference was found between the overall mean scores of the "Impact of Event Scale" according to having relatives or friends passed due to Covid-19 (p=0.037). The overall mean score of those who had relatives or friends passed due to Covid-19 was 28.51±13.22, while the overall mean score of those who did not was

24.09±14.67. There was no statistically significant difference between the mean scores of the "Impact of Event Scale" according to other socio-demographic characteristics of the medical personnel (p>0.05)(Table 1).

Table 1. Comparison of Socio-Demographic Characteristics of Medical Personnel with the Impact of Event Scale and Mean Subscale Scores

Introductory Characteristics	Arithmetic Mean ± S.D (Min-Max)		Intrusion	Avoidance	Hyperarousal	The Impact of Event Scale
			Test/p	Test/p	Test/p	Test/p
Age	37.75 ± 9.51(20-62)		0.101/0.175[e]	0.165/**0.026**[e]	0.069/0.359[e]	0.108/0.149[e]
Working Year	13.7 ± 10.22(1-39)		0.172/**0.021**[e]	0.190/**0.010**[e]	0.143/0.054[e]	0.178/**0.016**[e]
Duration of Experience in Filiation Team (Month)	8.25 ± 7.35(1-24)		0.122/0.101[e]	0.061/0.416[e]	0.145/0.051[e]	0.105/0.159[e]
Gender	n	%				
Female	101	55.8	2.417/**0.017**[a]	1.828/0.069[a]	3029.5/**0.004**[c]	2.788/**0.006**[a]
Male	80	44.2				
Marital Status						
Married	131	72.4	2972.5/0.336[c]	0.622/0.534[a]	2834.5/0.161[c]	1.251/0.214[a]
Single	50	27.6				
Educational Status						
High school	33	18.2	1.140/0.335[b]	0.601/0.615[b]	3.485/0.323[d]	0.963/0.412[b]
Associate degree	30	16.6				
Bachelor's degree	94	51.9				
Postgraduate degree	24	13.3				
Family Type						
Nuclear Family	170	93.9	696.5/0.156[c]	2.914/**0.004**[a]	683.5/0.134[c]	2.146/**0.033**[a]
Extended Family	11	6.1				
Occupation						
Nurse	27	14.9	10.783/0.214[d]	2.795/**0.006**[b]	11.905/0.156[d]	14.176/0.077[d]
Midwife	15	8.3				
Physician	7	3.9				
Psychologist	13	7.2				
Driver	15	8.3				
Dentist	19	10.5				
Social Worker	16	8.8				
Technician	39	21.5				
Other	30	16.6				
Introductory Characteristics			Intrusion	Avoidance	Hyperarousal	The Imp. of Event Scale
Changing the Institution During the Filiation Process	n	%	Test/p	Test/p	Test/p	Test/p
Yes	134	74	3128.5/0.947[c]	2420.5/**0.018**[c]	2895.5/0.410[c]	-1.103/0.272[a]
No	47	26				
Presence of Chronic Diseases						
Yes	35	19.3	2046.0/0.067[c]	2172.0/0.168[c]	1860.0/**0.012**[c]	2.118/**0.036**[a]
No	146	80.7				
Presence of Psychiatric Illness						
Yes	13	7.2	1089.0/0.987[c]	835.5/0.158[c]	1018.0/0.683[c]	0.71/0.478[a]
No	168	92.8				
Taking Psychiatric Medication						
Yes	13	7.2	1089.0/0.987[c]	835.5/0.158[c]	1018.0/0.683[c]	0.71/0.478[a]
No	168	92.8				
Infected with Covid-19						
Yes	68	37.6	3788/0.874[c]	-0.328/0.743[a]	3696.5/0.669[c]	-0.028/0.977[a]
No	113	62.4				
Quarantined due to Contact Tracing						
Yes	69	38.1	-0.468/0.640[a]	-0.342/0.732[a]	3850/0.967[c]	-0.437/0.663[a]
No	112	61.9				
Family Member Infected with Covid-19						
Yes	94	51.9	0.105/0.619[a]	-0.652/0.515[a]	3992/0.782[c]	-0.266/0.790[a]
No	87	48.1				
Passed Family Member due to Covid-19						
Yes	10	5.5	811.5/0.787[c]	717/0.391[c]	851.5/0.983[c]	-0.295/0.772[a]

No	171	94.5				
Relatives and Friends Passed due to Covid-19						
Yes	78	43.1	3257.5/**0.029**[c]	3480/0.123[c]	3340/0.052[c]	2.097/**0.037**[a]
No	103	56.9				
Being Affected by the Event						
Affected	55	30.4				
Unaffected	126	69.6				
aTwo independent sample t-test, bOne-way analysis of variance, cThe Mann Whitney U test, dKruskall Wallis H test, eSpearman's rho correlation coefficient						

The established linear regression model was found to be statistically significant (F=4.294, p=0.006). In the linear regression model, the independent variables and the dependent variable were explained at a rate of 5.2%. As the working year increased, the intrusion score increased by 0.091 units (p=0.045). The independent variables affecting the "Avoidance Subscale" score of the scale were examined with linear regression analysis. The established linear regression model was found to be statistically significant (F=2.786, p=0.002). In the linear regression model, the independent variables and the dependent variable were explained at a rate of 10.6%. The avoidance score of psychologists was 5.456 lower than those who were from other professions (p=0.002). The avoidance score of drivers was 4.237 lower than those who were from other professions (p=0.024). The independent variables affecting the "Hyperarousal Subscale" score were examined with linear regression analysis. The established linear regression model was found to be statistically significant (F=8.125, p<0.001). In the linear regression model, the independent variables and the dependent variable were explained at a rate of 7.3%. Hyperarousal score of female participants was 2.143 higher than males (p=0.003). Those with chronic diseases had a 2.301 higher hyperarousal score than those without (p=0.011). The independent variables affecting the Impact of Event Scale were examined with linear regression analysis. The established linear regression model was found to be statistically significant (F=4.023, p=0.002). In the linear regression model, the independent variables and the dependent variable were explained at a rate of 7.7%. However, the independent variables affecting the overall score were not found to be statistically significant (p>0.05) (Table 2).The average age of the medical personnel was 33±10.96 (Min:23; Max:54), and it was found that 77.8% of them were female, 44.4% were married, 44.4% were bachelor's graduates, and the average working year was 9.77±12.84 (Min:1; Max:39) (Table 3).

Table 2. Examination of the Factors Affecting the Impact of Event Scale and Subscale Scores with Linear Regression

Intrusion	β_0 (95% CI)	S. Error	β_1	t	p	r^1	r^2	VIF
Constant	6.95 (5.165- 8.735)	0.904		7.684	**<0.001**			
Gender (Reference: Male)	1.751 (-0.081- 3.583)	0.928	0.140	1.886	0.061	0.178	0.140	1.047
Working Year	0.091 (0.002- 0.179)	0.045	0.149	2.019	**0.045**	0.180	0.150	1.029
Relatives and Friends Passed due to Covid-19 (Reference: No)	1.329 (-0.513- 3.171)	0.934	0.106	1.424	0.156	0.153	0.106	1.052

F=4,294, p=0,006, R^2=0.068, Adjusted R^2=0,052, β_0: The non-standardized beta coefficient; S. Error: Standard Error; β_1: Standardized beta coefficient; r^1: Zero-order correlation; r^2: Partial correlation

Avoidance	β_0 (95% CI)	S. Error	β_1	t	p	r^1	r^2	VIF
Constant	11.607 (5.627- 17.587)	3.029		3.832	**<0.001**			
Age	-0.021 (-0.167- 0.126)	0.074	-0.035	-0.279	0.780	0.131	-0.022	3.235
Working Year	0.103 (-0.053- 0.259)	0.079	0.189	1.305	0.194	0.200	0.100	4.219
Family Type (Reference: Extended Family)	2.728 (-0.906- 6.362)	1.841	0.117	1.482	0.140	0.213	0.114	1.261
Occupation (Reference: Other)								
Nurse	-2.882 (-5.911- 0.147)	1.534	-0.185	-1.878	0.062	0.008	-0.143	1.948
Midwife	-2.599 (-6.247- 1.049)	1.848	-0.129	-1.406	0.161	0.060	-0.108	1.693
Physician	-0.428 (-4.958- 4.101)	2.294	-0.015	-0.187	0.852	0.062	-0.014	1.276
Psychologist	-5.456 (-8.952- -1.959)	1.771	-0.253	-3.081	**0.002**	-0.213	-0.231	1.364
Driver	-4.237 (-7.906- -0.568)	1.858	-0.210	-2.280	**0.024**	-0.225	-0.173	1.712
Dentist	-1.124 (-4.386- 2.138)	1.652	-0.062	-0.680	0.497	0.043	-0.052	1.673
Social Worker and Sociologist	-1.051 (-4.306- 2.205)	1.649	-0.054	-0.637	0.525	0.007	-0.049	1.429
Technician	-1.497 (-4.178- 1.184)	1.358	-0.111	-1.102	0.272	0.044	-0.085	2.033
The Institution Worked Before Filiation (Reference: No)	-1.758 (-3.902- 0.386)	1.086	-0.139	-1.618	0.107	-0.179	-0.124	1.479

F=2.786, p=0.002, R2=0.166, Adjusted R2=0.106, β0: The non-standardized beta coefficient; P. Error: Standard Error; β1: Standardized beta coefficient; r1: Zero-order correlation; r2: Partial correlation

Table 2. (Continued) Examination of the Factors Affecting the Impact of Event Scale with Linear Regression

Hyperarousal	β_0 (95% CI)	S. Error	β_1	t	p	r^1	r^2	VIF
Constant	4.785 (3.689- 5.881)	0.555		8.615	**<0.001**			
Gender (Reference: Male)	2.143 (0.734- 3.551)	0.714	0.216	3.002	**0.003**	0.223	0.220	1.002
Presence of Chronic Disease (Reference: No)	2.301 (0.53- 4.072)	0.898	0.184	2.564	**0.011**	0.193	0.189	1.002

F=8.125, p<0.001, R^2=0.084, Adjusted R^2=0.073, β_0: The non-standardized beta coefficient; S. Error: Standard Error; β_1: Standardized beta coefficient; r^1: Zero-order correlation; r^2: Partial correlation

The Impact of Event Scale	β_0 (95% CI)	S. Error	β_1	t	p	r^1	r^2	VIF
Constant	13.273 (4.825- 21.721)	4.280		3.101	**0.002**			
Gender (Reference: Male)	4.096 (-0.1- 8.291)	2.126	0.144	1.926	0.056	0.204	0.144	1.086
Family Type (Reference: Extended Family)	6.52 (-2.082- 15.122)	4.359	0.110	1.496	0.136	0.158	0.112	1.056
Working Year	0.164 (-0.047- 0.376)	0.107	0.118	1.537	0.126	0.198	0.115	1.160
Presence of Chronic Disease (Reference: No)	3.65 (-1.706- 9.007)	2.714	0.102	1.345	0.180	0.156	0.101	1.119
Relatives and Friends Passed due to Covid-19 (Reference: No)	3.138 (-1.014- 7.291)	2.104	0.110	1.492	0.138	0.155	0.112	1.057

F=4.023, p=0.002, R^2=0.103, Adjusted R^2=0.077, β_0: The non-standardized beta coefficient; S. Error: Standard Error; β_1: Standardized beta coefficient; r^1: Zero-order correlation; r^2: Partial correlation

Table 3. Introductory Characteristics of Medical Personnel

Medical Personnel	**Age**	**Working Year**	**Gender**	**Marital Status**	**Educational Status**	**Occupation**
P1	29	3	Female	Single	Bachelor's degree	Dentist
P2	43	23	Female	Married	Bachelor's degree	Midwife
P3	27	3	Female	Single	Bachelor's degree	Physiotherapist
P4	24	1	Female	Single	Bachelor's degree	Physician
P5	54	39	Female	Married	Master's degree	Nurse
P6	33	7	Male	Married	Master's degree	Psychologist
P7	26	2	Female	Single	Master's degree	Social Worker
P8	45	7	Male	Married	High school	Driver
P9	23	3	Female	Single	Associate degree	Forensic Technician
Avg.±S.D(Min-Max)	33±10.96 (23-54)	9.77±12.84 (1-39)				

Qualitative Findings of the Research

Medical personnel working during the filiation process stated that they had experienced psychological effects such as fear, anxiety, loneliness, sleep problems, stigma, trauma, changes in affectivity, stress, deterioration in social relationships, fatigue and strain. They also mentioned that they had fear due to being sick during the filiation process, transmitting the disease, the presence of chronic diseases, uncertainty, touching somewhere in public areas and the death of their relatives (P1, P2, P3, P4, P5, P6, P7, P8, P9). They said they experienced anxiety related to being sick, transmitting the disease, uncertainty, using public transportation, crowded environment, sneezing/coughing, and media (P1, P2, P3, P4, P5, P6, P7, P8, P9). It was reported that they felt loneliness due to the fear of getting sick (P1, P4) and that they experienced sleep problems related to work intensity and fatigue (P1, P2, P4, P5, P6, P9). They said they were subjected to stigma as medical personnel and due to using personal protective equipment (P5, P6, P8), and experienced trauma due to encountering a situation outside of the standards (P2). They stated that they had changes in affectivity due to bumpy emotions and a sense of restriction (P4, P5, P9), and that they experienced stress due to work intensity and personal protective equipment (P8, P9). They shared that their social relations deteriorated due to fear of disease (P1, P5, P8), and that they had fatigue due to work intensity and transportation (P3, P4, P7, P8). They mentioned difficulties in transportation, home visits, phone communication, address finding, quarantine, meeting basic needs and using personal protective equipment during the filiation process (P1, P2, P3, P6, P7, P8, P9) (Figure 1).

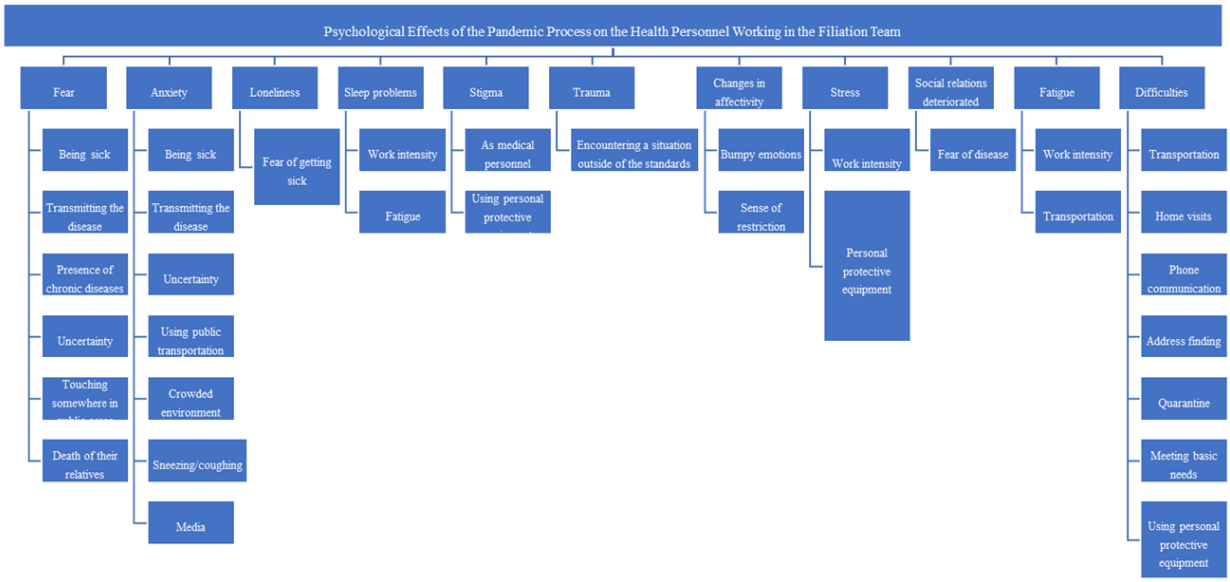

Figure 1. Psychological Effects of the Pandemic on Medical Personnel Working in the Filiation Team

Table 4. Examples of Statements of Medical Personnel

Theme	Category	Statements of Medical Personnel
Psychological Effects	Fear	*"...Uncertainties led to fear. Like, will I not be able to see the future? How long are we going to go like this, how long is it going to take, so I'm constantly thinking about tomorrow, so what will happen, will it end or not? Will they find a cure? Like, I don't know, will they find a vaccine...?" (P9)*
	Anxiety	*"...I started to experience mild anxiety like panic attacks. Because I might infect my family. Since they have other diseases, the thought of transmitting the disease caused me constant anxiety..." (P1)*
	Loneliness	*"...You can be lonely with the instinct to protect yourself from disease. Socially, you can already feel lonely because it affects you negatively..." (P4)*
	Sleep Problems	*"...There were times when we couldn't sleep because we were tired. We experienced sleep problems especially during periods when we were working in a very busy, stressful manner and cases were intense. Like not being able to sleep soundly, waking up often, not sleeping much..." (P6)*
	Stigma	*"...When you go to a citizen's door wearing overalls in filiation, you are being stigmatized overtly..." (P6)*
	Trauma	*"...I think it caused trauma. Because everyone lost somebody, different things they had been through. It was not an occasional thing that we had in our lives. It was something that completely affected the world..." (P2)*
	Changes in Affectivity	*"...It tired our feelings in general. We experienced many emotions at the same time..." (P4)*
	Stress	*"...Intensive work brought a great amount of stress...We were constantly working under stress..." (P9)*

	Deterioration in Social Relationships	*"...When the pandemic occurred, we stopped visiting our friends and relatives, whom we used to see, out of fear of disease..." (P8)*
	Tiredness	*"...There were times when we were tired... We went everywhere from village to city to neighborhoods...It was very exhausting..." (P8)*
	Strain	*"...It's hard to be constantly on the move..." (P1)*
		"...When we went to the houses, we saw very different reactions, some people thought we were scammers or something...Those who chased us saying they were about to report us to the police... it was challenging" (P1)
		"...For example, someone pulled a gun on a friend saying they were not contacted... Most of them rejected.... That put a lot of pressure on us..." (P2)
		"...Not being able to take a break... we had a hard time..." (P9)
		"...I think it was extremely difficult to wear personal protective equipment...(P9).
		"...When I went up stairs with a mask, N95, helmet, overalls, and overshoes on my feet. I had difficulty breathing, there were times when I said I think I'll stop breathing..." (P2)

4. DISCUSSION

The findings of the study conducted in order to determine the psychological effects of the Covid-19 pandemic on medical personnel working in the filiation team and to examine the possible effects in depth were discussed in this stage in accordance with the literature.

It was found that 30.4% of medical personnel were psychologically affected by the event. In the study, it was determined that the "Intrusion" subscale was affected by gender, working year, and the status of having relatives and friends passed due to Covid-19. In the linear regression analysis, it was found that the intrusion score increased by 0.091 units as the working year increased. It was found that the "avoidance" subscale was affected by family type, age, working year, profession and the situation of changing institutions during the filiation process. In linear regression analysis, the avoidance score of psychologists was 5.456 lower than those from other professions, and the avoidance score of drivers was 4.237 lower than those from other professions. It was determined that the "Hyperarousal" subscale was affected by gender and the presence of chronic diseases. In the linear regression analysis, female participants obtained a hyperarousal score 2.143 higher than males. Those with chronic diseases had a 2.301 higher hyperarousal score than those without. It was found that the overall score of the "Impact of Event Scale" was affected by gender, family type, presence of chronic diseases, working year and status of having relatives or friends passed due to Covid-19. In a study conducted on healthcare workers by Yilmaz and Karakuş (2022), it was determined that educational status, working 48 hours a week and above, exposure to verbal or physical violence affected the "Impact of Event Scale" and all its subscales. In a study conducted by Bayramoğlu (2022), on people who had Covid-19 found that gender, BMI and presence of chronic disease were effective in the "Intrusion" subscale; BMI and gender, were effective in the "Avoidance" subscale; gender, BMI, previous psychiatric diagnosis and presence of chronic disease were effective in the "Hyperarousal" subscale; and gender, BMI and presence of chronic disease were effective in the overall "Impact of Event Scale" score. In a study conducted by Elagöz (2022), on people who had Covid-19, it was found that the 'Intrusion' subscale was affected by gender, age, marital status and continuation of symptoms of Covid-19; the "Avoidance" subscale was affected by educational status, having a psychiatric diagnosis, receiving psychiatric treatment and continuation of symptoms of Covid-19; the "Hyperarousal" subscale was affected by

gender, marital status, educational status, chronic illness and continuation of symptoms of Covid-19; and the overall "Impact of Event Scale" score was affected by gender, marital status, educational status and continuation of symptoms of Covid-19. In a study conducted by Öner (2021), to determine the impact of the Covid-19 pandemic on medical personnel found that the "Intrusion" subscale was affected by the status of being in need for psychological support, the "Avoidance" subscale was affected by the status of being in need for psychological support, the "Hyperarousal" subscale was affected by the status of being in need for psychological support, and the overall "Impact of Event Scale" score as affected by the status of being in need for psychological support. Our research findings showed consistency with the literature.

In in-depth interviews conducted in the qualitative stage of the study; it was determined that medical personnel experienced fear during the filiation process. When the literature was examined, it was seen that medical personnel experienced fear and their mental health was adversely affected during the Covid-19 pandemic (Khattak et al., 2021). In a study conducted by Mohsin et al. (2021), with medical personnel in the Covid-19 pandemic, it was found that 10.7% experienced mild, 73.5% moderate and 15.7% high levels of fear. Kumar et al. (2020), and Sevimli and Sevimli (2021), found in their study that healthcare workers experienced fear due to getting sick during the pandemic, transmitting the disease to family members, uncertainty of the disease process and the presence of chronic diseases. In our research, similar to the literature, it was observed that medical personnel working in the filiation process experienced fear due to being sick, transmitting the disease, the presence of chronic diseases, uncertainty, touching somewhere in public areas and the death of their relatives. In the study, it was determined that they also experienced anxiety during the filiation process. This finding was also supported by previous studies reporting that healthcare workers experienced anxiety during Covid-19 (Alnazly et al., 2021; Akova et al., 2022; Aymerich et al., 2022). Alenazi et al. (2020), reported that 32.3% of medical personnel experienced high-level, 36.1% moderate and 31.5% low-level anxiety in the Covid-19 pandemic, and Martsenkovskyi et al. (2022), found that 55.4% of medical personnel experienced moderate and high-severity anxiety during the Covid-19 pandemic. Şahin and Kulakaç (2022), determined that medical personnel experienced anxiety due to reasons such as transmitting the disease to their family and surroundings, changing working hours, fear of death, loneliness, anger, hopelessness, uncertainty, the presence of chronic diseases and working with Covid-19 patients. In our research, it was observed that medical personnel experienced anxiety related to being sick, transmitting the disease, uncertainty, using public transportation, crowded environment, sneezing/coughing and media during the filiation process. In the study, it was also determined that medical personnel working during the filiation process experienced loneliness. When the studies conducted on medical personnel during the Covid-19 pandemic were examined; Stubbs and Achat (2022), found that they had less contact with family and friends and lived alone, and Cabello et al. (2022), stated that they experienced feelings of loneliness due to the risk of illness, being in quarantine, exposure to news about the disease, and uncertainty of the disease process. In our research, it was observed that medical personnel working in the filiation process experienced loneliness more often due to fear of disease.

In the study, it was determined that the medical personnel working during the filiation process also experienced sleep problems. When the literature was examined, it was reported that medical personnel working during the Covid-19 pandemic experienced sleep problems (Aymerich et al., 2022). However, Şahin et al. (2020), reported that healthcare workers providing care for those with psychiatric illness experienced more sleep problems, while Alboghdadly et al. (2022), reported the healthcare workers providing care for Covid-19 patients. In our research, it was observed that medical personnel working in the filiation process experienced sleep problems due to work intensity and fatigue. It was determined that they were also exposed to stigma. Bagcchi (2020), found that healthcare workers were stigmatized by society due to infectious diseases during the Covid-19 pandemic, Mostafa et al. (2020), reported that 31.2% of physicians were exposed to pandemic-induced stigma, and Al Sulais et al. (2020), indicated that 31% of physicians stated that they were worried about being stigmatized due to being a medical personnel. In addition, in a study by Taylor et al. (2020), conducted on society during the Covid-19 pandemic, it was determined that about a quarter of the public thought that medical personnel should be isolated from society and their families, and more than a third of the participants stayed away from medical personnel due to fear of disease transmission. In our research, it was seen that medical personnel working during the filiation process were exposed to stigma due to the risk of transmitting the disease. In the study, it was determined that the medical personnel working during the filiation process experienced trauma. Similarly, during the pandemic process, Aymerich et al. (2022), found that 32% of medical personnel and Martsenkovskyi et al. (2022), found that 20% of medical personnel experienced trauma. In our research, it was seen that the events outside of standards occurred during the pandemic caused trauma to medical personnel. In the study, it was determined that the medical personnel working during the filiation process experienced changes in affectivity. In a study conducted with

medical personnel during the Covid-19 pandemic, Lin et al. (2021), found that 13.35% of medical personnel experienced mood disorders, and Amra et al. (2021), determined that mood disorders were experienced by medical personnel who showed symptoms of Covid-19 disease and those who worked directly with Covid-19 patients. In our research, it was observed that medical personnel working during the filiation process experienced changes in affectivity due to bumpy emotions and a sense of restriction. In the study, it was determined that medical personnel working during the filiation process experienced stress. When the studies conducted on healthcare workers working during the pandemic were examined; Aymerich et al. (2022), found that 40% experienced acute stress symptoms, while Alnazly et al. (2021), reported that 35%, Martsenkovskyi et al. (2022), reported that 42.4%, and Akova et al. (2022), reported that 15.4% experienced serious stress symptoms. In our research, it was observed that medical personnel working during the filiation process experienced stress due to work intensity and the use of personal protective equipment. It was determined that they experienced a deterioration in their social relationships. According to Sethi et al. (2020), in a study conducted with medical personnel during the Covid-19 pandemic, it was determined that the social lives of medical personnel were restricted due to the pandemic, they could not attend funerals and other social gatherings, and their social lives changed. Martsenkovskyi et al. (2022), on the other hand, stated that the social support of healthcare workers decreased during the Covid-19 pandemic, and which was an important risk factor for mental illnesses. In our research, it was observed that the medical personnel working during the filiation process experienced deterioration in their social relationships due to fear of disease. In the study, medical personnel working during the filiation process stated that they experienced fatigue. When the literature was examined found that the fatigue levels of healthcare workers increased during the pandemic (Kurtaran et al., 2022). In addition, Yeager et al. (2023), stated that the workload of healthcare workers increased during the pandemic. In our research, it was observed that medical personnel experienced fatigue due to both work intensity and transportation during the filiation process. In the study, health personnel stated that they experienced difficulties in transportation, home visits, phone communication, address finding, quarantine, meeting basic needs and using personal protective equipment during the filiation process. When the literature was examined; in studies conducted on medical personnel working during the filiation process, it was stated that they experienced difficulties in transportation during the filiation process, patient and contact tracing during home visits, during and after phone calls, finding addresses, quarantining patients and contacts, meeting basic requirements such as nutrition and excretion, and using personal protective equipment (Sevimli & Sevimli, 2021; Beyoğlu et al., 2022; Kaya, 2022; Ilgaz et al., 2022; Yeager et al., 2023). Our research findings showed similarities with the literature.

5. CONCLUSION

In the study, it was found that about a third of the medical personnel working in the filiation process were psychologically affected by the Covid-19 pandemic. In in-depth interviews, it was determined that medical personnel experienced psychological effects such as fear, anxiety, loneliness, sleep problems, stigma, trauma, changes in affectivity, stress, deterioration in social relationships, fatigue and strain. In accordance with these results, it is recommended to provide psychological support to the medical personnel worked during the filiation process during the pandemic, as well as particularly empowering in terms of transportation, home visits, telephone communication, address finding, quarantine, meeting their basic needs during this process and the difficulties they experience in using personal protective equipment.

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Comparison of Spinal Curvatures of Women Had Given Multiple Times and Never Given Birth

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ABSTRACT

Background: It is known that the amount of load loaded on the body affects the spine and spinal curvature. It was thought that the spine could be affected during each pregnancy experienced by the women. The spine measurements of women who gave birth and those who did not were compared.

Material and Method: This research study was conducted in 2021, with the approval of Van YYU Non-Interventional Clinical Ethics Committee, the spines of women who came to Van YYU Dursun Odabaşı Medical Centre Gynecology and Obstetrics Outpatient Clinic were examined by means of the Spinal Mouse device. Posture was assessed by a single investigator with the SM device in two different positions: upright and extension. Thoracic kyphosis (TK), lumbar lordosis (LL), sacral kyphosis (SK) angle values and sagittal vertical position (SDP) posture of the whole spine were evaluated. A total of 100 women in the age range of 30-35 years, 50 women who had never given birth and 50 women who had given at least three births were included in the study. T-Test was used to compare group means in terms of continuous variables.

Results: As a result of the findings obtained, the average weight of women who gave birth and never gave birth was p=0.001 as a result of statistical analysis and it was found significant. There was a difference in angular values between the two groups, with LL [p=0.001] and SK [p=0.003] measurements taken in the extension position in the measurements taken in the upright position, a significant result was obtained in the TK [p=0.040] and LL [p=0.001] values.

Conclusions: It is seen that every birth process experienced negatively affects the posture of women. Therefore, women who have given birth should be made aware of the necessary exercise and physical activity in order to control and protect the spine health.

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1.INTRODUCTION

The columna vertebralis (spine) is a mobile and flexible column on the axis of the body, which, together with the skull and breast bones, forms the skeleton axiale. It plays a role in the movement of the head, neck and trunk [1]. The upright posture of the columna vertebralis is in a certain static order and is called "posture". Posture is also expressed as a component of all posture points of the body [2]. Columna vertebralis can stand upright with the support of various soft tissues such as muscles, ligaments and capsules [3,4]. Posture is very important for body health and appearance. There are various factors affecting posture. These are factors such as race, heredity, gender, nutrition, environmental factors, socio-economic status, psychological status, soft tissue deformation, fractures and deformation of the normal position angle of the joint [5,6]. The concept of gender among these factors draws attention to the difference between men and women. It has been reported that pregnancy, which is a physiological process especially for women, may play a role in postural changes [7,8].

Pregnancy is a period in which many hormonal and anatomical changes affect the musculoskeletal system. Changes in the musculoskeletal system such as lordosis, kyphosis, anterior and posterior longitudinal ligament changes, increased joint laxity, increased strain and mobility in the sacroiliac joint and symphysis pubis may be observed due to pregnancy [9]. Women experience a sudden decrease in abdominal circumference and body weight after giving birth. However, it is reported that it may take 3-6 months after delivery for the female body and spinal posture to return to pre-pregnancy values after the end of pregnancy [10].

Pregnancy may cause changes in spinal curvature and posture. It has been found that there are some differences in the characteristics of the spine, degree of lordosis and kyphosis values during pregnancy [11,12]. The growing uterus shifts the centre of gravity of the body forward. Expanding lordosis bends the sacrum forward, putting pressure on the joints, intervertebral discs and ligaments of the lumbosacral spine [7]. The increasing and changing mass distribution of the trunk can shift the centre of gravity forward and lumbar lordosis can occur with pelvic tilt forward [13]. An increase in cervical lordosis has also been reported to compensate for these changes in the thoracic region [14,15].

In this study, it was thought that spinal posture would be affected more as the number of births increased. For this purpose, it was aimed to compare the spinal posture of women who had never been pregnant and women aged 30-35 years who had given birth at least three times with the spinal mouse device and to determine whether there was a difference between the groups.

2. MATERIALS AND METHOD

1.1. Study Design

A total of 100 volunteer female participants between the ages of 30-35 (This age range was chosen because of the deformations that may occur with advancing age) who had never given birth and who had given at least three births were included in the study and two groups with the following characteristics were formed. Sample size, "Sample with Unknown Universe (Population Volume) The calculation was determined by the formula (n=t2pq /d2). According to the literature review, it was determined that the "effect size value is 0.1" (Ohlin and Rösner). Accordingly; Primary Type Error 5 (t=1,96), Power of the Test (Power) 80% and effect size value was taken as 0,1 unit and the minimum sample size was calculated as n=96. Thus, considering the study process, it was envisaged to work with 100 women. Two comparisons were made in the study the group consists of two normally distributed main masses randomly selected. None of the women participating in the study had a history of abortion or miscarriage. On the other hand, approximately 90% of the women who participated in the study lived in rural areas and did not have any occupation.

1. Group [n:50]: X. X.X. Medical Center Gynecology and Obstetrics outpatient clinic consists of women who have never given birth.

2. Group [n:50]: Women who had given at least three births (normal or caesarean section) in the Gynaecology and Obstetrics outpatient clinic of X.X.X. Medical Centre and who had been at least twelve months since the last birth (It has been reported that postural changes that develop in the body during pregnancy enter the recovery phase in the third month after delivery and return to the systemic pre-pregnancy function by the sixth month [21]. Considering this, it was thought that the results after twelve months may be more reliable).

2.2. Procedures and Outcome measures

People were asked about their ages and notes were taken. This study was conducted using the Spinal Mouse M365, a radiation-free non-invasive device that is increasingly used in the clinical evaluation of the vertebral column (Idiag, Volketswil, İsviçre) [16,17,18,19,20].

In this study, spine measurements were only in the sagittal plane, thoracic kyphosis (TK), lumbar lordosis (LL), and sacral kyphosis (SK) angle values and sagittal upright position (SDP) posture data of the

spine were evaluated. With the measurements made, the values of thoracic curvature (T1-T2 to T11-T12), lumbar curvature (L1 to L5), sacral curvature (S1 to S5), and angular upright position of the entire spine were determined. It was evaluated with the SM device by a single investigator in two different positions: extension ve upright

To take the measurements in accordance with the standards, a measurement speed study was carried out for 2 weeks to gain the habit of hand [18,19].

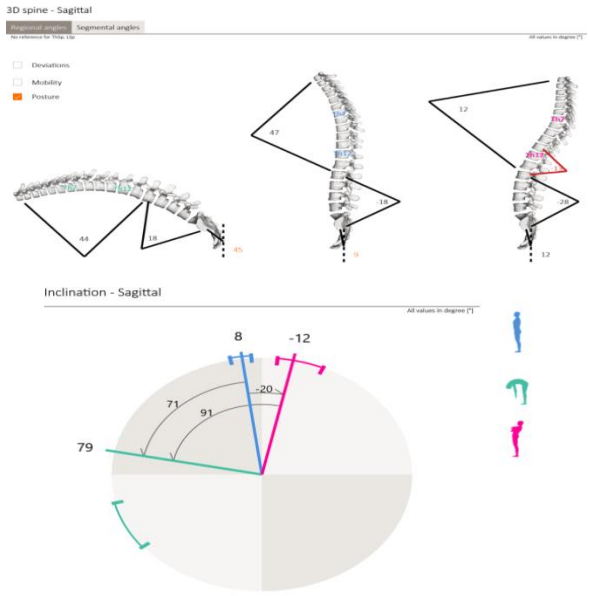

Figure 1. An examaple of the measurement taken in the sagittal plane with Spinal Mouse.

2.3. Statistical analysis

The descriptive statistics for the continuous variables of the age, height, body weight values of the participants and the measurements taken in anatomical, flexion and extension positions were determined as Average, Standard Deviation, Minimum and Maximum values. The normality of the distribution of the data was tested with the Kolmogorov-Smirnov Test, and the homogeneity of the variances was tested with the Levene test. In two-group comparisons in terms of continuous variables, the t-test was used for the cases that met the normal distribution conditions, and the Mann-Whitney U test was used for the cases that did not meet the normal distribution conditions.

3. RESULTS

Age, body weight and heightmean value and standard deviation of the subject (Table 1). The body weights of the groups included in the study were measured as 61.58 kg in those who did not give birth and 69.42 kg in those who gave birth. It is seen that the average body weight is higher in women who have given birth. According to the results of the analysis, it was determined that there was a statistically significant difference [p=0.001] between women who had given birth and women who had never given birth [p<0.05]. In addition, the number of births of the women participating in the study was at least 3 and at most 9, and the time elapsed since the last birth was at least 1 and at most 10 years.

Table 1: Mean age, weight and height distribution.

	Group	n	Mean±Std. deflection	p
Age (years)	NGB	50	33.34±0.688	0.837
	GB	50	33.40±1.938	
Body weight(kg)	NGB	50	61.58±8.031	**0.001**
	GB	50	69.42±11.947	
Height (cm)	NGB	50	162.52±4.929	0.922
	GB	50	162.42±5.265	
NGB: Not Giving Birth; GB: Giving Birth				

The results of TK, LL, SD and Angle of the spine measurements taken in the extension position are given in Table 2.. The mean TK angles of the two study groups were (29.50±13.281) in women who had never given birth and (31.80±14.483) in women who had given birth. As a result of the analysis, the p probability value was 0.410 and was not found to be statistically significant. When LL angles were analyzed, the highest mean (-18.64±13.641) belonged to women who had given birth. The mean LL angle of women who had never given birth was (-11.14±6.854) and there was a significant difference between the two groups (p=0.001). The mean SD value was (-14.38±11.537) in women who had never given birth and (1-6.04±15.258) in women who had given birth and there was a significant difference between the groups [p=0.003].When evaluating the mean extension angle positions, there was no significant difference observed between those who have never given birth (-13.28±6.902) and those who have given birth (-11.50±4.743) [p=0.136].

Table 2: Comparison of TK, LL, SK, and angle measurements in the extension position of the spines of the groups participating in the study

	Group	n	Mean±Std. deflection	p
Extension TK	NGB	50	29.50±13.281	0.410
	GB	50	31.80±14.483	
Extension LL	NGB	50	-11.14±6.854	**0.001**
	GB	50	-18.64±13.641	
Extension SK	NGB	50	-14.38±11.537	**0.003**
	GB	50	-6.04±15.258	
Extension Angle	NGB	50	-13.28±6.902	0.136
	GB	50	-11.50±4.743	
NGB: Not Giving Birth; GB: Giving Birth				

The comparisons of TK, LL, SK and ANGLE in the measurements taken in the upright position of the spine are given in Table 3. It was determined that TK angles had a higher mean of (48.46±13.961) in women who had given birth and (43.32±12.743) in women who had never given birth. There is a significant difference between the mean values obtained [p=0.040]. It is seen that the highest mean value in LL angles belongs to women who have given birth with (-18.16±11.182), while the mean value of LL angle in women who have never given birth is (-11.56±5.096) and there is a statistically significant difference between the two groups [p=0.001]. SK values were (3.40±3.276) in women who had never given birth and (3.84±10.925) in women who had multiple births and the difference between the groups was not significant [p=0.786]. The mean SDP of the spine of the groups was calculated as (3.00±2.850) in women who had never given birth and (2.44±5.023) in women who had given birth and there was no significant difference between them at 5% significance level [p=0.495].

Table 3: In the upright position of the spines of the groups participating in the study, TK, LL, SK and Comparison of SDP measurements

	Group	n	Mean±Std. deflection	p
Upright TK	NGB	50	43.32±12.743	**0.040**
	GB	50	48.46±13.961	
Upright LL	NGB	50	-11.56±5.096	**0.001**
	GB	50	-18.16±11.182	
Upright SK	NGB	50	3.40±3.276	0.786
	GB	50	3.84±10.925	
Upright SDP	NGB	50	3.00±2.850	0.495
	GB	50	2.44±5.023	
NGB: Not Giving Birth; GB: Giving Birth				

4. DISCUSSION

The reason for the excess body weight in women who have given birth is that the amount of fat retained by the body increases with each birth and the person cannot return to his/her old weight after birth. However, although it is stated that the postural changes that develop in the body during pregnancy enter the recovery phase in the third month after birth and systemically return to the pre-pregnancy function until the sixth month, it is stated that some permanent changes occur in the mother's body [21]. In this study, body weight was found to be statistically significant in women who gave birth compared to those who did not give birth (p= 0.001). It is clear that there is a positive correlation between body weight after each pregnancy period (No similar study was found to discuss our findings. Therefore, similarities and differences could not be compared)

The increase in lumbar lordosis, which is one of the common postural changes in pregnancy, causes changes in the proximal and distal lumbar regions. Dorsal kyphosis increases to compensate for lumbar lordosis. In this context, pregnancy has been reported to be a risk factor for future disc herniations or existing disc pathologies may worsen during pregnancy [22]. In the measurements taken in the upright position of the spines of the groups participating in the study, the angle values of the women who gave birth to many children and those who did not were found to be TK (48.46º, 43.32º), LL (-18.16º , -11.56º), SD (3.84º, 3.40º) and upright SDP (2.44º, 3.00º). The findings showed that as the number of births increased, the TJ angle value increased, whereas the LL angle values were not within normal limits and decreased. In the measurements of the spine of the groups participating in the study in the extension position, the angle values of the women who had multiple births and the women who did not give birth were found to be TK (31.80º, 29.50º), LL (-18.64º, -11.14º) and SD (14.38º, -6.04º). Considering these values, it was observed that lumbar lordosis angles were not within normal physiological limits and were less in both groups.

The lumbar spine, which is affected by hormonal and postural changes during pregnancy, will cause more loading and strain due to weight gain. This situation leads to recurrent and sometimes chronic health problems that negatively affect the comfort and activities of women during pregnancy and after delivery [26]. Okanishi et al. [24] , Spinal Mouse device was used to calculate the mean of spinal curvature, sacral inclination, thoracic and lumbar curvature, and inclination of nonpregnant and pregnant women. The study showed that the lumbar spinal curvature is straight or the lumbar lordosis and sacral posterior slope are reduced in pregnant women. They reported that during pregnancy, women have a rounded back posture shaped by the placement of the upper body backwards from the lower body. In addition to the changes that occurred during pregnancy, conditions such as an increase in thoracic kyphosis, scapular protraction, and internal rotation in the upper extremity were observed. It has also been reported that cervical anterior tilt (inclination) and an increase in cervical lordosis are observed because of enlargement of the thorax [14]. It has been reported that lumbar lordosis and pelvic tilt rates increase during pregnancy, and lateral deviation in spinal posture is observed during pregnancy [25,7]. According to literature information, decreased lumbar lordosis angle is among the factors that cause low back pain [27.28.29]. It has been reported that thoracic kyphosis, which increases during pregnancy, also increases after delivery [27]. Dumas et al [23] examined pregnant women with lateral photography method and reported that pregnancy has an increasing effect on thoracic kyphosis, although no numerical data could be determined. Betsch et al [7] calculated that pregnancy has an increasing effect on thoracic kyphosis using topographic measurement

devices and numerical data. In our study, a significant difference was observed at 5% significance level between the two groups in terms of LL and SC in the measurements taken in the extension position [p<0.05], while no significant difference was observed in TK and Angle measurements [p>0.05]. In this context, TK angles of both groups were within normal physiological limits (20º - 45º) and not significant [p>0.05], while LL and SK angles were statistically significant [p<0.05]. Accordingly, a significant difference was found between the two groups in terms of TK and LL at 5% significance level [p<0.05]. TK angles (48.46º, 43.32º), LL angles (-18.16º, -11.56º) and SD angles (3.84º, 3.40º) were found in the measurements taken in the spine upright position of the groups participating in the study. According to the comparison results, SD and LL angles were found to be significant [p=0.040, p=0.001]. According to these data, it can be said that there is an increase in lumbar lordosis after birth.

5. CONCLUSION

In this study, the spinal postures of women who had given birth and women who had never given birth were evaluated with SM in the sagittal plane. The data show that the increasing number of births has a negative effect on the postural posture values in the spine. Women who have given birth have a high degree of lumbar lordosis and thoracic kyphosis. In this study, it can be said that the measurements made in the flexion position had no effect on the determination of spinal curvature. The results of this study could not be compared with the literature and discussed since there are no publications on whether the lumbar lordosis that occurs during pregnancy persists in the postnatal period and if so, at what level. The women who participated in this study were between 30 and 35 years of age. Changes in the spine in women who have given birth to a large number of children at advanced ages, especially in the geriatric period, should be determined in future studies. We think that these results will be a source for future studies on spinal posture. It is seen that the number of studies based on the long-term physical health problems of women that may develop after birth and may cause hidden morbidity is quite insufficient. Based on this study, we think that pilot applications supported by new field studies are needed to control and protect the spine health of women who have given birth more than once. It is thought that the Spinal Mouse device, which will be used in the measurement and analysis of spinal postures, may be an alternative to radiation-containing imaging devices and may facilitate the evaluation of the structure of spinal postures in the field of health.

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Conflict of Interest: This study is the doctoral dissertation article of G.S. Advisers H.K. and D.D.
There is no conflict of interest between the authors.
Ethical Approval: In order to conduct the research, Van Yüzüncü Yıl University Non-Interventional Clinical Research Ethics Committee (Decision no: 2021/01-01, Date:15.01.2021) necessary permission was obtained. The participants who participated in this study were informed verbally and then a voluntary written consent form was obtained.
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A Bibliometric Analysis of Studies on Diversity Management

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ABSTRACT

The present study seeks to perform a bibliometric examination of global publications on diversity management from 1990 to 2023. The objective is to scrutinize advancements in the field and present prospective researchers with fresh avenues for exploration. Because well-done bibliometric studies can create solid foundations for advancing a field in new and meaningful ways. A total of 15727 records were found in the WoS database in all languages and by the topic of all types of publications in which the keywords "diversity management", "relational demography", "demographic diversity", "workforce diversity", "cultural diversity" and "workgroup diversity" were mentioned in articles published between 1990 and November 2023. Then, with the restrictions applied, 3555 articles were subjected to Citation, Bibliographic Coupling and co- citation analyses. The VOSviewer software package (Version1.6.9) was used to create bibliometric maps and networks. 2020 was the year in which the most articles were published with 277 articles. The study identified Syed Jawa as the most productive author in diversity management research, with "Equality Diversity and Inclusion" as the most productive journal, and "cultural diversity", "diversity" and "diversity management" as the most frequently used keywords. The articles by Vertovec(2007), Jehn(1999), and Harrison(1998) stand out as the three most impactful in relation to citation count. Four clusters were identified according to the citation analysis. Developed countries were found to be the most influential in diversity management research. This study adds to the existing body of literature by offering an extensive bibliometric evaluation of diversity management studies.

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1.INTRODUCTION

Today's workforce is more diverse than ever before and this trend is expected to continue in the 21st century (Bhadury et al., 2000). Not only does the labour market consist of a highly diverse profile of potential employees, but also the customers and suppliers of businesses are changing (Pitts, 2009). The swift demographic shifts in the worldwide workforce necessitate managerial attention towards effectively handling these changes (Yang and Konrad, 2011). Both academics and practitioners have begun to explore the effects of increasing workforce diversity on work-related outcomes (Pitts, 2009). Consequently, managers and academics are exploring and experimenting with various approaches to deal more effectively with the changing demographic and social composition of the workforce (Gilbert et al., 1999; Ivancevich and Gilbert, 2000; Mamman et al., 2012). Since diversity management is a multifaceted concept, there are differences in its conceptualization (Mannix and Neale, 2005). Diversity management refers to programs or policies initiated by managers and/or human resource management (HRM) practices designed to empower a diverse workforce through the integration of various social groups (Fujimoto et al., 2013). It is voluntary organizational actions designed to ensure greater inclusion of employees from diverse backgrounds in formal and informal structures through policies and programs (Mor Barak et al., 2016). Managing diversity is a successful business strategy that tackles issues related to workforce diversity on a global scale within organizations (Richard, 2000). The current body of literature characterizes diversity management as a multifaceted phenomenon involving managerial efforts to encourage workforce diversity, recognize diversity as a crucial corporate objective, foster cultural awareness, and ultimately institute formal diversity programs (McCrea and Zhu, 2019). Historical analysis of the efforts in managing diversity shows that businesses have taken various actions primarily in order to comply with the legal requirements issued by governments. In later periods, it is observed that, apart from legal and ethical concerns, they approach the issue in terms of business paradigms (Qin et al., 2014; Kreitz, 2008). Historically, organizations have embraced a melting-pot strategy regarding diversity, presuming that employees can naturally adjust to the prevailing culture. Nevertheless, contemporary managers recognize that employees do not set aside their cultural values when they enter the workplace. Therefore, it has become imperative for managers to take into account a workforce with different lifestyles, family needs and work styles in managing their business (Aldaibat et al., 2019; García-Rodríguez et al., 2020).

Today, many researchers state that organizations that want to survive and develop should benefit from the competitive advantage brought by a diverse workplace (Qin et al., 2014; Kreitz, 2008). Research shows that businesses achieve significant benefits through different practices within the framework of diversity management strategy (McCrea and Zhu, 2019). Diversity management increases the social integration of all individuals regardless of their differences. It also helps organizations to recruit and retain people with a wide range of talents, improve organizational culture, increase organizational competitiveness and organizational innovation, and improve services to customers, thus increasing organizational performance (García-Rodríguez et al., 2020). Diversity management provides a strategic priority and sustainable competitive advantage (Noon and Ogbonna, 2021) and is instrumental in benefiting the organization through greater innovation and creativity, better decision-making and therefore more effective problem solving, drawing on a larger talent pool and appealing to a wider customer base. Furthermore, it establishes a competitive edge in terms of cost, acquiring resources, marketing, and organizational adaptability. In addition, it is known to be effective in increasing organizational productivity and ultimately achieving higher profits, increasing workplace commitment, ensuring employee integration and increasing the ability to adapt to environmental change more effectively (Allen and Montgomery, 2001; Bhadury et al.,2000; Jackson et al.,2003; Davis et al.,2016; Gilbert et al.,1999; Guıllaume et al.,2017; Ivancevich and Gilbert, 2000). This management paradigm is seen as an important phenomenon in solving the problems of social categorisation and discrimination, contributing to the overall development of employees and their performance in the organization (Yadav and Lenka, 2023). Failure to manage diversity leads to conflict and dysfunctional behaviours that can have serious consequences for the organization (Fujimoto et al., 2013; Harrison et al., 1998; Mamman et al., 2012). Failure to manage diversity also leads to higher labour turnover and less social cohesion (Fujimoto et al., 2013; Mamman et al., 2012). It can also lead to social divides. Therefore, it creates weak social integration and cohesion and leads to negative consequences for the group (Mannix and Neale, 2005). For the 21st century, a diverse workforce is not only recommended but also necessary. As businesses expand their horizons to include increasingly diverse markets, their ability to do business effectively will depend on the cultural make-up of the employees working in the business (Allen and Montgomery, 2001). Considering all these reasons, diversity management is developing day by day in the eyes of both scientists and many organizational managers. Therefore, it is important to systematically review the studies on this management

paradigm and to map the findings obtained, as it will provide significant convenience to the researchers in the field. Bibliometric analysis, which is one of the methods that can be used to achieve this goal, is a statistical method that identifies quantitative changes to identify and retrospectively analyze each stage of a study in a specific field (Vogel and Güttel, 2013). The term bibliometric pertains to the mathematical and statistical examination of patterns in published articles (Yadav and Lenka, 2023). Bibliometric analysis aims to pinpoint the most impactful authors, articles, journals, and themes across various countries, institutions, and topics within a specific area of knowledge (Alhosani and Nobanee, 2023). This type of analysis allows scholars to obtain a one-stop overview, recognize gaps in knowledge, generate new research ideas, and strategically align their proposed contributions to the field (Donthu et al., 2021). Despite the fact that research on bibliometrics began in the 1950s (Wallin, 2005), it is actually quite a new field. The bibliometric methodology involves the use of quantitative techniques, such as bibliometric analysis (e.g., citation analysis), applied to bibliometric data, including units of publication and citation (Donthu et al., 2021). Bibliometric analyses bring together current research, visually represent the primary themes and concepts within the field, and utilize this information to emphasize in-depth research areas (Bouckenooghe et al., 2021). Researchers employ bibliometric analysis for multiple purposes, including identifying emerging trends in the performance of articles and journals, patterns of collaboration, components of research, and examining the intellectual structure of a specific field within the current literature. Bibliometric analysis serves as a valuable tool for unraveling and charting the accumulated scientific knowledge and evolutionary intricacies of established fields by systematically interpreting extensive amounts of unstructured data. Consequently, well-executed bibliometric studies have the potential to establish solid foundations for advancing a field in innovative and significant ways (Donthu et al., 2021). The primary objectives of bibliometric analysis involve recognizing, arranging, and examining the fundamental elements within a particular research domain (Alhosani and Nobanee, 2023). It is believed that this study, which subjects international studies on diversity management to bibliometric analysis, will make a significant contribution to researchers who want to conduct research on diversity management. Citation analysis was employed to pinpoint top journals, notable authors, and impactful articles, aiming to assist upcoming researchers in discovering noteworthy research articles, authors, and highlighted studies published in major journals associated with diversity management. Secondly, it is aimed to contribute to the field by using co-citation analysis.

2. MATERIALS AND METHOD

In this section, information will be provided on the purpose, method, data collection process and analysis of the study.

2.1 Purpose

This study aims to perform a bibliometric analysis of global articles on diversity management published from 1990 to 2023. Since the articles related to the subject in the WoS database were first published in 1990, articles from the period from today to 1990 could be scanned. The goal is to scrutinize developments in the field and offer future researchers new directions for their investigations. In line with this general purpose, the following questions are sought to be answered:

I. What is the present status of research on diversity management concerning publications, authors, journals, and other bibliometric trends (such as co-authorship and co-citation, etc.), and in what direction is it moving?

II- Which organizations stand out concerning the impact of their diversity management research?

III- Which countries and collaborative authorships contribute significantly to the productivity in the field of diversity management?

IV- Considering the findings, explore areas with limited research and propose future directions for research to achieve a comprehensive understanding of diversity management.

2.2. Research Method

The study makes use of bibliometrics in order to analyse the studies on diversity management in the journals listed in the Web of Science Core Collection (WoS) between 1990 and 2023 using bibliometric parameters. The WoS database is regarded as the most suitable for this bibliometric analysis since it encompasses numerous journals, articles, and authors, while also fulfilling the criteria for scientific quality through peer review. This analysis included articles published from 1990 to November 2023. "Diversity management", "relational demography", "demographic diversity", "workforce diversity", "cultural diversity" and "workgroup diversity" were used as keywords.

Boolean operations were performed with OR. Nevertheless, these different keywords have been employed interchangeably in earlier diversity research literature (Yadav and Lenka, 2023). The search was carried out in all languages in which the keyword occurred and by topic of all types of publications. A total of 15727 records were identified as a result of the analysis. We subsequently narrowed down the article

count to 4752 by applying the following WoS categories: Business, Management, Business Finance, Social Sciences Interdisciplinary, Economics, Sociology, Ethics, Social Issues, Ethnic Studies and Women's Studies. Only the research articles published in journals were selected. The analysis excluded articles published in languages other than English. Next, SSCI, ESCI, SCI-EXPANDED, A&HCI, BKCI-SSH and BKCI-S were selected in the Web of Science Index, leading to the inclusion of 3555 articles in the analysis. For the purposes of the study, data including the registration numbers of relevant publications, universities, authors, countries, publication years and journals were tabulated and interpreted. Then, Citation and Bibliographic Coupling and co-citation analyses were performed by Mapping Based on Bibliographic Data. The VOSviewer software package (Version 1.6.9) was used to create bibliometric maps and networks.

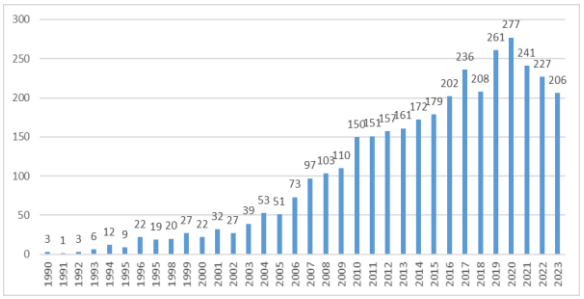
3. RESULTS

In this section, we explore trends in publications, noteworthy and impactful journals, countries, organizations, as well as analyses of citation, co-citation, and other bibliographic aspects within the 3555 articles published from 1990 to 2023.

3.1. Evolution of publications

In order to evaluate the current publication trend of diversity management, the publication trend was analyzed based on the total number of publications per year. In the past 34 years, a total of 3555 articles have been published in journals indexed in the WoS database. The oldest paper was published in 1990 and the annual number of publications remained below 100 articles per year until 2008. However, it can be observed that the number of articles published has increased almost every year. Since 2009, the number of articles per year has increased steadily, so the cumulative number of papers has increased rapidly. 2020 was the year in which the most articles were published with 277 articles. Several reasons can be mentioned for the increase in the number of articles published on the subject in the 2000s. The first of these is that the management of diversity has started to be perceived as a management idea apart from legal and ethical concerns. Another reason for this increase can be considered as the fact that when diversity is managed effectively, there is an increase in employee loyalty and satisfaction as well as in productivity in the organization (Davis et al., 2016; Guıllaume et al., 2017).

Table 1: Change in documents by year from 1990 to 2023



3.2. Productive articles

The aim of this section is to assess and chart the most impactful papers based on their level of productivity, as indicated by the number of citations they have received. Table 2 provides a catalog of the most prolific articles on diversity management from 1990 to 2023. As depicted in Table 2, Vertovec (2007) ranks first with 2766 citations. It is followed by Jehn (1997) with 1787 citations and Harrison (1998) with 1279 citations. The first nine papers have over 1000 citations.

Table 2: The most significant articles on diversity management

Authors	Citations
Vertovec (2007)	2766
Jehn (1999)	1787
Harrison (1998)	1279
Park (2001)	1260
Ely (2001)	1168
Lau (1998)	1149
Bowleg (2008)	1067
Fearon (2003)	1055
Harrison (2002)	962
Reagans (2001)	945
Bernerth (2016)	886
Erhardt (2003)	834
Richard (2000)	621
Stahl (2010)	571
Hinds (2005)	556
Shin (2007)	526
Nishii (2013)	516
Bell (2011)	508
Farh (1998)	501
Chatman (2001)	492

3.2.2. Cluster analysis of diversity management research articles

The network diagram illustrating the most productive papers in diversity management (Figure 1) reveals four primary clusters, with the respective papers listed in Tables 2a, 2b, 2c and 2d.

Table 2a: Analysis of Productive Articles Cluster 1.

	Author	Citations
Cluster 1	Chatman (2001)	492
	Hind (2005)	556
	Jehn (1999)	1787
	Stahl (2010)	571

Table 2b: Analysis of Productive Articles Cluster 2.

	Author	Citations
Cluster 2	Bell (2011)	508
	Harrison (2002)	962
	Reagans (2001)	945
	Shin (2007)	526

Table 2c: Analysis of Productive Articles Cluster 3.

	Author	Citations
Cluster 3	Erhardt (2003)	834
	Harrison (1998)	1279
	Richard (2000)	621

Table 2d: Analysis of Productive Articles Cluster 4.

	Author	Citations
Cluster 4	Ely (2001)	1168
	Lau (1998)	1149
	Nishii (2013)	516

Cluster 1 contains four papers. These are Chatman and Flynn (2001), Hinds and Mortensen (2005), Jehn et al. (1999) and Stahl et al. (2010). Cluster 2 contains four papers: Bell et al. (2011), Harrison et al. (2002), Reagans and Zuckerman (2001) and Shin et al. (2007). Cluster 3 contains three papers: Erhard et al. (2003), Harrison et al. (1998), and Richard et al. (2004). Cluster 4 contains three papers: Ely and Thomas (2001), Lau and Murnighan (1998) and Nishii (2013).

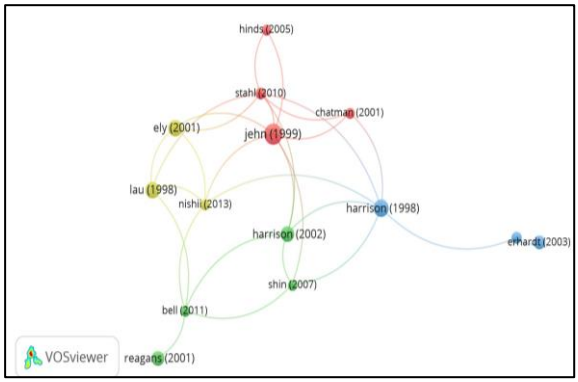


Fig. 1. The impactful clusters represented by five distinct colors: The most impactful articles on Diversity Management published between 1990 and 2023.

3.3. Analysis of author productivity and co-authorship

3.3.1. Most productive authors

Table 3 lists the authors with the highest productivity in the literature on diversity management from 1990 to 2023. Ranking was determined by a combination of the publication count (>1) and the number of citations. Syed Jawa is the most productive author in this field, contributing to eighteen papers in total. Lauring Jakop, ranking as the second with 17 publications, is followed by Avery Derek as the third most productive author 16 papers. Steven Vertovec leads as the author with the highest citation count, having 2958 citations across his four articles.

Table 3: The Most Productive Authors in Diversity Management Research

Author	Citations	Author	Total Publications
Vertovec, Steven	2958	Syed Jawad	18
Harrison, David A.	2241	Lauring Jakop	17
Price, Kenneth H.	2241	Avery Derek	16
Jehn, Karen A.	2229	Daan, van Knippenberg,	14
Neale Margaret	2221	Mckay Patrick	11
Northcraft Gregory B.	1787	Jehn, Karen A.	10
Daan, van Knippenberg,	1714	Tatlı Ahu	10
Lau, Dora C.	1620	Kulik Carol	9
Murnighan, J. Keith	1620	Ali Muhammad	9
Bell, Myrtle P.	1449	Richard Orlando	9
Chatman, Jennifer A.	1429	Yuka Fujimoto	9
Richard OC	1367	Nijkamp Peter	9

3.3.2. Analysis of co-authorship

Analyzing co-authorship is among the most thorough methods for examining scientific collaboration (Newman, 2001). Figure 2 shows the co-authorship network analysis. In VOSviewer, the criterion for the minimum number of documents per author was established at five, and the threshold for relevant citations was set at 25 to ensure that particularly pertinent articles are displayed. The diagram illustrated in Figure 2 contains nodes that represent authors, with arrows denoting connections between them. The size of the nodes indicates the number of journal articles the author has co-published. 73 out of 7192 authors met these criteria. Table 4 presents the authors with the greatest overall link strength in comparison to other authors. Table 4 and Figure 2 show the co-operation between authors. It can be argued that collaboration among authors in conducting research within the field of diversity management is still limited and the co-operation of different authors is needed.

Table 4: Co-Authorship in Diversity Management

Authors	Total link strength	Documents	Citations
Avery Derek	12	16	790
Mckay Patrick	11	11	673
Shemla Meir	8	6	297
Lauring Jakop	7	17	370
Selmer Jan	7	7	172
Greene Anne-Marie	6	6	89
Kirton Gill	6	6	89
Meyer Bertold	6	5	302
Tatlı Ahu	6	10	492
Juergen Wegge	6	5	130

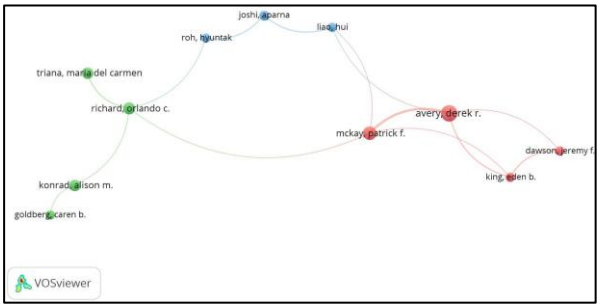


Fig. 2. The authors' collaboration network in diversity management

3.4. Analysis of Productivity Co-citation by journal and source

3.4.1. Most productive journal

1086 journals publishing on diversity management were analyzed. Journal productivity was assessed based on the quantity of published articles and the citation count, resulting in the identification of the top 10 most productive journals. Table 5 presents the count of diversity management studies published in these journals along with the corresponding number of citations. These journals publish articles in various fields. The journal that published the most articles is "Equality Diversity And Inclusion", followed by "International Journal Of Human Resource Management" with 84 articles and "International Journal Of Intercultural Relations" with 57 articles. The most impactful journals on the subject are mapped in Figure 3.

Table 5: Journals with the highest count of publications and citations

Source	Citations	Source	Published articles
Academy of Managemant Journal	8983	Equality Diversity and Inclusion	89
Organization Science	4438	International Journal of Human Resource Management	84
Administrative Science Quarterly	4276	International Journal of Intercultural Relations	57
Journal of Applied Psychology	4200	Journal of Business Ethics	50
Etnich and Racial Studies	3971	Academy of Management Journal	46
International Journal of Human Resource Management	3133	Group&Organization Management	44
Journal of Organization Behavior	2846	Journal of Applied Psychology	41
Group&Organization Management	2831	Journal of Organization Behavior	38
Journal of Business Ethics	2789	Human Relations	38
Personnel Psychology	2513	Ethnic and Racial Studies	35

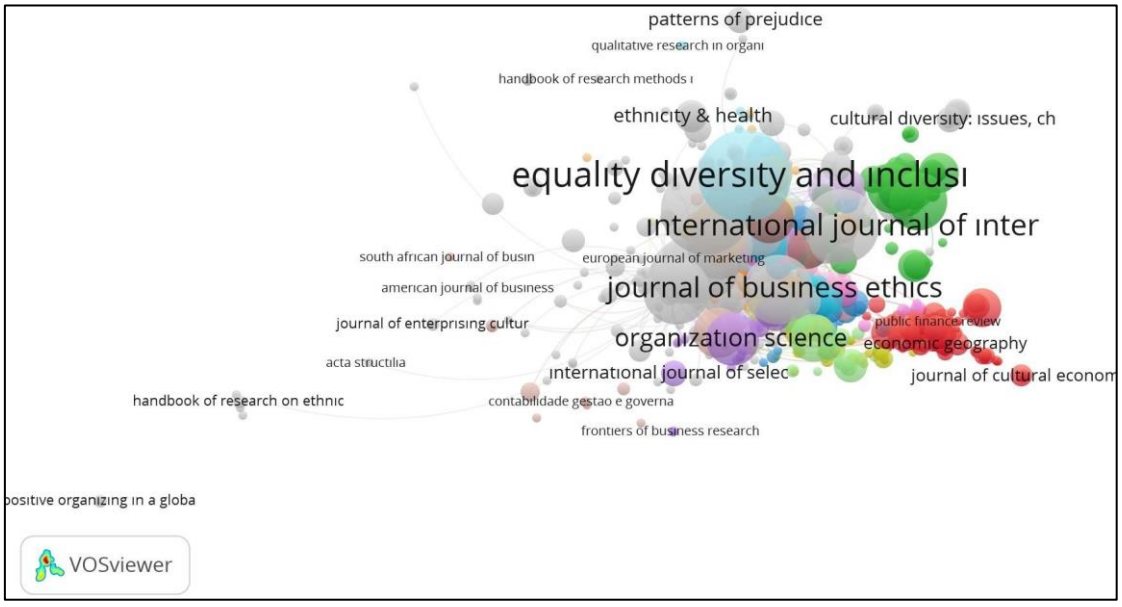


Fig. 3. Most productive journal

3.4.2. Analysis of Source Co-citation

Analyzing the co-citation of sources (journals) offers a more detailed perspective on the key areas of diversity management where the most citations are found, as shown in Figure 4. As a criterion, the minimum number of citations for a journal source was established at 25. Out of 55519 journal sources, 902 journal sources met this criterion. The source co-citation map displayed in Fig. 4 incorporates nodes representing the journal sources, and edges denote the connections between them. The edges signify that the journal sources are linked through citations. The size of the nodes indicates the total link strength between sources. According to this data, Ajad Management Journal, Journal of Applied Psychology, and Ajad Management Review hold the highest rankings based on source co-citation. The source co-citation analysis also produced the five main clusters displayed.

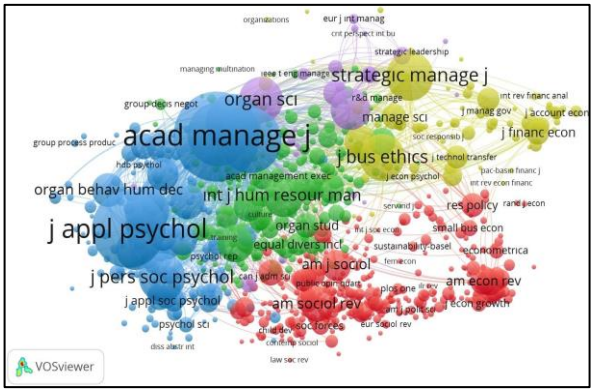


Fig. 4. Source Co-citation map

3.4.3. Productivity by organization

Table 6 provides the leading 10 organizations making contributions to diversity management research based on the number of citations. Stanford University is the most influential organization (with 5730 citations). Stanford University is followed by Rutgers State University (4433) and the University of Texas (3925).

Table 6: The Most Productive Organizations in Diversity Management Research

Organization	Citations
Stanford Universty	5730
Rutgers State University	4433
Texas University	3925
Illinois University	3650
Harvard University	3369
Oxford University	3358
Penn University	3135
Erasmus University	2419
Penn State University	2407
Northwestern University	2248
University of California, Berkeley	2103

3.5 Productivity by country and country Co-authorship

3.5.1. Most productive journal

Table 7 illustrates the countries with the highest productivity in diversity management research, considering both the frequency of publications and the citation count. The United States stands as the most impactful country with 1148 publications and 61127 citations, followed by the United Kingdom, which had 433 articles cited 13861 times. Australia, Canada, the Netherlands, and China come next in the ranking.

Table 7: The Most Productive Countries in Diversity Management Research

Country	Citations	Articles
USA	61127	1148
UK	13861	433
AUSTRALIA	9333	389
CANADA	9268	226
THE NETHERLANDS	7849	213
CHINA	6575	246
GERMANY	5019	222
FRANCE	3660	140
SWITZERLAND	3082	74
ITALY	2698	110

3.5.2. Country Co-authorship

Co-authorship among countries is another crucial form of scientific collaboration. To ensure that notably pertinent countries are displayed in VOSviewer, the threshold for documents per country was established at 5, and the number of citations at 20. The diagram in Figure 5 consists of nodes that represent countries and lines connecting countries to publications. The proximity of nodes indicates a higher frequency of collaboration between two countries. 59 out of 115 countries have reached this threshold and are ranked according to total link strength.

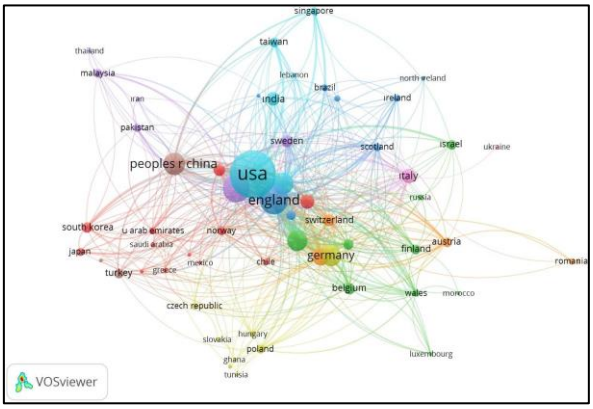


Fig. 5. Country Co-authorship map

3.6. Analysis of keywords and keyword co-occurrence

3.6.1. Keyword analysis

Keyword formation, which is the emergence of keywords in a journal article, offers insights into the primary themes in diversity management research. These primary themes are outlined in Table 8 which shows that in selected articles published between 1990 and 2023, the most frequently cited keyword is "cultural diversity" with 409 citations, followed by "diversity" with 401 citations. The third and fourth most frequently used keywords are "diversity management" and "gender", respectively.

Table 8: Themes of diversity management by keyword

Keyword	Occurrence
Cultural Diversity	409
Diversity	401
Diversity Management	302
Gender	117
Multiculturalism	107
Culture	93
Ethnicity	66
Workforce Diversity	62
Relational Demography	57

3.6.2. Analysis of Keyword Co-occurrence

Figure 6 illustrates the analysis of keyword co-occurrence and its connections. The threshold for the keyword co-occurrence analysis is established at 20. The proximity of the nodes to each other indicates the strength of the association between keywords. The line connecting two nodes signifies that the respective keywords are employed in the same article. The larger node reflects the frequency with which the associated keywords appear together in more than one article. There are 6 different clusters with distinct colors. The clusters are defined by the research areas where these keywords commonly appear together.

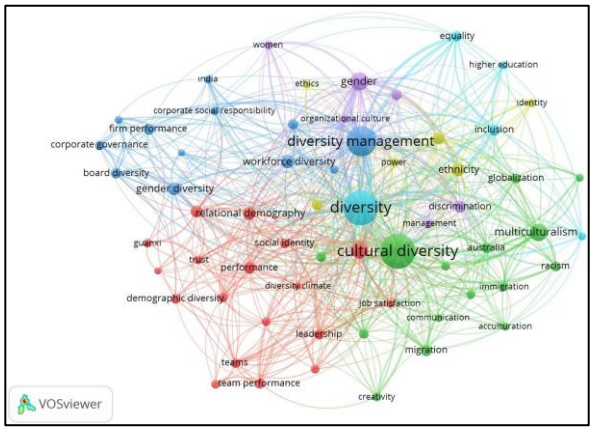


Fig. 6. Keyword co-occurrence network map

4. DISCUSSION

Although diversity management is a subject of extensive debate in developing nations, there has been only one bibliometric analysis conducted in the last three decades that provides a comprehensive review and summary of the literature, advancements, prevailing trends, and prospective directions (Yadav & Lenka, 2023). The findings of this study can help future studies to easily identify the most impactful articles, prominent journals, key authors, and seminal works published in the field as well as to pinpoint research gaps and gain new insights.

This bibliometric analysis revealed the overarching trends and discursive difficulties within Diversity Management literature, offering additional insights in comparison to prior literature reviews (Tatli and Ozbilgin, 2012; Jansen and Searle, 2021; Yadav and Lenka, 2020). The objective of this study is to examine the developments in diversity management research and present future researchers with novel avenues for exploration in this field.

The bibliometric analysis undertaken in this study showed various implications for diversity research, enabling the recognition of prevalent research gaps and indicating potential directions for future investigations. Firstly, this study indicates a consistent growth in the number of publications addressing diversity management, particularly notable since 2010. As mentioned above, this finding can be attributed to several reasons. First of all, the general belief that diversity management provides various benefits to businesses (Qin et al., 2014) and the fact that workplaces have become increasingly heterogeneous as a result of the phenomenon of demographic change with globalization changing the workforce of most nations in the world (Aldaibat et al., 2019; Qin et al., 2014) can be counted as reasons for the topic to attract more attention. In addition, from a corporate social responsibility perspective, given that managing diversity has become important for organizations (Alhosani & Nobanee, 2023; McCrea & Zhu, 2019), the importance attached to diversity has increased as a result of all these.

The results of the keyword analysis support this finding. Cultural diversity, diversity, diversity management, gender and multiculturalism were found to be the most important themes related to the topic. Secondly, the examination of articles showed that the three most prolific articles, by citation count, were Vertovec (2007), Jehn (1999), and Harrison (1998). Thirdly, the bibliometric analysis pinpointed the authors with the greatest impact in the field, guiding other researchers in choosing relevant research areas. The authors with the highest productivity are Syed Jawad, Lauring Jakop, and Avery Derek. The co-

authorship analysis showed the co-operation that exists in three separate clusters.

Accordingly, it reveals that co-operation among authors in conducting research in the field of diversity management is still limited and we recommend further research in the field of diversity management with the co-operation of different authors. Fourthly, the examination of journals presented us with the most pertinent and productive publications in the field, guiding future researchers in diversity management to choose the most relevant journals. The most productive journals are “Equality Diversity And Inclusion”, “International Journal Of Human Resource Management and International Journal Of Intercultural Relations”. The most cited journals are “Academy of Management Journal”, “Organization Science and Administrative Science Quarterly”.

This clearly shows that the topic of diversity management is attracting increasing interest in research on organizational behavior, human resources and intercultural relations. Nevertheless, the source co-citation analysis presented a conflicting outcome in comparison to the previously discussed most productive journals. Ajad Management Journal, Journal of Applied Psychology, and Ajad Management Review are the leading journals in terms of source co-citation. This suggests that existing journals need to further expand research on diversity management to improve their source co-citation. It was also found that a significant portion of diversity management research is carried out in developed nations including the USA, the UK, Australia and Canada while, in developing countries, diversity research is still in its infancy. Only China, a developing country, is among the top 10 productive countries. Therefore, future researchers should specifically explore the issue of diversity management within the context of developing countries. Country co-authorship shows that the USA, UK, Germany and China are the main clusters, with the USA, India, Singapore and Taiwan being the most active in country co- authorship compared to other countries. Therefore, more research needs to be conducted in greater co-operation between developed and developing countries. Moreover, further studies, the data can analysed by R program and obtained articles from Pubmed or Scopus sources. Also, evaluating the relationship between "diversity management" and/or "leadership", "job satisfaction", "organizational commitment", "organizational justice" can be investigated via bibliometric analysis.

5. CONCLUSION

The demographics of the labor force, consumers and suppliers of the business continues to change rapidly. In order to adapt to these changes, businesses also want to manage diversity in their favor due to legal obligations and ethical concerns. Managers and academicians who are aware of the various advantages of effective diversity management have started to work on the issue of managing diversity. Nevertheless, the evolution of knowledge in this domain and its interconnections lack clarity. This study enhances the literature by presenting a thorough bibliometric review of diversity management studies. It emphasizes the most productive articles, authors, journals, institutions, sponsors, and countries, along with conducting keyword analysis. The present study demonstrated a gradual increase in the number of journal articles on the topic, with a significant surge noted since 2010. Cultural diversity, diversity and diversity management are the main themes and keywords frequently used in the studies on the topic. Five clusters were identified according to the citation analysis. Developed countries were found to be the most influential in diversity management research.

This study has several limitations. Firstly, since the data is only available from the WOS database the bibliometric analysis does not include relevant articles that are only available in other databases. Secondly, this study only included articles in English, which likely skews the results in favor of specific countries. Thirdly, this study focuses exclusively on articles in peer-reviewed journals, potentially limiting the scope of the analysis. During the article screening process, certain research contributions, including editorials, books, and conference proceedings, were also excluded. As a fourth limitation, citation analyses take into account the citation counts of articles. This approach is prone to bias in favor of previously published articles, given that these articles have more time to collect citations compared to newly published ones.

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The Effect of Digital Literacy Levels of Health Managers and Employees on Job Satisfaction: The Case of Sakarya

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ABSTRACT

Increasing internet usage enables individuals to easily access the information they are searching for. This situation brings up the concept of digital literacy. Healthcare institutions are also increasingly keeping up with this internet age. In this study, it was tried to reveal the difference between the socio-demographic characteristics of healthcare managers and employees working in healthcare institutions and the lower dimensions of digital literacy and job satisfaction. This study also aims to investigate the impact of digital literacy lower dimensions on job satisfaction's lower dimensions and make suggestions. The research was carried out with the participation of health managers and employees consisting of 396 people working in Sakarya University Training and Research Hospital. According to the research results, a low-level positive relationship was found between digital literacy lower dimensions and internal and external satisfaction ($p<0.005$), but no positive or negative effect was found ($p>0.001$). In the research, it was determined that the lower dimensions of digital literacy do not differ according to gender, marital status and age, but vary according to the position in the institution. While there is a significant difference between internal satisfaction, which is a lower dimension of job satisfaction, and gender, age and position in the institution, there is a significant difference between external satisfaction and only the position in the institution. It is thought that the offered service will be provided more efficiently and effectively by eliminating the deficiencies determined as a result of the analysis in the institution where the study is conducted.

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1.INTRODUCTION

1.1. Digital Literacy

While it was difficult and expensive to obtain the needed data in the past, today, with the development of technology and science, this situation has become both easier and cheaper. This has led to the widespread use of the internet. People can easily access the data they need thanks to the internet. However, there is a question mark in minds whether the data obtained is reliable or not. Whether the data obtained from the internet is reliable or not can be understood by having a good level of literacy. This situation has introduced the concept of digital literacy to us. As time progresses, rapid developments in technology have provided new opportunities for innovations, learning and digital opportunities in the field of education (Kop and Fournier, 2010:2). There is a lot of information in digital media. The diversity of digital technology has required people to constantly improve their skills in accessing information. Literacy levels come to the fore in order to understand and use the accuracy of the information obtained from the digital environment, and this situation reveals the concept of digital literacy.

The word digital is a French word meaning "numerical" and "electronic display of data on a screen" and is derived from the word "digital" (Url-1). Digital literacy appeared for the first time in the work named "Digital Literacy" published by Paul Gilster in 1997 (Kum, 2022:33). Paul Gilster defined digital literacy as "The ability to understand and use information from different sources via computers."

According to Martin (2008), acquiring knowledge, methods, attitudes and individual qualities and using the ability to plan, realize and evaluate situations in life by using these qualities is called digital literacy. This definition includes a lack of creative functions (Reddy et al., 2020: 18).

Bawden (2008) stated that traditional literacy has also been digitized, that is, it has been made suitable for digital environments, and digital literacy is an insight into technology by using technological tools and equipment other than cognitive.

In the study titled "Digital Literacy: Determining Boundaries and Identifying Partners", digital literacy is expressed as the ability to research content through both information technology and the internet, use the content found after evaluating it and share it with the environment (Walton, 2016:1).

Digital literacy consists of a combination of three skills: technical dimension, cognitive dimension and socio-emotional dimension (Üstündağ et al., 2017:21; Nawaz and Kundi, 2010:20). Wan Ng developed three dimensions for digital literacy. The dimensions are technical, cognitive and social-emotional, respectively (Onursoy, 2018:994). Having both technical and functional skills to effectively use information and communication technologies is the first dimension of digital literacy, the technical dimension (Tuncay, 2021:24). The cognitive dimension, which is the second dimension of digital literacy, is the skills that one must have in order to search for information critically on the internet by being informed about moral and legal obligations, and to analyze and evaluate the information obtained (Tuncay, 2021: 24; Doğan, 2022:18). Considering ethical and legal obligations, the skill required for the safe use of the internet, which is used in communication, socialization and access to information, is expressed as the social-emotional dimension (Tuncay, 2021:24).

Digital literacy has an important place in people's communication with each other, in business life and in all public transactions, leaving aside traditional methods and adopting the phenomenon of digitalization, which is the need of the age (Özkaya and Erat, 2022:253). With digitalization, there is a lot of information in our world, which we call the information age, and its number increases with every passing second. It has become important to raise people with a high level of digital literacy in increasing the amount of information and accessing the needed correct information (Öztürk and Budak, 2019:159).

The concept of digital literacy becomes important for employees as digital technologies are integrated into business life and daily activities. The concept and skills of digital literacy have been emphasized by the OECD, international organizations, governments and experts as important both in workplaces and in society and economic life (Bejaković and Mrnjavac, 2020: 923).

The World Health Organization (WHO) defines health as "a state of complete mental, physical and social well-being and not merely the absence of disease or infirmity."In the Universal Declaration of Human Rights, the importance of health is expressed as "no economic necessity shall hinder human health". Health services are one of the most important sectors within economic systems. All countries in the world allocate a large share of their budget to provide services in the health sector. The lack of substitutes for health services made it necessary for the employees to personally adapt to technological developments and renew themselves (Erbir, 2021:347).

While the possibilities offered by technology were limited in the past, nowadays with the development of technology, digitalization processes have caused great changes in business life. Technological innovations and changes in the work life of employees in all sectors have also been effective in the health sector (Eden et al., 2019:2). Health institutions use technological developments to increase the reliability of the service provided, the quality of patient care and treatment (Brown et al., 2020:452). The comprehensive and complex structure of health institutions provides both

advantages and disadvantages to the digital institution. First of all, it is thought that health institutions with a complex structure will make important contributions to facilitate the work done (Tüfekçi et al., 2017:147).
With digital transformation, patient records, recording of observation results in digital fields, etc. is a professional requirement. One of the most important conditions of mastering these processes is digital literacy (Akalın and Veranyurt, 2020:133).
The ability of healthcare workers to type and enter information into the system with the help of a keyboard and to use a mouse is considered an example of digital literacy (Kuek and Hakkennes, 2021:593).
Since there have not been enough studies revealing the digital literacy levels of healthcare professionals and managers in our country, this study will try to partially fill the gap in the literature.

1.2. Job Satisfaction

Business life adds new values and different emotions to the person every day (Eğinli, 2009:36). The main factor that determines all the feelings and thoughts that people show in their business life is job satisfaction (Buyrukoğlu, 2022:3). The most used definition of job satisfaction was made by Locke (1976). He defined job satisfaction as "a pleasant or positive state of mind resulting from the value one attaches to one's job or work experiences" (Locke, 1976:27). The concept of job satisfaction took its place in the management and business literature with the book "Work Motivation" written by Herzberg and his friends in 1959 (Lacy and Sheehan, 1997:305).Davis's definition of job satisfaction has been used most in studies on job satisfaction. Davis defined job satisfaction as the state of individuals being satisfied or dissatisfied with their job (Davis, 1998:45).People spend most of their daily life at work. The job that is worked affects the person economically and psychologically. The fact that the society can be more healthy, happy and productive is related to the high job satisfaction of the people (Mutlupoyraz, 2010:22).
Health institutions are complex organization that provides 24/7 service, includes many occupational groups, have a Matrix organizational structure, has labor-intensive technology and is oriented to human life (Arıcıoğulları, 2021:29; Tekingündüz et al., 2015:28). Considering the quality of the service provided in health institutions and customer satisfaction, the attitudes and behaviors of health workers towards work emerge as a serious issue (Hoş and Oksay, 2015:2). Because the concept of health and disease directly affects human health. For this reason, job satisfaction and motivation of health workers are important (Ürtürk, 2020:73).
Factors affecting the job satisfaction of healthcare workers are listed as objective decision-making on promotions and salaries, rational distribution of tasks, fair distribution of shifts, and impartial attitude of the management (Kitsios and Kamariotou, 2021:2). The environment and conditions in which healthcare professionals work affect their job satisfaction. Having a comfortable working environment, allowing the staff to rest, having the equipment and consumables used and being suitable for use, and having good teamwork and relationships with other employees increase the job satisfaction of employees (Shopman et al., 2016:6).
Managers in health institutions play an important role for the institution to serve effectively and efficiently. Therefore, good management of the institution is ensured by managers being responsible and valuing their employees (Soysal and Sezgin, 2018:184). When health personnel are not satisfied with their work and this situation is not taken into account by the manager, employees see their work as worthless, simplify their work and become alienated from their work (Aşık, 2010:45-46). If the health workers who experience job dissatisfaction disrupt or slow down their work, the workload of other employees increases in order to maintain the service uninterruptedly (Ürtürk, 2020:63).
The aim of this study is to reveal whether there is a difference between the socio-demographic variables of managers and employees working in health institutions and the lower dimensions of digital literacy and job satisfaction. Another aim is to reveal whether the lower dimensions of the digital literacy level affect the lower dimensions of job satisfaction, and if so, which lower dimensions affect it, and to make suggestions accordingly.
There are not enough studies in the literature in which the terms "digital literacy and job satisfaction" are used together. With this study, the gap in the literature will be filled to some extent and the results will provide feedback for the health institution, helping to eliminate the deficiencies and increase the service quality of the institution.

2. MATERIALS AND METHOD

In this study, the survey method, one of the data collection tools, was used to reveal the effect of digital literacy on job satisfaction. The survey forms are divided into 3 parts. The survey forms consisting of 45 questions are listed as "Personal and Demographic Information Form", "Digital Literacy Scale" and "Minnesota Job Satisfaction Scale".
The digital literacy scale was developed by Ng in 2012 (Ng, 2012:1069). The scale, which was applied in a study in Australia, was translated from English to Turkish and its validity and reliability analysis was done by Hamutoğlu et al. (2016). The Digital Literacy Scale consists of 4 lower dimensions named attitude, technique, cognitive and socio-emotional including 17 questions.
The Minnesota Satisfaction Questionnaire was developed by Weis et al. in 1967. The scale consisted

of long questions of 100 ones, and then it was converted into short questions of 20 ones. Minnesota Job Satisfaction Scale was adapted from English to Turkish by Aslı Baycan Binark in 1985.

The Cronbach Alpha reliability coefficient was used to reveal the internal consistency, also known as the reliability, of the digital literacy and job satisfaction scales used in this study to achieve the determined goal. The Cronbach Alpha value of the digital literacy scale was 0,937. The attitude lower dimension has the highest rate among the lower dimensions with a reliability value of 0.921. The technical lower dimension reliability value was found to be 0.879, the cognitive lower dimension reliability value was 0.601 and the socio-emotional lower dimension reliability value was 0.517. The job satisfaction scale consists of 2 lower dimensions, internal and external, and 20 statements. The Cronbach alpha value of the scale was found to be 0.906. Internal satisfaction reliability value was found to be 0.854 and external satisfaction reliability value was 0.840.

The universe in this study is 2962 people including health managers, doctors, nurses and midwives working in the Training and Research Hospital in Sakarya Province. Since it was not possible to reach all of the health managers and employees who formed the universe of the research, the study was continued with the sample group determined in the universe. The sample of the study was determined according to the snowball sampling method, which is one of the probability-free sampling methods. The sample group consists of 396 people, including 76 health administrators, 120 doctors, 111 nurses and 89 midwives.

With the digitalizing age, studies in the digital field have increased in recent years. Some hypotheses were created by bringing together the basic topics of this study. In line with the research purpose and model, 5 hypotheses have been developed and the created hypotheses are listed below, respectively.

Hypothesis 1: The lower dimensions of digital literacy of health managers and employees show a significant difference according to socio-demographic characteristics.

H1a : The lower dimensions of digital literacy of health managers and employees show a meaningful difference according to gender .

H1b : The lower dimensions of digital literacy of health managers and employees show a meaningful difference according to marital status.

H1c : The lower dimensions of digital literacy of healthcare managers and employees show meaningful differences according to age .

H1d: The lower dimensions of digital literacy of healthcare managers and employees show a meaningful difference according to the position in the institution.

Hypothesis 2: There are significant differences between the socio-demographic characteristics of health managers and employees and the internal lower dimension of job satisfaction.

H2a : The internal lower dimension of job satisfaction of health managers and employees shows a meaningful difference according to gender.

H2b : The internal lower dimension of job satisfaction of health managers and employees shows a meaningful difference according to marital status.

H2c : The internal lower dimension of job satisfaction of health managers and employees shows a meaningful difference according to age.

H2d : The internal lower dimension of job satisfaction of health managers and employees shows a meaningful difference according to the position in the institution.

Hypothesis 3: There are significant differences between the socio-demographic characteristics of health managers and employees and the external lower dimension of job satisfaction.

H3a : The external lower dimension of job satisfaction of health managers and employees shows a meaningful difference according to gender.

H3b : The external lower dimension of job satisfaction of health managers and employees shows a meaningful difference according to marital status.

H3c : The external lower dimension of job satisfaction of health managers and employees shows a meaningful difference according to age.

H3d : The external lower dimension of job satisfaction of healthcare managers and employees shows a meaningful difference depending on the position in the institution.

Hypothesis 4: The lower dimensions of digital literacy of health managers and employees have a positive effect on the internal lower dimension of job satisfaction.

Hypothesis 5: The lower dimensions of digital literacy of health managers and employees have a positive effect on the external lower dimension of job satisfaction.

The data collected for the research was analyzed using the SPSS 27.0 package program. "Independent Sample T-Test" was used to reveal the differences between two groups, and "One Way ANOVA Test" was used to reveal the differences between three or more groups. Tukey Test, one of the Post-Hoc tests, was used to determine the source of the difference. Correlation Analysis was used to determine the relationship between the variables in the research, and Multiple Regression Analysis was used to determine the effect.

3. RESULTS

The percentage (%) and frequency distribution of the participants are given in the Table 1.

Table 1. Distribution of socio-demographic variables of the sample group

Variables		F	%
Gender	Female	283	71.5
	Male	113	28.5
Marital status	Single	165	41.7
	Married	231	58.3
Age	21-25	78	19.7
	26-30	106	26.8
	31-35	74	18.7
	36-40	44	11.1
	41 and over	94	23.7
Position in the Institution	Hospital Management	76	19.2
	Doctor	120	30.3
	Nurse	111	28.0
	Midwife	89	22.5

As a result of the analysis, most of the participants in the study are women and married. Considering the age status, most of the participants in the study are between the ages of 26-30. Most of the participants in the study were doctors, followed by nurses, midwives and hospital management, respectively.

Table 2. Comparison of lower dimensions of digital literacy and job satisfaction of healthcare managers and employees based on socio-demographic variables

		Digital Literacy				Job Satisfaction	
		Attitude	Socio-Emotional	Technical	Cognitive	Inner Satisfaction	External Satisfaction
Variables	**n**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**
Gender							
Male	113	4.19±0.83	3.66±0,85	3.85±0.77	3.69±0.90	3.74±0.62	3.32±0.87
Female	283	4.16±0.66	3.83±0.81	3.82±0.69	3.71±0.80	3.57±0.62	3.18±0.77
Statistical analysis		t: 0.364	t: -1.867	t: 0.404	t:-0.168	t: 2.444	t: 1.572
Possibility		0.716	0.063	0.686	0.867	**0.015***	0.117
Marital Statüs							
Single	165	4.13±0.73	3.75±0.88	3.80±0.74	3.74±0.87	3.56±0.63	3.24±0.79
Married	231	4.19±0.70	3.81±0.78	3.84±0.69	3.67±0.80	3.65±0.62	3.21±0.81
Statistical analysis		t: -0.738	t: -0.654	t: -0.554	t: 0.738	t: -1.130	t: 0.337
Possibility		0.461	0.514	0.580	0.461	0.184	0.736
Age							
21-25	78	4.17±0.50	3.68±0.78	3.87±0.54	3.83±0.65	3.68±0.59	3.35±0.73
26-30	106	4.23±0.60	3.91±0.80	3.91±0.71	3.67±0.93	3.59±0.60	3.15±0.72
31-35	74	4.25±0.71	3.93±0.75	3.86±0.78	3.80±0.89	3.45±0.59	3.09±0.81
36-40	44	4.06±0.93	3.72±0.95	3.86±0.77	3.65±0.90	3.56±0.74	3.21±0.93
41 and over	94	4.06±0.84	3.64±0.84	3.65±0.75	3.56±0.75	3.74±0.64	3.30±0.86
Statistical analysis		F:1.249	F:2.299	F: 1.923	F: 1.460	F:2.681	F: 1.464
Possibility		0.290	0.058	0.106	0.214	**0.031***	0.213
Position							
Hospital Management	76	4.38±0.55	3.95±0.65	3.97±0.60	3.81±0.76	3.76±0.58	3.55±0.67
Doctor		4.09±0.85	3.63±0.86	3.67±0.79	3.54±0.94	3.60±0.68	3.07±0.87
Nurse	120	4.17±0.53	3.90±0.76	3.94±0.59	3.80±0.75	3.45±0.65	3.10±0.80
Midwife	111	4.07±0.79	3.72±0.93	3.78±0.80	3.70±0.79	3.71±0.52	3.29±0.73
	89	4.16±0.71	3.79±0.82	3.83±0.71	3.70±0.83	3.61±0.63	3.22±0.80
Statistical analysis		F:3.281	F: 3.347	F: 4.000	F: 2.560	F:4.599	F: 6.813
Possibility		**0.021***	**0.019***	**0.008***	0.055	**0.004***	**0.001***

*p<0.05, SD: Standard Deviation

In the findings in Table 2, the participants' attitude lower dimension (t: 0.364; p > 0.05), socio-emotional lower dimension (t: -1.867; p> 0.05), technical lower dimension (t: 0.404; p> 0.05) and cognitive lower dimension (t:-0.168; p>0.05) were found to have no statistically significant difference according to gender variable. In this case, H1a hypothesis was rejected.

The findings in Table 2, it was determined that the averages of the answers given to the digital literacy lower dimensions did not differ statistically according to marital status and age variables (p>0.05). In this case, hypotheses H1b and H1c were rejected.

The averages of the answers given to the surveys by the health managers and employees in the research were compared according to the position variable in the institution. Depending to the analysis results, it was determined that the cognitive lower dimension (F: 2.560; p>0.05) did not show a significant difference depending on the position variable in the institution.

Attitude lower dimension (F:3.281; p<0.05), socio-emotional lower dimension (F:3.347; p<0.05) and technical lower dimension (F:4.000; p<0.05) according to position groups in the institution It was found that there was a significant difference. To determine the source of the difference, the Tukey test, one of the post-hoc tests, was used. According to the Tukey test, it was concluded that the average of the answers given by those in hospital management positions in the attitude lower dimension was significantly higher than the average of the answers given by employees in other positions (p<0.05). In the socio-emotional lower dimension, it was concluded that the average of the answers given by employees in hospital management positions was significantly higher than the average of answers given by employees in doctor positions (p <0.05). In the technical lower dimension, it was concluded that the average of the answers given by hospital managers and nurses was significantly higher than the average of the answers given by physicians (p <0.05). Hypothesis H1d was partially accepted.

Participants' internal satisfaction levels differed according to gender (t: 2.444; p<0.05). When the source of the differences was examined, it was found that men's internal satisfaction levels were higher than women's (p<0.05). Hypothesis H2a was accepted. However, it was determined that external satisfaction did not differ according to gender (t: 1.572; p>0.05). Hypothesis H3a was rejected.

Participants' internal satisfaction (t: -1.130; p>0.05) and external satisfaction (t: 0.337; p>0.05) levels did not differ according to marital status. H2b and H3b hypotheses were rejected.

According to the analysis results, the internal satisfaction levels of the participants differed according to the age variable (F:2.681; p<0.05). When the source of the differences were examined, it was determined that the answer averages of participants aged 41 and over were higher than the answer averages of participants aged 31-35 (p <0.05). Hypothesis H2c was accepted. It was determined that the age variable did not differ on external satisfaction (F:1.464; p>0.05). Hypothesis H3c was rejected.

According to the findings, it was determined that the participants' internal satisfaction (F:4.599; p<0.05) and external satisfaction (F:6.813; p<0.05) levels differed significantly depending on the position variable in the institution. When the source of the differences were examined, it was determined that the internal and external satisfaction levels of those in hospital management positions were higher than those in other positions (p>0.05). Hypotheses H2d and H3d were accepted.

Table 3.Correlation analysis between participants' lower dimensions of digital literacy and internal satisfaction

N: 396	Inner Satisfaction	Attitude	Socio-Emotional	Technical	Cognitive
Inner Satisfaction	1	r : 0.205* p : 0.000	r : 0.157* p : 0.001	r : 0.192* p : 0.000	r : 0.178* p : 0.000

*P<0.05

The findings in Table 3, show the correlation between the lower dimensions of digital literacy and internal satisfaction of health managers and employees. It was revealed that there was a low level of positive relationship between internal satisfaction and attitude lower dimension (r: 0.205; p: 0.000). It has been determined that there is a low-level positive relationship between inner satisfaction and the socio-emotional lower dimension. (r: 0.157; p: 0.001). It was determined that there was a low level of positive correlation between internal satisfaction and the technical lower dimension (r: 0.192; p: 0.000). It was determined that there was a low level of positive correlation between inner satisfaction and cognitive lower dimension (r: 0178;p:0.000).

Table 4. Correlation analysis between participants' digital literacy lower dimensions and external satisfaction

N: 396	External Satisfaction	Attitude	Socio-Emotional	Technical	Cognitive
External Satisfaction	1	r : 0.147* p : 0.002	r : 0.131* p : 0.005	r : 0.160* p : 0.001	r : 0.138* p : 0.003

*p<0.01

Table 4 shows the correlation between digital literacy lower dimensions and external satisfaction. It was determined that there was a low level positive relationship between external satisfaction and the attitude lower dimension (r: 0.147; p: 0.002). It was determined that there was a low-level positive relationship between external satisfaction and the socio-emotional lower dimension (r: 0.131; p: 0.005). It was determined that there was a low level positive relationship between external satisfaction and the technical lower dimension (r: 0.160; p: 0.001). It was determined that there was a low-level positive relationship between external satisfaction and the cognitive lower dimension (r: 0.138; p: 0.003).

Table 5. Multiple regression analysis of the effect of digital literacy lower dimensions on intrinsic satisfaction

Independent variables	Dependent Variable: Intrinsic Satisfaction						
	B.	Std. error	Beta (β)	T	p	Tolerance	VIF
Still	***2.773***	0.193		***14.353***	0.000		
Attitude	0.106	0.069	0.121	1.540	0.124	0.397	2.517
Socio Emotional	0.012	0.052	0.015	0.228	0.820	0.531	1.883
Technical	0.049	0.072	0.056	0.688	0.492	0.364	2.744
cognitive	0.046	0.054	0.060	0.844	0.399	0.476	2.103
MODEL							
R	**R2 -**	**Adjusted R 2**		**F**	**p**	**Durbin-Watson**	
0.221	0.049	0.039		5.002	0.000	1.708	

According to the results of the multiple regression analysis between the independent and dependent variables in Table 5, a low degree of positive and statistically significant relationship was found between intrinsic satisfaction and the lower dimensions of digital literacy (R : 0.221; p<0.001). The model established in this relationship turned out to be significant and valid. According to the findings that emerged as a result of the analysis, the attitude lower dimension (β: 0.121; p>0.001), socio-emotional lower dimension (β: 0.015; p>0.001), technical lower dimension (β: 0.056; p>0.001), and cognitive lower dimension (β: 0.060; p>0.001) It was found that there was no effect on internal satisfaction. H3 hypothesis was accepted.

Table 6. The effect of digital literacy lower dimensions on extrinsic satisfaction multiple regression analysis

Independent variables	Dependent Variable Extrinsic Satisfaction						
	B.	Std. Mistake	Beta (β)	T	p	Tolerance	VIF
Still	**2.400**	**0.249**		**9.645**	**0.000**		
Attitude	0.048	0.089	0.043	0.546	0.585	0.397	2.517
Socio-Emotional	0.038	0.067	0.038	0.563	0.574	0.531	1.883
Technical	0.093	0.092	0.083	1.010	0.313	0.364	2.744
cognitive	0.033	0.070	0.034	0.477	0.634	0.476	2.103
MODEL							
R	**R2 -**	**Adjusted R 2**	**F**	**p**	**Durbin-Watson**	**R**	**R2 -**
0.172	0.029	0.020	2.966	0.020	1.619	0.172	0.029

According to the results of the multiple regression analysis between the independent and dependent variables in Table 6, a low-level positive and statistically meaningful relationship was found between extrinsic satisfaction and the lower dimensions of digital literacy (R : 0.172; p<0.05). The model established in this relationship turned out to be significant and valid. According to the findings that emerged as a result of the analysis, the attitude lower dimension (β: 0.043; p>0.001), socio-emotional lower dimension (β: 0.038; p>0.001), technical lower dimension (β: 0.083; p>0.001) and cognitive lower dimension (β: 0.034; p>0.001) ıt was found that there was no effect on external satisfaction. H4 hypothesis was accepted.

4. DISCUSSION

Health institutions are labor-intensive businesses that provide 24/7 service and the latest technologies are used. Since human health is at the forefront, errors are not allowed in the service. Providing uninterrupted, complete and error-free service within this intensity is possible with a high level of job satisfaction. Job satisfaction is the positive feelings of employees in an organization towards their job. The higher job satisfaction level of an employee resulted in the higher contribution to the organization.

When health institutions, where information is used extensively, provide services with false information, it can cause mistakes that are difficult and impossible to reverse. In order to avoid this situation, every obtained information should be evaluated critically and provided with good information literacy. All of these have introduced the concept of digital literacy.

In this study, no statistically significant difference was found when the average answers given by the participants to the lower dimensions of digital literacy were evaluated according to gender. This situation is explained by the fact that the male and female employees participating in the research know how to evaluate digital information. In the study conducted by Aksoy et al. (2021), it was revealed that there is no significant difference between the digital literacy level

and the gender variable. In the study administer by Yılmaz et al. (2020) on participants studying in the field of health, it was revealed that digital literacy did not differ according to gender. Some studies have found that women's digital literacy levels are lower than men's (Acar, 2015; Özerbaş and Kuralbayeva, 2015). In the literature, the results between the lower dimensions of digital literacy and gender may vary depending on the sample group to which the study is applied.

In this study, no significant difference was found between the marital status of the participants and the average answers they gave to the technical, attitude, socio-emotional and cognitive dimensions which were the lower dimensions of digital literacy. In the study status by Yeşildal (2018), there was a significant difference between the mean answers given to the attitude, technical and socio-emotional lower dimensions of digital literacy and marital status, while there was no difference in the cognitive dimension. According to the study conducted by Ağaç (2020), it was determined that there was a significant difference between digital literacy and marital status, and that single people's digital literacy levels were higher than married people. The reason why being married or single has no effect on the research results can be attributed to the fact that they know where and how they use technological devices and are more conscious than in the past.

According to the conclusion of this work, no significant difference was found between age and lower dimensions of digital literacy. In the study carried out by Aksoy et al. (2021), there is a significant difference between the technical and socio-emotional dimensions and the age variable, which are the lower dimensions of digital literacy, while there is no significant difference in attitude and cognition. In the study conducted by Alipur and Pyandeh (2022) on healthcare professionals working in a training and research hospital, it was establish that there was no meaningful difference between the digital literacy levels of the employees and the age variable. Some studies have found a difference between age and digital literacy (Carrington and Robinson, 2009, Marsh et al. 2019). According to the results of the study, the reason why the age variable is ineffective can be shown as the fact that everyone, young and old, has kept up with technological life and started using it in every field. There is no fixed result in the literature and it may vary depending on the place where the study is applied.

When the answer averages of healthcare managers and employees participating in the research to the lower dimensions of digital literacy are evaluated according to position groups in the institution, it is observe that there is a meaningful difference. The difference occurred in the hospital management position in the attitude dimension, socio-emotional dimension, and cognitive dimension. The cause for this situation can be clarified by the fact that hospital managers use information and communication technologies more than doctors, nurses and midwives due to their working conditions. In their study by Oo et al. (2021) on healthcare professionals working in a hospital providing tertiary healthcare services, it was observed that doctors had more information and communication technology literacy than nurses. In the study conducted In the study carried out by Erbir (2021), it is seen that there is no difference in the digital literacy level of those who are nurses and work in the space of administration of the institution.

In this research, it was resolved that the internal satisfaction levels of the participants indicates a significant difference according to the gender variable. It has been concluded that men are more satisfied than women in terms of internal satisfaction according to the gender factor. The reason for the difference may be that women in the health sector are more tired than men in the working conditions and that men are more socially active. In their study on 292 employees providing emergency medicine services, Blau and Gibson (2011) revealed that there was a meaningful difference between gender and internal satisfaction. There are studies in which there is a significant difference between internal satisfaction and gender factors, as well as studies in which there is no difference (Aydoğmuş, 2021; Fidan 2021; Kirkcadly and Martin, 2000).

When examined according to marital status, the answer averages of married participants were found to be higher than those of single participants. However, no significant difference was found between marital status and internal satisfaction. It can be counted as marital status not being an obstacle to making a career and not creating a difference in responsibilities according to changing conditions. In the study carried out by Güder (2021), in his research on administrative staff, doctors, nurses and other healthcare professionals working in a healthcare institution, he found that being married or single did not make a difference on internal satisfaction. It seems that this study gives the same result as our study. There are other studies supporting this result (Kara, 2020; Pan et al. 2015; Görgülü and Akilli, 2016). There are studies that give opposite results to this study (Saner and Eyüpoğlu, 2013; Demirbaş, 2022; Özaydın and Özdemir, 2014). It can be said that the type of hospital where the research was conducted caused the results to be different in the literature.

According to the comparison results, it was determined that the average response to internal satisfaction differed significantly according to age groups. The group with the greatest difference in internal satisfaction was found to be 41 and over. The reason may be that they do not want to work in shifts and lead a monotonous life due to their age. Elias et al. (2012) investigated the effect of attitudes toward technology on job satisfaction and found that as age increases, intrinsic satisfaction increases. Briones and Tobernero

(2012) revealed in their study that internal satisfaction decreases as age increases. In another work, it was found that there was a positive relation between the age levels and internal satisfaction of the employees of an institution providing home care services (Denton et al., 2002). As a result of the research, it was determined that there was no significant difference between the age variable and internal satisfaction (Keklik and Coşkun Us, 2013).

When the response averages of the health managers and employees participating in the research to internal satisfaction are evaluated according to the position groups in the institution; A significant difference was found in internal satisfaction in hospital management and midwife positions. Leblebici and Mutlu (2014) found a significant difference between the position in the institution and job satisfaction, and it overlaps with our study in this regard. In a study, doctors had the highest level of internal satisfaction, while nurses had the lowest. This result revealed that there is a significant difference between internal satisfaction and the position in the institution (Güder, 2021). In the studies of Arslan and Demir (2017) and Kayabaşı (2019), internal satisfaction of physicians is high while nurses are low. Although there is a significant difference between internal satisfaction and the position in the institution, there are studies where there is no difference (Nal and Nal, 2018; Ürtürk, 2021). It can be said in the literature that the location of the hospital where the research was conducted causes different results.

When the health managers and employees participating in the research were evaluated according to gender, although the average of the answers of the men was higher than the average of the answers of the women, no considerable difference was found between the extrinsic satisfaction and the gender variable. In the study resoluted by Nur (2011) on public hospitals, it was determined that there was no considerable difference between the gender variable of health workers and their job satisfaction. In the study conducted by Keklik and Coşkun Us (2013) on health workers working in a public institution, it is seen that the external satisfaction scores of men are higher than the external satisfaction scores of women, but there is no significant difference. Aikins et al., (2023) found a considerable difference between gender and extrinsic satisfaction in a study conducted on healthcare professionals working in 34 primary healthcare institutions. In most of the studies, no significant difference was found between extrinsic satisfaction and gender factor.

When analyzed according to marital status, the average of the answers of the single participants is higher than the married participants. However, no considerable difference was found between marital status and external satisfaction. In the study of Jayasuria et al., (2012) on nurses working in rural areas, the extrinsic satisfaction scores of married nurses are lower than the extrinsic satisfaction scores of single nurses, and there is no significant difference between extrinsic satisfaction and marital status variables. In a study conducted by Görgülü and Akilli (2016) on doctors, nurses and other health workers, the extrinsic satisfaction response averages of married workers were found to be higher than those of single workers.

According to the results of the analysis made between age and external satisfaction in this study, it was decided that there was no statistically considerable difference. There are similar studies in the literature that do not have a significant difference between extrinsic satisfaction and age. In the study of Aydın et al., (2014), no considerable difference was found between extrinsic satisfaction and age. This result was supported by the studies of Ürtürk (2020) and Aydoğmuş (2022). There are results that are the opposite of these results (Sharma and Joyti, 2009; Saner and Eyüpoğlu 2012; Pickett and Sevastos, 2003).

When the response averages of the participants to external satisfaction are evaluated according to the institution position, those in the hospital management position have the highest average, and those in the doctor position have the lowest average. According to the conclusions of this research, there was a significant difference among the position in the institution and the external satisfaction. The reason for this difference is that the doctors are in more communication with the patients and their relatives, their workload, their work in turn, the high patient density of the institution they are in, etc. can be sorted accordingly. Similarly, in Kayabaşı's (2019) research, it was determined that there was a significant difference among external satisfaction and the position in the institution, and those in the midwife position had a lower average than the doctor and nurse. However, contrary to our study, in the study conducted by Çağan and Günay (2015) on primary healthcare workers, it is seen that the extrinsic satisfaction response averages of doctors, nurses and midwives are the same. In this study revealed that there is no significant difference between position in the institution and external satisfaction.

It was aimed to investigate whether digital literacy, which is the main subject of the study, has an impact on job satisfaction. According to the conclusions of the research, multiple regression analysis was conducted to analyze whether the lower dimensions of digital literacy of health workers and managers have an effect on internal satisfaction. In the model created according to the results of the analyze, there is a low surface of positive and significant relationship (R: 0.221; $p<0.001$) between the lower dimensions and internal satisfaction, while the attitude lower dimension (β: 0.121; $p>0.001$), the socio-emotional lower dimension (β: 0.015; $p>0.001$), technical lower dimension (β: 0.056; $p>0.001$) and cognitive lower dimension (β: 0.060; $p>0.001$) did not have an effect on internal

satisfaction concluded. Likewise, multiple regression analysis was conducted to analyze whether the lower dimensions of digital literacy had an effect on external satisfaction. In the model created according to the outcomes of the analysis, there was a low surface of positive and meaningful relationship (R: 0.172; $p<0.05$) between the lower dimensions and external satisfaction. Attitude lower dimension (β: 0.043; $p>0.001$), socio-emotional lower dimension (β: 0.038; $p>0.001$), technical lower dimension (β: 0.083; $p>0.001$), and cognitive lower dimension (β: 0.034; $p>0.001$) had no effect on extrinsic satisfaction. In the study of Emer (2021), it was aimed to investigate the effect of the level of technology used on job satisfaction. As a result of the study, it was revealed that the level of technology has a positive effect on inner and extrinsical satisfaction. In the study of Itsekor and James (2012), it was determined that having digital literacy skills in information and communication technologies increases job satisfaction, so there is a positive effect between them. In the research conducted by Akınlade and Gberevbie (2022), it was concluded that information and communication technologies positively affect job satisfaction, and if information and communication technologies are misused for employees in the institution, it may have negative consequences.

5. CONCLUSION

Health institutions are sectors where information is used intensively. Undesirable results may occur if institutions, especially health institutions, are managed with false information and provided services. If a doctor, a nurse or a midwife serves a patient with false information, the patient's life may be endangered. If those at the hospital management level continue to manage the institution with incomplete or incorrect information, they may cause the institution's service to stop and be closed. In order to avoid this situation, the missing information must be completed, and the incorrect information must be replaced with the correct information.

Employees performing their jobs with incorrect information affects their job satisfaction levels. Job satisfaction is a person's reaction to his job. One of the sectors is the healthcare sector in which job satisfaction is important. Healthcare institutions are sectors that have a large number of employees and provide uninterrupted services. Disruption of the services provided in health institutions causes serious consequences. In these businesses where human life is at stake, employees must be satisfied with their jobs in order to ensure that the service does not fail. Necessary improvements should be made to prevent employees from experiencing job dissatisfaction.

Partially meaningful discrepancy was found between the socio-demographic factors of the participants in the study and the lower dimensions of digital literacy. Employees' use of information and communication technologies in their workplaces, using intensive health technology, knowing how to solve technical problems, and how to obtain information from the internet have partial difference on employees' digital literacy.

It was analyzed whether there was a significant difference between intrinsic and external satisfaction, which are the lower dimensions of job satisfaction, which is the other main subject of the research, and socio-demographic variables. According to the analysis, a partial difference was found. It can be said that situations such as the working conditions of managers and employees working in health institutions, the applicability of work-related decisions, their wages, promotion opportunities, the management of the institution, the appreciation of their work and the sense of success cause differences in the intrinsic and external satisfaction of the participants.

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Examination of Nurses' Personal Traits and Intention to Collaborate within the Theory of Planned Behavior: The Case of Health Institutions

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ABSTRACT

The aim of current study was to evaluate the relationship between nurses' cooperation intentions and personality traits within the scope of the theory of planned behavior. The population of the study consisted of nurses working in a public hospital. (n=600) In current study, no sampling was made from the population and a survey was applied to all nurses (n=549). Five-factor personality traits scale, nurse-nurse cooperation scale and general cooperation scale were applied in data collection. SPSS (Statistical Package for the Social Sciences) statistical package program was used to analyze the data. Cronbach Alpha Analysis was performed for the reliability of the scales used in the study. Normal distribution test was applied before statistical analysis was performed with the data obtained from the survey. Factor analysis was performed to determine to what extent the survey questions could explain the theory of planned behavior and its sub-dimensions, and also to determine how all the questions in the survey were distributed among the theory of planned behavior sub-dimensions. At the end of the analysis, it was determined that all survey questions explained the theory of planned behavior at a rate of 61% and the Kaiser-Meyer-Olkin Sampling Adequacy Measurement result was high (KMO = 0.935). In our study; A significant difference was observed between the perceived behavioral control/self-efficacy/normative belief dimensions, which are sub-variables of the theory of planned behavior, and the perceived behavioral control/subjective norm dimensions depending on the nurses' workplaces. A significant difference was found between the intention to cooperate and neuroticism/openness/self-discipline personality types. Also, a significant difference was found between intention to cooperate and neuroticism/openness/self-discipline personality types. As a result of the research, suggestions were presented for the development of nurses' personality traits and cooperation intentions within the scope of the theory of planned behavior.

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1.INTRODUCTION

Collaboration is known as working together in communication with individuals or units that will contribute positively to the result of the task they perform, while achieving their goals while continuing their duties. Health institutions, especially hospitals, are institutions that serve in a matrix structure. Therefore, in order to ensure patient satisfaction, there is a need for close cooperation and cooperation among healthcare professionals in hospitals. Otherwise, an incompatible behavior of one of the healthcare professionals, which will adversely affect the process, will have negative consequences for all patients and will reduce patient satisfaction and satisfaction. Cooperation is an important coordination activity of teamwork (Doran, 2005).

"Personality"; it can be said that it is the lifestyle of people. However, within this lifestyle term, the individual's abilities, communication with his relatives, and mental characteristics are also included. All these elements can determine personality. In addition, personality can also be expressed as the differences in the mental and physical states of the person and the effects of these titles on the behavior and thoughts of the person (Erdoğan, 1991).

Planned Behavior Theory was developed by Icek Ajzen from "Logical Action Theory". In both theories, it is assumed that there is a specific reason for the behavior (Ajzen and Fishbein, 1980). According to the planned behavior theory, intention affects behavior. Intention, on the other hand, is under the influence of three elements called attitude, subjective values, and perceived behavioral control. When the person believes that the desired situation will come true (attitude), the behavior is approved by those around him (subjective values), and the individual does not see the behavior as difficult to perform (perceived behavioral control), he will perform the behavior (Armitage and Christian, 2003). Planned behavior theory is one of the successful social psychology models in terms of explaining and predicting the causes of behavior (Ajzen, 1991). It is a useful and preferred theory that aims to adapt to behavioral studies (Schultz, 2014).

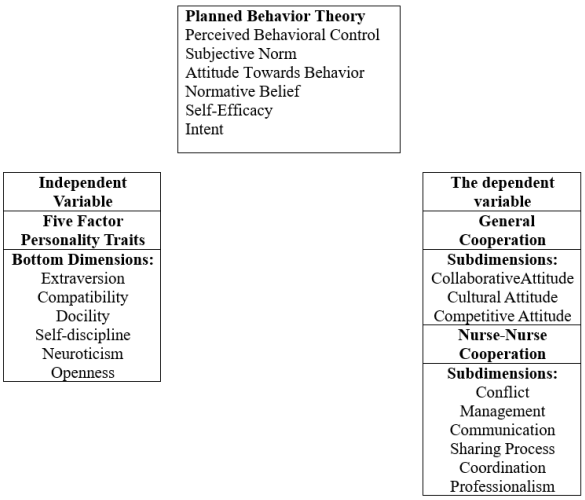
Empirical support for the theory is provided by a series of correlational studies of interventions demonstrating the ability to predict intentions and behaviors, with changes in intentions being reflected in subsequent behaviors (Ajzen, 2012). The earlier version of the Theory of Planned Behavior, the Theory of Causal Behavior; It explains behaviors that are completely under the control of the person (Erten, 2002). It is a theory that assumes that people are rational and will behave logically (Çetin and Şentürk, 2016), that individuals consider the benefits of a behavior when performing a behavior, and that individuals carry out all of their behaviors under their own control and will (Argan, 2016).

Healthcare services provided by nurses in hospitals have an important place in total health services. Personal characteristics and cooperation intentions of nurses; it is essential for the effectiveness and efficiency of the health services provided. The subject of this research is; the aim of this study is to examine the personality traits of nurses who provide health care services in health institutions, and their cooperation intentions with other health service providers in the hospital, within the framework of the theory of planned behavior.

Model of the Research

Within the framework of the theory of planned behavior; the arithmetic mean and standard deviation data were used in the analyzes to determine whether there is a significant relationship between the personality traits of the nurses according to the data obtained from their cooperation intentions. This research is in the relational browsing model. In the screening model, the subject or individual in the research is tried to be described as it is in the conditions in which it is located (Karasar, 2015). Based on this model, nurses' age, gender, education level, marital status, and professional seniority variables; personality traits were analyzed within the scope of nurse-nurse cooperation, general cooperation, and planned behavior theory.

The model of this research is as follows:



2. MATERIALS AND METHOD

Population and Samples of the Research

The population of the research is all nurses in a public hospital. In the study, a questionnaire was planned and applied for all nurses working in the hospital, whose sampling process was not performed (n=549).

Data Collection Tool of the Research

In the study, the 'five basic personality traits scale', which was used to examine nurses' personality traits and cooperation intentions within the scope of planned behavior theory, was developed by Rammstedt and John in 10 items. The scale is a five-point Likert type: strongly disagree-1, somewhat disagree-2, neither agree nor disagree-3, somewhat agree-4, strongly agree-5.

The 'nurse-nurse cooperation scale', which was used in the study to examine nurses' personality traits and cooperation intentions within the scope of planned behavior theory, was developed by Dougherty and Larson in 2019 and adapted to Turkish culture by Temuçin et al. in 2019 and consists of 25 items and five subdimensions. The subdimensions, item numbers, and Cronbach Alpha reliability coefficients of the scale rated with a 4-point Likert type are shown in Table 2.

It was determined that the Cronbach Alpha values of the general and subdimensions of the scale were above 0.6, and the scale and its subdimensions were reliable. The high mean scores obtained from the scale indicate that there is a high level of cooperation among nurses.
In the study, the 'general cooperation scale', which was used to examine the personality traits and cooperation intentions of nurses within the scope of the theory of planned behavior, was developed by Xie, Yu, Chen and Chen in 2006, and was adapted into Turkish by Yerlikaya and Doğruyol in 2020. It consists of 16 items and three dimensions. consists of. Among the items in the scale, 9 items describe their collaborative attitudes (eg, "group members must cooperate in order to be successful in the work being worked on."); 6 items (3, 6, 10, 11, 12 and 16) are based on competitive attitudes (e.g. “I prefer to be alone rather than running a business with group work”) with the opposite item and 1 item from a culturally meaningful proverb (“The proverb "What's wrong with one hand, two hands have a voice" makes a very correct point"). The scale is a five-point Likert type: strongly disagree-1, somewhat disagree-2, neither agree nor disagree-3, somewhat agree-4, strongly agree-5 (Yerlikaya & Doğruyol, 2020).

Research Hypotheses

According to the data obtained from the results of the questionnaire applied to the nurses; the following hypotheses were tested in terms of five-factor personality traits, nurse-nurse cooperation, and general cooperation, and planned behavior theory. As demographic data in the survey; gender, age, graduated school, marital status, number of children, department, time worked in the health sector, time worked in the hospital, and monthly income was defined.

Hypothesis: The relationship between nurses' five-factor personality traits and the variables of general cooperation and nurse-nurse cooperation can be explained through planned behavior theory subdimensions (Perceived Behavioral Control, Subjective Norms, attitude towards behavior, Self-Efficacy, Intention).

Analysis Method

We used SPSS 21.0 (Statistical Package for the Social Sciences) statistical package program for the analysis of the data. The distribution of demographic information of the participants was given via frequency and percentage. Cronbach's alpha coefficients were calculated for the validity and reliability of the applied questionnaire. In order to test the accuracy of the hypotheses established in the research and to decide on the statistical analysis to be made before, the analysis of whether there is a difference in terms of variables, the normal distribution of the data obtained from the survey was conducted.

The Kolmogrov-Smirnov test results were taken as the basis for the normal distribution test, since the number of individuals examined was more than 50. The Mann-Whitney U test was used in pairwise group comparisons for five-factor personality traits, nurse-nurse cooperation, and general cooperation variables that did not show normal distribution according to the results of the normal distribution test applied to the data obtained from the questionnaire. In comparison of more than two groups, the Kruskal Wallis Analysis of Variance test was used for the five-factor personality traits, nurse-nurse cooperation, and general cooperation variables that did not show normal distribution. Mann-Whitney U Test and Kruskal Wallis Analysis of variance test are non-parametric tests that can be applied to data that do not fulfill the parametric test assumptions on the data obtained by measurement. The statistical significance level was accepted as α=0.05 (Evliyaoğlu, 2016). Within the framework of the theory of planned behavior; the arithmetic mean and standard deviation data were used in the analyzes to determine whether there is a significant relationship between the personality traits of the nurses according to the data obtained from their cooperation intentions.

3. RESULTS

Table 1. Demographic Findings

Gender	Number	Percentage (%)
Female	373	67,9
Male	176	32,1
Age Groups		
18-24 years old	69	12,6
25-34 years old	249	45,4
35-44 years old	142	25,9
45-49 years old	73	13,2
50 and over	16	2,9
Marital Status		
Married	315	57,4
Single	234	42,6
Education Status		
High School	22	4,0
University	466	84,9
Master's and Above	61	11,1
Duty		
Internal Sections	236	43,0
Surgical Departments	189	34,4
Administrative Departments	9	1,6
Operating Room	115	20,9
Number Of Children		
None	269	49,0
1 Child	138	25,1
2 Children	106	19,3
3 and Over Children	36	6,6
Total	**549**	**100,0**
Working Time in the Health Sector		
0-5 Years	168	30,6
6-10 Years	124	22,6
11-15 Years	97	17,7
16-20 Years	49	8,9
21-25 Years	70	12,8
26 Years or More	41	7,5
Working Time in the Hospital		
0-5 Years	409	74,5
6-10 Years	56	10,2
11-15 Years	42	7,7
16-20 Years	22	4,0
21 Years or More	20	3,6
Monthly Income		
3500-4499 tl	129	23,5
4500-5499 tl	184	33,5
5500 tl or More	236	43,0
Total	**549**	**100,0**

Looking at the gender distribution, it is seen that the rate of women is higher than that of men.

When the age distributions are examined, it is seen that nurses between the ages of 25-34 are the most, and the nurses are at least 50 and over.

Considering the marital status distribution, it is seen that married nurses are more than single nurses.

When the educational status distribution is examined, it is seen that most university graduate nurses and the least high school graduate nurses.

Looking at the distribution of the nurses' workplaces, it is seen that the nurses mostly work in the internal departments and the least nurses work in the administrative departments.

Considering the distribution of the number of children, it is seen that the nurses who do not have the most children, and the nurses who have 3 or more children the least.

Considering the distribution of working hours in the health sector, it was seen that most nurses work between 0-5 years, while the least nurses work for 26 years or more.

Looking at the distribution of working hours in the hospital, it is seen that nurses work mostly between 0-5 years and at least 26 years or more.

Looking at the monthly income distributions; nurses' maximum 5500 TL. and above, and at least between 1600-2499.

Table 2: General Reliability Analysis of the Survey Study (Five Factor Personality Traits, Nurse-Nurse Collaboration and General Collaboration Scales)

Scale	Number of Questions in the Scale	Cr.a
Five Factor Personality Traits Scale, Nurse-Nurse Collaboration Scale, General Collaboration Scale	51	0,903

Internal consistency and validity reliability analyzes of all general (Five Factor Personality Traits Scale, Nurse-Nurse Collaboration Scale, General Collaboration Scale) questions were performed and the result was found to be highly reliable (Table-2).

Table-3: Factor Analysis Findings

Measuring Kaiser-Meyer-Olkin Sampling Adequacy							0,935		
Bartlett's Test of Sphericity				**Approximately. Chi-Square**			13988,359		
				Sd.			820		
				Sig.			0,000		
	Initial Eigenvalues			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings**		
Component	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	13,515	32,963	32,963	13,515	32,963	32,963	9,624	23,472	23,472

2	5,217	12,725	45,688	5,217	12,725	45,688	6,822	16,638	40,110
3	2,169	5,291	50,979	2,169	5,291	50,979	3,368	8,215	48,325
4	1,556	3,796	54,775	1,556	3,796	54,775	1,836	4,479	52,804
5	1,321	3,223	57,997	1,321	3,223	57,997	1,752	4,274	57,077
6	1,243	3,032	61,030	1,243	3,032	61,030	1,620	3,952	**61,030**
7	1,094	2,668	63,698						
8	1,014	2,474	66,172						
9	0,880	2,147	68,319						
10	0,862	2,103	70,422						
11	0,784	1,912	72,334						
12	0,705	1,719	74,053						
13	0,628	1,532	75,584						
14	0,609	1,484	77,069						
15	0,604	1,472	78,541						
16	0,596	1,455	79,996						
17	0,563	1,374	81,369						
18	0,532	1,298	82,667						
19	0,481	1,172	83,840						
20	0,462	1,128	84,968						
21	0,445	1,085	86,052						
22	0,428	1,043	87,096						
23	0,413	1,007	88,103						
24	0,390	0,951	89,054						
25	0,383	0,934	89,987						
26	0,366	0,894	90,881						
27	0,345	0,841	91,722						
28	0,328	0,800	92,522						
29	0,320	0,780	93,302						
30	0,299	0,729	94,031						
31	0,279	0,681	94,712						
32	0,268	0,654	95,367						
33	0,261	0,637	96,004						
34	0,250	0,611	96,614						
35	0,234	0,570	97,184						
36	0,227	0,554	97,739						
37	0,223	0,544	98,282						
38	0,211	0,514	98,796						
39	0,195	0,475	99,271						
40	0,159	0,388	99,658						
41	0,140	0,342	100,000						

Factor analysis was applied to determine how well the questionnaire questions applied to the nurses could explain the theory of planned behavior and its subdimensions, and to determine the planned behavior subdimensions of all questionnaire questions. As a result of the analysis, it was determined that all survey questions explained the theory of planned behavior that we wanted to measure by 61% and the result of the Kaiser-Meyer-Olkin Sampling Adequacy Measurement was high (KMO = 0.935). The subdimensions of all questions asked to explain the theory of planned behavior are given in Table-3.

Table 4: Rotated Component Matrix in 6 Dimensions Analysis

Survey Questions	**Component**					
	1	**2**	**3**	**4**	**5**	**6**
1	0,371		**0,652**			
2	0,378		**0,728**			
3			**0,584**			
4	0,432		**0,607**			
5	0,467		**0,585**			
6	0,494		**0,554**			
7				**0,702**		
8				**0,804**		
9	**0,566**		0,355			
10	**0,638**					
11	**0,665**					
12	**0,684**					
13	**0,638**					
14	**0,711**					
15	**0,703**					

16	**0,659**			0,321		
17	**0,690**					
18	**0,683**		0,351			
19	**0,754**					
20	**0,789**					
21	**0,786**					
22	**0,774**					
23	**0,747**					
24	**0,698**		0,395			
25	**0,692**					
26		**0,801**				
27		**0,817**				
28		**-0,396**			-0,432	
29		**0,722**				
30		**0,716**				
31		**-0,583**				
32		**0,796**				
33		**0,835**				
34		**0,807**				
35						**0,780**
36						**-0,805**
37					**-0,564**	0,380
38		0,461			**0,562**	
39		**0,687**				
40		**0,773**				
41		-0,440			**-0,594**	

After the analysis, the scale was collected in 6 dimensions. In this study, the subdimensions were named as perceived behavioral control, subjective norm, attitude towards behavior, normative belief, self-efficacy and intention in accordance with the theory of planned behavior. The first dimension is perceived behavioral control; It consists of questions 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 and 25. The second dimension is the subjective norm; It contains questions 26, 27, 28, 29, 30, 31, 32, 33, 34, 30, and 40. The third dimension is attitude towards behavior and questions 1, 2, 3, 4, 5, and 6. The fourth dimension is normative belief and covers questions 7 and 8. The fifth dimension is self-efficacy and consists of questions 37, 38, and 41. The last dimension, the sixth dimension, is intention and includes questions 35 and 36.

Table-5: Five Factor Personality Traits, Nurse-Nurse Collaboration, General Collaboration and Planned Behavior Theory Correlation Analysis Table Variables

			Perceived Behavioral Control	Subjective Norm	Attitude Towards Behavior
Spearman's rho	Five Factor Personality Traits	r	0,058	0,095*	0,544**
		p	0,173	**0,027**	**0,000**
		n	549	549	549
	Nurse-Nurse Collaboration	r	0,980**	0,429**	0,213**
		p	**0,000**	**0,000**	**0,000**
	General Cooperation	r	0,379**	0,633**	0,295**
		p	**0,000**	**0,000**	**0,000**
	Perceived Behavioral Control	r		0,451**	0,230**
		p		**0,000**	**0,000**
	Subjective Norm	r	0,451**		0,266**
		p	**0,000**		**0,000**
	Attitude Towards Behavior	r	0,230**	0,266**	
		p	**0,000**	**0,000**	
	Normative Belief	r	0,022	-0,203**	-0,101*
		p	0,615	**0,000**	**0,018**
	Self-Efficacy	r	-0,176**	-0,127**	-0,277**
		p	**0,000**	**0,003**	**0,000**
	Intent	r	0,668**	0,387**	0,174**
		p	**0,000**	**0,000**	**0,000**

When the table is examined; there is a significant (p=0.000) and positive (r=0.095) relationship between the perceived behavioral control subdimensions of the theory of planned behavior and the subjective norm subdimension variable.

There is a significant (p=0.000) and positive (r=0.230) relationship between the subdimensions of the theory of planned behavior, perceived behavioral control, and the subdimension of attitude towards behavior.

There is a significant (p=0.000) and positive relationship (r=0.266) between the subjective norm, which is the subdimensions of the theory of planned behavior, and the subdimension of attitude towards behavior.

There is a significant (p=0.000) but negative (r=-0.203) relationship between the normative belief subdimensions of the theory of planned behavior and the subjective norm subdimension variable.

There is a significant (p=0.000) and positive relationship (r=0.668) between intention, which is the subdimensions of the theory of planned behavior, and the variable of perceived behavioral control.

There is a significant (p=0.000) and positive (r=0.387) relationship between intention, which is the subdimensions of the theory of planned behavior, and the subjective norm subdimension variable

There is a significant (p=0.000) and positive (r=0.174) relationship between the subdimensions of Planned Behavior Theory Intention and Attitude towards Behavior subdimension variables.

Table-6: Five Factor Personality Traits, Nurse-Nurse Collaboration, General Collaboration and Planned Behavior Theory Correlation Analysis Table Variables

			Normative Belief	Self Effectiveness	Intent
Spearman's rho	Five Factor Personality Traits	r	-0,010	0,601**	0,020
		p	0,822	**0,000**	0,641
		n	549	549	549
	Nurse-Nurse Collaboration	r	0,097*	-0,169**	0,764**
		p	**0,022**	**0,000**	**0,000**
		n	549	549	549
	General Cooperation	r	-0,257**	-0,051	0,352**
		p	**0,000**	0,229	**0,000**
		n	549	549	549
	Perceived Behavioral Control	r	0,022	-0,176**	0,668**
		p	0,615	**0,000**	**0,000**
		n	549	549	549
	Subjective Norm	r	-0,203**	-0,127**	0,387**
		p	**0,000**	**0,003**	**0,000**
		n	549	549	549
	Attitude Towards Behavior	r	-0,101*	-0,277**	0,174**
		p	**0,018**	**0,000**	**0,000**
		n	549	549	549
	Normative Belief	r	1,000	0,071	0,072
		p		0,096	0,094
		n	549	549	549
	Self-Efficacy	r	0,071	1,000	-0,149**
		p	0,096		**0,000**
		n	549	549	549
	Intent	r	0,072	-0,149**	1,000
		p	0,094	**0,000**	
		n	549	549	549

When the table is examined; There is a significant (p=0.000) but negative (r=-0.149) relationship between the subdimensions of the theory of planned behavior, Self-Efficacy and the intention subdimension variable. As the self-efficacy subdimension score increases, the intention subdimension score also increases, although it does not have a very strong linear relationship. Thus, we can say that those who give importance to the self-efficacy subdimension of the nurses who take part in the provision of health services and who are surveyed also attach importance to the intention subdimension.

4.DISCUSSION

There was a significant (p=0.000) and positive (r=0.980) relationship between the perceived behavioral control variable, which was a subdimension of the theory of planned behavior, and the nurse-nurse cooperation variable. As the perceived behavioral control subdimension variable score increases, the nurse-nurse cooperation score also increased with a very strong linear relationship. Thus, we can state that the nurses who take part in the provision of health services and who were surveyed give importance to the level of nurse-nurse cooperation among those with high perceived behavioral control subdimensions.

There was a significant (p=0.000) and positive relationship (r=0.379) between the perceived behavioral control variable, which was a subdimension of the theory of planned behavior, and the general cooperation variable. As the Perceived Behavioral Control subdimension variable score increases, the overall cooperation score also increases, although it did not have a very strong linear relationship. Thus, we can explain that those who give importance to the perceived behavioral control subdimension of the nurses who take part in the provision of health services and who are surveyed also attach importance to the general level of cooperation.

There was a significant (p=0.027) and positive (r=0.095) relationship between the subjective norm variable, which was the subdimension of the theory of planned behavior, and the nurse-nurse cooperation variable. As the subjective norm subdimension variable score increased, the nurse-nurse cooperation score also increases, although it does not have a very strong linear relationship. Thus, we can say that those who give importance to the subjective norm subdimension of the nurses who take part in the provision of health services and who are surveyed also attach importance to the level of nurse-nurse cooperation.

There was a significant (p=0.000) and positive (r=0.633) relationship between the subjective norm variable, which was the subdimension of the theory of planned behavior, and the general cooperation variable. As the subjective norm subdimension variable score increases, the overall cooperation score also increased with a very strong linear relationship. Thus, we can interpret that those who give importance to the subjective norm subdimension of the nurses who take part in the provision of health services and who are surveyed also attach importance to the general level of cooperation.

There was a significant (p=0.000) and positive (r=0.429) relationship between the subjective norm variable, which was the subdimension of the theory of planned behavior, and the nurse-nurse cooperation variable. As the subjective norm subdimension variable score increases, the nurse-nurse cooperation score also increased, even if it does not have a very strong linear relationship. Thus, we can evaluate that those who give importance to the subjective norm subdimension of the nurses who take part in the provision of health services and who are surveyed also attach importance to the level of nurse-nurse cooperation.

There was a significant (p=0.000) and positive (r=0.544) relationship between the variable of attitude towards behavior, which was a subdimension of the theory of planned behavior, and the variable of five-factor personality traits. As the attitude towards behavior subdimension variable score increased, the five-factor personality traits score also increases with a very strong linear relationship. Thus, we can explain that nurses with a high general level of five-factor personality traits included in the provision of health services and surveyed attach importance to the subdimension of attitude towards behavior.

There was a significant (p=0.022) and positive (r=0.097) relationship between the normative belief variable, which was a subdimension of the theory of planned behavior, and the nurse-nurse cooperation variable. As the normative belief subdimension variable score increased, the nurse-nurse cooperation score also increases, even though it does not have a very strong linear relationship. Thus, we can explain that the nurses who take part in the provision of health services and who are surveyed give importance to the normative belief subdimension and that they also attach importance to the level of nurse-nurse cooperation.

There was a significant (p=0.000) and positive relationship (r=0.601) between the self-efficacy variable, which was a subdimension of the theory of planned behavior, and the five-factor personality trait variable. As the self-efficacy subdimension variable score increased, the five-factor personality traits score also increases with a very strong linear relationship. Thus, we can say that nurses who take part in the provision of health services and who are surveyed with a high level of five-factor personality traits also attach importance to the subdimension of self-efficacy.

There was a significant (p=0.000) and positive (r=0.764) relationship between the intention variable, which was the subdimension of the theory of planned behavior, and the nurse-nurse cooperation variable. As the intention subdimension variable score increased, the nurse-nurse cooperation score also increases with a very strong linear relationship. Thus, we can explain that those who give importance to the intention subdimension of the nurses who take part in the provision of health services and who are surveyed also attach importance to the level of nurse-nurse cooperation.

There was a significant (p=0.000) and positive (r=0.352) relationship between the intention variable, which was a subdimension of the theory of planned behavior, and the general cooperation variable. As the intention subdimension variable score increased, the overall cooperation score also increases, even if it does not have a very strong linear relationship. Thus, we can define that the nurses who take part in the provision of health services and who are surveyed give importance to the general cooperation level of those who attach importance to the intention subdimension.

There was a significant (p=0.000) and positive (r=0.095) relationship between the subdimensions of the theory of planned behavior, perceived behavioral control, and the Subjective Norm variable. As the perceived behavioral control subdimension score

increased, the Perceived Behavioral Control subdimension score also increased, although it did not have a very strong linear relationship. Thus, we can interpret that those who give importance to the perceived behavioral control subdimension of the nurses who take part in the provision of health services and who are surveyed also attach importance to the subjective norm subdimension. Remina (2017), Chavarria and Phakdee-auksorn (2017), Kurt (2018), and Erkek (2016) found a positive and significant relationship between “perceived behavioral control” and “subjective norms” in their studies on planned behavior theory.

There was a significant (p=0.000) and positive (r=0.230) relationship between the subdimensions of the theory of planned behavior, perceived behavioral control, and the attitude towards behavior subdimension variables. As the Perceived Behavioral Control subdimension score increases, the attitude towards the behavior sub-dimension score also increased, although it did not have a very strong linear relationship. Thus, we can say that those who give importance to the perceived behavioral control subdimension of the nurses who take part in the provision of health services and who are surveyed also attach importance to the attitude towards behavior subdimension. Remina (2017), Erkek (2016), Demirer (2019), and Demirbağ (2019) stated in their studies on the theory of planned behavior that there was a positive and significant relationship between "attitude" and "perceived behavioral control".

There was a significant (p=0.000) and positive relationship (r=0.266) between the subjective norm, which is the subdimensions of the theory of planned behavior, and the subdimension of attitude towards behavior. As the subjective norm subdimension score increased, the attitude towards behavior subdimension score also increased, although it did not have a very strong linear relationship. Thus, we can explain that those who give importance to the subjective norm subdimension of the nurses who take part in the provision of health services and who are surveyed also attach importance to the attitude towards behavior subdimension. Remina (2017), Erkek (2016), and Demirer (2019) found a positive and significant relationship between “attitude” and “subjective norms” in their studies on the theory of planned behavior.

There was a significant (p=0.000) but negative (r=-0.203) relationship between the normative belief subdimensions of the theory of planned behavior and the subjective norm subdimension variable. As the normative belief subdimension score increased, the subjective norm sub-dimension score also decreased, although it did not have a strong inverse relationship. Thus, we can say that those who give importance to the Normative Belief subdimension of the nurses who take part in the provision of health services and who are surveyed do not attach importance to the subjective norm subdimension. Demirer (2019) found a positive and significant relationship between “subjective norm” and “normative belief” in his study. Therefore, it can be said that those who attach importance to the Normative Belief sub-dimension are positive with the subjective norm, as they have personality traits suitable for the organizational culture of the institution they work for.

There was a significant (p=0.000) and positive relationship (r=0.668) between intention, which was the subdimensions of the theory of planned behavior, and the variable of perceived behavioral control. As the intention subdimension score increased, the perceived behavioral control subdimension score also increased with a very strong linear relationship. Thus, we can say that those who give importance to the Intention subdimension of the nurses who take part in the provision of health services and who are surveyed also attach importance to the perceived behavioral control subdimension. Karahan (2018) did not find a positive significant relationship between "perceived behavioral control" and "intention" in his study on the theory of planned behavior. Remina (2017), Işın (2018), Erkek (2016), Bayındır (2018), Göktürk (2019), Demirer (2019), Demirbağ (2019), Batıbeki (2020) on the other hand, in their studies on the theory of planned behavior "perceived behavioral stated that there was a positive and significant relationship between “control” and “intention”. Özer et al., (2015) found that there was a negative relationship between intention and perceived behavioral control. In Özer's research, reasons for this situation can be stated, such as employees feeling inadequate, pressure or learned helplessness.

There was a significant (p=0.000) and positive (r=0.387) relationship between intention, which was the subdimensions of the theory of planned behavior, and the subjective norm subdimension variable. As the intention subdimension score increases, the subjective norm subdimension score also increases, although it does not have a very strong linear relationship. Thus, we can say that those who give importance to the intention subdimension of the nurses who take part in the provision of health services and who are surveyed also attach importance to the subjective norm subdimension. In the study of Vural (2021) and Erkek (2016), it was determined that there was no statistically significant relationship between subjective norm and intention, which was the dependent variable. Remina (2017), Karahan (2018), Akça (2019), Göktürk (2019), Özer et al., (2015), Demirer (2019), Batıbeki (2020), on the other hand, use the "subjective norm" in their studies on the theory of planned behavior. They stated that there was a positive and significant relationship between “intention” and “intention”.

There was a significant (p=0.000) and positive (r=0.174) relationship between the subdimensions of the theory of planned behavior intention, and the

subdimension of attitude towards behavior. As the intention subdimension score increased, the attitude towards behavior subdimension score also increases, although it does not have a very strong linear relationship. Thus, we can say that the nurses who take part in the provision of health services and who are surveyed give importance to the intention subdimension of those who have a high level of attitude towards behavior. Vural (2021) and Remina (2017) found a positive and significant relationship between "attitude" and "entrepreneurial intention" in their studies on the theory of planned behavior. Kurt (2018), Karahan (2018), Bayındır (2018), Göktürk (2019), Demirer (2019), Batıbeki (2020), and Karaman (2020) found a statistically significant difference between intention and attitude in their studies on the theory of planned behavior. They found a positive relationship. Ozer et al. (2015), on the other hand, found that there was a statistically negative relationship between attitude and intention. Contrary to our research, we can state that the behavior of the participants in Özer's research within the institution varies depending on the environment and the personal characteristics that form their own intentions.

5. CONCLUSION

In this study, it was aimed to explain the cooperative behavior by taking into account the personality traits of the nurse staff by using the theory of planned behavior. According to the results of the study, it was revealed that the planned behavior theory was an adequate model for explaining the cooperation behaviors by considering the personality traits of the nurse personnel. In this respect, it could be said that the study had achieved its purpose.

According to the results of the analysis of our study, the demographic findings indicated that the density of nurses was women with 67.9%. When the nurses were analyzed according to age groups, it was determined that the density was 45.4% in the 25-34 age group. When the data on the marital status of the nurses were analyzed, it was found that the number of married nurses was 57.4%, and when the education level of the nurses was examined, it was determined that the density was composed of university graduates with a rate of 84.9%. When the distribution of duties of the nurses is examined, it is seen that the density of 43.0% works in the internal departments, when the number of children was examined, the density of 49.0% is the absence of children. When examined in terms of working time in the hospital, it has been determined that the density is 74.5% of the nurses who have worked between 0-5 years, and in the monthly income distribution, the density of the nurses who received the highest monthly income (5500 TL and above) with 43.0%.

As the perceived behavioral control sub-dimension variable score increases, the nurse-nurse cooperation score also increases with a very strong linear relationship. Thus, we can state that nurses who are involved in the provision of health services and who were surveyed, those who have high perceived behavioral control sub-dimension, also attach importance to the level of nurse-nurse cooperation.

There is a significant and positive relationship between the perceived behavioral control variable, which is the sub-dimension of the theory of planned behavior, and the general cooperation variable. As the perceived behavioral control sub-dimension variable score increases, the general cooperation score also increases, even if it does not have a very strong linear relationship. Thus, we can interpret that the nurses who are involved in the provision of health services and who were surveyed, those with high levels of Perceived behavioral control sub-dimension, attach importance to general cooperation.

There is a significant and positive relationship between the subjective norm variable, which is the sub-dimension of the theory of planned behavior, and the nurse-nurse collaboration variable. As the subjective norm subdimension variable score increases, the nurse-nurse cooperation score also increases, although it does not have a strong linear relationship. Thus, we can state that those who give importance to the subjective norm sub-dimension of nurses who are involved in the provision of health services and surveyed also attach importance to the level of nurse-nurse cooperation.

Suggestions

• It was seen that nurse personnel were inclined to general cooperation during the delivery of health care services. It was thought that the reason for this was the necessity of being prone to cooperation due to the education they receive and their position in the provision of health services. They should cooperate with other health personnel in the provision of services.

• A significant relationship was found between the nurse staff who have agreeableness, neuroticism, and openness personality traits and the department they work in. These personality traits were higher in nurses working in internal departments. Among these personality traits, it was recommended that nurses with neuroticism should be followed closely and their positions changed when necessary.

• It was seen that the perceived behavioral control level of the nurse staff significantly affected the conflict management skills. The reason for this was the positive perceptions of the nurse staff arising from the conflict management behavior of their own will. Therefore, it is

recommended to provide convenience, opportunities, and resources to manage conflict situations that nurse staff may encounter during service delivery.

• As the level of neuroticism and openness of the nurse staff increases, the subjective norm increases significantly. This situation arises from the values and social norms that people perceive in the environment in which they work. Therefore, it was recommended that the environment in which people work and the corporate culture be kept away from social pressure, sanctions, motivational factors, and harsh rules as much as possible.

• The self-discipline personality trait level of the nurse staff had a significant and positive effect on the person's behavioral intentions. In this case, it was recommended to encourage self-discipline-enhancing training in order to increase the intention levels of the nurse staff.

• It was stated that the cooperative attitudes of the nurses with a high level of intention were also high. In order to keep the level of cooperation high, it is recommended to put encouraging rewards that intensify the cooperation intention of the nurses.

• Since there was a negative relationship between the intention level of the nurse staff and their competitive attitudes, it was recommended to keep the working environment away from competition as much as possible and to explain to the nurses through training that cooperation will gain more than competition.

• To increase the level of cooperation of nurses, both in-service training should be ensured and encouraging measures should be taken to increase their general education level.

• It was seen that nurses working in stressful and patient safety departments have higher cooperation score averages. It would be appropriate for health institution managers to develop policies that reduce the stress levels of the personnel working in such places and motivate them.

• It was thought that the level of cooperation between nurses will decrease as the workload of nurses is high, the inadequacy of their numbers, and long working hours, fatigue, stress, and conflict as a result of the burden of non-duty responsibilities. For this reason, it was recommended to investigate the relationship between nurses' workload and cooperation.

• It was thought that it would be appropriate to make wage increase arrangements in order to increase the general cooperation of nurses and to make additional wage arrangements to encourage especially nurses working in busy and stressful departments.

• In this study, general cooperation, nurse-nurse cooperation, the subdimensions of these collaborations and their effects on each other, as well as the effects on the planned behavior theory and the subdimensions of the planned behavior theory, which were the basis of the study, were examined by correlation analysis. In future scientific studies within this scope; regression analysis should be done for the dimensions with a high level of correlation between them and the levels of influence of the dimensions on each other should be examined mathematically.

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Estimating of Health Services Expenditures within the Framework of Public Financial Management Using ARIMA Method

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ABSTRACT

This study aims to estimate and evaluate the trends in public health expenditures and total expenditures within the scope of public financial management. The study employs the ARIMA model, a time series method, using monthly data spanning 202 periods from January 2006 to October 2022. The estimated period extends from November 2022 to December 2024. The findings reveal a notable upward trend in both public health expenditures and total expenditures. Projections indicate that public health services expenditures are estimated to be approximately TL 251 billion in 2024, with total expenditures reaching approximately TL 3.98 trillion. By emphasizing a strong linkage between policy, planning, and budgeting, the study draws inferences to enhance the potential for effective and efficient resource utilization. In this context, the study underscores the importance of a strategic framework for the effective utilization of public resources. The results of this study, shedding light on decision-makers in public expenditure management, can provide valuable insights for future planning and policy considerations.

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1. INTRODUCTION

The share allocated to healthcare services from the national income has been steadily increasing. This trend exerts continuous pressure on public budgets and poses a significant challenge for policymakers (Braendle and Colombier, 2016:1051). Public expenditures allocated to healthcare services from public budgets contribute to increasing the efficiency of healthcare services and enhancing health outcomes. Therefore, planning and establishing a robust health budget and financing system have become a priority among many countries worldwide (Nolte and McKee, 2004:58). Due to the variability in the public policy-making process, the importance of budget systems that encompass planning and programming has increased. A well-designed and planned system that operates effectively can ensure rational allocation of resources.

Establishing a structure that embraces transparent and accountable principles, facilitating access to information and reporting processes, is crucial for monitoring the progression of the process (Yılmaz and Akdeniz, 2020:89). Public sector planning is a crucial tool for translating the government's intentions and policies into on-the-ground activities. In the public sector, planning is viewed as a continuation of the policy-making process. It is considered as a daily management tool for operationalizing policies through long-term strategic vision and short-term operational plans (Tsofa et al., 2016:261). It is asserted that the aim of rationalizing and prioritizing the use of limited available resources through public sector planning and budgeting is not sufficient. Simultaneously, there is an emphasis on the inevitability of responding to internal and external environmental factors such as political interests, institutional arrangements in planning and budgeting, and societal values (Green and Mirzoev, 2008:40). Within the framework of public financial management, evaluating public budgets as both a planning tool and, beyond planning, as a fiscal policy tool in economic interventions highlights the necessity for detailed consideration and planning of public expenditure programs (Ergen, 2021:283). A significant portion of the world's economic output is allocated to healthcare systems. Therefore, making decisions to optimize the performance of healthcare systems is crucial (Fekri et al., 2018:1). It is emphasized that in addition to stronger institutional integration for planning and budgeting processes, there is a need for evidence-based approaches and realistic goal-setting with improved data for top-level health policymakers and decision-makers (Tsofa et al., 2016:271).

Indicators of healthcare system performance are not considered separately from their ultimate goals and measurement subjects. Governments need studies that routinely monitor and evaluate the functioning of the system, employing scientific methods and techniques to make more informed decisions about healthcare expenditures, financing, organization, and policies (Kruk and Freedman, 2008: 264). The inclusion of budgeting in future planning increases the importance of planning and programming. Therefore, it is emphasized that statistical and mathematical methods should be utilized more during the planning process (Bektaş and Çetinkaya, 2021:250; Yılmaz and Akdeniz, 2020:105).

In this context, the aim of the study is to provide evidence to policymakers and decision-makers in the context of the planning-budget relationship by predicting future expenditures under the functional classification within the scope of public financial management. This will be achieved by examining the trends of healthcare service expenditures and total expenditures. The goal is to make forecasts for the future, offering insights into the relationship between planning and budgeting within the realm of public financial management.

To achieve the goal of health planning, the planning process needs to be conducted with a flexible and participatory understanding, and coordination with other decision-making mechanisms must be structured (Huzaifaf et al., 2014:30). In other words, health planning is evaluated as a process within the policy-making where actors make rational and realistic decisions among alternatives (Tosun, 2022:111).

Health planning is of critical importance in developing and underdeveloped countries due to the scarcity of resources, aiming to meet the expectations of individuals in terms of healthcare services. In many countries, a lack of understanding of budgeting issues results in disjointed processes such as disjointed health policy-making, planning, costing, and budgeting. This situation can lead to misguided planning between the health sector priorities stated in general strategic plans and policies and the funds allocated to the health sector through the budgeting process (WHO, 2016:397).

A sound health planning, by establishing partnerships and collaborative relationships to reduce inequalities and disparities among populations, groups, and especially geographical areas, allows for effective and efficient use of resources. This can bring about changes in agencies, professionals, and individuals to enhance the quality of healthcare services and positively impact the relationship between healthcare expenditures and economic growth (Keleher, 2011:330). Countries can improve the quality of healthcare service delivery and positively influence the relationship between healthcare expenditures and economic growth by utilizing their resources more effectively and efficiently (Yıldız and Yıldız, 2018:214). Kıran et al. (2023) state

the importance of countries taking necessary measures to maintain a balance between economic growth and healthcare expenditures. They emphasize the significance of controlling the increasing costs in healthcare expenditures for the efficient and effective utilization of resources.

Focusing on differences across cultures, history, economics, and sociopolitical contexts is crucial. This understanding isn't just vital for policymakers shaping healthcare delivery and financing worldwide; it's also essential for health economists and policymakers measuring national health expenditures effectively (WHO, 2003:5).

Public sector performance management implementation is stated to enhance performance through the effective operation of transparency and accountability principles. Additionally, the importance of utilizing various factors such as different budget proposal scenarios, different budgeting techniques and practices, and involving stakeholders in the performance evaluation process has been emphasized (Çiçek and Şahin İpek, 2013:93).

The necessity of addressing the health sector in conjunction with the social and demographic characteristics of the economy is emphasized. Therefore, national health and healthcare expenditure decisions are not only influenced by biological and environmental factors but also by economic, social, and demographic changes (Abbes and Hiemenz, 2011:1). Measures such as increasing healthcare revenues, adopting scientific approaches in resource allocation, tax exemptions in medical technology, and strengthening public-private partnerships enable the efficient use of the budget (Braithwaite et al., 2017). Poverty, inequality, market failures, and other negative externalities underscore the need for government intervention, especially in significant public service sectors, particularly in healthcare services, especially in developing countries (World Bank, 1993:286).

2. MATERIALS AND METHOD

The aim of the study is to predict future trends by using functional classification, which indicates the type of government activities according to budget classification, through healthcare expenditure and total expenditure trends. Additionally, the study aims to evaluate the level of health expenditures within the overall budget expenditures in comparison to the current implemented policies. The ARIMA (AutoRegressive Integrated Moving Average) method, one of the time series-based future forecasting methods, has been utilized for data analysis. In order to make predictions for the future using the dataset, the autoregressive (AR) model defined by Yule in 1926 and the moving averages (MA) model introduced by Slutzky in 1937 have been employed together. The EViews 12 software package was used to implement the method. In the study, a monthly dataset comprising 202 periods from January 2006 to October 2022 was utilized (Figure 1 and Figure 2). The data was obtained from the General Directorate of Accounting of the Ministry of Treasury and Finance of the Republic of Turkey, Central Government Budget Statistics. The conducted forecast covers the period from November 2022 to December 2024, encompassing a two-year period.

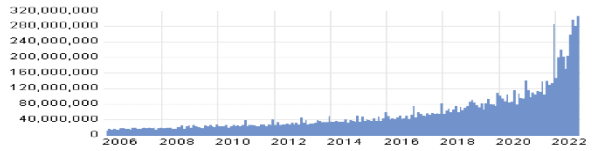

Figure 1: Total Expenditure (2006-2022) (Thousand TL)

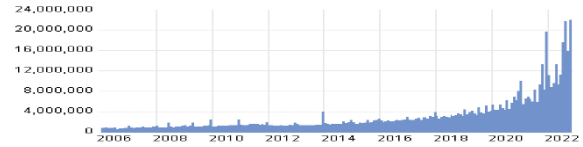

Figure 2: Total Health Expenditure (2006-2022) (Thousand TL)

ARIMA Method

ARIMA models, commonly known as the Box-Jenkins method in the literature, are frequently used in forecasting economic variables (Dritsakis and Klazoglou, 2019:80; Ramezanian et al., 2019:2). In addition to forecasting economic variables, the ARIMA method is employed for predictions in various fields (Alghamdi et al., 2019; Singh et al., 2020; Schaffer et al., 2021). In forecasts related to the health sector, it is often observed that income (Andellini et al., 2021; Jiao et al., 2020) and healthcare expenditures (Jakovljevic et al., 2022; Klazoglou and Dritsakis, 2019; Oshinubi et al., 2019; Zheng et al., 2020; Kıran et al., 2022) data are commonly used.

The ARIMA model can be composed of autoregressive (AR), moving average (MA), and integration (I) functions based on the stationarity degree of the time series (Fattah et al., 2018:3). The application of the method takes place through specific steps. The first step is the selection of the model. In this step, appropriate values for p, d, and q are determined to define the ARIMA (p, d, q) model. Initially, the value of d is determined by transforming non-stationary time series into stationary series. The Augmented Dickey-Fuller (ADF) unit root test helps determine whether the time series is stationary or not. Logarithmic transformations and differencing are preferred approaches for stabilizing the time series in non-stationary series (Cao et al., 2013:3; Cheung and Lai, 1995:277). The

stationarity status of the variables used in the research may vary according to the selected ARIMA model (Ramezanian et al., 2019:2; Zheng et al., 2020:2). In the next step, an attempt is made to determine the order of p for the autoregressive process (AR) and the order of q for the moving average (MA). In this step, the autoregressive process model is typically expressed with a p-order model and is represented as in Equation 1 (Ramezanian et al., 2019:2).

$$y_t = c + \sum_{i=1}^{p} \alpha y_{t-1} + \varepsilon_t \qquad (1)$$

In Equation 1, p represents the parameter of the model; c is the constant term, and ε denotes the error term. The process function for the moving average is represented with a q-order model, as shown in Equation 2.

$$y_t = \mu + \varepsilon_t + \sum_{i=1}^{q} \theta_i y \varepsilon_{t-1} \qquad (2)$$

ARMA model prediction method is commonly applied based on time series data, providing the ability to forecast future changes and values in time series. The model takes its final form by combining the p and q models and is represented as in Equation 3.

$$y = c + \sum_{i=1}^{p} \alpha y_{t-1} + \varepsilon_t + \sum_{i=1}^{q} \theta_i y \varepsilon_{t-1} \qquad (3)$$

The model suitable for the purpose of the study is determined based on certain parameters. In the subsequent step, to ensure the verification of the results, the forecast coefficients are examined, including "R2" for goodness of fit, "p value" for significance level, and the significance of residual values. The most suitable model is decided by considering Akaike or Schwarz criteria values in the case of having multiple optimal AR and MA models. It is desired that these values have the smallest value, and the decision for the optimal model can be made accordingly (Klazoglou and Dritsakis, 2018:461; Ramezanian et al., 2019:2).

3. RESULTS

Data analysis followed the steps of the Box-Jenkins approach, including selecting the model, estimating parameters, reviewing alternative models, and selecting the most suitable model to obtain forecast data. To achieve accurate results in the model selection step, the data should be stationary. According to the functional classification table of general budget expenditures, Table 1 provides the data covering the periods 200601-202210 for healthcare expenditures. To test stationarity, the Augmented Dickey-Fuller (ADF) unit root test was applied. In cases where time series data is non-stationary, a logarithmic transformation followed by differencing was performed. As a result of the differencing process, stationarity was observed at the 1% significance level at the level. The data regarding the results of the unit root test are provided in Table 1.

Table 1. Augmented Dickey-Fuller (ADF) Unit Root Test Results

Variable	Level	t-Statistic	Prob.
Healthcare Expenditures	%1(-3.46) %5(-2,87) %10(-2,57)	-3,60**	0,0065
Total Expenditure	%1(-3.46) %5(-2,87) %10(-2,57)	-3,931**	0,0022

t-statistic values are labeled as ***, **, and * when the p-value is less than 0.01, between 0.01 and 0.05, and between 0.05 and 0.1, respectively.

In ARIMA modeling, the values for p (autoregressive order) for AR and q (moving average order) for MA are determined by examining the ACF (autocorrelation function) and PACF (partial autocorrelation function), establishing the suitability of the model. When selecting appropriate values for p, d, and q in the models, it is essential to consider certain criteria. These criteria can be listed as follows: the estimated parameters being statistically significant, the F-statistic value being significant, and the AIC and SIC values being smaller among alternative models. In this context, the values related to the selection of the most suitable model for income and expenditure balance according to AIC (Akaike Information Criterion) and SIC (Schwarz Criterion), Hannan-Quinn criteria are provided in Table 2. The Durbin-Watson statistic is employed to test for the presence of autocorrelation. As stated in the literature, the Durbin-Watson statistic must fall within the range of 0 to 4, and in the absence of autocorrelation, it is expected to be approximately 2 (Gujarati, 2001:423). Therefore, if the calculated Durbin-Watson statistic is around 2, it can be inferred that there is no autocorrelation in the model.

Table 2. Determining the Most Suitable ARIMA Model for the Developed Forecast Models

Variable	Model	AIC	SIC	Hannan-Quinn
Healthcare Expenditures	ARIMA (1, 1, 1)	-0,2996	-0,2501	-0,2796
	ARIMA (2, 1, 2)	-0,2805	-0,1978	-0,2470
	ARIMA (2, 1, 1)	-0,2877	-0,2215	-0,2609
	ARIMA (2, 1, 3)*	**-0,3570**	**-0,2577**	**-0,3168**
Total Expenditure	ARIMA (1, 1, 1)	-0,9946	-0,9492	-0,9763
	ARIMA (2, 1, 2)	-0,9772	-0,9013	-0,9466
	ARIMA (2, 1, 1)	-0,9838	-0,9231	-0,9593
	ARIMA (2, 1, 3)*	**-1,0866**	**-0,9955**	**-1,0498**

To determine the appropriate model for predicting healthcare expenditures and total expenditures, multiple models were tested. After these trials, it was decided that the most suitable models for both variables were ARIMA (2,1,3). The Table 3 provides the values related to the parameter estimation results of the identified optimal models.

Table 3. Values Related to the Prepared Optimal Models for Variables

Variable	**Model**	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Healthcare Expenditures	C	0,015729	0,003739	4,207170	**0,0000***
	AR(1)	-1,079887	0,018055	-59,81197	**0,0000***
	AR(2)	-0,975040	0,017746	-54,94353	**0,0000***
	MA(1)	0,397996	0,051568	7,7717839	**0,0000***
	MA(2)	0,126554	0,058420	2,166269	**0,0315***
	MA(3)	-0,726986	0,050069	-14,51973	**0,0000***
	Value				
	R-squared	0.378965	Theil's U		**0.473610**
	Prob(F-statistic)	0.000000	Hannan-Quinn		-0,3168
	Akaike info criterion	-0,357038	Schwarz criterion		-0,257742
			Durbin-Watson		1,871282
Total Expenditure	**Model**	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
	C	0,015043	0,002458	6,120454	0,0000
	AR(1)	-1,726453	0,005663	-304,8408	0,0000
	AR(2)	-0,995767	0,003812	-261,2442	0,0000
	MA(1)	0,999053	0,048614	20,55080	0,0000
	MA(2)	-0,280321	0,079728	-3,515967	0,0005
	MA(3)	-0,736627	0,045730	-16,10803	0,0000
	R-squared	0,502635	Theil's U		0,19
	Prob(F-statistic)	0,0000	Hannan-Quinn		-1,0498
	Akaike info criterion	-1,086619	Schwarz criterion		-0,995523
			Durbin-Watson		2,046206

When Table 3 is examined, it is observed that the values required for the parameters to perform the prediction modeling are met, and the F-statistic is significant ($p<0.05$). According to the analysis results, Theil-U values for the income variable are found to be 0.47 and 0.19. The fact that the data is within acceptable ranges indicates that the model is predictable. Based on the created models, the forecast for healthcare expenditures in the general budget covering the period from November 2022 to December 2024 has been made. The values related to the results are provided in Table 4.

Table 4. Healthcare Expenditure Predictions for the Period November 2022 to December 2024

Monthly Period	**Healthcare Expenditures**	**Monthly Period**	**Healthcare Expenditures**
202211	₺ 15.005.386,25	**202312**	₺ 22.597.927,99
202212	₺ 18.101.362,65	**202401**	₺ 20.582.788,57
202301	₺ 18.255.277,57	**202402**	₺ 19.908.309,75
202302	₺ 15.807.179,26	**202403**	₺ 23.718.094,08
202303	₺ 19.216.133,64	**202404**	₺ 21.278.245,66
202304	₺ 18.789.688,21	**202405**	₺ 21.162.467,68
202305	₺ 16.696.184,50	**202406**	₺ 24.829.047,06
202306	₺ 20.341.766,19	**202407**	₺ 22.039.432,16
202307	₺ 19.348.815,83	**202408**	₺ 22.506.118,83
202308	₺ 17.675.106,20	**202409**	₺ 19.534.071,94
202309	₺ 21.471.022,17	**202410**	₺ 17.233.190,77
202310	₺ 19.943.060,14	**202411**	₺ 18.031.662,13
202311	₺ 18.745.621,78	**202412**	₺ 20.357.781,46

When examining Table 4, it is anticipated that expenses will be approximately 15 billion TL in November 2022 and 18 billion TL in December 2022. Looking at January 2024, health service expenditures expected to be around 20.5 billion TL, while in December 2024, it is observed that the health service expenses were 20.3 billion TL.

Table 5. Total Expenditure Estimates for the Period 2022:11-2024:12

Monthly Period	Total Expenditure	Monthly Period	Total Expenditure
202211	₺ 253.302.329,50	**202312**	₺ 276.943.566,27
202212	₺ 285.694.127,31	**202401**	₺ 311.855.753,87
202301	₺ 261.784.528,10	**202402**	₺ 286.876.197,06
202302	₺ 239.875.911,35	**202403**	₺ 310.922.210,40
202303	₺ 261.322.101,96	**202404**	₺ 310.625.421,43
202304	₺ 259.778.086,62	**202405**	₺ 342.176.181,01
202305	₺ 254.546.811,33	**202406**	₺ 313.214.341,59
202306	₺ 280.118.227,07	**202407**	₺ 349.959.961,97
202307	₺ 255.973.456,50	**202408**	₺ 333.380.591,10
202308	₺ 287.132.491,92	**202409**	₺ 342.832.419,05
202309	₺ 272.137.581,72	**202410**	₺ 362.162.408,53
202310	₺ 281.221.257,73	**202411**	₺ 338.443.699,01
202311	₺ 296.089.198,01	**202412**	₺ 380.428.691,95

Examining Table 5, it is projected that the total expenditures will be approximately 253 billion TL in November 2022 and 285 billion TL in December 2022. Looking ahead to January 2024, the estimated total expenditures are expected to be around 312 billion TL, while the actual total expenditures for December are observed to be 380 billion TL. Referring to Table 6, the estimated total health service expenditures for November and December 2022 are approximately 173 billion TL, with total expenditures reaching 2,823 billion TL. The forecast for health service expenditures in 2023 is about 229 billion TL, and for 2024, it is anticipated to be 251 billion TL. Total expenditures are expected to be around 3,227 billion TL in 2023 and 4,000 billion TL in 2024.

Table 6. Annual Total Estimated Amounts of Monthly Health Expenditure and Total Expenditures for General Budget for the Years 2022:11-2024:12 (Thousand TL)

Years	2022	2023	2024
Healthcare Expenditures	173.495.907	228.887.783	251.181.210
Total Expenditure	2.822.857.858	3.226.923.219	3.982.877.877

4. DISCUSSION

In public financial management, functional classification plays a crucial role in the preparation, allocation, and monitoring of budgets. Each function in the functional classification encompasses various sub-level activities. It is emphasized that the numerical measurement of program objectives determined for these functions through econometric methods has positive contributions to the rational decision-making process (Ergen, 2021:288). It is well known that conducting the budget creation process rationally and making decisions accordingly will enhance policy-making capacity. Monitoring the relationship between planning and budgeting and ensuring managerial control over the process can increase the potential for effective and efficient use of resources (Yılmaz and Akdeniz, 2020:107). The Ministry of Treasury and Finance's 2019-2023 Strategic Plan emphasizes the goal of determining fiscal policies to achieve economic balance, budget discipline, sustainable growth, and equitable distribution. In this context, the plan sets the objective of developing participatory, collaborative, and cooperative methods in fiscal decision-making and practices (Ministry of Treasury and Finance, 2019:10). In this context, the study, by predicting future expenditures of health services and total expenditures-one of the functions of the state-holds evidential value for policymakers in the decision-making process of public financial management.

Public financial management is concerned with how budgets are prepared, resources are allocated, and expenditures are monitored. In this study, within the scope of public financial management, the trend of health service expenditures and total expenditures according to functional classification, indicating the type of state activities, has been predicted. It was found that the best forecasting models for both variables were ARIMA (2,1,3). These models were applied separately for each variable, and predictions were made for the period from November 2022 to December 2024. The findings obtained indicate an increasing trend in health expenditures and total expenditures. According to the predictions, health service expenditures are estimated to be approximately 251 billion TL, and total expenditures are expected to be around 4,000 billion TL

in the year 2024. In line with the literature and the findings obtained, it can be stated that promoting evidence-based management in the context of health and economic policies will contribute to the control of healthcare expenditures. The health expenditure budget serves as a significant indicator in achieving a country's fundamental financial objectives, implementing and evaluating health policies and strategies. In this context, when evaluated, the findings of the study can potentially guide policymakers in developing new policies and feasible strategies. Health authorities are emphasized to aim for effective engagement with budget authorities to promote reliable, priority-focused health budgets, ultimately strengthening accountability in budget execution (WHO, 2016:399).

5. CONCLUSION

The forecasts for healthcare expenditure may exhibit temporal variations depending on the specific problem they intend to address. While it may focus on a very short period to manage current resources, forecasts regarding how the demographic and epidemiological transition processes of the country will affect expenditures can encompass longer periods. In light of this information, taking measures for the reforms aimed at implementing a strong correlation between policy, planning, and budgeting can be facilitated based on the findings of the study. Anticipating future healthcare expenditures and total expenditures can contribute to the determination of programs and plans associated with this function. Consequently, the boundaries and scope of the budget allocated to healthcare services will be defined, and policies and strategies can be shaped within these limits. This can potentially enhance the potential for effective and efficient use of resources by ensuring proper allocation of resources.

The study has certain limitations and strengths. The dataset used for the variables in the study covers a specific period, limiting the forecast period to a constrained timeframe. Upon reviewing the literature, the uniqueness and strength of the study emerge from the absence of similar econometric studies, particularly focusing on healthcare, within the field of public financial management. The literature emphasizes the need for such studies. Future research expanding the variables and time dimension may reveal new findings. Lastly, it should be noted that the obtained results may be influenced by changes both in the timeframe and the sample data dimensions. The limitation arises from the presentation of estimates in nominal figures without accounting for inflation. This signifies a constraint in the study as it disregards the potential impact of inflation on the real value of healthcare expenditures over time, thus rendering the estimates potentially unable to adapt to such changes. Therefore, it is crucial to consider this limitation when interpreting the findings.

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Conflict of Interest:
The authors declare that they have no conflict of interest.
Ethical Approval:
This study is based on the analysis of existing publicly available secondary data. The data has been previously collected and sourced from public channels, tailored to align with the objectives of this study. The dataset has been obtained in accordance with the purpose of this research. Given that the study's data is derived from existing publicly available sources, we believe it is ethically sound, and no ethical review board approval is deemed necessary.
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