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The relationship between digital financial literacy and financial behaviors of pharmacy faculty students: A comprehensive evaluation through structural equation model

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ABSTRACT

This study aims to assess the relationship between financial literacy levels and digital financial skills among pharmacy faculty students. Conducted with students from pharmacy faculties in Istanbul, the research utilizes a dataset comprising factors like demographic characteristics, financial conditions, and digital financial literacy levels. The analysis, employing Structural Equation Modeling, elucidates the connections between financial literacy and digital financial skills. Significant correlations have been identified between young adults' financial behaviors and digital financial attitudes. This research contributes to the broader understanding of financial literacy, particularly underscoring the interplay between traditional financial literacy and digital financial literacy. The findings reveal notable correlations and contradictions with existing literature in the domain of financial literacy, as related to digital financial literacy and pharmacy students' financial behaviors. The multifaceted nature of financial literacy, especially in the context of intertwining traditional and digital aspects, has been expanded upon in this study.

Keywords: financial literacy, digital financial literacy, pharmacy student, behavior

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INTRODUCTION

In today's world, making financial decisions and increasing financial well-being have significant impacts on individuals' lives. Young adults are at a critical stage in gaining financial independence and achieving future financial goals. Financial literacy is an important tool for individuals to make informed and effective financial decisions during this process. However, the level of financial literacy among young adults and its relationship with digital financial skills are still not fully understood.

Financial literacy includes more than one dimension; the focus is on the knowledge itself as well as the ability to acquire and use knowledge[1]. Digital literacy can be defined as using the digital technologies that come into our lives and are presented to us.

The competence to use the mentioned technologies together with the knowledge to find, create, evaluate and communicate, the use of effective technological possibilities, therefore requires both cognitive knowledge and technical skills as prerequisites for the use of technology[2]. While the Organization for Economic Co-operation and Development (OECD, 2018) defines this concept in various ways, various aspects of digital financial literacy include information about digital financial products and services, awareness of digital financial risks, and consumer rights and enforcement procedures. The multiplicity and importance of these definitions show the depth of the concept. Since all concepts require knowledge and conceptual literacy is required to use them effectively. Due to the prevalence and impact of financial know-how use, the financial services sector is trying to expand its existing financial literacy programs by taking advantage of the opportunities. Global economic investments increased rapidly in this area from 2017 to 2018. The approximate amount of investment in this field has increased from 12 billion US dollars to over 50 billion US dollars. There is a constant expansion of the scope mentioned in the studies conducted by Collins and Urban[3]. Financial know-how will become more responsible for individuals' economic well-being over time. Increasing these opportunities also has an increasing effect on perceived financial well-being. Financial well-being can be defined as: the conditions a person can face are the ability to meet their financial obligations and have a positive financial forecast for the future[3]. In this context, financial literacy and digital financial literacy, which are associated with financial well-being, are increasingly the subject of comprehensive research.

Although it has many different definitions, financial literacy is, in summary, considered as having some basic financial information and the ability to use this information to be successful in making the right financial decisions[4]. Today, the rapid development of communication technologies has caused financial instruments to enter our lives from many different points. People who have a certain level of financial literacy can utilize these opportunities more efficiently in terms of profitability and efficiency in economic activities. Today, at the level of financial literacy they have, it is essential to carry out financial transactions using complex and unconventional information that considers the developing and changing environmental conditions other than classical knowledge and practices. The concept of financial literacy has gained new dimensions with digitalization, and studies have shown that people are more successful as a result of having sufficient knowledge when applying financial information transactions[5]. When the literature is reviewed about the concept of financial literacy and digital financial literacy, it is stated that the concept of finance and digitalization is basically shaped around three elements: fintech, financial behavior in digital media and behavioral interventions. Fintech, one of these elements, in its most general definition, is the combination of technology and finance in order to provide financial services faster, better and easier. In other words, with the technology, financial services can be made more user friendly, and consumers can access financial services in new and different ways. The rapid increase in mobile applications and the widespread use of the internet are among the factors that have created Fintech in recent times. That's why consumers now expect to access fast, user-friendly and entertaining financial services that they can easily access from any point. In order to meet all these expectations, competition and studies in this field are increasing day by day in our country as well as in the whole world. Although the Turkish fintech field is a competitive environment, it is also an environmental system where new working and collaboration opportunities are found. An example of this is the implementation of the digital wallet project in Türkiye in 2012, with all banks and leading e-commerce companies working together[6]. In addition, some applications are put into effect in order to gain financial literacy skills and the necessary awareness in this sense. Applications located at the intersection of financial literacy and technology skills can help children and young people to acquire this awareness and parents who aim to teach children and young people savings and money management and saving. While the mentioned applications are being implemented one by one by banks or entrepreneurs, the opportunities offered by digital environments are used very efficiently in the context of creating a more conscious consumer base compared to others[7].

Today, it is possible for individuals to access digital communication and information resources, identify, manage and evaluate the resources through the technologies used for communication purposes and the application tools developed accordingly. In addition, information needs to be analyzed, synthesized and integrated with existing and new information. Apart from this, the phenomenon defined as the awareness, attitude and ability to use digital tools and digital environments appropriately in order to create new information, create expression in media channels and communicate with others, constitutes the broad framework of digital literacy[8]. When we evaluate the concept of digital literacy together with financial literacy, we see that individuals under the age of 18 have knowledge of money, budget, finance, etc. It is thought that it is necessary to develop the ability to use digital tools and related environments for virtual environment transactions by gaining the awareness of being able to act cautiously on issues. In this context, the concept of financial literacy emerges with its evolving dimension into digital processes and is offered with different models and applications[8].

The main aim of the study is to assess students' levels of financial literacy and digital financial skills, identify their strengths and weaknesses in these areas, and develop recommendations for financial literacy education programs. The methodology of the analysis focuses on revealing the relationships between financial literacy and digital financial skills using confirmatory factor analysis.

METHODOLOGY

This study was conducted to understand the level of financial literacy and its relationship with digital financial skills among students in pharmacy faculties at universities in Istanbul. The study focuses on providing an in-depth analysis of the demographic characteristics, financial situations, digital financial literacy levels, and financial behaviors of pharmacy students. In this context, the dataset used in the analysis includes demographic and financial characteristics of participants such as gender, age, type of university, class, credit card usage, and internet banking habits.

The flow of the study initially examines the demographic characteristics of the participants, followed by addressing their financial situations and spending habits. Subsequently, confirmatory factor analysis is conducted to measure financial literacy and digital financial literacy levels. The results have helped us understand the relationships between financial behaviors and digital financial attitudes of pharmacy faculty students.

In the analysis part of the study, the data set was evaluated through Structural Equation Model. The research model was created and after the consistency of the fit indices was determined, the relationships between the sub-dimensions of financial knowledge, financial attitude, financial behavior, digital financial attitude and digital financial behavior suggested by the model were analyzed.

Research type

This study is a comprehensive evaluation exploring the relationship between financial literacy levels and digital financial skills among pharmacy students. It adopts a correlational research design to analyze the interplay between financial behaviors and digital financial attitudes, using the Structural Equation Model for detailed analysis.

Data collection technique

The methodology employed involves an online survey to gather data. The survey is designed on a five-point Likert scale, with options ranging from "Strongly Disagree" to "Strongly Agree." It aims to assess participants' demographic information, financial situation, digital financial literacy, and financial behavior. The survey incorporates the Financial Literacy and Digitalization Scale developed by Kaya and Kılıç[9].

Research universe

The research universe encompasses pharmacy faculty students from various universities in Istanbul. The study provides a detailed analysis of these students' demographic characteristics, financial situations, and levels of digital financial literacy. The study delves into factors such as gender, age, university type, grade, credit card usage, and internet banking habits, offering insight into the diverse backgrounds of the participants.

Dataset and sample structure

The sample size of the study is 600 participants, predominantly female, and primarily aged 21 and under. The participants are students from different age groups, genders, university types, and academic years within pharmacy faculties. The study includes a detailed demographic distribution of participants, covering aspects such as household income levels and monthly expenses, further enhancing the understanding of the study's population.

The participants of this study are a sample of 600 students from the faculty of pharmacy of universities in Istanbul. Participants were selected from different age groups, genders, university types and grades. The data collection process

was carried out through online surveys. The survey form was prepared in a five-point Likert type as “Strongly Disagree” (1), “Disagree” (2), “Undecided” (3), “Agree” (4) and “Strongly Agree” (5). The survey forms were specifically designed to assess participants’ demographic information, financial situation, digital financial literacy, and financial behavior. Kaya and Kılıç developed the financial literacy and digitalization scale and in this research this scale was used[9].

The collected data were analyzed using statistical techniques such as descriptive statistics, correlation analyses, independent samples t-test, and analysis of variance (ANOVA). SPSS and R statistical software were used for statistical analysis. Data analysis was carried out in two stages. First, the validity of the scales was evaluated using confirmatory factor analysis. Then, the obtained data was analyzed using statistical methods. Correlation analysis was used to examine the relationships between financial knowledge, attitudes and behavior and digital financial attitudes and behavior.

RESULTS and DISCUSSION

From a total population of 1,000 people, 600 people were reached and all of them completed the survey. There is no missing data. The survey form included variables determined to measure the digital financial literacy level of the participants. These dimensions include Financial Knowledge, Financial Attitude, Financial Behavior, Digital Financial Attitude, Digital Financial Behavior.

When the distribution of participants by gender is examined, the rate of women is 82.7% and the rate of men is 17.3%. The rate of those between the ages of 18 and 21 is approximately 73%, and the rate of those over 21 is 27%. When the distribution by university type is examined, the rate of those studying at a public university is 24.5% and the rate of those studying at a foundation university is 75.5%. The rate of first graders is 36%, the rate of second graders is 30.8%, the rate of third graders is 10.8%, the rate of fourth graders is 14.8%, and the rate of fifth graders is 7.5%. 57.7% of the participants use credit cards. It was observed that 92.5% of the participants used internet banking. Table 1 shows the demographic characteristics and distribution of the sample group.

Table 1. Demographic distribution table

		n	%
Gender	Female	496	82.7
	Male	104	17.3
	Total	600	100.0
Age	18	122	20.3
	19	92	15.3
	20	149	24.8
	21	75	12.5
	21+	162	27.0
	Total	600	100.0
University Type	Public	147	24.5
	Private	453	75.5
	Total	600	100.0
Grade	1	216	36.0
	2	185	30.8
	3	65	10.8
	4	89	14.8
	5	45	7.5
	Total	600	100.0
Credit Card Usage	Yes	346	57.7
	No	254	42.3
	Total	600	100.0
Internet Banking Usage	Yes	555	92.5
	No	45	7.5
	Total	600	100.0

When the family monthly income distribution is examined, the rate of those whose income is less than 12,000 Turkish Lira (TL) is 13.7%, 12,000-16,999 TL is 19.8%, 17,000-21,999 TL is 16.7%, and the rate of those whose income is 22,000-26,999 TL is 9.2%. The rate of those with 27,000-31,999 TL is 9.3%, with 32,000-36,999 TL is 7.3%, with 37,000-41,999 TL is 7.2%, with 42,000-46,999 TL is 3%, with 47,000-51,999 TL is 2.8%, with income of 52,000 TL and above is 11%. The rate of those who spend 3,000-4,999 TL is 64%, 5,000-6,999 TL is 13.3%, 7,000-8,999 TL is 4.3%, 9,000-10,999 TL is 6%, 11,000 TL and more is 12.3%. When the distribution of sources where participants follow financial developments is examined, it is seen that the internet takes the lead. 94.7 % of the participants use the internet, 2.2% use

TV, and the remaining 0.7% use books, magazines, newspapers, etc. While using other resources, the rate of those using other resources is 2.5%. It is seen that the family ranks first with 64.8% in the distribution of resources acquired financial behavior towards spending money. It is followed by the social environment in second place with 16.7% and the school in third place with 6%. The rate of other sources is 11.2%. Table 2 shows the distribution of income levels of the sample group.

Table 2. Distribution table by income status

		n	%
Household Income	Less than 12,000 TL	82	13.7
	12,000-16,999 TL	119	19.8
	17,000-21,999 TL	100	16.7
	22,000-26,999 TL	55	9.2
	27,000-31,999 TL	56	9.3
	32,000-36,999 TL	44	7.3
	37,000-41,999 TL	43	7.2
	42,000-46,999 TL	18	3.0
	47,000-51,999 TL	17	2.8
	52,000 TL and above	66	11.0
	Total	600	100.0
Monthly Expenses	3,000-4,999 TL	384	64.0
	5,000-6,999 TL	80	13.3
	7,000-8,999 TL	26	4.3
	9,000-10,999 TL	36	6.0
	11,000 TL and above	74	12.3
	Total	600	100.0
What is the financial terminal where you follow financial developments?	Internet	568	94.7
	TV	13	2.2
	Book, Journal, Magazine etc.	4	0.7
	Other	15	2.5
	Total	600	100.0
What is the source from which you acquired the financial behavior of spending money?	Family	389	64.8
	Social Environment	100	16.7
	School	36	6.0
	Journal, Book etc.	8	1.3
	Other	67	11.2
	Total	600	100.0

Structural equation model

It was examined with Structural Equation Model to determine the validity of the financial literacy and digitalization scale. The ratio of chi-square statistics to degrees of freedom obtained for model fit indices, root mean square error of approximation (RMSEA), Tucker-Lewis index (TLI) value and comparative fit index values were examined[10]. A model's comparative fit index (CFI) and Tucker-Lewis index (TLI) values of 0.90 or above mean that it has a good fit. The fit indices calculated for the scales are given in the table below. When the model fit indices were examined, it was seen that the model had a good fit. Table 3 reflects the fit indices of the model used in the research.

Table 3. Model fit indices table

Acceptable Fit Indices	Calculated Fit Indices
$\chi 2$/sd. <5	3.268
GFI>0.90	0.932
AGFI>0.90	0.921
CFI>0.90	0.901
TLI>0.90	0.927
RMSEA<0.08	0.079
RMR<0.08	0.076

The model fit indices in Table 3 are based on widely accepted standard threshold values in structural equation modeling[11,12,13]. Values greater than 0.95 for the Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) as indicative of a good fit, and values less than 0.06 for the Root Mean Square Error of Approximation (RMSEA) as indicative of a close fit[11,12]. Provide more detailed recommendations for these indices, and[13] offers a comprehensive overview of model fit assessment in SEM, including a discussion of various fit indices and their acceptable thresholds. Table 4 of coefficients of the research model is given below.

Table 4. Model coefficients table

			Coefficients	Std. Coefficients	S.E.	C.R.	P
s5	<---	Financial Knowledge	1	0.626			
s4	<---	Financial Knowledge	1.24	0.752	0.087	14.323	<0.001
s3	<---	Financial Knowledge	1.449	0.73	0.103	14.038	<0.001
s2	<---	Financial Knowledge	1.41	0.763	0.097	14.461	<0.001
s1	<---	Financial Knowledge	1.165	0.698	0.086	13.604	<0.001
s14	<---	Financial Attitude	1	0.679			
s13	<---	Financial Attitude	0.806	0.71	0.052	15.522	<0.001
s11	<---	Financial Attitude	0.999	0.715	0,064	15,62	<0.001
s10	<---	Financial Attitude	1.105	0.7	0.072	15.328	<0.001
s9	<---	Financial Attitude	0.984	0.739	0.061	16.072	<0.001
s8	<---	Financial Attitude	0.839	0.655	0.058	14.437	<0.001
s7	<---	Financial Attitude	0.958	0.606	0.071	13.453	<0.001
s6	<---	Financial Attitude	0.881	0.579	0.068	12.891	<0.001
s20	<---	Financial Behavior	1	0.484			
s19	<---	Financial Behavior	1.591	0.601	0.16	9.952	<0.001
s18	<---	Financial Behavior	1.69	0.614	0.168	10.07	<0.001
s17	<---	Financial Behavior	1.592	0.774	0.142	11.18	<0.001
s16	<---	Financial Behavior	1.397	0.549	0.148	9.466	<0.001
s15	<---	Financial Behavior	1.312	0.621	0.13	10.125	<0.001
s29	<---	Digital Financial Attitude	1	0.544			

s30	<---	Digital Financial Attitude	0.962	0.505	0.101	9.513	<0.001
s33	<---	Digital Financial Attitude	1.284	0.804	0.104	12.38	<0.001
s34	<---	Digital Financial Attitude	1.034	0.488	0.111	9.277	<0.001
s35	<---	Digital Financial Attitude	1.182	0.644	0.106	11.154	<0.001
s22	<---	Digital Financial Behavior	1	0.355			
s23	<---	Digital Financial Behavior	1.19	0.677	0.153	7.788	<0.001
s24	<---	Digital Financial Behavior	1.187	0.664	0.153	7.746	<0.001
s32	<---	Digital Financial Behavior	1.131	0.705	0.144	7.864	<0.001

When the coefficients of the items in the model were examined, it was seen that all of them were significant. When the levels of the coefficients were examined, it was seen that all item sub-dimension correlations were high, so no items needed to be removed from the model. Figure 1 provides a graphical representation of the research model.

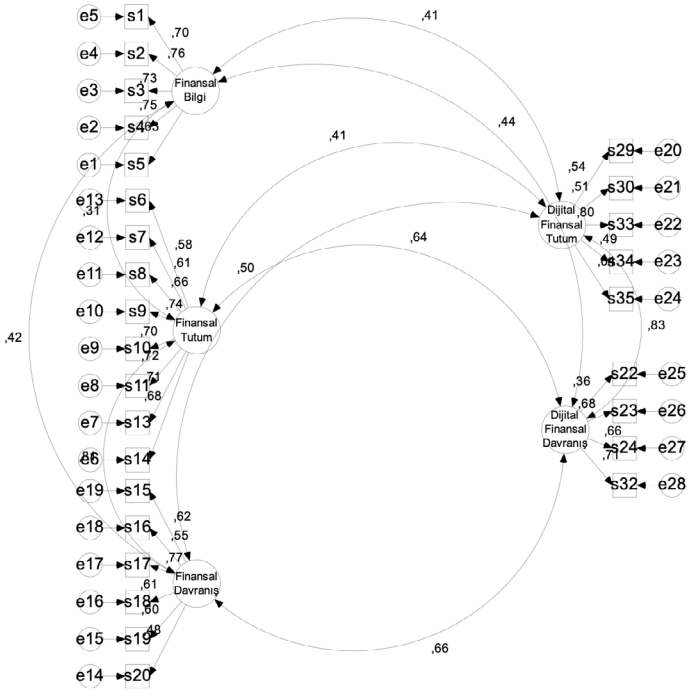

Figure 1. Research model

Relationships between sub-dimensions

The relationships between the sub-dimensions of the scale were examined by correlation analysis. Table 5 gives the analysis table of the sub-dimensions of the research scales.

Table 5. Scale sub-dimension analysis table

		Financial Knowledge	Financial Attitude	Financial Behavior	Digital Financial Attitude	Digital Financial Behavior
Financial Knowledge	r	1	.291**	.358**	.327**	.352**
	p		.000	.000	.000	.000
Financial Attitude	r	.291**	1	.669**	.293**	.485**
	p	.000		.000	.000	.000
Financial Behavior	r	.358**	.669**	1	.397**	.501**
	p	.000	.000		.000	.000
Digital Financial Attitude	r	.327**	.293**	.397**	1	.540**
	p	.000	.000	.000		.000
Digital Financial Behavior	r	.352**	.485**	.501**	.540**	1
	p	.000	.000	.000	.000	

According to the table, the financial knowledge sub-dimension has a positive significant relationship with financial attitude at the level of 29.1%, with the financial behavior sub-dimension at 35.8 %, with digital financial attitude at 32.7%, and with digital financial behavior at 35.2 % ($p<0.05$).

The financial attitude sub-dimension has a positive significant relationship with the financial behavior sub-dimension at 66.9%, with digital financial attitude at 29.3%, and with digital financial behavior at 48.5% ($p<0.05$). The financial behavior sub-dimension has a positive significant relationship with digital financial attitude at 39.7% and digital financial behavior at 50.1% ($p<0.05$). There is a 54% positive significant relationship between digital financial attitude and digital financial behavior ($p<0.05$).

The findings of this research, conducted to understand the relationship between digital financial literacy and the financial behaviors of pharmacy faculty students, have revealed several significant correlations and contrasts with existing literature in the field of financial literacy. This research has extended the understanding of financial literacy's multifaceted nature, particularly highlighting the intertwining of traditional financial literacy with digital financial literacy, as previously noted by Zait and Berata[1] and Aydın and Artar[5]. Alexander et al. emphasized increasing importance of digitalization in financial education, and the observed proficiency in digital financial literacy among those

with higher traditional financial literacy levels not only corroborates these studies but also underscores this importance[2].

Collins and Urban suggested that the predominance of female participants in this study sheds light on gender differences in financial literacy, aligning with the growing awareness of gender-specific needs in financial literacy programs[3]. This gender-based perspective in financial literacy is relatively underexplored in the literature, indicating a pivotal area for future investigation. Deloitte and Kızıloğlu identified that the extensive use of digital platforms for financial transactions and literacy among the study participants mirrors the shifting trends towards fintech and digital financial platforms[6,7]. This shift highlights the evolving landscape of financial literacy, where digital platforms are becoming central to financial education and behavior.

Contrasting with the findings of Klapper and Lusardi who reported a non-proportional relationship between financial literacy rates and economic development in the United States, this study suggests a more direct correlation between financial literacy and socioeconomic factors within the context of Istanbul's pharmacy students[14]. This variance could be attributed to the distinct demographic and regional characteristics of this study, thereby indicating the influence of local contexts on financial literacy. The impact of digital literacy on financial decision-making, emphasized by Kakinuma as a contributor to quality of life, is further highlighted in this study with specific focus on its influence on financial behaviors and attitudes[15]. It is suggested that the role of digital literacy in financial decision-making is context-dependent and multifaceted, thus requiring further exploration.

These findings underscore the necessity for financial literacy programs to incorporate digital literacy elements, echoing the suggestions made by Kaya and Kılıç[9]. The distinct gender differences in financial literacy underscore the importance of developing tailored educational approaches. It is acknowledged that this study's focus on a specific demographic—pharmacy students in Istanbul—limits its generalizability. Therefore, future research should consider exploring the impact of digital financial literacy across diverse age groups and socioeconomic backgrounds, thus broadening the understanding of financial literacy in various contexts.

This study has significantly enhanced the understanding of financial literacy, particularly by exploring the intersection of digital and traditional financial literacy among pharmacy faculty students. A unique focus on this specific demographic has been provided, underscoring how financial behaviors and lit-

eracy skills are shaped within specialized academic contexts. The investigation into gender-based differences in financial literacy is a notable aspect of this research, highlighting the need for gender-specific approaches in financial education – a relatively new consideration in the literature. Moreover, the research has contributed localized insights into the impact of socioeconomic factors on financial literacy in the context of Istanbul, diverging from broader geographic studies and adding depth to the understanding of these influences. The adoption of digital platforms in financial transactions and education, aligning with the global trend towards digitalization, has been comprehensively addressed, emphasizing the integration of digital literacy in financial education. Methodologically, the employment of Structural Equation Modeling has provided robust analysis, enhancing the research's credibility and offering a methodological blueprint for future studies in the field. Additionally, practical implications for the design and implementation of financial literacy programs have been derived, particularly emphasizing the inclusion of digital literacy elements and addressing gender-specific needs. In essence, this study not only aligns with but also advances the current literature on financial literacy by providing new insights into the digital era's dynamics and the nuanced role of gender in financial education, thereby shaping the future direction of financial literacy programs.

This study was conducted to understand the demographic characteristics, financial situations, digital financial literacy and financial behaviors of students studying at the Faculty of Pharmacy in Istanbul. The analysis results show that the participants have various characteristics according to demographic factors such as gender, age, university type, grade, credit card usage and internet banking habits. When we look at the gender distribution, it is seen that the participation rate of women in the research is higher than that of men. This situation suggests that it may be useful to examine financial literacy education and programs in relation to gender-based needs. In addition, it was determined that the majority of the participants had the habit of using internet banking and followed financial developments on the internet. This highlights the importance of efforts by financial institutions to provide more information on digital platforms and to increase students' digital financial literacy.

Confirmatory factor analysis results showed that there were strong and significant relationships between financial knowledge, attitude and behavior and digital financial attitude and behavior. People who are proficient in financial literacy are also more conscious about digital financial literacy. It is important that financial literacy programs include not only basic financial knowledge but

also digital financial literacy. This is necessary so that students can make more informed financial decisions. Consequently, understanding the factors that influence students' financial behavior is important to improve individuals' financial well-being. This study provides important information that can guide the design and implementation of financial literacy education programs. Future research should evaluate more specific strategies and approaches to improve students' financial literacy levels, including different dimensions.

The findings of this study point to various practices in the development and implementation of financial literacy programs. In particular, organizations that offer financial literacy education should update their programs to ensure integrity that including digital financial literacy topics. Additionally, it is possible to make financial literacy programs more effective by developing educational materials and strategies appropriate to gender-based needs.

Since this study was conducted in a certain time period and on a certain sample group, its general validity is limited. In addition, its limitations include the fact that it is based on participants' statements, is not based on objective data, and contains a subjective evaluation. Future research may increase the generalizability of the results by conducting larger and more diverse sample groups.

This study provided a basic understanding of the financial behavior of pharmacy school students. Future research should aim to evaluate the impact of financial literacy programs on a long-term basis and understand the differences between different demographic groups. Additionally, studies that examine the need for digital financial literacy in more detail can better direct developments in the field of financial literacy.

STATEMENT OF ETHICS

Ethical committee approval was received from the Ethics Committee of Yeni Yüzyıl University (Approval No: 2024/01-1167, Date: 09.01.2024).

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

All authors contributed to the work equally throughout.

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