Araştırma Makalesi / Research Article

MEDIATING AND MODERATING VARIABLE EFFECT OF FINANCIAL KNOWLEDGE ON THE RELATIONSHIP BETWEEN FINANCIAL ATTITUDE AND FINANCIAL BEHAVIOR*

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ABSTRACT

Today's economic conditions, developments in information and communication technologies and the impact of digitalization have obliged individuals to exhibit more responsible financial behavior. In this context, the role of financial knowledge is very important in helping individuals make correct financial decisions and engage in responsible financial behavior. Although there are many studies in the literature on financial knowledge, attitudes and behavior, there are few studies examining the moderating and mediating effects. In this study, first the relationship between individuals' financial attitudes and financial behaviors was determined. Then, it was investigated whether financial knowledge has a moderating and mediating effect on this relationship. The data of the research was obtained through the survey method from 402 university students studying in different departments with various demographic characteristics. Correlation analysis and regression analysis were conducted using SPSS 21.0 software. Analyzes regarding the mediation and moderation effects were carried out using the SPSS Process plug-in. The first finding of the research is the existence of the effect of financial knowledge as a mediating variable. on the relationship between participants. Another result of the research is that financial knowledge has a partial moderating effect on the relationship between participants' financial attitudes and financial behaviors.

Keywords: *Financial Attitude, Financial Behavior, Financial Knowledge, Behavioral Finance.*

JEL Classification: *G4, G5, G53*

FİNANSAL TUTUM İLE FİNANSAL DAVRANIŞ ARASINDAKİ İLİŞKİ ÜZERİNE FİNANSAL BİLGİNİN ARACI VE DÜZENLEYİCİ ETKİSİ

ÖZET

Günümüz ekonomik koşulları, bilgi ve iletişim teknolojilerindeki gelişmeler ve dijitalleşmenin etkisi, bireyleri daha sorumlu finansal davranışlar sergilemeye zorunlu kılmıştır. Bu bağlamda bireylerin doğru finansal kararlar almalarına ve sorumlu finansal davranışlar sergilemelerine yardımcı olmada finansal bilginin rolü oldukça önemlidir. Literatürde finansal bilgi, tutum ve davranışa ilişkin pek çok çalışma bulunmasına rağmen düzenleyici ve aracılık etkilerini inceleyen az sayıda çalışma bulunmaktadır. Bu çalışmada öncelikle bireylerin finansal tutumları ile finansal

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davranışları arasındaki ilişki tespit edilmiştir. Daha sonra finansal bilginin bu ilişki üzerinde düzenleyici ve aracılık etkisinin olup olmadığı araştırılmıştır. Araştırmanın verileri çeşitli demografik özelliklere sahip farklı bölümlerde öğrenim gören 402 üniversite öğrencisinden anket yöntemiyle elde edilmiştir. Korelasyon analizi ve regresyon analizi SPSS 21.0 yazılımı kullanılarak yapılmıştır. Aracılık ve düzenleyicilik etkilerine ilişkin analizler SPSS Process eklentisi kullanılarak gerçekleştirilmiştir. Araştırmanın ilk bulgusu katılımcılar arasındaki ilişkide aracı değişken olarak finansal bilginin etkisinin varlığıdır. Araştırmanın bir diğer sonucu ise finansal bilginin, katılımcıların finansal tutumları ile finansal davranışları arasındaki ilişkide kısmi düzenleyici etkiye sahip olmasıdır.

Anahtar Kelimeler: *Finansal Tutum, Finansal Davranış, Finansal Bilgi, Davranışsal Finans.*

JEL Sınıflandırması: *G4, G5, G53*

1. Introduction

The economic development of a country depends on the correct and effective functioning of financial markets and people having sufficient information about these markets. In this respect, it is necessary to assess the extent to which individuals have a good command of financial elements, starting from managing their own budgets to their participation in financial markets. As a result of the developments in communication and information technologies from the beginning of 1980s, financial instruments have become more accessible to everyone at the global level, the average human lifespan has increased with the developments in the field of health, and the need for individuals and societies to have foresight in consumption and investment decisions has gained importance due to the increasing contagion effect of financial crises. It has made its effective use and future planning a much more sensitive issue. In many developed countries, increasing life expectancy has made it necessary to invest more in retirement compared to the past. In addition to the increased accessibility of financial instruments, the need to stop consumption and make more investments and savings for the future has arisen. In this context, the variety of financial products, which were previously few and easy to manage, has also increased. Among these products, checking and savings accounts, as well as variable rate bonds and loans are difficult to choose and manage. In particular, limited accounts, convertible bonds, option bonds, futures, swaps and foreign currency hedged deposit transactions are used for hedging purposes (Ongun, 1993).

Increasing instabilities in individuals' working lives, increases in income and debt levels, the expected pressure on the social security system due to the increase in average life expectancy, and the increase in the diversity and accessibility of financial instruments have increased the responsibility of individuals to know the structure and functioning of financial markets (Habschick et al., 2007). The importance of financial education, described as the process of improving individuals' understanding of financial products, services and concepts that will help them make informed choices, avoid pitfalls, and know where to go for help, in order to improve their current and long-term financial well-being (President's Advisory Council on Financial Literacy, 2009). In different studies in the literature, there was a need to make different definitions for the concept of "Financial Literacy", which can be substituted with the concepts of "Financial Awareness" and "Financial Sufficiency", and even to address the common points of these different definitions (Demir et al., 2016). In fact, in the 2008 Annual Activity Report of the Financial Literacy Advisory Council of the US Treasury, it was emphasized that standard definitions should be made about the competencies, skills and behaviors that individuals should exhibit in order to define financial literacy.

According to the OECD's definition financial literacy is a skill that can be improved through financial education. Financial education is the process of equipping individuals with the necessary knowledge and skills through information, instruction, and advice to understand financial products and concepts, be aware of financial risks and opportunities, make informed choices, and know where to go for help, and maintain and improve their current financial situation (OECD, 2005). Financial literacy is the combination of financial knowledge, financial attitude and financial behavior, and these three components should be examined in determining financial literacy (Atkinson & Messy, 2012).

In order to make inferences about the financial behavior of households in Turkey, data obtained through statistical reports can be evaluated. Based on these data, household consumption and saving behaviors can be interpreted. An important variable in this regard is savings. Savings, defined as the unspent portion of income and one of the main sources of investments, are important not only for individual future planning but also for macroeconomic growth. Savings that are transformed into investments are the driving force of economic growth. According to data from the Turkish Statistical Institute (TUIK), the savings rate, defined as the ratio of household savings to disposable income, has been on a downward trend in recent years. In fact, the savings rate, which was 15.1% in 2017, was realized as 13.9% in 2018, 12.8% in 2019, 10.9% in 2020, 11.5% in 2021 and 10.5% in 2022. Parallel to the decline in the savings rate, there has been an increase in the total number of credit cards and the volume of credit card transactions.

While the total number of credit cards in Turkey was 51 million in 2011, it reached 118 million in 2023. The volume of domestic transactions made with domestic and foreign credit cards, which was 294 billion TL in 2011, reached 7696 billion TL in 2023 (BKM, 2023). Based on the increase in the number of credit cards and transaction volume, it can be concluded that household indebtedness rates have also increased. An analysis of the gross amount of non-performing consumer loans and credit cards, which are indicators of household indebtedness, shows that the figure, which was 7 billion TL in 2010, increased continuously until 2016 and reached 19 billion TL in 2016 (BDDK, 2017: 16). The amount of non-performing consumer loans and credit cards, which was 18 billion TL in 2017, increased to 20 billion TL in 2019 and 24 billion TL in 2021 (BDDK, 2021: 16). By 2023, this amount increased to TL 45 billion (BDDK, 2023: 25).

While interpreting household consumption and savings rates, macroeconomic variables like income, inflation and interest rates as well as the failures in personal finance management should be taken into account. The basic rule for achieving success in personal finance management is increasing individual's financial literacy.

In this study, firstly, the concept of financial literacy is explained; secondly, the literature and methodology are presented and finally, the methodology and results of the study are discussed.

2. Concept of Financial Literacy

Financial literacy, which means having knowledge and skills in financial matters and being able to use this information effectively, encompasses the knowledge, understanding, and abilities necessary for individuals to make informed financial decisions. To understand financial literacy, which is the combination of financial knowledge, financial attitudes, and financial behavior, it is necessary to examine these three components.

The information required for financial literacy can be categorized as macroeconomic and microeconomic information (Özdemir, 2011). However, this information is not at the level of expertise, but is information about basic economic concepts and should be consistent with the basic principles taught in economics courses (Bodie, 2006). Individuals who are financially literate should have information about fundamental principles related to financial products and services, money, prices, and budget control (Tomaskova et al., 2011). According to Gianni et al. (2013), the concepts that individuals know and need to know about their financial situations may differ depending on the national and cultural structures of the countries.

Financial attitude, which is the second component of financial literacy; individuals' tendency to save for the future. Individuals with negative attitudes about saving for the future are less likely to engage in saving behavior (Atkinson & Messy, 2012). Şahin and Barış see financial literacy as a policy tool that will increase private savings due to positive attitudes towards savings (Şahin & Barış, 2017).

Financial behavior, the third component of financial literacy; it refers to how individuals or institutions act and what kind of decisions they make regarding financial matters. Individuals' financial behavior affects their level of well-being, and positive financial behaviors are important in determining the status of financial literacy.

Financially literate individuals can protect themselves from the risks associated with financial ignorance (Habschick et al., 2007). Increasing instability in individuals' working lives, rising income and debt levels, expected increases in average life expectancy, anticipated pressure on the social security system, and the development of financial markets, product diversity, and complexity are raising individuals' responsibilities and the importance of financial literacy. Financially literate individuals can manage their financial resources and personal debts by participating fully and consciously in economic life. Individuals who are knowledgeable about credit management and budgeting can plan investments and savings for the future while meeting their current needs. One can choose among a variety of investment funds, including international funds, growth funds, income funds, tax-free funds. Having knowledge about new financial instruments can protect the individual from using high-cost traditional credit sources and direct him to low-cost effective credit sources and provide the opportunity to benefit from financial markets in the most effective way. Financially informed individuals are more resilient to fraud and abuse and can protect themselves against possible abuse by financial intermediaries.

Individuals with a high level of financial literacy can ensure the creation of new and high-quality financial products by informing financial institutions about their needs. In this way, it can serve the development of financial markets and increase competition and quality.

Financial literacy can contribute to keep expenses and debts under control for individuals of all ages, acquiring budgeting and saving habits, and creating the discipline to save for the future. Individuals who know the advantages and disadvantages of alternative investment and debt instruments can increase their welfare by borrowing at minimum cost and choosing investment instruments with maximum returns.

Individuals who are excluded from financial services for various reasons, do not have a bank account, are not affiliated with a financial institution, and cannot obtain financial products and services are defined as financially excluded individuals (Temizel, 2015: 124). In addition to being deprived of the benefits of being financially literate, financially excluded individuals become increasingly disadvantaged due to developments in financial markets and are exposed to the risk of being further isolated.

Developments in financial markets, changes in the demographic structure and retirement system, increasing income levels cause positive effects that increase consumer welfare for all individuals who invest and save for retirement, use loans, do not benefit from banking services and do not remain outside the financial system. A high status of financial literacy rises social and macro welfare along with its individual benefits, and in this context, contributes to the increase in global welfare.

Financially literate individuals save and invest more and accelerate the long-term growth of countries by transferring more resources to the real economy (Widdowson & Hailwood, 2007: 32). On the contrary, individuals who do not understand financial products and are reluctant to engage with them, hesitate to enter the financial system, and cannot communicate with financial institutions may prevent savings from being directed into the real economy, leading to their inactivity. Individuals who are financially literate and invest and save today in order to overcome the financial difficulties they may encounter in retirement not only provide resources to the economy with these savings, but also alleviate the financial burden of the state's retirees, expected to rise in the future, and reduce the source costs of financial organizations through the increase in savings and deposits. As a matter of fact, economic misallocation of private wealth may lead to social decline, loss of welfare and increase in public expenditures due to increases in health and care costs in the following year’s illiteracy (Habschick et al., 2007).

No matter how well the banking system works, the success of the financial system as a whole in transferring individual savings to the real economy depends on knowledgeable individuals. Financially knowledgeable individuals can help create a stronger and more competitive market by increasing the product diversity and quality in financial markets with their demands.

3. Literature

As a result of the developments mentioned above, the increasing importance of financial literacy also increases the research conducted on this subject. Literature studies can be divided into two main groups. First group; unlike traditional microeconomic models, which assume that individuals have the capacity to make complex economic calculations in consumption and savings decisions and expert knowledge about the functioning of capital markets, they are microeconomic models that internalize financial knowledge as an investment in human capital. The second group of studies are empirical studies that measure the impact of financial information on economic behavior (Lusardi & Mitchell, 2014).

Some of the studies conducted on the financial literacy literature, which consists of financial knowledge, financial attitude and financial behavior components, are as follows:

In their study analyzing survey data from 924 university and college students using cross-tabulations and the Chi-Square (X^2) method, Chen & Volpe (2002: 289) found that education and experience positively affect all students' financial literacy. However, they noted that women had lower financial knowledge compared to men. They attribute this result to women being less enthusiastic about learning financial topics compared to men and having lower self-confidence.

Lusardi et al. (2013: 31-33) establish a dynamic life cycle model in which the individual invests in financial knowledge as well as capital market investments. According to the model, some individuals, especially those with high social security income expectations in old age, may rationally choose to invest little or no in financial knowledge. To achieve high returns, individuals who attach importance to financial knowledge bear the costs of acquiring knowledge and invest in financial knowledge until the marginal time and money cost of acquiring knowledge equals its marginal benefit. The level of financial knowledge of individuals follows a slouching course throughout the life cycle, in other words, the period when the individual is most financially knowledgeable is middle age, and the period when he is most susceptible to being deceived is youth and old age.

Klapper & Panos (2011: 13) used data obtained through face-to-face surveys from a sample of 1,400 Russian individuals with different characteristics in terms of age, education, gender, and region. In their study using probit regression analysis, they found that participants' financial knowledge was quite low and that financial literacy was significantly and positively related to retirement planning. They noted that those living in rural areas were more dependent on public services and saved less and invested less in private pension funds for retirement.

Rooij et al. (2011: 25) apply the Pearson Chi-Square test to data obtained from surveys of more than 2,000 households representing the population of the Netherlands. They find that financial literacy affects financial decisions in their study of participants, most of whom have basic financial knowledge but relatively limited knowledge of topics such as the time value of money, inflation, and compound interest. According to the study, individuals with low financial literacy are less likely to invest in stocks and not participating in the stock market is likely to cause major welfare losses.

Alkaya & Yağlı (2015: 597-598) apply the Chi-Square test to data obtained through face-to-face surveys from 185 students studying at Nevşehir Hacı Bektaş Veli University. They identify a significant relationship between financial attitudes and financial behavior in their study in which they theoretically examined the financial knowledge, attitudes and behaviors of university students. It is concluded that women's financial literacy level and borrowing tendencies are lower than men, their risk aversion and credit card usage are higher, and that there is no significant difference between women and men in terms of savings tendency.

Relatively more recent and minority studies focus on the mediator and moderator effect of financial literacy. A “moderator variable” is a third variable that affects the established relationship between two variables and helps us understand how the relationship may change under certain conditions. The moderator effect helps us identify situations where the relationship changes conditionally (Seçer, 2023). In order to detect and analyze the presence of a moderator effect in regression analyses, an interaction term can be added, subgroup analysis, graphical analysis and statistical significance tests can be applied. Another variable used to explain different aspects of the relationship between variables is the "mediator variable". The mediator mediates the relationship between variables and tries to explain the mediating mechanism between the causes and consequences of the relationship. Two-step regression analysis, Baron and Kenny approach, Causality analysis, Path analysis, Sobel test, Bootstrapping method, graphical analysis can be used to analyze the mediator effect in regression analyses. Some of the most recent studies on the mediator and moderator effects of financial literacy are as follows:

Yıldırım & Aydın (2023) apply T-test, ANOVA, correlation, and regression analysis to the data obtained from 334 participants through surveys. In this study they found that the relationship between risk aversion and stock investment preference is negative and significant. The authors also found that financial literacy affects this relationship as a mediating variable.

Aydın & Sümer (2023) analyze the data obtained through random sampling from 503 individual investors trading on Borsa Istanbul using the SPSS AMOS software package. In this study, which examines the relationship between the self-control and financial security of individual investors trading on the Istanbul Stock Exchange, they find a positive and significant relationship between the two variables and demonstrate that financial literacy has a moderating effect on this relationship.

In their study on the mediating effect of financial literacy on the impact of next-generation branch applications in banking on customer satisfaction, Demirel & Al-Furaıji (2024) conduct regression analysis using the Hayes macro in SPSS on data obtained through surveys from 413 adult bank customers living in Istanbul. They find that financial literacy plays a full mediating role in this relationship.

In their study aiming to determine the impact of behavioral biases on individuals' investment decisions, Rehmat et al. (2023) use data collected from 367 retail individual market investors through face-to-face and online surveys. To determine the effect of behavioral biases and financial decisions, they use financial literacy as a moderator variable through the mediation of risk perception. The analysis, conducted using the SmartPLS, concludes that financial literacy significantly moderates the relationship between behavioral biases and investment decisions.

In their study analyzing the relationship between the personal characteristics of individuals trading in stock markets and investor risk behaviors, Akhtar & Malik (2023) use financial literacy as a moderator variable. Using data obtained through online surveys from 100 management students, the study applies multiple regression analysis and concludes that personality traits significantly affect investor risk behaviors and that financial literacy moderates this relationship.

Ishfaq et al. (2017) examine the effects of cognitive biases on risky investment decisions by including the mediator effects of risk perception. In this study conducted using data collected from 215 Pakistan Stock Exchange investors through surveys and analyzed with SPSS 20, a significant relationship is found between cognitive biases and risky investment decisions. The study also reveals that risk perception mediates the relationship between cognitive biases and risky investment decisions.

In their study where Parmitasari et al.(2023) used government support as a mediator variable, they examined the effects of financial bootstrapping and financial literacy on SME performance using data from 220 business and the partial least squares method. The study concludes that financial literacy significantly affects SME performance, that this positive effect occurs in direct or mediated relationships, and that financial bootstrapping does not significantly affect SME performance.

Oppong et al. (2023) examine the link between financial literacy, investment decisions and personal financial management for SME employees using data obtained from 402 city residents and least squares structural equation modeling. The study finds that there is a positive and significant relationship both between personal financial management and financial literacy, and between investment decision and personal financial management, and that the investment decision has a mediating effect on the relationship between financial literacy and personal financial management.

In his study, Fazal (2017) applied regression and moderation regression analysis to data obtained from 160 stock and bank investors to examine the relationship between emotional intelligence and investment decision-making. He finds a positive and significant relationship between emotional intelligence and investment decisions. By including financial literacy as a moderator variable, he concludes that the relationship between emotional intelligence and investment decision-making is further strengthened.

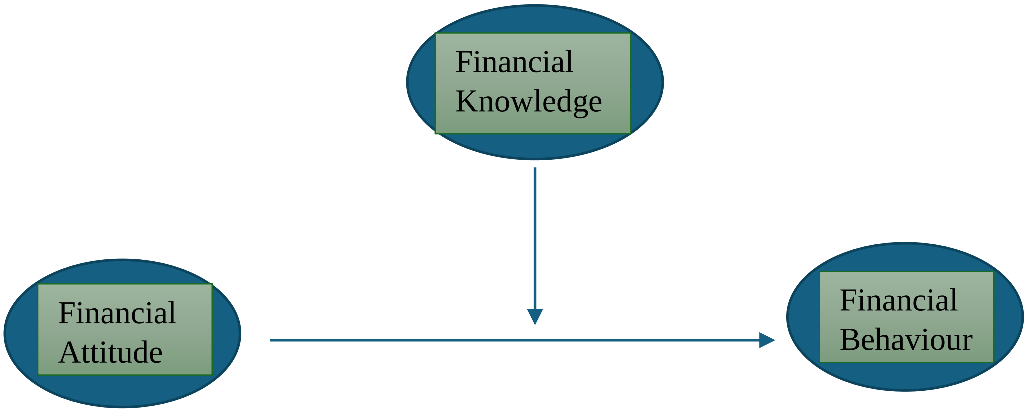
In their study, Owusu et al. (2024) use least squares structural equation modeling to examine how borrowing tendencies affect the saving behaviors of 370 undergraduate students at the University of Ghana Business School. They find that borrowing tendencies negatively impact saving behaviors and that financial literacy, as a moderating factor, mitigates the negative relationship between borrowing tendencies and saving behaviors.

In line with the current trends in the literature, the study aims to determine the relationship between financial attitude and financial behavior based on the data used in the study under the title "Measuring the Financial Literacy Perception of College Students Studying in Sapanca" (Mutlu et al., 2022) and to measure the mediator and moderator effect of financial knowledge in this relationship. Academic studies provide guidance on the economic consequences of financial literacy, the costs of low financial literacy, and the creation of public policies to improve financial literacy.

4. Methodology

In this research, first of all, after determining the relationship between individuals' financial attitudes and financial behaviors, it was investigated whether financial knowledge has a moderating and mediating effect on this relationship. The data required to achieve the purpose of the study were obtained via simple random sampling technique, designed to be obtained by the quantitative research method, and the survey method, which is one of the primary data collection methods. The sample of the research consists of 402 associate and undergraduate students of different ages, genders and marital status, who receive primary and secondary education in different departments at Sakarya University of Applied Sciences in Sapanca District. Ethics committee permission was granted by the Ethics Committee of Sakarya University of Applied Sciences for the survey application of this study with the decision dated 18.04.2024 and numbered 2024/43. The research models used in the study are shown in Figure 1 and Figure 2.

Figure 1. Moderating Effect of Financial Knowledge



Source: Prepared by authors

The research model presented in Figure 1 shows whether financial knowledge differentiates the relationship between financial attitude and financial behavior.

The hypotheses used in this model are as follows;

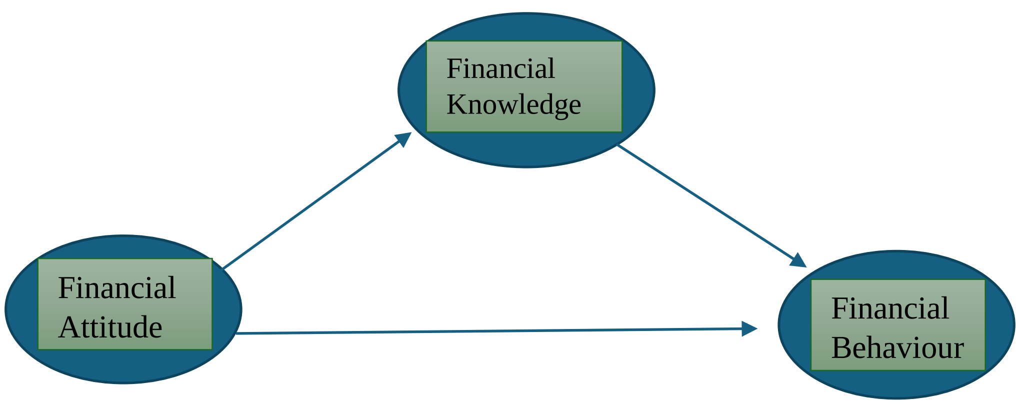
H_1: The financial knowledge that individuals have has a positive impact on their financial behavior.

H_2: Individuals' financial attitudes have a positive impact on their financial behavior.

H_3: Financial knowledge has a moderating effect on the relationship between individuals' financial attitudes and financial behaviors.

Figure 2 shows the mediator effect of financial knowledge**.**

Figure 2. Mediating Effect of Financial Knowledge



Source: Prepared by authors

The research model presented in Figure 2 shows the existence of a mediating effect in the relationship between financial knowledge, financial attitude and financial behavior. The hypotheses used to investigate this model are as follows;

H_4: Individuals' financial attitudes have a positive impact on their level of financial knowledge.

H_5: Financial knowledge has a mediator effect on the relationship between individuals' financial attitudes and financial behaviors.

Descriptive statistics regarding the data collected from the sample via the survey techniques are stated in the relevant tables.

Table 1: Gender of Participants

		Freq.	Percentage	Valid Percentage	Cumulative Percentage
	Women	237	59.0	59.0	59.0
	Men	165	41.0	41.0	100.0
	Total	402	100.0	100.0	

Source: Prepared by authors

As seen in Table 1, out of the 402 participants, 237 (59%) are female and 165 (41%) are male.

Table 2: Marital Status of Participants

		Freq.	Percentage	Valid Percentage	Cumulative Percentage
	Single	384	95.5	95.5	95.5
	Married	18	4.5	4.5	100.0
	Total	402	100.0	100.0	

Source: Prepared by authors

As seen in Table 2, 4.5% of the participants are married and 95.5% are single.

Table 3: Age of Participants

Age of Participants		Freq.	Percentage	Valid Percentage	Cumulative Percentage
	17.0	1	,2	,2	,2
	18.0	28	7,0	7,0	7.2
	19.0	64	15,9	15.9	23.1
	20,0	99	24,6	24,6	47,8
	21,0	81	20,1	20,1	67,9
	22,0	65	16,2	16,2	84,1
	23,0	24	6,0	6,0	90,0
	24,0	10	2,5	2,5	92,5
	25,0	1	,2	,2	92,8
	26,0	4	1,0	1,0	93,8
	27,0	1	,2	,2	94,0
	28,0	3	,7	,7	94,8
	29,0	5	1,2	1,2	96,0
	30,0	3	,7	,7	96,8
	34,0	1	,2	,2	97,0
	35,0	2	,5	,5	97,5
	36,0	1	,2	,2	97,8
	37,0	1	,2	,2	98,0
	40,0	1	,2	,2	98,3
	41,0	1	,2	,2	98,5
	43,0	1	,2	,2	98,8
	44,0	3	,7	,7	99,5
	47,0	1	,2	,2	99,8
	56,0	1	,2	,2	100,0
	Total	402	100,0	100,0	

Source: Prepared by authors

Considering the age ranges, 92.8% of them are between the ages of 17-25, as seen in Table.

Table 4: Programs of Participants

		Freq.	Percentage	Valid Percentage	Cumulative Percentage
	Cookery	36	9.0	9.0	9.0
	Banking and Insurance	39	9.7	9.7	18.7
	Gastronomy (4 years)	38	9.5	9.5	28.1
	Public Relations	43	10.7	10.7	38.8
	Media and Communication	20	5.0	5.0	43.8
	Accounting	20	5.0	5.0	48.8
	Hotel Management	28	7.0	7.0	55.7
	Marketing	20	5.0	5.0	60.7
	Landscape	18	4.5	4.5	65.2
	Recreation Management (4)	40	10.0	10.0	75.1
	Travel	30	7.5	7.5	82.6
	Tourism Management (4)	20	5.0	5.0	87.6
	Tourism Guidance (4)	50	12.4	12.4	100.0
	Total	402	100.0	100.0	

Source: Prepared by authors

As seen in Table 4, in terms of the department they studied, the distribution was realized in approximately 10% segments.

Table 5: Type of Education

		Freq.	Percentage	Valid Percentage	Cumulative Percentage
	Secondary education	60	14.9	14.9	14.9
	Formal education	342	85.1	85.1	100.0
	Total	402	100.0	100.0	

Source: Prepared by authors

In Table 5, in terms of the type of education, approximately 15% are second education students and 85% are formal education students.

Table 6: KMO and Bartlett's Test

KMO				.792
Bartlett's Test of Sphericity	Approx. Chi-Square			1396.314
	df			91
	Sig.			.000
	Total	402	100.0	100.0

Source: Prepared by authors

Data regarding the KMO and Bartlett tests performed to measure sampling adequacy are presented in Table 6. Reaching a value above 0.50 for sample adequacy is appropriate for the research (Field, 2013). As can be seen in Table 6, this value of 0.792 indicates good suitability in the research.

Table 7: Scale Validity

Expressions	Financial Behavior	Financial Attitude	Financial Knowledge
FD1	0.671		
FD3	0.709		
FD4	0.510		
FD5	0.557		
FD7	0,.93		
FT3		0.861	
FT4		0.826	
FB1			0.855
FB2			0.864
Cronbach Alfa	0.627	0.792	0.776

Source: Prepared by authors.

The statements used to measure the variables intended to be measured in the research were obtained by using the accepted scales obtained as a result of the literature study conducted in line with the research content. Table 7 shows the factor loadings and Cronbach Alpha values of the variables. Some statements were eliminated after the factor analysis in order to obtain statements that provide the desired factor structures to be measured in accordance with the results of the factor analysis. In the scales, a 5-point Likert-type scale was used. According to Hair et al. (2010), if the reliability of the variables is 0.70 and above, internal consistency reliability is ensured. While the financial behavior scale has an acceptable level of reliability, the financial knowledge and financial attitude scales have reached a reliability above 0.70.

According to the skewness and kurtosis values in the appendix, it is determined that the scale expressions are normally distributed. Kline (2011) reported that if the absolute values of skewness and kurtosis of the statements are not greater than 3, the normal distribution of the variables will be accepted (Kline, 2011). The skewness and kurtosis values obtained from the analysis conducted to test the normal distribution of the scale expressions of the research variables are presented in Appendix-1

Table 8: Correlation Table

		Financial Behavior	Financial Attitude	Financial Knowledge
Financial Behavior	Pearson Correlation	1	.347**	.366**
	Sig. (2-tailed)		.000	.000
	N	402	402	402
Financial Attitude	Pearson Correlation	.347**	1	394**
	Sig. (2-tailed)	.000		.000
	N	402	402	402
Financial Knowledge	Pearson Correlation	.366**	.394**	1
	Sig. (2-tailed)	,000	.000	
	N	402	402	402
**. Correlation is significant at the 0.01 level (2-tailed).				

Source: Prepared by authors

According to the results of the correlation analysis, there is a significant relationship between financial behavior and financial attitude variables at the p:00, 0.01 significance level. There is a same-directional relationship between financial knowledge and financial attitude. In addition, there is a same-directional relationship between financial knowledge and financial behavior variables.

Table 9: Multiple Linear Regression Table

Model Summary				
	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.427[a]	.182	.178	.52138

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.238	.145		15.386	.000
	Financial Attitude	.151	.031	.240	4.872	.000
	Financial Knowledge	.173	.031	.271	5.511	,000
a. Dependent Variable: Financial Behavior						

Source: Prepared by authors

According to Table 9, showing the multiple linear regression analysis, the explanatory power of the research according to the model summary is 18%. As can be seen from the coefficient table in Table 9, the effect between the variables used in the study is significant at p:00. In this context, the H1 hypothesis that financial knowledge has a significant effect on financial behavior was accepted. Table 9 also proves the existence of the effect of financial attitude on financial behavior. Accordingly, H2 hypothesis was accepted.

Table 10: Financial Knowledge Measurement Model

	R	**R square**	**p**
	.3938	.1551	.0000
Coefficient	p	LLCI	ULCI
Constant	.0000	2.0395	2.8173
Financial Attitude	.0000	.3010	..4803

Source: Prepared by authors

According to Table 10, in the mediation effect analysis conducted in SPSS Process, the significant effect of financial attitude on financial knowledge, which is one of the assumptions of the mediation effect, is seen as p:00. In this context, H4 hypothesis was accepted.

Table 11: SPSS Process Moderation Effect

Financial Behavior				
		R	R square	p
		.5058	.2558	.0000
Coefficient		P	LLCI	ULCI
Constant	3.7902	0,0000	3.7234	3.8570
ZFinancialAttitude	.2297	0,0000	.1544	.3049
ZFinancialKnowledge	.1707	0,0000	,0985	,2429
Int_1	-,0476	-,0464	-,0945	-,0008
Int_1	ZFinancialAttitude x ZFinancialKnowledge			
	R2-chng p			
X*W	.0075	.0464		

Source: Prepared by authors

As can be seen in Table 11, the model measuring the effect of financial knowledge as a moderating variable on the relationship between financial attitude and financial behavior is significant. The int_1 value, which shows the interaction effect between financial knowledge and financial attitude variables, is interpreted as significant with a significance value of 0.0464 and because the LLCI-ULCI confidence intervals do not include zero. Therefore, hypothesis H3 was accepted.

Table 12: SPSS Process Mediation Effect

Total Impact of Financial Attitude on Financial Behavior			
Effect	p	LLCI	ULCI
.2953	0.0000	.2195	.3712
Direct Impact of Financial Attitude on Financial Behavior			
Effect	p	LLCI	ULCI
.1994	0,0000	.1204	.2785
Indirect Effect of Financial Knowledge on Financial Attitude and Financial Behavior			
	Effect	BootLLCI	BootULCI
FinancialKnowledge	0,0959	.0517	.1463
Partial Standardized Indirect Effect			
	Effect	BootLLCI	BootULCI
FinancialKnowledge	0.1274	.0712	.1918
Total Standardized Indirect Effect			
	Effect	BootLLCI	BootULCI
FinancialKnowledge	0.1161	.0632	.1761

Source: Prepared by authors

According to the mediation analysis results, the total effect of financial attitude on financial behavior is significant and has a coefficient value of 0.2953, while the direct effect is 0.1994, as seen in Table 12.

The indirect effect coefficient showing the mediating effect of financial knowledge on the relationship between financial attitude and financial behavior is 0.0959. Since the confidence intervals in this effect size do not include the value zero (0), this shows that the effect is significant. Therefore, H5 hypothesis is accepted.

While the partial standardized indirect effect coefficient of financial knowledge is 0.1274, the total standardized indirect effect coefficient of financial knowledge is 0.1161, and the confidence intervals show that these effects are significant.

When interpreting effect sizes, it is generally interpreted as low effect when it approaches K^2=.01, medium effect when it is close to K^2=.09, and high effect when it is close to K^2=.25 (Gürbüz, 2021). In this framework, it is concluded that the mediating effect of financial knowledge is almost moderate in the investigated model.

5. Discussion and Conclusion

Financial literacy, whose importance is increasing day by day due to economic, demographic, and technological reasons, is a skill that can be developed through financial education. Financial education is the process by which individuals acquire a minimum level of financial knowledge for proper budget management and the effective and efficient use of resources, and how this knowledge translates into financial attitudes and behaviors. Therefore, financial literacy is a combination of financial knowledge, financial attitudes, and financial behaviors.

In a study where data collected through face-to-face surveys from 402 university students studying in the Sapanca district were analyzed using the SPSS program, the existence and direction of the relationship between the components of financial literacy; financial knowledge, financial attitudes, and financial behaviors were first identified, followed by an investigation into the effect of financial knowledge and attitudes on financial behaviors. The analyses revealed that financial knowledge and financial attitudes have a positive impact on financial behaviors. Additionally, it was found that financial knowledge has a moderate partial mediating and moderating effect on the relationship between financial attitudes and financial behaviors. The results obtained from the study support similar studies in the literature, including those by Mulyadi et al. (2023), Hidayat et al. (2023), Mutlu & Özer (2022), Yıldırım & Aydın (2023).

The results of the study have implications for the government, academic institutions, researchers, and groups seeking information on personal and family finance. Since financial knowledge has a significant impact on both students' financial attitudes and financial behaviors, providing financial education that enables students to reach the basic competency level defined as financial literacy will yield concrete benefits in demonstrating responsible financial behavior. It is crucial to instill efficient planning, spending, saving, and budgeting behaviors in individuals from an early age, starting within the family. In this context, it is important to provide the necessary financial knowledge both in the family environment and during early education and teaching processes, particularly at the primary and secondary education levels. The mandatory inclusion of financial literacy education in the educational curriculum is of great importance, requiring further collaboration among policy developers, educators, experts, and researchers on the subject.

Improvements in financial decision-making skills achieved through education will lead to more responsible financial behaviors at the individual level, contributing to macroeconomic stability in the medium and long term. To rank among the top countries in financial literacy, national initiatives, projects, and programs aimed at enhancing the financial literacy levels of young people should be prepared through the Ministry of Youth and Sports. These efforts should focus on increasing the financial knowledge and skills of young people.

In this context, it will be effective for the financial education programs to focus on the targeted outcomes in education and to be designed in line with advancements in information and communication technologies, particularly digital financial transformation and sustainability. It is recommended that behavior changes be continuously monitored to evaluate whether the education programs achieve the desired impacts on individuals' financial behaviors and that the programs be revised as necessary to meet the objectives.

Contribution Rate Declaration

The authors contributed equally the study.

Conflict Statement

There is no conflict of interest between the authors.

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Appendix.1

Skewness And Kurtosis Values				
			Statistic	Std. Error
FD1	Mean		3,886	,0558
	95% Confidence Interval for Mean	Lower Bound	3,776	
		Upper Bound	3,995	
	5% Trimmed Mean		3,984	
	Median		4,000	
	Variance		1,254	
	Std. Deviation		1,1197	
	Minimum		1,0	
	Maximum		5,0	
	Range		4,0	
	Interquartile Range		2,0	
	Skewness		-1,058	,122
	Kurtosis		,503	,243
FD2	Mean		3,256	,0720
	95% Confidence Interval for Mean	Lower Bound	3,115	
		Upper Bound	3,398	
	5% Trimmed Mean		3,285	
	Median		3,000	
	Variance		2,086	
	Std. Deviation		1,4444	
	Minimum		1,0	
	Maximum		5,0	
	Range		4,0	
	Interquartile Range		3,0	
	Skewness		-,145	,122
	Kurtosis		-1,367	,243
FD3	Mean		2,846	,0646
	95% Confidence Interval for Mean	Lower Bound	2,719	

		Upper Bound	2,973	
	5% Trimmed Mean		2,829	
	Median		3,000	
	Variance		1,677	
	Std. Deviation		1,2950	
	Minimum		1,0	
	Maximum		5,0	
	Range		4,0	
	Interquartile Range		2,0	
	Skewness		,220	,122
	Kurtosis		-1,050	,243
FD4	Mean		3,435	,0519
	95% Confidence Interval for Mean	Lower Bound	3,333	
		Upper Bound	3,537	
	5% Trimmed Mean		3,484	
	Median		3,500	
	Variance		1,084	
	Std. Deviation		1,0413	
	Minimum		1,0	
	Maximum		5,0	
	Range		4,0	
	Interquartile Range		1,0	
	Skewness		-,440	,122
	Kurtosis		-,157	,243
FD5	Mean		4,271	,0530
	95% Confidence Interval for Mean	Lower Bound	4,167	
		Upper Bound	4,375	
	5% Trimmed Mean		4,404	
	Median		5,000	
	Variance		1,131	
	Std. Deviation		1,0634	
	Minimum		1,0	
	Maximum		5,0	
	Range		4,0	
	Interquartile Range		1,0	
	Skewness		-1,621	,122
	Kurtosis		2,030	,243
FD6	Mean		3,348	,0638
	95% Confidence Interval for Mean	Lower Bound	3,223	
		Upper Bound	3,474	
	5% Trimmed Mean		3,387	
	Median		4,000	
	Variance		1,634	
	Std. Deviation		1,2783	
	Minimum		1,0	
	Maximum		5,0	
	Range		4,0	
	Interquartile Range		2,0	
	Skewness		-,379	,122
	Kurtosis		-,951	,243
FD7	Mean		3,490	,0601
	95% Confidence Interval for Mean	Lower Bound	3,372	
		Upper Bound	3,608	
	5% Trimmed Mean		3,544	
	Median		4,000	
	Variance		1,453	
	Std. Deviation		1,2052	
	Minimum		1,0	
	Maximum		5,0	

	Range		4,0	
	Interquartile Range		1,0	
	Skewness		-,479	,122
	Kurtosis		-,584	,243
FT1	Mean		4,239	,0514
	95% Confidence Interval for Mean	Lower Bound	4,138	
		Upper Bound	4,340	
	5% Trimmed Mean		4,362	
	Median		5,000	
	Variance		1,060	
	Std. Deviation		1,0296	
	Minimum		1,0	
	Maximum		5,0	
	Range		4,0	
	Interquartile Range		1,0	
	Skewness		-1,539	,122
	Kurtosis		1,963	,243
FT2	Mean		4,104	,0519
	95% Confidence Interval for Mean	Lower Bound	4,003	
		Upper Bound	4,206	
	5% Trimmed Mean		4,216	
	Median		4,000	
	Variance		1,081	
	Std. Deviation		1,0399	
	Minimum		1,0	
	Maximum		5,0	
	Range		4,0	
	Interquartile Range		1,0	
	Skewness		-1,280	,122
	Kurtosis		1,293	,243
FT3	Mean		4,192	,0539
	95% Confidence Interval for Mean	Lower Bound	4,086	
		Upper Bound	4,297	
	5% Trimmed Mean		4,315	
	Median		5,000	
	Variance		1,168	
	Std. Deviation		1,0806	
	Minimum		1,0	
	Maximum		5,0	
	Range		4,0	
	Interquartile Range		1,0	
	Skewness		-1,448	,122
	Kurtosis		1,459	,243
FT4	Mean		4,294	,0488
	95% Confidence Interval for Mean	Lower Bound	4,198	
		Upper Bound	4,389	
	5% Trimmed Mean		4,412	
	Median		5,000	
	Variance		,956	
	Std. Deviation		,9778	
	Minimum		1,0	
	Maximum		5,0	
	Range		4,0	
	Interquartile Range		1,0	
	Skewness		-1,581	,122
	Kurtosis		2,221	,243
FB1	Mean		4,182	,0470
	95% Confidence Interval for Mean	Lower Bound	4,089	
		Upper Bound	4,274	

	5% Trimmed Mean		4,285	
	Median		4,000	
	Variance		,887	
	Std. Deviation		,9419	
	Minimum		1,0	
	Maximum		5,0	
	Range		4,0	
	Interquartile Range		1,0	
	Skewness		-1,305	,122
	Kurtosis		1,732	,243
FB2	Mean		3,990	,0520
	95% Confidence Interval for Mean	Lower Bound	3,888	
		Upper Bound	4,092	
	5% Trimmed Mean		4,091	
	Median		4,000	
	Variance		1,087	
	Std. Deviation		1,0427	
	Minimum		1,0	
	Maximum		5,0	
	Range		4,0	
	Interquartile Range		2,0	
	Skewness		-1,055	,122
	Kurtosis		,825	,243
FB3	Mean		3,117	,0584
	95% Confidence Interval for Mean	Lower Bound	3,002	
		Upper Bound	3,232	
	5% Trimmed Mean		3,130	
	Median		3,000	
	Variance		1,370	
	Std. Deviation		1,1706	
	Minimum		1,0	
	Maximum		5,0	
	Range		4,0	
	Interquartile Range		2,0	
	Skewness		-,182	,122
	Kurtosis		-,790	,243