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Financial Literacy Gender Gap: A Meta-Analysis

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Finansal Okuryazarlıkta Cinsiyet Eşitsizliği: Bir Meta Analiz Çalışması

Abstract

Several studies around the world identify a gender gap in financial literacy against women regardless of age, education level, and socioeconomic status. Although gender is included as one of the variables in many studies focusing on Türkiye, as far as we know, none of them particularly has examined the gender difference. This paper integrates the outputs of these studies in terms of gender and combines them into one measure by conducting meta-analysis techniques. The results reveal a gender gap in financial literacy among women. Financial literacy is essential for women who mostly experience the gender pay gap, face more significant employment interruption challenges and tend to live longer than men. Given those issues, this study highlights implementing inclusive education policies and establishing comprehensive, long-term education programs to improve women's financial literacy.

Keywords : Financial Literacy, Gender-Gap, Meta-Analysis, Türkiye.

JEL Classification Codes : C83, D14, J16.

Öz

Dünya genelinde çok sayıda çalışmanın bulguları; yaş, eğitim düzeyi ve sosyoekonomik statüden bağımsız olarak, kadınlar aleyhine finansal okuryazarlık seviye farkının olduğuna işaret etmektedir. Türkiye'ye yönelik araştırmalarda ise, genellikle cinsiyet değişkenler arasında yer almasına karşın, yazar tarafından bilindiği kadarıyla, bunlardan hiçbirisi özellikle cinsiyet farklılığına odaklanmamıştır. Bu araştırma ilgili çalışmaların sonuçlarını meta-analiz teknikleri kullanmak suretiyle tek bir ölçümde birleştirmektedir. Araştırma bulguları Türkiye'de finansal okuryazarlık konusunda kadınlar aleyhine istatistiksel olarak anlamlı fark olduğunu ortaya koymuştur. Çoğu zaman cinsiyetler arası ücret farkına maruz kalan, daha fazla istihdam kesintisiyle karşılaşan ve daha uzun yaşama eğiliminde olan kadınlar için finansal okuryazarlık son derece önemlidir. Çalışmanın sonuçları ve kadınların dezavantajlı konumları bir arada değerlendirildiğinde, finansal okuryazarlık düzeylerinin yükseltilmesine yönelik kapsayıcı eğitim politikalarının oluşturulmasının ve uygulanmasının yararlı olacağı anlaşılmaktadır.

Anahtar Sözcükler : Finansal Okuryazarlık, Cinsiyet Eşitsizliği, Meta Analiz, Türkiye.

1. Introduction

Financial literacy (hereafter referred to as FinLit) combines knowledge, skills, attitudes, and behaviours that enable an individual to process financial information and make rational decisions. The findings indicate that individuals' FinLit levels are low in developing countries and developed economies (Lusardi & Mitchell, 2014; Preston & Wright, 2019). Although the FinLit gender gap is a universal concept rather than country-specific, some revealed that individuals had lower FinLit levels in many developing countries (e.g., Atkinson & Messy, 2012; Klapper et al., 2015; Xu & Zia, 2012). One of the possible reasons for the difference between developed and developing countries is the relatively higher general level of FinLit education programs and initiatives in developed countries. While many developed countries have embedded curricula specialised for financial education to enable children to gain high FinLit levels, FinLit curricula are often lacking in developing countries (Pinto, 2013). According to Xu and Zia (2012), FinLit is one of the tools for strengthening consumer protection in developed countries. Moreover, complicated financial instruments and products and the dynamism of the financial sector in these countries reinforce the need for a higher FinLit level. On the other hand, developing countries' FinLit model can be associated with financial market depth and structure and their social demographics. Although it is also important for individuals in developed countries, the primary purpose of FinLit in developing countries is to enable them to learn key financial concepts and acquire the necessary financial behaviours and skills to become financially healthy (Fanta et al., 2016). On the other hand, disparities are prevalent amongst groups in society where the poor, the youth, and women exhibit lower FinLit. One of the stylised facts revealed in numerous studies on FinLit is that women have less financial knowledge than men (e.g., Klapper et al., 2015; Lührmann et al., 2018; Hasler & Lusardi, 2017; Preston & Wright, 2019). Financially illiterate women might have far-reaching effects on their autonomy, quality of life, families, and the community. On the contrary, being financially literate empowers women to make decisions independently and gain more confidence in their financial decision-making. However, due to the challenges they face throughout their lives, women are more likely to be at a disadvantage regarding financial issues. Getting into the habit of saving, investing, and gaining the right spending skills can be related to women's employment status in FinLit. Legislation in many countries, foremost in developed economies, promotes equality policies that improve women's societal roles, with greater participation in the labour market, providing more autonomy in their financial decisions. However, various factors that cause differences between women and men regarding financial issues continue to exist (Driva et al., 2016). Especially in developing countries, women's labour participation rates are lower than men's, with high unemployment rates. Despite the remarkable increase, women's low labour participation rate still makes Türkiye one of the countries with the highest underutilisation rates in the OECD (OECD, 2018). Moreover, many women are more likely to turn to part-time and temporary jobs since they continue their household responsibilities. Providing care for the children and elderly family members is among women's primary responsibilities, and their income is viewed as complementary to household earnings. A recent International Labour Organization time-use

survey data indicated that women in Türkiye spend up to 5 hours daily performing domestic chores and looking after children or other family members (OECD, 2019). Moreover, the wage gender gap is persistent, and female employment is concentrated in the informal market, which might deepen the gender gap. While financial independence provides flexibility for unforeseen situations, prepares for emergencies, and ensures the right steps are taken, a woman's leaving the household financial decisions and practices entirely to the male members of the family leads to a financially dependent life. Although the relationship of women with financial issues forms a range between the strict implementation of Islamic texts and practices and the autonomy of women at the highest level, one of the reasons for the low labour force participation rate of women accompanying possible lack of FinLit in Türkiye might be the widespread acceptance of the traditional Islamic view which emphasises that women do not have to work for wages or salaries (Tekin-Önür & Dündar, 2021).

It is another case in point that women are not able to leave their marriages in abusive family situations and various ongoing domestic adversities due to their financial dependence. Data from the Turkish Statistical Institute show that between 2010 - 2020, divorce rates in Türkiye ranged from 1.62 to 1.90 per 1,000 (TurkStat, 2021a). Divorce turns couples focused on different financial issues in the household into single individuals who need to acquire new knowledge and skills. Considering the literature revealing the FinLit gender gap, women lacking financial knowledge and skills will be disadvantaged (West & Mitchell, 2022). Another threat to women's financial independence is that in many societies, the income of career women is often recognised as an extra cash inflow to the household. At the same time, they are asked to take on additional responsibilities at home. Furthermore, women are more likely to leave the workplace for reasons related to gender differences in financial inclusion, gender roles, and discrimination.

On the other hand, women are responsible for managing daily finances in some households. When women are financially literate, this also influences children's financial habits. In most developing countries with low female employment, the mother is the primary caregiver with the most significant impact on the children. Therefore, the mother must have sufficient financial knowledge, attitudes, behaviours and skills to transfer them to her children and form the right financial habits. However, women's financial independence is related to family and workplace situations and long-term issues, so not worrying about the future must be considered.

As is the case in the rest of the world, women tend to live longer than men in Türkiye. According to official country data, life expectancy at birth in Türkiye is 81.3 years for women and 75.9 years for men (TurkStat, 2021b). Women mostly earn less and have less opportunity to save due to systemic inequalities and gender stereotypes and roles. Therefore, they are less likely to optimise their investing method to build wealth, especially for retirement. A low level of FinLit is one of the main obstacles women face in accumulating wealth and securing their future. Financial illiteracy might cause problems such as developing lousy spending habits, being more likely to accumulate debt, and lacking

financial preparedness for long-term needs. Empowering young women with FinLit, increasing their relationship with money, and their skills to manage money will help them achieve their life and career goals more effectively and reduce welfare losses after retirement.

FinLit is also important in preparing to face economic challenges since the more financially literate individuals are expected to be more resilient in the face of economic shocks. The gender gap in FinLit might cause women to become more disadvantaged, especially in times of crisis. Although periods of recession or economic crisis increase unemployment regardless of gender, gender inequalities persist and widen (Antonopoulos, 2009; Seguino, 2010). The COVID-19 pandemic has caused a decrease in households' incomes and revealed that households and individuals do not have sufficient financial reserves. The rate of unemployed or on-leave women facing reduced hours of paid work during the pandemic was higher than the rate of men (Collins et al., 2020; Montenovo et al., 2020). The increasing inflation rates are another economic effect of the COVID-19 pandemic in many countries. Along with some country-specific problems, the economic impact of the pandemic has caused inflation in Türkiye as measured by the consumer price index, which has been over 10% since the pandemic's beginning, to increase to 64.77% in 2023. In many developing countries subjected to high inflation, such as Türkiye, being financially literate allows women to know how best to manage money and helps them cope with rising living costs and inflation.

Although several empirical studies were conducted on FinLit in Türkiye, very few revealed a gender gap favouring women (e.g., Yücel, 2022; Aydın, 2023). However, a substantial number of studies determined the FinLit level of women to be lower than man (e.g., Başarır & Sarıhan, 2017; Coskun et al., 2019; Ergün & Serel, 2019; Karakoç & Yeşildağ, 2019; Kaya & Güneş, 2019). On the other hand, some of them failed to find differences between genders in terms of FinLit levels (e.g., Gümüş & Pailer, 2019; Güvemli & Meydan, 2019; Karakulle & Tan, 2018). In this respect, this research aims to re-examine the FinLit gender gap in Türkiye by employing meta-analysis techniques, which have the advantages of integrating data sets from past research addressing a specific issue and providing an aggregate summary of the results by identifying the trends in various pieces of these studies. To the author's knowledge, this study is the first to conduct a meta-analysis investigating the FinLit gender gap in Türkiye.

Identifying the existence of a gender gap in Türkiye is essential for designing interventions aimed at increasing FinLit throughout society and for achieving significant improvements in long-term financial security. Although the primary objective of this study is to contribute to the literature by exploring the existence of a FinLit gender gap, it also discusses the relationship between women and finance in terms of systemic barriers and cultural stereotypes. It explains the effects of various factors on women's current and future financial well-being.

The rest of the study is organised as follows: the next section shows the conceptual framework. Section 3 reviews the literature. Section 4 presents sampling and data collection and describes the empirical method used in the study. Section 5 reports the outputs of the analyses. The final section provides concluding remarks and policy implications.

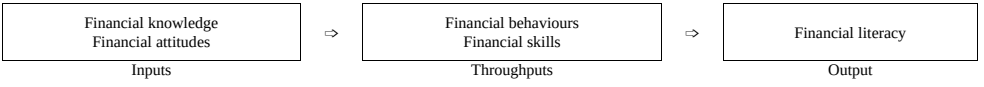
2. Conceptual Framework

Although different researchers and organisations describe FinLit using a variety of concepts, the terms of educational sciences, such as developing knowledge and skills, and the concepts of psychology, like attitude and behaviour, are frequently referred to.

In many studies, the authors associate FinLit exclusively with financial knowledge (e.g., Agnew & Szykman, 2004; Bucher-Koenen et al., 2017; Lusardi & Mitchell, 2011; Lyons et al., 2007; van Rooij et al., 2011). Huston (2010) analysed seventy-one published studies on FinLit and determined that "financial literacy" and "financial knowledge" were used synonymously in 47% of these studies. Meanwhile, a growing number of researchers scrutinised the behavioural tendencies of individuals toward financial issues in terms of FinLit. Among these authors, Atkinson and Messy (2012) considered behaviour, attitude, and knowledge as illustrative components of FinLit. A few authors discuss the associations between financial knowledge and saving and investment behaviours regarding acquiring FinLit (Delavande et al., 2008; Hsu, 2011; Jappelli & Padula, 2011). Hung et al. (2009) approached FinLit as a compound of financial knowledge, financial skills, perceived knowledge, and financial behaviour. The link between these components has also been argued by Lusardi and Mitchell (2011) and Xiao et al. (2014) as financial literacy. Similarly, Khan et al. (2017) conceptualised financial literacy as including knowledge, skills, and attitudes that affect individuals' financial behaviours.

Financial literacy is discussed in this study as conceptualised by the World Bank as a link between knowledge and skills, skills to attitudes, and attitudes to behaviours (Figure 1). This link is extremely important because knowledge affects attitudes, and attitudes then arise in a variety of behaviours (Holzmann, 2010). It encompasses the skills of reading, analysing, managing, and communicating on financial issues that impact the financial well-being of individuals.

Figure: 1
Conceptual Model of Financial Literacy



Knowledge: Financial knowledge is at the centre of financial literacy. A person labelled "financially literate" has financial knowledge regarding budget, insurance, savings, investment, loans, interest, inflation, risk and return, and balance sheets. Moreover, mathematical capability is an important component individuals need to improve financial

knowledge and mathematical confidence is positively related to financial behaviours (Marley-Payne et al., 2022). The findings of Hilgert et al. (2003) reveal that financial knowledge in a particular area is positively associated with financial practices. However, their findings also indicate that financial knowledge gained through personal experiences and obtained from people close, such as friends, family, and relatives, have the same effect. According to Gibson et al. (2021), receiving a financial education via multiple channels is the most favourable way for individuals to improve their financial well-being in the long run. Lack of financial knowledge may cause additional fees and commissions because of paying only the minimum amount due on the credit card bill, exceeding credit card limits or using cash advances. Individuals with less financial knowledge tend to have fewer savings and investments, apply for more loans, ignore the conditions of the loans and pay more fees (Lusardi & Mitchell, 2008). The financial knowledge level does not have to be advanced; even basic knowledge is useful in financial markets and is a primary condition for FinLit. However, knowing alone is not enough to be financially literate. FinLit will be beneficial if the knowledge gained is transformed into the right financial attitude, behaviour, and skills.

Attitude: The individual's lifestyle, experiences, psychological, social, cultural, and other environmental conditions may affect their financial decisions. A few behavioural finance and psychology studies have revealed that people do not always act rationally, even if they have sufficient knowledge (Baker et al., 2019; Carpena et al., 2019). This may arise from the personality traits of individuals, or it may occur due to cultural and socio-demographic factors. In other words, socio-demographic factors, complicated financial products, cultural reasons, and an individual's knowledge, skills and personality characteristics can influence financial attitudes and behaviours. Attitude towards financial issues and practices is among the key determinants of financial behaviour. Beliefs, values, and attitudes towards financial practices may affect financial decisions and determine a person's behaviour regarding financial issues. A person's beliefs, values and attitudes about financial matters may also affect his/her financial stability and goals.

Behaviour: Lusardi (2019) emphasises that FinLit differs from financial knowledge and includes the capability to perform desirable financial behaviours. The findings of the research conducted by Palmer et al. (2021) in the south-eastern United States show that financial self-efficacy positively impacts individuals' financial management behaviour; general self-regulation plays an indirect role in this effect. Although self-confidence, dependent on objective financial knowledge, helps make sound financial decisions and proactive choices, overconfidence might cause negative financial behaviours (Atlas et al., 2019).

Skill: A financially literate person should also have financial skills. In other words, "financial literacy" will be incomplete unless financial knowledge is put into practice. Financial literacy includes determining financial options, negotiating financial issues, planning for the future, defining the situations that may cause financial disturbances, understanding the developments in the general economy and making effective financial decisions. A financially competent person has sufficient skills to manage available resources

to ensure her/his financial well-being. Financially literate individuals know money and asset management, banking practices, investment, credit, insurance and tax, making financial plans and using them in practice (Bianchi, 2018; Fonseca & Lord, 2019; Nolan & Doorley, 2019).

3. Literature Review

Even though women and men must be financially literate to make the right financial decisions for themselves and their families, the data collected from more than 140 countries shows that gender differences exist between developed and underdeveloped countries (Klapper et al., 2015). The FinLit gender gap appears not only in countries with different institutional and economic systems but also in countries with different cultural and social backgrounds (Hasler & Lusardi, 2017; Lusardi & Mitchell, 2008). The gender gap does not differ depending on age, regardless of the basic or sophisticated aspect of FinLit questions asked in the surveys.

Adam et al. (2018) investigated the gender difference in FinLit among retirees in Ghana by using questionnaires that covered the respondents' general knowledge of financial issues. The results of the independent sample *t*-test and the Chi-square test of independence revealed significant differences favouring men. Cupák et al. (2018) investigated the FinLit gender gap in 12 countries using a modified Blinder-Oaxaca counterfactual decomposition model. While the findings revealed remarkably high gaps for women in Canada, Germany, the Netherlands and the UK, this gap was lower in Eastern European countries. The findings of the multiple regression analysis conducted by Greimel-Fuhrmann and Silgoner (2018) using sample data from 2,000 Austrian respondents showed that men significantly outperformed women regarding financial knowledge. Karakurum-Ozdemir et al. (2018) conducted research in 5 middle-income economies. The outputs obtained by running a linear regression model showed no FinLit gender gap in Mexico. However, the women, whether educated or not, had lower FinLit scores in Colombia, Lebanon, Mexico, Türkiye, and Uruguay. The authors determined the highest and lowest significant gender gaps in Türkiye and Uruguay. Okamoto and Komamura (2018) conducted a FinLit survey in Japan. Using the Blinder-Oaxaca decomposition method, the authors found that women were less financially literate than men, regardless of age. Potrich et al. (2018) explored the FinLit level in Brazil by surveying 2,485 individuals. The t-test results and the Mann-Whitney U test revealed that the proportion of men was significantly higher than women among those with higher FinLit scores. Fonseca and Lord (2019) used the Canadian Financial Capability Survey to measure financial knowledge, skills, and behaviours to explore the FinLit level of Canadians aged 18 and older. Applying the Oaxaca-Blinder decomposition technique, the authors observed that women were significantly less financially literate than men. Chambers et al. (2019) explored the impacts of parents on their children's understanding of financial concepts in 18 countries. The findings of the multilevel regression model using the Financial Literacy Assessment from the OECD's Programme for International Student Assessment (PISA) survey data implied a gender gap in financial knowledge among students, which their parents might impact. Philippas and Avdoulas (2019) conducted a survey in Greece

comprising 456 university student respondents and analysed the data using cross-tabulations, chi-square tests, logistic regressions, and a marginal effect analysis. Among others, research findings implied that men had 2.02 times more acceptable levels of FinLit than women.

Another topic of discussion in the literature is the potential explanations for the gender difference in FinLit. Social and cultural factors are the issues examined in theoretical and empirical studies aiming to demonstrate the difference between women and men in financial matters. Using binary logistic regressions, Ameer and Khan (2020) provided evidence that adult men gain higher FinLit and higher financial confidence than women from the financial socialisation experiences differing between women and men in many cases in New Zealand. The impact of culture on the FinLit gender gap might occur in several ways. Considering that education is one of the main factors impacting FinLit, girls are less knowledgeable in financial matters in a society that prioritises boys' education. The gender gap might reflect various traditional and cultural aspects, particularly in the role women in the household play in financial decision-making. A mechanism might emerge that enables both women and men to create distinct FinLit levels through a process in the household where men take responsibility for financial issues, and women concentrate on other household chores (Fonseca et al., 2012; Kumar et al., 2019). Women may remain financially illiterate in a culture where household finances are the men's responsibility. In contrast, men's financial skills increase by doing learning (Rink et al., 2021). One of the arguments for their lower FinLit level is that, on average, women are less interested in collecting and processing financial information (Bajtelsmit & Bernasek, 1997). Transferring the financial decision-making consequently to the male members of the family causes the women to be less motivated to obtain financial information (Aguiar-Díaz & Zagalaz-Jiménez, 2021).

From a socialisation perspective, patterns of interaction among family members may affect the development of FinLit (Aguiar-Díaz & Zagalaz-Jiménez, 2021). Wilmarth et al. (2021) argue that young couples' perceptions of their spouses and positive financial behaviours are associated with increased shared financial values. While couples appreciate their spouse's good financial behaviours, they contribute to their shared financial values and develop their financial behaviours. Nevertheless, using Blinder-Oaxaca decomposition, Fonseca et al. (2012) found no differences in FinLit levels between couples, regardless of whether they were married. Kadoya and Khan (2020) obtained similar results in Japan by employing a linear regression model, which indicated no liaison between marital status and FinLit levels. However, Baglioni et al. (2018) revealed in their analysis based on ordered probit regressions and linear regressions that the levels of FinLit of couples in Italy were higher than in single individuals, regardless of gender.

Theories of gender socialisation assume that children face and deal with different financial socialisation while growing up (Miller, 2016). Differential treatment that children receive from their parents and the common gender stereotypes they are exposed to in their environment reasonably lead to different levels of FinLit as adults. Over time, gender-based financial role patterns become internalised norms affecting children's financial attitudes and behaviours (Danes & Haberman, 2007). Payne et al. (2014) assume that much of the

financial behaviour develops in the family as members observe the behaviour of others. According to Szendrey and Fiala (2021), a higher level of communication between parents about proper consumer skills and family resources is among the patterns of young adults' developing appropriate financial behaviour. LeBaron et al. (2020) performed multivariate linear regressions. They revealed that the financial education parents provide to their children effectively forms healthy financial behaviours at an early age, which is not dependent on gender and benefits them throughout adulthood. Shim and Serido (2011) argue that the effect of children's experience of FinLit levels when observing their parents in financial matters, especially in the shopping process, is 1.5 times higher than that of financial education. On the other hand, there is mostly a gender bias in parents' association with children on financial issues, and the impact of financial interactions with same-sex role models is more powerful (Bussey & Perry, 1982; Shim & Serido, 2011). If the mother is a poor money manager, it is possible that children, particularly the daughters, would model the mother's bad financial attitudes and behaviours.

Although numerous research studies have been carried out on FinLit issues over the last few decades, only five have used meta-analysis techniques to the best of the author's knowledge. However, four studies were conducted on the association between financial education and financial literacy or its components. Fernandes et al. (2014) examined 168 articles to reveal the relationships between FinLit, financial education and financial behaviours. The results showed that the educational activities to increase FinLit had a small impact on financial behaviours. This effect was even weaker in low-income samples. The meta-analysis of Miller et al. (2015), which included 188 studies, provided evidence that financial education might influence financial behaviours. The outputs of the meta-analysis conducted by Kaiser and Menkhoff (2017), based on data derived from 126 studies, showed that financial education impacts financial literacy, especially financial behaviour. However, the effect is less in low- and lower-middle-income economies and low-income customers. The evidence obtained from the meta-analysis of Kaiser and Menkhoff (2020), which used data from 35 studies, indicated that the effect sizes of financial education treatments on financial knowledge were larger in developed economies than in developing economies. Nevertheless, the results revealed that the effects of the treatments on financial behaviour did not differ significantly in the countries' per capita income levels. The literature review showed that the only meta-analysis of FinLit in which explanatory variables included gender was carried out by Santini et al. (2019). The outputs of the meta-analysis of 44 studies implied that educational level, household income and gender were among the factors impacting FinLit. Furthermore, the results revealed that women had significantly lower FinLit than men.

4. Current Empirical Studies in Türkiye

The interest in financial literacy in Türkiye does not have a long history. However, there has been a noticeable increase in the number of studies interpreting and measuring FinLit in recent years. Although none of the empirical studies mainly focused on the FinLit

gender gap, gender was included as an explanatory variable in many studies conducted on FinLit issues.

The extant empirical literature on FinLit in Türkiye has demonstrated different findings. At the same time, some studies have not identified a statistically significant FinLit gender gap; most present empirical evidence of differences against women. Although a limited number of studies reveal the FinLit gender gap favouring women in Türkiye, the vast majority of them report non-significant statistical results.

The findings of Başarır and Sarıhan (2017) obtained from the *t*-test, using data from a survey in which 407 undergraduate students participated, showed that a significant FinLit gender gap existed against women. The one-way analysis of variance test performed by Karakulle and Tan (2018), with data obtained from the questionnaire administered to university students, revealed that gender and age did not influence FinLit. Coskun et al. (2019) investigated the level of FinLit in Türkiye by using the OECD questionnaire and the methodology developed by the International Network on Financial Education. The results implied that the financial knowledge, financial behaviour, and FinLit levels of the sample, including 1,230 respondents in Türkiye, eighteen years and older, were lower than the average of 14 OECD countries compared. Moreover, the findings of the *t*-test and the Wilcoxon rank-sum test showed that women respondents were lagging the men, which was more significant than those in the 14 countries. Ergün and Serel (2019) applied a FinLit questionnaire to 2,050 university student participants in Türkiye. Using a *t*-test and one-way analysis of variance test, and alternatively Mann Whitney U and Kruskal-Wallis H tests, the authors determined that the level of FinLit was low among university students, and the scores of men were significantly higher than women. Gümüş and Pailer (2019) also conducted a survey in Türkiye that included financial knowledge, financial attitude, and financial behaviour components within FinLit. Findings from the chi-squared and independent sample *t*-tests did not reveal significant differences in terms of gender and employment status. Similarly, the findings of the research of Güvemli and Meydan (2019) based on the *t*-test and the one-way analysis of variance test using a data set of four hundred participants in Türkiye revealed no significant association between financial behaviour and gender. Karakoç and Yeşildağ (2019) investigated the FinLit levels of university students by using the data set of 697 participants in the Aegean Region of Türkiye. The findings of the *t*-test and the one-way analysis of variance test implied that the scores of female students were slightly lower than male students, and the gap was statistically significant. On the other hand, by applying the *t*-test and the one-way analysis of variance test, Yücel (2022) observed that women high school teachers were significantly more financially literate than men. Aydın (2023) conducted a survey comprising 427 adult respondents and analysed the data using a *t*-test and the one-way analysis of variance test. The findings implied a statistically significant gender gap favouring women regarding financial behaviours.

5. Methodology

A meta-analysis is a statistical study intended to integrate the findings of a vast group of analysis results from individual studies (Glass, 1976). Different studies conducted on FinLit in Türkiye with different findings were quantitatively synthesised systematically. The Comprehensive Meta-Analysis Version 4 program was used to perform meta-analysis.

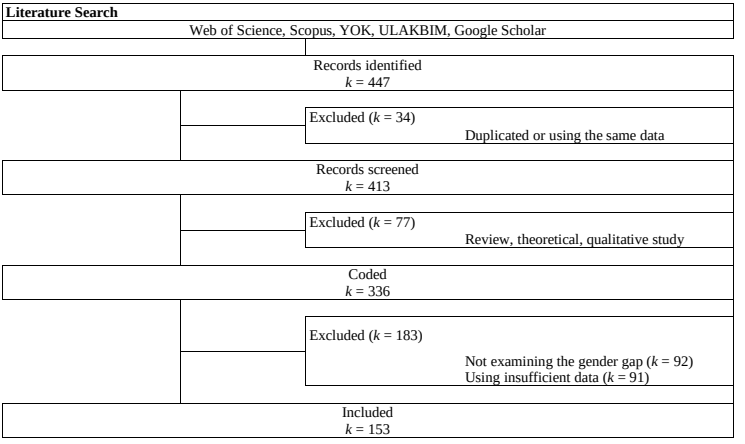
5.1. Literature Search and Coding

In January 2024, the study electronically searched the databases of Clarivate, Scopus, Google Scholar, ULAKBIM TR Index and Turkish Council of Higher Education Thesis Centre for the studies which had been conducted in Türkiye using the keywords "financial literacy", "financial knowledge", "financial attitude", "financial behaviour" or their combinations and identified 447 records. Duplicate studies were excluded; if one study used the same data as another, the most recent one was chosen. After exclusion, 413 relevant records were identified and screened considering the following inclusion criteria:

- The study must be empirical or quantitative. Reviews, theoretical, and qualitative analyses were excluded.
- The study must examine a financial literacy gender gap. Others were excluded.
- At least one of the "independent groups sample sizes, means, standard deviations", "independent groups sample sizes, means, *t*-value", "independent groups sample sizes, *t*-value", or "effect size" for each group must be provided. Others were excluded.

After the final exclusion process, 153 studies were identified for use (Figure 2).

Figure: 2
Study Flow Diagram



The study covers empirical studies on financial literacy in Türkiye in the 2014-2023 period. Data from 5 conference papers, 75 articles published in academic and scientific journals, and 73 theses/dissertations are used in the meta-analysis (Table 1).

Table: 1
Distribution of Studies by Publication Years and Types

Year	Conference Papers	Articles	Theses / Dissertations	Total
2014		3	1	4
2015		5	1	6
2016	1	6	4	11
2017		2	4	6
2018	2	8	8	18
2019	1	10	15	26
2020		12	11	23
2021	1	8	13	22
2022		17	9	26
2023		4	7	11
Total	5	75	73	153

The sample comprises 48.047% women (N_w= 38,423) and 51.953% men (N_m= 41,546). The entire sample contains 185 sample data. Apart from the meta-analysis covering the whole research period, the 2014-2019 and 2020-2023 periods were also examined with financial knowledge and financial attitude-behavior data to provide comparative outcomes. The financial knowledge sample includes 46,533 participants and comprises 47.566% women (N_w= 22,134) and 52.434% men (N_m = 24,399). There are 33,436 participants in total in the individual studies presenting data on financial attitude and/or behaviour, out of which 48.717% are women (N_w= 16,289) and 51.283% are men (N_m = 17,147). The financial knowledge and attitude-behavior samples include 99 and 86 studies, respectively (Table 2). The difference between the total number of studies reported in Table 1 and Table 2 is that some studies present data on financial knowledge and financial attitude-behaviour dimensions.

Table: 2
Sample Characteristics

Dimension	Period	*k*	N	N_m	N_w	Men (%)	Women (%)
Financial knowledge	2014-2019	54	29,822	15,425	14,397	51.724	48.276
	2020-2023	45	16,711	8,974	7,737	53.701	46.299
	2014-2023	99	46,533	24,399	22,134	52.434	47.566
Financial attitude-behavior	2014-2019	38	17,061	7,862	9,199	46.082	53.918
	2020-2023	48	16,375	9,285	7,090	56.702	43.298
	2014-2023	86	33,436	17,147	16,289	51.283	48.717
Financial literacy	2014-2019	92	46,883	23,287	23,596	49.670	50.330
	2020-2023	93	33,086	18,259	14,827	55.186	44.814
	2014-2023	185	79,969	41,546	38,423	51.953	48.047

k indicates the number of studies.
N is the entire sample size.
N_m and N_w represent the total numbers of men and women participants reported in the individual studies, respectively.

5.2. Examining Publication Bias

Initially, a funnel plot was used to examine publication bias. The funnel plot is a scatter plot of the effect estimates obtained from the individual studies in the meta-analysis. A funnel plot's X- and Y-axis represent the average result, sample size, or precision index.

The standard error of the effect estimate is usually appointed as the measure of study size and plotted on the vertical axis with an inverted scale, placing the most powerful studies at the top. It is assumed that small studies are more likely to be susceptible to publication bias than large ones. Since meta-analysis often includes samples that are smaller than large ones, the points shown in the graph representing each mean value are broad at the base and narrower towards the apex. The triangle will contain approximately 95% of the studies if there is no bias under the fixed effect assumption. As trial size increases, trials are likely to coalesce around the underlying true effect size and are distributed equally. Without publication bias, the plot will resemble a symmetrical inverted funnel. Nevertheless, an asymmetry in the distribution of small studies is expected when publication bias occurs (Lee & Hotopf, 2012).

Moreover, Orwin's Fail-Safe *N* performs the test to capture the number of missing studies that would bring the overall effect to a level other than zero.

$$O_s = \frac{\mathrm{N}\,(\bar{x}_0 - \bar{x}_c)}{x_c - \bar{x}_s} \tag{1}$$

where N is the number of studies included in the analysis, $\bar{x}_0$ the mean *x* obtained for N studies, x_c criterion value assumed as 0.05 and $\bar{x}_s$ the mean *x* for the safe studies taken as zero (Orwin, 1983).

5.3. Measuring Heterogeneity

Cochran's *Q* test (Cochran, 1950) is the primary approach used in meta-analysis for measuring heterogeneity, which refers to the variation in study outcomes between studies. In this method, the *Q* statistics with a *p*-value and I^2 index measure is used to assess whether there is homogeneity among studies included in the meta-analysis. It is considered that the larger the statistically significant estimation coefficients, the larger the variance between studies rather than the subjects within a study. *Q* statistics is estimated as

$$Q = \sum_{i=1}^{N} w_i\, es_i^2 - \frac{\left(\sum_{i=1}^{\mathrm{N}} w_i es_i\right)^2}{\sum_{i=1}^{\mathrm{N}} w_i} \tag{2}$$

where w_i is the weight for the ith observation. es_i represents the effect size (Hedges' g in this paper) of the i_th study. N stands for the number of studies included in the analyses.

Afterwards, the percentage of variability in the overall effect size (I^2) is derived from the *Q* statistic.

$$I^2 = \frac{Q - (\mathrm{N} - 1)}{Q} \tag{3}$$

An I^2 over 50% is commonly considered high heterogeneity, between 50% and 25% moderate and under 25% as low heterogeneity (Cooper et al., 2019).

5.4. Effect Size Estimations

The effect size, which reveals how different one group is from another, is considered a quantitative measure of the magnitude of the experimenter effect. The strength of the association between the two variables causes the effect size width. Hedges' g (Hedges, 1981), derived from Cohen's *D*, is the effect size.

Standardised mean differences such as Cohen's *D* are calculated as in Eq.4 for the studies providing sample size, mean and standard deviation data for each group (Borenstein et al., 2021).

$$\sigma_{pooled} = \sqrt{\frac{(n_m-1)\sigma_m^2+(n_w-1)\sigma_w^2}{n_m+ n_w-2}} \tag{4}$$

where σ_{pooled} donates the pooled (within groups) standard deviation, n_m and n_w group sizes of men (*m*) and women (*w*) in an individual study. σ_m^2 and σ_w^2 are the variances reported in the individual studies for men and women, respectively.

$$D = \frac{\bar{X}_m- \bar{X}_w}{\sigma_{pooled}} \tag{5}$$

where *D* stands for standardised mean differences. $\bar{X}_m$ and $\bar{X}_w$ are the means of the binary outcome variables from each study for men and women.

For the studies reporting "sample size for each group and *t*-value" Cohen's *D* calculation is as follows (Lipsey & Wilson, 2009):

$$D = t * \sqrt{\frac{n_m+n_w}{n_m* n_w}} \tag{6}$$

In the following step, effect size estimates (*D*) from each study are combined (D_c) by using a precision weighted average of the observed effect sizes (Van Den Noortgate & Onghena, 2003).

$$D_c = \frac{\sum_{i=1}^{N} v_j D_j}{\sum_{j=1}^{N} v_j} \tag{7}$$

where v_j is the $1/\sigma^2$ of D_j. N is the number of studies included in the analyses.

Finally, *D* of each study and D_c are converted into Hedges' g.

$$g = \left(1 - \frac{3}{4(n_m+n_w-2)-1}\right) * D \text{ and } g_c = \left(1 - \frac{3}{4(N_m+N_w-2)-1}\right) * D \tag{8-9}$$

where g is the Hedges g effect size of an individual study. g_c stand for the overall Hedges g effect size. n_m and n_w are the group sizes of men and women for each study. N_m and N_w represent the total number of men and women in the entire sample.

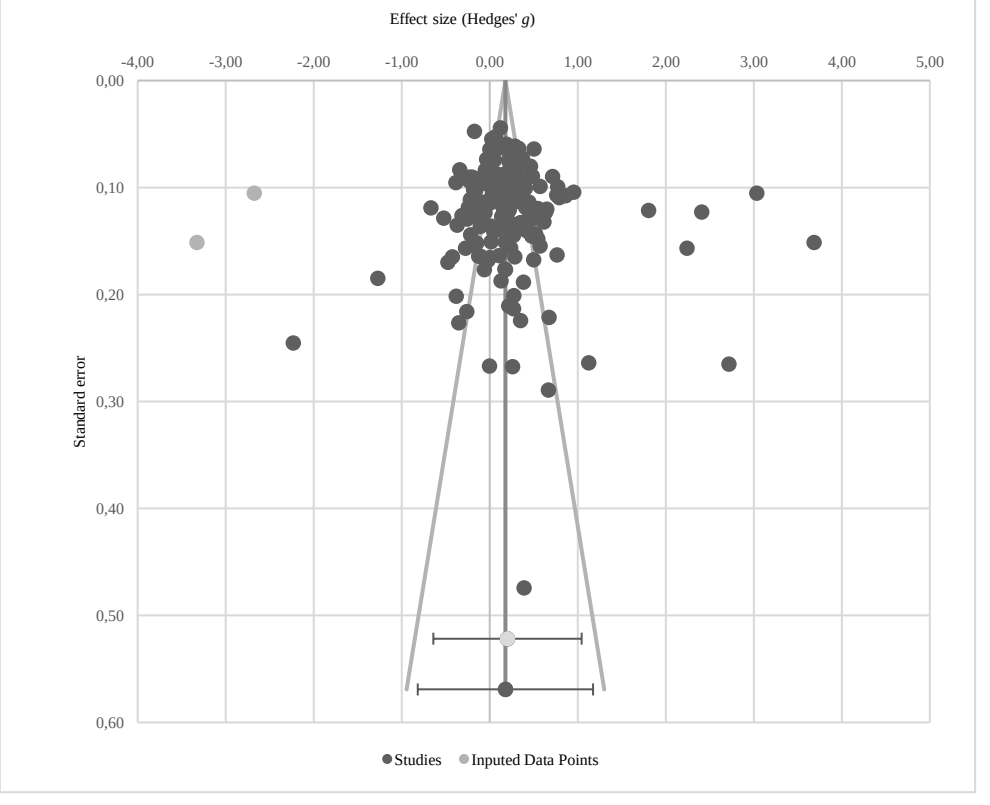
A positive Hedges' g indicates a literacy gender gap against women. The criteria for effect sizes are accepted as very large ($g > 1.00$), large ($1.00 \geq g \geq 0.66$), moderate ($0.65 \geq g \geq 0.36$), trim ($0.35 \geq g \geq 0.11$), and minimal ($g \leq 0.10$) by Cohen (1988) *and* Hyde (2005).

6. Findings

6.1. Assessment of Publication Bias

Before estimating effect *sizes*, the author examined whether there was publication bias by creating a funnel plot and applying Orwin's fail-safe *N* to test. The plots are expected to be shaped like funnels without publication bias. As the sample size increases, studies are expected to converge symmetrically and more closely around the true mean. When the funnel plot is analysed, it becomes evident that an almost symmetric inverted funnel shape arises from the financial literacy gender variables data set (Figure 3).

Figure: 3
Funnel Plot for Financial Literacy in Terms of Gender Variables



Furthermore, Orwin's fail-safe *N* was applied to test statistically for publication bias. The results with a trivial g set at 0.01 specify that 562 studies with 0-effect size are needed to reduce the overall effect size to an insignificant level. Since the current meta-analysis includes all the studies in Türkiye on FinLit with adequate data, it is impossible to reach an additional 562. The results reveal a statistical indication of no publication bias in this meta-analysis.

6.2. Heterogeneity Analyses

Q statistics with a *p*-value and I^2 index measures were used to evaluate the study's homogeneity estimates. It is found that the entire sample uncovered significant (Q = 3,323.59; p = 0.00) and high (I^2 = 0.95) heterogeneity in the effect sizes. Moreover, the results indicate significant heterogeneities ($p < 0.01$) in the effect sizes with considerably high I^2 values ($I^2 > 90\%$) for all of the FinLit dimensions and period samples (Table 3).

Table: 3
Heterogeneity Test Results

Sample	*Q*	*p*	I^2
Overall	3,323.594*	0.000	0.945
2014-2019	1,434.633*	0.000	0.937
2020-2023	1,840.602*	0.000	0.950
Financial knowledge	944.663*	0.000	0.903
Financial attitude-behavior	2,335.395*	0.000	0.964

Q refers to the variation in study outcomes between studies.
p is the probability value.
I^2 is the percentage of variability in the effect size.

6.3. Effect Analyses

The fixed-effects and random-effects techniques were applied to determine the effect sizes extracted from the studies of a FinLit gender gap presented and the between-study variation, respectively. The effect sizes of individual studies range from g = -2.234 to g = 3.684. The number of separate studies contributing to the overall average effect size in favour of men with positive g values is 136. The number of negative g values favouring women is 47. Test statistics show no substantively significant relationship between variables in the two studies (Table 4).

Table: 4
Effect Size Statistics for Individual Studies

Code	95%-CI Limits		*g*	*p*	Code	95%-CI Limits		*g*	*p*
	Lower	Upper				Lower	Upper		
2014-01	-0.509	-0.002	-0.256	0.048	2020-02	0.019	0.447	0.233	0.033
2014-02	-0.438	-0.003	-0.220	0.047	2020-03	0.066	0.457	0.262	0.009
2014-03	-0.084	0.378	0.147	0.211	2020-04	-0.540	1.319	0.390	0.411
2014-04	-0.083	0.130	0.024	0.664	2020-05	0.146	0.697	0.421	0.003
2015-01	-0.090	0.149	0.030	0.626	2020-06	-0.684	0.162	-0.261	0.227
2015-02	0.165	0.405	0.285	0.000	2020-07	-0.072	0.398	0.163	0.174
2015-03	-0.266	-0.081	-0.173	0.000	2020-08	-0.012	0.543	0.266	0.060
2015-04	-0.374	0.160	-0.107	0.432	2020-09	0.010	0.402	0.206	0.040
2015-05	-0.001	0.351	0.175	0.052	2020-10	-0.506	-0.179	-0.343	0.000
2015-06	-0.071	0.282	0.105	0.241	2020-11	0.275	0.778	0.527	0.000
2015-07	-0.409	-0.056	-0.233	0.010	2020-12	-0.094	0.197	0.052	0.486

2015-08	-0.222	0.156	-0.033	0.734	2020-13	0.066	0.358	0.212	0.004
2015-09	-0.409	0.284	-0.062	0.723	2020-14	-0.795	0.092	-0.352	0.120
2015-10	-0.165	0.274	0.054	0.628	2020-15	-0.042	0.309	0.134	0.136
2015-11	-0.179	0.108	-0.036	0.628	2020-16	0.059	0.410	0.234	0.009
2015-12	-0.142	0.239	0.048	0.617	2020-17	-0.141	0.181	0.020	0.808
2016-01	0.057	0.423	0.240*	0.010	2020-18	-0.231	0.322	0.046	0.746
2016-02	-0.090	0.789	0.350	0.119	2020-19	0.190	0.584	0.387	0.000
2016-03	-0.135	0.266	0.066	0.522	2020-20	0.206	0.601	0.403	0.000
2016-04	-0.050	0.393	0.172	0.129	2020-21	0.073	0.306	0.190	0.001
2016-05	-0.360	0.042	-0.159	0.122	2020-22	-0.448	0.195	-0.127	0.441
2016-06	-0.214	0.115	-0.049	0.555	2020-23	-0.040	0.606	0.283	0.086
2016-07	-0.216	0.425	0.104	0.523	2020-24	-0.063	0.343	0.140	0.176
2016-08	-0.251	0.123	-0.064	0.504	2020-25	0.097	0.425	0.261	0.002
2016-09	-0.309	0.152	-0.079	0.504	2020-26	-0.280	0.310	0.015	0.921
2016-10	-0.335	0.161	-0.087	0.492	2020-27	-0.182	0.362	0.090	0.517
2016-11	-0.111	0.231	0.060	0.492	2021-01	-0.429	0.005	-0.212	0.056
2016-12	-0.040	0.166	0.063	0.230	2021-02	-0.427	0.216	-0.105	0.520
2016-13	-0.487	0.112	-0.188	0.220	2021-03	2.196	3.236	2.716	0.000
2017-01	0.098	1.232	0.665	0.022	2021-04	0.256	0.837	0.547	0.000
2017-02	-0.014	0.233	0.109	0.082	2021-05	-0.634	-0.104	-0.369	0.006
2017-03	0.202	0.450	0.326*	0.000	2021-06	1.567	2.043	1.805	0.000
2017-04	0.376	0.626	0.501*	0.000	2021-07	-0.131	0.269	0.069	0.499
2017-05	-0.407	0.046	-0.180	0.118	2021-08	-1.635	-0.910	-1.273	0.000
2017-06	-0.069	0.544	0.238	0.128	2021-09	-0.445	0.150	-0.147	0.332
2017-07	-0.147	0.689	0.271	0.204	2021-10	2.827	3.239	3.033	0.000
2017-08	-0.051	0.393	0.171	0.132	2021-11	0.231	0.515	0.373	0.000
2018-01	0.239	0.800	0.519*	0.000	2021-12	-0.196	0.629	0.216	0.304
2018-02	-0.307	0.138	-0.085	0.456	2021-13	-0.122	0.315	0.097	0.387
2018-03	-0.114	0.384	0.135	0.287	2021-14	0.165	0.613	0.389	0.001
2018-04	-0.240	0.494	0.127	0.497	2021-15	2.166	2.647	2.406	0.000
2018-05	0.102	0.462	0.282*	0.002	2021-16	0.549	0.968	0.759	0.000
2018-06	-0.169	0.523	0.177	0.316	2021-17	-0.363	0.147	-0.108	0.405
2018-07	-0.161	0.192	0.016	0.862	2021-18	0.183	0.699	0.441	0.001
2018-08	1.933	2.547	2.240	0.000	2021-19	-0.324	0.324	0.000	1.000
2018-09	0.138	0.579	0.359	0.001	2021-20	0.170	0.827	0.499	0.003
2018-10	-0.375	-0.021	-0.198	0.029	2021-21	-0.298	0.186	-0.056	0.652
2018-11	0.379	0.766	0.573*	0.000	2021-22	0.239	1.107	0.673	0.002
2018-12	-0.350	0.309	-0.020	0.904	2021-23	-0.124	0.127	0.001	0.983
2018-13	0.747	1.156	0.952	0.000	2021-24	-0.042	0.502	0.230	0.097
2018-14	0.183	0.623	0.403	0.000	2021-25	-0.015	0.459	0.222	0.066
2018-15	-0.031	0.429	0.199	0.090	2021-26	-0.573	-0.199	-0.386	0.000
2018-16	-0.583	0.030	-0.277	0.077	2021-27	-0.267	0.088	-0.089	0.324
2018-17	-0.001	0.369	0.184	0.051	2021-28	0.194	0.763	0.479	0.001
2018-18	-0.416	-0.048	-0.232	0.013	2021-29	0.136	0.406	0.271	0.000
2018-19	0.067	0.506	0.286	0.011	2022-01	-0.266	0.782	0.258	0.335
2019-01	-0.093	0.248	0.078	0.373	2022-02	-0.527	0.518	-0.005	0.986
2019-02	-0.563	-0.068	-0.315	0.012	2022-03	-0.746	-0.101	-0.424	0.010
2019-03	-0.233	0.137	-0.048	0.610	2022-04	-0.042	0.349	0.153	0.124
2019-04	-2.714	-1.754	-2.234	0.000	2022-05	0.003	0.401	0.202	0.047
2019-05	-0.809	-0.143	-0.476	0.005	2022-06	0.538	0.889	0.714	0.000
2019-06	-0.776	0.014	-0.381	0.059	2022-07	0.147	0.544	0.346	0.001
2019-07	0.232	0.589	0.411	0.000	2022-08	0.012	0.750	0.381	0.043
2019-08	0.213	0.511	0.362	0.000	2022-09	-0.005	0.437	0.216	0.056
2019-09	-0.472	0.009	-0.232	0.059	2022-10	-0.175	0.516	0.170	0.334
2019-10	3.388	3.980	3.684	0.000	2022-11	0.578	0.967	0.773	0.000
2019-11	-0.034	0.447	0.207	0.092	2022-12	0.574	1.003	0.788	0.000
2019-12	-0.015	0.508	0.247	0.065	2022-13	-0.225	0.224	0.000	0.998
2019-13	-0.175	0.237	0.031	0.769	2022-14	0.084	0.498	0.291	0.006
2019-14	0.090	0.611	0.351	0.008	2022-15	-0.026	0.368	0.171	0.089
2019-15	0.136	0.657	0.396	0.003	2022-16	-0.235	0.207	-0.014	0.901
2019-16	0.177	0.642	0.409	0.001	2022-17	-0.385	0.015	-0.185	0.069
2019-17	0.112	0.414	0.263	0.001	2022-18	-0.250	0.283	0.016	0.904
2019-18	0.413	0.884	0.648	0.000	2022-19	-0.014	0.554	0.270	0.062
2019-19	-0.116	0.406	0.145	0.277	2022-20	0.119	0.519	0.319	0.002
2019-20	0.178	0.486	0.332	0.000	2022-21	0.652	1.074	0.863	0.000
2019-21	0.033	0.207	0.120	0.007	2022-22	-0.106	0.295	0.094	0.356
2019-22	-0.052	0.400	0.174	0.131	2022-23	0.270	0.876	0.573	0.000
2019-23	0.119	0.462	0.290	0.001	2022-24	0.090	0.487	0.288	0.004
2019-24	-0.004	0.338	0.167	0.055	2023-01	-0.166	0.240	0.037	0.723
2019-25	0.078	0.386	0.232	0.003	2023-02	-0.067	0.339	0.136	0.189

2019-26	0.092	0.440	0.266	0.003	2023-03	-0.502	0.063	-0.219	0.128
2019-27	0.143	0.501	0.322	0.000	2023-04	0.110	0.553	0.332	0.003
2019-28	0.206	0.684	0.445	0.000	2023-05	-0.012	0.430	0.209	0.064
2019-29	0.222	0.668	0.445	0.000	2023-06	0.311	0.661	0.486	0.000
2019-30	-0.776	-0.272	-0.524	0.000	2023-07	0.174	0.470	0.322	0.000
2019-31	0.311	0.779	0.545	0.000	2023-08	-0.119	0.668	0.275	0.171
2019-32	0.357	0.874	0.615	0.000	2023-09	0.025	0.429	0.227	0.027
2019-33	0.444	1.083	0.763	0.000	2023-10	0.063	0.467	0.265	0.010
2019-34	0.392	0.874	0.633	0.000	2023-11	-0.476	-0.013	-0.244	0.039
2019-35	-0.903	-0.437	-0.670	0.000	2023-12	0.606	1.641	1.123	0.000
2019-36	0.304	0.618	0.461	0.000	2023-13	-0.120	0.471	0.176	0.244
2020-01	0.031	0.378	0.205	0.021					

Note: The table presenting the authors' names and the characteristics of each study included in the meta-analysis is available upon request from the author of this paper.
95%-CI presents information about the precision of the effect size in the 95% confidence interval.
g stands for the Hedge's g statistic, which expresses the difference of the means in the pooled standard deviation units.
p is the probability value.

The full sample FinLit test results of the fixed-effects model, assuming no variation between studies, are positive and statistically significant (95% CI= [0.187, 0.217], $g = 0.202$, $p = 0.000$). Then, the random-effects model was applied by removing the assumption of variance in the model. The results indicate a positive and statistically significant effect size (95% CI= [0.161, 0.290], $g = 0.225$, $p = 0.000$). Based on the general criteria (Cohen, 1988; Hyde, 2005), the overall average of effect sizes $g = 0.202$ and $g = 0.225$ are characterised as a statistically significant yet small effect against women for FinLit (Table 5). A similar result revealing a FinLit gender gap against women was obtained by Santini et al. (2019) from their FinLit meta-analysis. Furthermore, the result of this meta-analysis is consistent with many highly-cited individual studies in the literature, which found that the FinLit level of women is significantly lower than men among young (Lusardi et al., 2010; Sekita, 2011) and older people (Lusardi & Mitchell, 2008), within households (Fonseca at al., 2012), widows or single people (Bucher-Koenen et al., 2017), throughout stock market participants (Almenberg & Dreber, 2016), and in both developed and developing countries (Lusardi & Mitchell, 2011).

To test the effect of possible moderators, we conducted sub-group analyses. The publication years of the studies might have influenced the likelihood of revealing the FinLit gender gap. In this respect, the 2014-2019 and the 2020-2023 periods were examined to capture the historical changes in the effect sizes. The fixed-effects model outputs indicate that the effect size of the 2014-2019 period (95% CI= [0.251, 0.290], $g = 0.269$, $p = 0.000$) is slightly lower than the 2020-2023 period (95% CI= [0.239, 0.285], $g = 0.262$, $p = 0.000$). Similarly, random-effects model findings imply that studies in the 2020-2023 period reported lower effect sizes on average (95% CI= [0.260, 0.420], $g = 0.339$, $p = 0.000$) than those in the 2014-2020 period (95% CI= [0.173, 0.378], $g = 0.275$, $p = 0.000$). However, the results show that the FinLit gender gap against women is apparent and small in magnitude, both in the 2014-2019 and 2020-2023 periods (Table 5).

Afterwards, we examined the influence of financial knowledge and attitude dimensions on the overall effect size. The estimation results show that the association between financial literacy and financial knowledge is more significant than those observed for financial behaviour. Furthermore, both models' financial expertise and attitude-

behaviour findings imply statistically significant and small effects on women. The effect sizes of financial attitude-behaviour dimension according to fixed- and random-effects models are g = 0.156 (95% CI= [0.133, 0.179], p = 0.000) and g = 0.135 (95% CI= [0.069, 0.202], p = 0.000), respectively. The effect size of financial knowledge under the fixed-effect model is g = 0.237 (95% CI= [0.217, 0.257], p = 0.000) in the fixed-effects model. Based on the random-effect estimators, the effect size of the financial knowledge dimension is revealed as g = 0.305 (95% CI= [0.203, 0.408], p = 0.000).

Table: 5
Full Sample and Sub-group Effect Size Statistics

	Model	95%-CI Limits		*g*	*p*
		Lower	Upper		
Full sample	Fixed-effects	0.187	0.217	0.202	0.000
	Random-effects	0.161	0.290	0.225	0.000
2014-2019	Fixed-effects	0.251	0.290	0.269	0.000
	Random-effects	0.260	0.420	0.339	0.000
2020-2023	Fixed-effects	0.239	0.285	0.262	0.000
	Random-effects	0.173	0.378	0.275	0.000
Financial attitude-behavior	Fixed-effects	0.133	0.179	0.156	0.000
	Random-effects	0.069	0.202	0.135	0.000
Financial knowledge	Fixed-effects	0.217	0.257	0.237	0.000
	Random-effects	0.203	0.408	0.305	0.000

95%-CI presents information about the precision of the effect size in the 95% confidence interval.
g stands for the Hedge's g statistic, which expresses the difference in the means in the pooled standard deviation units.
p is the probability value.

7. Conclusion

The current study re-examined the financial literacy gender gap in Türkiye using meta-analysis methods. Firstly, a funnel plot was used to explore whether there was publication bias, and it was determined that there was an almost symmetric inverted funnel shape that arose from the financial literacy gender variables data set. Moreover, Orwin's fail-safe N was applied. Results revealed the statistical indication of no publication bias in the meta-analysis. Q statistics with a p-value and I^2 index measures were used to examine the homogeneity among the studies - a positive between-study variance uncovered significantly high heterogeneity in the effect sizes.

Fixed- and random-effects models were applied to determine the effect sizes extracted from the studies of a financial literacy gender gap and their between-study variation. The results of both models indicated positive and statistically significant effect sizes. Based on the general criteria, the overall average of effect sizes was characterised as a statistically significant effect against women for financial literacy.

Furthermore, to test the moderation effect of financial knowledge and financial attitude behaviour on the gender gap in financial literacy, we conducted a sub-group analysis. The results imply that financial knowledge and attitude-behaviour positively moderate the financial literacy gender gap against women. However, the impact of financial knowledge on the overall effect size is higher than that observed for financial attitude behaviour. This suggests that knowledge has a stronger effect on the gender gap in financial literacy than attitude and behaviour. Moreover, the 2014-2019 and 2020-2023 periods were

examined separately to obtain comparative findings. The results of both fixed- and random-effects models show that studies in the 2020-2023 period reported lower effect sizes on average than those in the 2014-2020 period. Although the effect size of the 2020-2023 period is smaller than the 2014-2019 period, a financial literacy gender gap exists, favouring men both in the 2014-2019 and the 2020-2023 periods.

Financial literacy has become one of the concepts shaping many countries' inclusive growth policies and strategies. International organisations, especially the World Bank and the OECD, publish much research and reports on financial literacy issues. They encourage countries to attach importance to financial literacy, making it a public policy. Economic empowerment of women is one of the major prerequisites for promoting an inclusive society. Increasing the financial literacy level of women, who are presumed to be among the most socially and economically disadvantaged groups, is essential to achieving this goal, as being financially literate is critical to attaining financial security (Hasler & Lusardi, 2017). The financial needs and resources of women differ from men in various ways. Women with a longer average life expectancy are exposed to career interruptions more than men and experience lower income. Without the participation of women in social, political, and economic life, it is impossible to achieve sustainable development goals (UN, 2015). In this framework, the Turkish government created the "Financial Access, Financial Education, Financial Consumer Protection Strategy" in 2014, which aims to increase financial awareness, financial literacy and financial inclusion in the country. Against this background, the Financial Stability Committee of Türkiye prepared a Financial Education Action Plan between 2014 and 2017, including target groups such as families and women. In this respect, efforts have been made to design and implement formal and non-formal education and lifelong learning programs. One institution that undertakes a mission to achieve the goals above is the Central Bank of the Republic of Türkiye (CBRT). The CBRT aims to reach various target groups within financial literacy and economic education activities called "Economy for All". Likewise, the Banks Association of Türkiye offers educational programs for different occupational groups and individuals to contribute to increasing the level of financial literacy in Türkiye. Moreover, the K12 Skills Framework of Türkiye covers financial literacy. In this context, the Republic of Türkiye Ministry of National Education conducts education and training activities to increase financial literacy in cooperation with several institutions and organisations.

However, the effect size findings of this study revealing a gender gap a gender gap against women raises the question as to whether these efforts in Türkiye are adequate, efficient and equitable. Although the aforementioned financial education and training programs play a pivotal role in supporting socially and economically disadvantaged groups to gain the knowledge and skills needed to make wise financial decisions, they can't erase the effects of decades of structural inequalities in a short period. In this respect, policymakers should put in more effort to improve financial literacy in general and that of women. National organisations, including schools, employers, financial institutions, and community groups are necessary for empowering women with the financial literacy skills they need. It is necessary to review the course contents, especially social studies and mathematics, and to

add finance-related topics to the curriculum, starting with primary education. Education and training programs should be designed for women to affect their attitudes and behaviours to achieve financial literacy and enhance financial knowledge. Furthermore, including financial literacy as a separate course in higher education programs will reinforce the knowledge and skills acquired in previous formal education and take financial literacy to an advanced level. Raising teachers' awareness regarding the benefits of financial education to society is necessary. More effective teaching and learning environments must be created to impart financial skills and knowledge to female students. Teachers should strive to counter the traditional perception of the role of women in the household and society regarding financial issues. Although learning financial matters in the classroom is considered one of the most effective ways to increase financial literacy to transform the knowledge acquired at school into good financial behaviours and decision-making skills, female students, especially, should be encouraged by their teachers to talk about financial issues with their parents at home and to be involved in the family budget building processes. However, some of the teachers' sufficiency in financial literacy concepts and the adequacy and quality of teaching and learning resources related to the field are questionable. It should be ensured that teachers have sufficient knowledge and resource equipment.

Women can be provided with sufficient financial literacy during their school years; however, this situation may not last a lifetime. Some of today's financial management elements and financial instruments and products (e.g., financial derivatives and hybrid financial instruments) are more complicated than those decades ago, and they will likely differ in the future from those of today. In this context, financial counselling should be considered as a complement to financial education in terms of lifelong learning. In other words, the author recommends a combination of financial education and financial counselling to derive short-term and long-term benefits from financial literacy.

This study is limited by the investigation of the financial literacy gender gap in Türkiye, cannot be generalised, and give implications for other countries or regions. However, the findings are in line with many recent studies around the world, which find the financial literacy gender gap favouring men. Although this research reveals a gender-based financial literacy gap in Türkiye, several variables that may explain the causes of the financial literacy gender gap could not be included in the meta-analysis due to insufficient data. Recognising why and when a gender gap in financial literacy arises is crucial for developing policies that aim to increase women's financial literacy and reduce gender inequalities. Moreover, continuity in monitoring and researching changes in practices and traditions will contribute to obtaining more robust results and developing dynamic policies. However, it is important to measure the financial literacy level of society across different demographic characteristics before creating and implementing financial education policies that will raise awareness, eliminate the gaps, and enhance financial literacy at all levels of society. More research is needed to identify and understand this gap's causes and financial implications.

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