International Journal of
Business Management and Entrepreneurship
Journal homepage: mbajournal.ir

Financial literacy patterns of managers of the University of Medical Sciences and its relationship with financial self-efficacy

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Received: 2025/07/01 Accepted: 2025/09/01 Published: 2025/12/30

Abstract

Background& aims: Financial literacy is recognized as one of the core competencies of managers in the 21st century, playing a decisive role in economic and organizational decision-making. Existing studies have primarily focused on describing average levels of financial literacy or its linear relationship with other variables, whereas university managers may exhibit heterogeneous and distinct patterns of financial literacy. Identifying such patterns provides a foundation for designing targeted educational interventions and policies tailored to the needs of each group. The present study was conducted to examine the financial literacy patterns of managers at Mazandaran University of Medical Sciences and to analyze their relationship with financial self-efficacy.

Methods: This cross-sectional study was carried out on a convenience sample of 81 managers at Mazandaran University of Medical Sciences. Participants completed online questionnaires on financial literacy, financial self-efficacy, and demographic information via social media platforms such as Eitaa (domestic Iranian platform) and WhatsApp. Latent profile analysis was employed to extract financial literacy patterns, while one-way ANOVA and chi-square tests were used to compare self-efficacy and demographic variables across the identified profiles.

Results: Based on three components of financial literacy—financial knowledge, financial experience, and financial skills—three distinct profiles were identified: high financial literacy (50.6%), moderate financial literacy (40.7%), and low financial literacy (8.6%). A significant relationship was found between financial literacy patterns and financial self-efficacy, with managers in the high financial literacy group reporting higher average levels of self-efficacy.

Conclusion: This study revealed diverse patterns of financial literacy among managers of Mazandaran University of Medical Sciences. Managers with higher financial literacy, likely due to greater knowledge and skills, demonstrate stronger confidence in their ability to manage financial matters effectively.

Keywords

Financial literacy, Financial self-efficacy, Latent profile analysis, University management, Medical sciences

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Introduction

Financial literacy is recognized as one of the core competencies of managers in the present century, playing a decisive role in economic and organizational decision-making (Adewumi, 2024). In the international literature, financial literacy is defined as individuals' ability to understand financial concepts, manage economic resources, and make informed decisions to enhance their own and their organization's financial well-being(Lusardi & Mitchell, 2011; Warmath & Zimmerman, 2019).This construct encompasses multiple dimensions, including financial knowledge, financial attitudes, financial skills, and financial behaviors, and deficiencies in any of these dimensions may lead to adverse outcomes at both individual and organizational levels (Lusardi & Mitchell, 2011; Warmath & Zimmerman, 2019). Numerous studies have demonstrated that the level of financial literacy across societies is generally unsatisfactory. International evidence indicates that financial literacy levels are significantly higher in developed countries compared to developing ones (Klapper & Lusardi, 2020). Various factors can influence individuals' financial literacy(Brown et al., 2018). Demographic variables such as age, gender, educational attainment, and income level are among the most important determinants of financial literacy(Lusardi & Tufano, 2015; Murendo & Mutsonziwa, 2017). Some studies have shown that men tend to possess higher financial literacy than women (Hasler & Lusardi, 2017; Zaimovic et al., 2023). Moreover, educational level is directly associated with financial literacy, such that individuals with university education—particularly those with training in finance and economics—demonstrate higher levels of financial literacy(Santini et al., 2019).

In addition to demographic variables, psychological factors also play a significant role in shaping financial literacy. One of the most important of these factors is financial self-efficacy(Lone & Bhat, 2022; Noor et al., 2020). Financial self-efficacy is considered a subset of general self-efficacy and refers to an individual's belief in their ability to successfully manage financial matters, including saving, budgeting, controlling expenses, debt repayment, investing, and planning for the future(Babu & Velmurugan, 2024). The concept of self-efficacy was first introduced by Albert Bandura within the framework of social cognitive theory. Bandura defines self-efficacy as an internal belief regarding one's capability to successfully perform a specific task (Bandura, 1977). This belief directly influences how individuals think, feel, and behave. Those with high self-efficacy are more motivated when facing challenges, exert greater effort, demonstrate stronger persistence in the face of obstacles, and are more likely to succeed(Engelberg, 2007).

Research indicates that individuals with higher financial self-efficacy are more likely to make sound financial decisions and to use their financial resources more effectively(moradzadeh et al., 2022). Moreover, such individuals perform better in debt management, retirement planning, and saving(Noor et al., 2020). Numerous studies have examined the relationship between financial literacy and financial self-efficacy. For example, findings from Lone & Bhat (2022) revealed that financial literacy has a significant impact on financial self-efficacy, and that financial self-efficacy partially mediates the effect of financial literacy on financial well-being. Similarly, results from pervious study demonstrated that financial self-efficacy plays a mediating role in establishing a positive relationship between financial literacy and financial participation(Yeganeh & Zarei, 2019).

Although numerous studies on financial literacy have been conducted in recent years, most have focused on groups such as students(Arofah, 2019; Kartawinata et al., 2021), bank

employees(Clark et al., 2017), or households(Agarwalla et al., 2015; LUSARDI et al., 2010), with relatively little attention given to managers in medical sciences(Adewumi, 2024). Universities of medical sciences, which simultaneously face educational, research, healthcare, and clinical responsibilities, require managers with adequate levels of financial literacy. In such environments, sufficient financial literacy among managers and decision-makers is critical, as they are continuously engaged with budgets, resource allocation, financial decisions, and strategic planning(Ferinia et al., 2023).

Enhancing the financial competencies of faculty members and managers is also essential, since these individuals are often responsible for managing projects, conducting research, and teaching. A sound understanding of financial issues can help them make better decisions regarding the allocation of both research and personal resources(Zubair et al., 2023). Moreover, because universities of medical sciences are typically accountable to governmental organizations, ministries of health and science, and funding agencies, financial literacy is indispensable for their managers to prepare transparent and accurate financial reports and to respond effectively to the inquiries and requirements of these institutions (Amin et al., 2021). Deficiencies in this area can directly undermine organizational efficiency, resource allocation, and even the quality of healthcare services. Despite this importance, evidence in Iran—particularly within academic and healthcare settings—remains limited (Amin et al., 2021).

Given that existing studies have predominantly focused on describing average levels of financial literacy or its linear relationship with other variables (Adesina et al., 2025; Adewumi, 2024), it is possible that university managers exhibit heterogeneous and distinct patterns of financial literacy. Latent Profile Analysis, as an advanced statistical approach, enables the identification of these hidden patterns and can reveal which groups of managers are at risk of low financial literacy and which groups demonstrate stronger competencies. This provides a foundation for designing targeted educational interventions and policies tailored to the specific needs of each group.

In light of this research gap, the present study was designed to examine financial literacy patterns among managers of Mazandaran University of Medical Sciences and to analyze their relationship with financial self-efficacy. As one of the largest universities in northern Iran, with a diverse combination of educational, research, and healthcare units, Mazandaran University of Medical Sciences offers a suitable context for investigating this issue. The findings of this study can contribute to the development of programs aimed at enhancing managers' financial literacy and provide practical guidance for health policymakers at both national and regional levels.

Methods

This study was designed as a cross-sectional investigation and, in terms of type, combined descriptive and correlational aspects, while pursuing a practical and applied objective. The target population consisted of all managers of educational, health, and clinical departments affiliated with Mazandaran University of Medical Sciences during the period 2024–2025. Based on the most recent official data provided by the university, the total number of these individuals was 120. Using Cochran's formula, a sample of 92 managers was selected to participate in the study. Sampling was conducted through a convenience method. Specifically, the online questionnaire link was sent via messaging applications such as Eitaa (a domestic Iranian platform) and WhatsApp to the Public Relations Office of Mazandaran University of Medical Sciences, which was then asked to share the link within its online groups with managers at various levels. To ensure adherence to ethical principles, a brief summary of the

study objectives was included at the beginning of the questionnaire, and participants were informed that their participation was entirely anonymous, voluntary, and based on personal willingness.

Data Collection Instruments

Financial Literacy Questionnaire:

This questionnaire was developed by integrating the standard items proposed by the Organisation for Economic Co-operation and Development(OECD, 2016) with items from previous studies(Klapper & Lusardi, 2020), thereby covering multiple dimensions of financial literacy. The instrument had also been employed in a prior study(Lone & Bhat, 2022). In the present research, the financial literacy questionnaire comprised three main dimensions:

1. Financial knowledge with 6 items (e.g., "I can explain concepts such as compound interest"),
2. Financial experience with 5 items (e.g., "I have invested for my financial future during the past year"),
3. Financial skills with 4 items (e.g., "I can prepare a personal budget and adhere to it").

All items were rated on a five-point Likert scale (1 = very low to 5 = very high). The overall Cronbach's alpha for the scale was calculated as 0.84. According to OECD (2016), the Cronbach's alpha coefficient for this instrument has been reported to range between 0.74 and 0.86 across different countries. In the present study, face and content validity were confirmed with the participation of experts in finance and education, and the overall Cronbach's alpha was again found to be 0.84.

Financial Self-Efficacy Questionnaire:

This scale was originally developed based on the study by Lone & Bhat (2022) to assess individuals' beliefs regarding their ability to manage financial matters. The questionnaire consisted of 6 unidimensional items measuring confidence in one's financial skills. Each item was scored on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Sample items include: "I am confident that I can make wise financial decisions" and "I am able to plan for my long-term financial goals." Lone & Bhat (2022) reported a Cronbach's alpha of 0.85 for this scale.

In the present study, face and content validity were first confirmed. A confirmatory factor analysis was then conducted, and a revised version of the scale with 4 items was validated (items 3 and 5 were removed). In the revised version, except for item 1 which had a factor loading of 0.19, the remaining items had factor loadings of 0.40 or higher. The Cronbach's alpha coefficient calculated for the revised scale in this study was 0.58.

Data Analysis

The data analysis consisted of two main phases. Initially, a Latent Profile Analysis (LPA) was employed to uncover distinct subgroups characterized by different patterns of financial literacy. Following this, we compared financial self-efficacy and demographic factors across these identified financial literacy profiles using ANOVA accompanied by Bonferroni post-hoc comparisons. The LPA method groups individuals into homogeneous classes based on their financial literacy scores. To determine the most appropriate model that best captured the underlying data structure and accounted for variability, models with an increasing number of profiles were sequentially tested. The process began with a model containing two profiles, progressively adding profiles until solutions with five profiles were reached, beyond which interpretability declined. Selection of the best-fitting model was guided by both statistical

indices and the conceptual clarity of the profiles. Key model fit indices included the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and Sample Size Adjusted BIC (aBIC). Lower values for these criteria generally indicate superior fit. According to pervious simulation study(Nylund et al., 2007), the aBIC tends to outperform AIC and BIC in model selection. Additionally, we employed the Bootstrapped Likelihood Ratio Test (BLRT), where a significant p-value suggests that the solution with k profiles significantly improves fit compared to the (k-1) profile model. Classification precision was assessed with entropy values ranging from 0 to 1, where higher values signify stronger profile assignment accuracy (Clark, 2010).The LPA analyses were carried out with Mplus version 8.3, utilizing full information maximum likelihood to handle missing data. Subsequent ANOVA procedures were conducted in Stata version 17.

Results

Of the 92 selected participants, 81 completed the questionnaires. The average age of respondents was 46.8 years (SD = 5.96), with an average work experience of 7.8 years (SD = 6.1). The sample was predominantly male, comprising 71.6% of participants, while females accounted for 28.4%. A majority of the participants (90.12%) were married. Regarding educational attainment, most held advanced degrees, with 35.8% possessing a master's degree and 38.27% holding a doctoral degree. Nearly half of the managers (48.15%) were affiliated with university staff units (see Table 1).

Table 1: Demographic characteristics of participants (n=81)

Demographic variables	Mean±SD
Age	46.09± 5.96
experience	7.8± 6.1
gender	n(%)
male	58(71.6)
female	23(28.4)
Marital	n(%)
single	8(9.88)
married	73(90.12)
Education	n(%)
BS	16(19.75)
MSc	29(35.8)
PhD-MD	31(38.27)
UP-DR	5(6.17)
Unit	n(%)
Faculty	21(25.93)
Education Hospital	21(25.93)
The university headquarters	39(48.15)
Predictors	Mean±SD
financial literacy Domains	
FA	21.19± 4.56
FE	17.31± 3.02
FS	14.21± 2.7
Outcome	Mean±SD
Financial Self-Efficacy	10.27± 2.45

Latent profile analysis (LPA) solutions ranging from two to five profiles were estimated, with model fit statistics presented in Table 2.

Table2: Latent Profile Analysis Fit Indices for Financial Literacy patterns

	Log likelihood	AIC	BIC	aBIC	LMR-LRT	BLRT	Entropy	sample size
2profile	-306.6	633.2	657.2	625.6	72.2*	76.3*	0.798	31(38.3%)/ 50(61.7%)
3profile	**-281.3**	**590.6**	**624.1**	**579.9**	**47.9***	**50.6****	**0.891**	**33(40.7%)/ 7(8.6%)/ 41(50.6%)**
4profile	-276.6	589.2	632.3	575.6	8.8	9.3	0.853	6(7.4%)/ 41(50.6%)/ 19(23.4%)/ 15(18.5%)
5profile	-273.5	591.1	643.6	574.3	5.9	6.2	0.869	6(7.4%)/ 8(9.9%)/ 16(19.7%)/26(32.1%)/ 25(30.9%)

Note. The bolded solution was determined to be the final model. BIC, Bayesian information criterion;.aBIC, sample size adjusted Bayesian information criterion; AIC, Akaike information criterion; LMR, Lo–Mendell–Rubin likelihood ratio test; BLRT, bootstrap likelihood ratio test

* P-value <0.05, ** P-value <0.01.

These fit indices indicated that the three-profile solution best represented the data. The profiles were defined based on the pattern of conditional standardized mean scores across the three financial literacy domains—financial knowledge, financial experience, and financial skills—as illustrated in Figure 1.

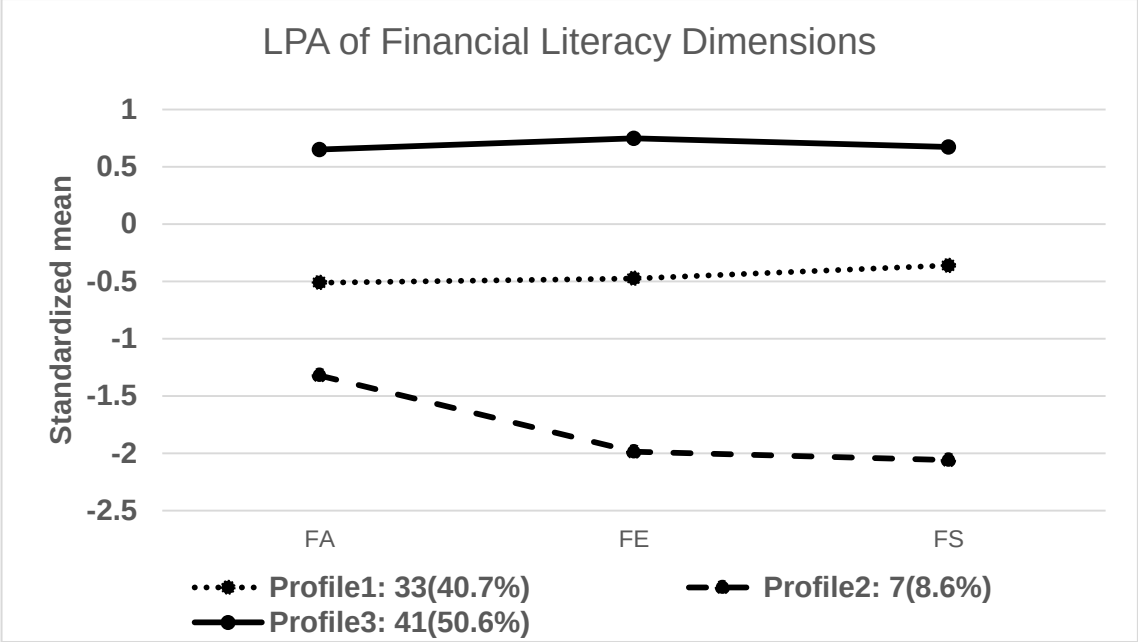

Figure1: Standardized Mean scores for financial literacy domains across the three-profile solution.

Profile 1, labeled "Moderate Financial Literacy," comprised 40.7% of the managers (n = 33) and was characterized by medium standardized scores across all financial literacy domains. Profile 2, termed "Low Financial Literacy," included 8.6% of the sample (n = 7) and showed low standardized scores (< -1.30) across all domains. Profile 3, designated "High Financial Literacy," represented the largest group at 50.6% (n = 41) and was marked by high standardized mean scores (> 0.6) on all financial literacy domains.

Comparative analyses of financial self-efficacy and selected demographic variables across these financial literacy profiles are summarized in Table 3. Significant differences were observed in all financial literacy domain scores across the three profiles. Importantly, financial self-efficacy scores varied significantly (F = 7.04, p = 0.0015), with the "High Financial Literacy" profile exhibiting the highest levels of self-efficacy and the "Moderate Financial Literacy" profile demonstrating the lowest.

variables	low	moderate	high	F-statistics	P-value	Comparisons
FA	15.14± 5.15	18.7± 3.33	24.22± 2.78	39.69	<0.001	1<2<3
FE	11.00± 1.00	15.82± 1.72	19.59± 1.26	133.52		1<2<3
FS	8.57± 1.62	13.15± 1.64	16.02± 1.46	82.31		1<2<3
FL	34.71± 5.88	47.67± 3.7	59.83± 3.92	160.65	<0.001	1<2<3
FSE	10.86± 2.27	9.12± 2.42	11.1± 2.19	7.04	0.0015	3>2
Age	45.71± 5.28	45.64± 6.87	46.51± 5.36	0.21	0.8127	
experience	6.86± 8.25	6.97± 6.09	8.63± 5.76	0.77	0.4673	
gender				1.0153	0.602	
male	4(57.14)	25(75.76)	29(70.73)			
female	3(42.86)	8(24.24)	12(29.27)			
Marital				8.079	0.018	
single	0(0)	7(21.21)	1(2.44)			
married	7(100)	26(78.79)	40(97.56)			
Education				15.843	0.015	

BS	0(0)	11(33.33)	5(12.2)			
MSc	4(57.14)	6(18.18)	19(46.34)			
PhD-MD	2(28.57)	16(48.48)	13(31.71)			
UP-DR	1(14.29)	0(0)	4(9.76)			
Unit				6.134	0.189	
Faculty	2(28.57)	9(27.27)	10(24.39)			
Education Hospital	2(28.57)	4(12.12)	15(36.59)			
The university headquarters	3(42.86)	20(60.61)	16(39.02)			

Furthermore, education level was significantly associated with financial literacy patterns ($p = 0.015$), where higher educational attainment corresponded with more advanced financial literacy. Marital status was also significantly related to profile membership ($p = 0.018$), indicating that married managers tended to exhibit higher levels of financial literacy.

Discussion

The present study examined financial literacy patterns among managers at the University of Medical Sciences and their relationship with financial self-efficacy through latent profile analysis. The identification of three distinct financial literacy profiles provides valuable insights into the heterogeneous nature of financial competencies within this critical organizational context. These findings contribute to the growing body of literature on financial literacy while addressing a significant gap in research focused on healthcare academic management.

The predominance of managers in the "High Financial Literacy" profile (50.6%) suggests a relatively encouraging baseline of financial competence among university medical science administrators. This finding contrasts with previous research indicating generally low financial literacy levels in developing countries (Klapper & Lusardi, 2020) and may reflect the specialized educational backgrounds and professional responsibilities of university managers. However, the presence of a substantial proportion of managers with moderate (40.7%) and low (8.6%) financial literacy levels indicates considerable room for improvement in financial competencies within this population, consistent with international evidence suggesting suboptimal financial literacy levels across various populations (OECD, 2016).

The significant positive relationship between financial literacy profiles and financial self-efficacy aligns with theoretical expectations based on Bandura's (1977) social cognitive theory and supports previous empirical findings (Lone & Bhat, 2022; Noor et al., 2020). Notably, the "High Financial Literacy" profile demonstrated the highest self-efficacy scores, while the "Moderate Financial Literacy" profile showed the lowest levels. This counterintuitive finding regarding the moderate group warrants further investigation, as it suggests that partial financial knowledge may paradoxically decrease confidence in financial decision-making abilities. This phenomenon could reflect the Dunning-Kruger effect in reverse, where increased awareness of financial complexity leads to decreased confidence among those with intermediate knowledge levels (Engelberg, 2007).

The significant association between educational attainment and financial literacy patterns corroborates extensive literature demonstrating the positive relationship between formal education and financial competence (Santini et al., 2019; Lusardi & Tufano, 2015). The finding that managers with advanced degrees predominantly clustered in higher financial

literacy profiles underscores the importance of educational investment in developing financial capabilities. This relationship is particularly relevant in university settings where continuous learning and professional development are institutional priorities, supporting the notion that individuals with university education, especially those with finance and economics-related backgrounds, demonstrate higher financial literacy (Santini et al., 2019).

The significant relationship between marital status and financial literacy profiles, with married managers exhibiting higher financial literacy levels, supports previous research suggesting that shared financial responsibilities and decision-making within partnerships may enhance financial knowledge and skills (Lusardi & Tufano, 2015; Murendo & Mutsonziwa, 2017). This finding has practical implications for targeted financial education programs, as single managers may benefit from additional support in developing financial competencies.

The implications of these findings extend beyond individual competency assessment to organizational effectiveness and strategic planning. In medical universities where managers oversee complex budgets, research funding, and resource allocation decisions, variations in financial literacy can significantly impact institutional performance (Ferinia et al., 2023; Zubair et al., 2023). The identification of managers with lower financial literacy levels provides opportunities for targeted professional development interventions. Furthermore, the strong relationship between financial literacy and self-efficacy suggests that improving financial knowledge and skills may enhance managers' confidence in making critical financial decisions, potentially leading to better organizational outcomes, as supported by research demonstrating that higher financial self-efficacy leads to more effective financial resource utilization (Moradzadeh et al., 2022).

The bidirectional relationship between financial literacy and financial self-efficacy observed in this study aligns with previous theoretical and empirical work. As suggested by Noor et al. (2020) and Yeganeh and Zarei (2019), increasing financial literacy can enhance financial self-efficacy by building confidence through improved knowledge and skills. Conversely, higher financial self-efficacy may motivate individuals to seek additional financial knowledge and skills, creating a positive feedback loop (Kartawinata et al., 2021; Lone & Bhat, 2022). This reciprocal relationship has important implications for intervention design, suggesting that programs targeting either financial knowledge or self-efficacy may yield complementary benefits.

Several limitations should be acknowledged when interpreting these results. The relatively small sample size (n = 81) from a single institution limits the generalizability of findings to other medical universities or healthcare organizations, particularly given that most previous research has focused on different populations such as students (Arofah, 2019; Kartawinata et al., 2021), bank employees (Clark et al., 2017), or households (Agarwalla et al., 2015; Lusardi et al., 2010). The cross-sectional design precludes causal inferences regarding the relationship between financial literacy and self-efficacy, and the self-reported nature of the measures may introduce response bias. Additionally, the study did not examine actual financial decision-making behaviors or performance outcomes, which would provide more comprehensive evidence of the practical implications of financial literacy variations.

Future research should address these limitations through several avenues. Longitudinal studies could examine the causal relationships between financial literacy development and self-efficacy changes over time, building on the theoretical framework established by Bandura (1977). Multi-institutional studies involving diverse medical universities would enhance the generalizability of findings and allow for examination of organizational factors

influencing financial literacy patterns. Investigation of the relationship between financial literacy profiles and actual financial decision-making performance would provide crucial evidence for the practical significance of these competencies, particularly in the context of financial well-being outcomes as demonstrated by Lone and Bhat (2022).

Research should also explore the specific financial challenges and decision-making contexts unique to medical university management, including research funding management, clinical revenue optimization, and compliance with healthcare financial regulations. Given the accountability requirements of medical universities to government organizations, ministries of health and sciences, and funding organizations (Amin et al., 2021), examination of how financial literacy relates to transparency and accuracy in financial reporting would be particularly valuable. Additionally, investigation of cultural and organizational factors that may influence the development and application of financial literacy in academic medical settings would provide valuable insights for institutional policy development.

The study's findings have immediate practical implications for human resource development and organizational capacity building in medical universities. The identification of distinct financial literacy profiles suggests that one-size-fits-all financial training approaches may be less effective than targeted interventions designed for specific competency levels. Organizations should consider implementing comprehensive financial literacy assessment programs to identify managers requiring additional support and develop differentiated professional development pathways accordingly, particularly given the critical role these managers play in educational, research, and healthcare service delivery (Adewumi, 2024).

In conclusion, this study provides important evidence regarding the heterogeneous nature of financial literacy among medical university managers and its relationship with financial self-efficacy. The identification of three distinct profiles offers a foundation for understanding the complexity of financial competencies in this critical organizational context. While the majority of managers demonstrated high financial literacy levels, the substantial proportion with moderate or low competencies highlights the need for continued attention to financial capability development, as weakness in financial literacy dimensions can lead to undesirable consequences at both individual and organizational levels (Lusardi & Mitchell, 2011; Warmath & Zimmerman, 2019). The strong relationship between financial literacy and self-efficacy underscores the potential benefits of investing in financial education programs that not only enhance knowledge and skills but also build confidence in financial decision-making (Babu & Velmurugan, 2024). As medical universities continue to face increasingly complex financial challenges, ensuring that managers possess adequate financial literacy becomes essential for organizational success and ultimately for the quality of educational, research, and healthcare outcomes they are responsible for delivering.

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