Pharmacists' knowledge and perceptions of financial literacy

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Keywords
financial literacy, pharmacists, training

Abstract

Success in today's rapidly evolving pharmaceutical industry requires more than groundbreaking research and innovative products - it demands sound financial decision-making. Financial literacy has become a crucial skill for managers tasked with steering their organisations through high-stakes investments, regulatory pressures, and intense market competition. This article highlights why financial literacy is essential for pharmacists and how targeted training can drive smarter decisions, better resource management, and sustainable growth. The purpose of this study was to assess the level of financial literacy among pharmacists. A self-assessment postal survey of more than 40 questions was developed and distributed to pharmacy institutions across the Republic of Serbia - three pharmacy groups. Serbia is home to 4,000 operating pharmacies. Over three months, 202 out of 230 surveys were completed and returned. Respondents recognized the importance of financial skills and knowledge for their work and expressed a need for training. Policymakers should consider incorporating financial literacy programs into pharmacists' curricula.

Introduction

In the modern era, where financial decision-making is one of the most complex human behaviors, individuals require a broad set of skills to make wise financial choices. Understanding economic principles, managing risks, and recognizing potential fraud have become essential skills. The digitalization of financial transactions and the expansion of artificial intelligence further complicate the decision-making process, making financial literacy necessary not only for individuals but also for organizations.

Various definitions of financial literacy can be found in the literature. One definition describes it as the ability to analyze financial options, plan for the future, and respond appropriately to events (Tejero et al., 2019, p. 138). One of the critical competencies required is pharmacy accounting and financial management (Alomi et al., 2023). Financial literacy is essential for effective financial management. It encompasses the essential knowledge and terminology individuals need to effectively manage personal finances and navigate functions in modern society.

With the growing availability of financial products and services, both individuals and companies face challenges in evaluating costs, benefits, and the long-term consequences of their decisions. In this context, the role of forensic accounting and auditing is becoming increasingly significant, as it enables the detection of irregularities, strengthens investor confidence, and improves regulatory frameworks. Financial literacy, supported by technological innovations and education, can significantly contribute to risk reduction and informed decision-making in today's business environment. Research indicates that higher levels of financial literacy within a community are associated with greater prosperity. As a result, financial literacy has garnered the attention of governments worldwide.

Changes in the business environment are intense, and pharmacy managers are expected to measure and respond to the financial impact of these changes (Abu Assab et al., 2024). The ultimate goal is to improve the financial health of pharmacies. Planned changes should ensure that pharmacies continue to grow and provide high-quality services to meet the needs of the communities they serve.

Literature Review

Healthcare organizations today face numerous challenges as they strive to improve service quality while reducing costs. Healthcare providers are increasingly under pressure to curb rising healthcare expenses in a dynamic environment. Efficient service delivery requires the application of methodologies tailored to the specificities of healthcare (Milojević et al., 2024). Effective financial management plays a crucial role in the functioning of the healthcare system, as well as in the implementation of these methodologies. In challenging conditions, healthcare organization managers must develop skills and knowledge that go beyond their primary clinical competencies, including leadership abilities (Gačić et al., 2023). This study focuses on examining financial literacy in pharmacies, as this issue has so far been insufficiently explored. In the modern, dynamic healthcare environment, pharmacists are increasingly taking on key managerial roles in pharmaceutical practice. For over a decade, there has been a growing trend of pharmacy ownership by multiple contractors, leading to many pharmacies being managed by pharmacists in managerial roles (Adamović, 2024). This research examines the key responsibilities of pharmacists as managers in pharmaceutical organizations, including financial management, human resource management, inventory control, and strategic planning. In this context, it presents an interesting hierarchy of the management structure (Figure 1).

Figure 1. Management Hierarchy

Source: De Silva, T. (2013). Essential Management Skills for Pharmacy and Business Managers. New York: Productivity Press (p. 7).

According to the author, communication styles vary depending on the hierarchical structure within an organization. For instance, communication between the general director and their subordinates typically occurs almost exclusively in a financial context, which can be described as the "language of money." On the other hand, managers communicate with frontline staff using operational language, which focuses on daily functions and tasks. Therefore, both managers and pharmacists need to master and understand both languages—financial and operational—to effectively manage communication within the organization.

Community pharmacists play a key role in the healthcare system, acting as easily accessible healthcare providers and entrepreneurs. Over time, the role of community pharmacists has significantly evolved, expanding beyond the traditional function of dispensing medications to a broader range of responsibilities. This transformation includes additional aspects of healthcare, such as providing advisory services, managing therapies, promoting public health, and educating patients. This expansion of pharmacists' roles reflects changes in community healthcare needs and highlights their importance as key players in the healthcare team. In this context, it is also necessary to emphasize the redefinition of

pharmacy management roles towards implementing strategies for cost optimization, improving operational efficiency, and differentiating services to maintain competitiveness and ensure long-term financial stability.

To successfully manage community pharmacies, pharmacists must possess financial literacy and apply relevant financial indicators. However, research on pharmacists' awareness of financial indicators remains very limited. This highlights the need for further studies in this field to improve understanding and application of financial principles in pharmacy operations (Assab et al., 2024). It is important to note that financial literacy encompasses both knowledge and financial behavior (Lusardi, 2019). Furthermore, as Özyeşil and Tembelo (2025) state, financial literacy includes multiple dimensions, emphasizing not only knowledge itself but also the ability to acquire and effectively apply it.

As noted by Bergin (2016), pharmacy owners and managers face the imperative of maintaining high-quality patient services while simultaneously adapting to key factors affecting the financial stability of the pharmacy sector. Some of the most significant challenges include:

- Reforms and price reductions within the existing benefits system, directly impacting the revenue structure of pharmacies.
- Co-payment discounts, which modify the economic viability of certain pharmaceutical products.
- High-cost medications with fixed margins, which may limit profitability, particularly in specialized therapies.
- Implementation of professional services, which require additional resources but can contribute to revenue diversification.
- Competitive pressures, manifesting through:
  - The increasing influence of discount offers that attract consumers with pricing advantages.
  - The consolidation of pharmacy groups, currently a trend in Serbia, which affects their bargaining power in procurement processes and indirectly influences market prices.
- Trends in operational costs, including rising rents and employee wages, which increase fixed expenses and impact the overall financial sustainability of pharmacies.

Individuals with adequate financial knowledge are more likely to achieve their financial goals. Conversely, a lack of such knowledge can hinder effective personal financial management, lead to financial difficulties, and negatively affect overall financial well-being. Another important reason for improving financial literacy in pharmacies is the ability to recognize and prevent fraudulent activities by employees.

Research Methodology

In this study, data were analyzed using the software tool SPSS (IBM SPSS Statistics), version 20. Descriptive statistics were applied for data analysis, with results for numerical variables presented as the arithmetic mean (mean) and standard deviation (SD), while categorical variables were represented by the number of respondents and their percentage. Pearson's correlation coefficient was used to analyze the correlation between numerical variables. Additionally, an independent samples t-test was used to test differences between two independent groups, while ANOVA was applied to compare multiple groups and identify significant differences among them. The results were presented in tabular format as well as through appropriate graphical representations.

Results

Sociodemographic Characteristics of Respondents

The empirical research was conducted using a survey method on a selected sample. The sample consists of 202 pharmacists, of whom 132 (65.3%) are female and 70 (34.7%) are male. An analysis of the age structure of the respondents shows that 42 pharmacists (20.8%) are under 25 years old, while the largest group consists of respondents aged 25 to 34 years—68 (33.7%). The age category of 35 to 44 years includes 62 respondents (30.7%), while 26 (12.9%) fall into the 45 to 54 age group. The fewest pharmacists are older than 55 years—only 4 (2.0%). Regarding educational background, most respondents have completed undergraduate academic studies—86 (42.6%), while 46 pharmacists (22.8%) hold a master's degree. Specialist studies have been completed by 20 respondents (9.9%), and 8 pharmacists (4.0%) have

obtained a doctoral degree. Other types of education were reported by 42 respondents (20.8%). An analysis of work experience shows that 62 pharmacists (30.7%) have less than five years of experience, while 54 (26.7%) have between 5 and 10 years. In the categories of 11–15 and 16–20 years of experience, there are 34 (16.8%) and 36 (17.8%) pharmacists, respectively. The fewest respondents have over 20 years of work experience—16 (7.9%). The sociodemographic characteristics are presented in Table 1.

SOCIODEMOGRAPHIC CHARACTERISTICS	*N (%)*
Gender	
Female	132 (65,3%)
Male	70 (34,7%)
Age	
Under 25	42 (20,8%)
25-34	68 (33,7%)
35-44	62 (30,7%)
45-54	26 (12,9%)
55 and older	4 (2,0%)
Education Level	
Undergraduate academic studies in pharmacy	86 (42,6%)
Master's degree in pharmacy	46 (22,8%)
Specialist studies in pharmacy	20 (9,9%)
Doctorate in pharmacy	8 (4,0%)
Other	42 (20,8%)
Years of Work Experience	
Less than 5 years	62 (30,7%)
5-10 years	54 (26,7%)
11-15 years	34 (16,8%)
16-20 years	36 (17,8%)
More than 20 years	16 (7,9%)

Table 1. Sociodemographic Characteristics of Respondents

Out of the total number of pharmacists included in this study, 130 (64.4%) work in privately owned pharmacies, while 72 (35.6%) are employed in state-owned pharmacies. The distribution of respondents by the type of pharmacy in which they are currently employed is shown in Figure 2.

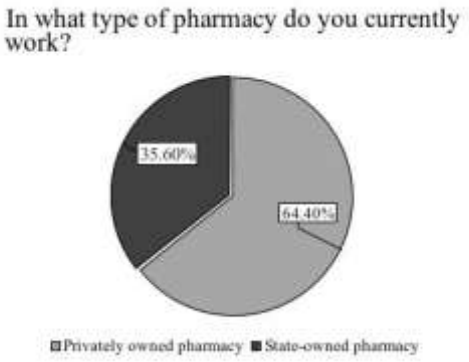

Figure 2. Distribution of Respondents by Type of Pharmacy in Which They Are Currently Employed

The self-assessment of financial literacy among respondents shows that 24 pharmacists (11.9%) rate their level of financial literacy as very low, while 28 respondents (13.9%) consider their level to be low. The largest portion of the sample, 79 pharmacists (38.6%), assess their financial literacy as moderate. A high level of financial literacy was reported by 53 respondents (25.7%), while 20 pharmacists (9.9%) believe they possess a very high level of financial literacy. Figure 3 shows the distribution of respondents based on their self-assessment of financial literacy level.

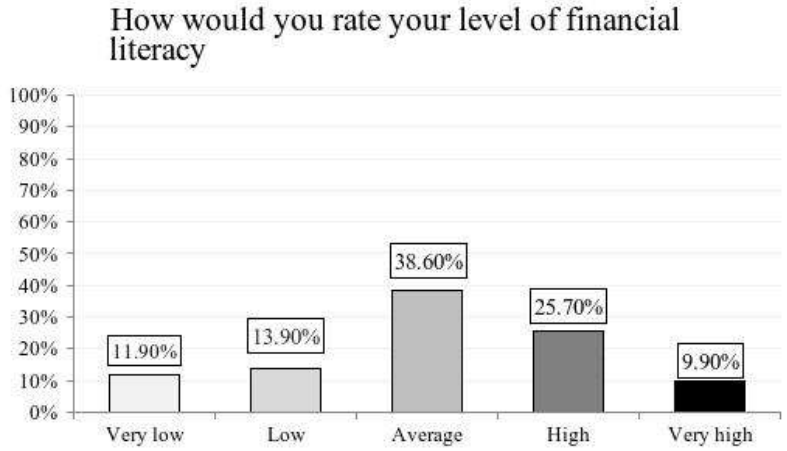

Figure 3. Distribution of respondents based on their self-assessment of financial literacy level

The analysis of respondents' attitudes toward the importance of financial literacy for pharmacists shows that 10 pharmacists (5.0%) do not consider financial literacy important at all, while the same percentage, 10 respondents (5.0%), express disagreement. A neutral stance on this issue is held by 40 pharmacists (19.8%). The largest percentage of respondents, 78 (38.6%), agree that financial literacy is important for pharmacists, while 64 pharmacists (31.7%) fully share this view. Figure 4 shows the distribution of respondents based on their opinion on the importance of financial literacy for pharmacists.

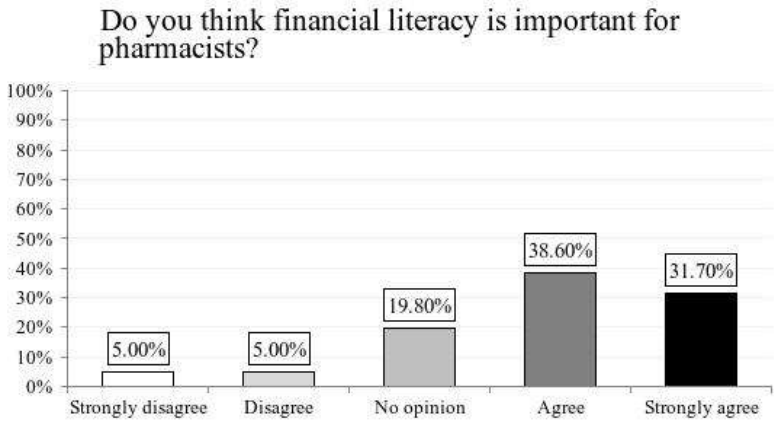

Figure 4. Distribution of respondents based on their opinion on the importance of financial literacy for pharmacists

Perceived Importance of Financial and Digital Education in the Pharmacy Profession

Respondents assessed their level of agreement with seven statements related to various aspects of financial and digital literacy in the pharmacy profession. Ratings were given on a Likert scale from 1 to 5, where lower values indicate disagreement, while higher values reflect a greater degree of agreement. The total score was calculated by summing the individual ratings, with a higher score indicating greater awareness of the importance of financial and digital education, as well as more positive attitudes toward improving the pharmacy profession through financial management and technology implementation. The research results indicate that respondents moderately positively evaluate the importance of financial and digital education in the pharmacy profession, with average ratings for individual statements generally above the mid-point of the scale (rating 3), ranging from 3.49 to 3.76 (Table 2).

RESPONDENTS' PERCEPTION OF THE IMPORTANCE OF FINANCIAL AND DIGITAL EDUCATION IN THE PHARMACY PROFESSION	***Mean±SD***
I need additional education in the field of finance	3,55±1,209
Financial literacy should be part of pharmacy education	3,70±1,151
Poor financial management is a common problem in pharmacies	3,73±1,110
I believe financial education would improve pharmacy business operations	3,76±1,057
The use of digital tools can enhance pharmacy business efficiency	3,71±1,105
It is important to regularly update knowledge about digital technologies used in the pharmaceutical sector	3,67±1,121
Artificial intelligence offers unlimited possibilities for improving drug management	3,49±1,177
TOTAL SCORE	**25,62±7,115**

Table 2. Respondents' Perception of the Importance of Financial and

Digital Education in the Pharmacy Profession

Respondents also rated the importance of topics related to various aspects of financial management in pharmacies using a Likert scale from 1 to 5. The results showed that respondents assign high importance to different aspects of financial management, with all average ratings above the mid-point of the scale (rating 3), as shown in Table 3. The highest-rated topic was *employee incentive programs* (4.21 ± 0.885), indicating that pharmacists recognize the importance of motivation and appropriate reward policies in pharmacy business operations. Additionally, *cost planning* (4.17 ± 0.904) and *pricing of pharmaceutical and non-pharmaceutical products* (4.16 ± 0.878) were rated highly, suggesting that these

aspects are crucial for the financial sustainability of pharmacies. *Efficient liquidity management* (4.04 ± 0.956) and *inventory management* (4.04 ± 0.891) were also recognized as important factors for successful business operations. On the other hand, the lowest average ratings were given for *seasonal variations in business operations* (3.84 ± 1.063) and the *impact of regulations on financial flows* (3.91 ± 0.958). This may indicate that respondents do not perceive these topics as key challenges in pharmacy management or that they lack specific knowledge and experience in these areas.

IMPORTANCE OF SPECIFIC TOPICS IN FINANCIAL MANAGEMENT OF PHARMACIES	***Mean±SD***
Pricing of pharmaceutical and non-pharmaceutical products	4,16±0,878
Revenue planning	4,11±0,956
Cost planning	4,17±0,904
Inventory management	4,04±0,891
Employee incentive programs	4,21±0,885
Seasonal variations in business operations	3,84±1,063
Efficient liquidity management	4,04±0,956
Properly calculated price margins	4,02±0987
Revenue diversification in pharmacy	3,92±0,964
Identifying financial opportunities and threats in pharmacy	4,02±0,997
Profitability analysis of opening a new pharmacy or expanding operations	4,01±0,941
Managing financial risks in pharmacy operations	3,94±0,944
Solvency	3,96±0,935
Impact of regulations on financial flows	3,91±0,958
Investment in new equipment or technology	3,97±1,002

Table 3. Importance of Specific Topics in Financial Management of Pharmacies

According to Respondents' Ratings

Respondents evaluated the importance of various forms of training and education in financial management in pharmacies in the same way (Table 4). The results show that pharmacists assign high importance to continuous education and additional training in financial management, with all ratings above 4.00. The highest average rating was given to the *need for participation in financial literacy workshops or seminars* (4.20±0.914), indicating a strong awareness of the importance of practical training in this field. The lowest, yet still high, rating was given to the *availability of resources and tools for improving financial management in pharmacies* (4.14±0.936), suggesting a need for enhancing the accessibility of materials and tools that would help pharmacists manage finances more efficiently.

IMPORTANCE OF TRAINING AND EDUCATION	***Mean±SD***
Continuous education on financial skills for pharmacists	4,18±0,851
Participation in financial literacy workshops or seminars	4,20±0,914
Integration of financial topics into pharmacy education programs	4,15±0,896
Availability of resources and tools for improving financial management in pharmacies	4,14±0,936

Table 4. Importance of Training and Education in Financial Management of Pharmacies

Respondents also evaluated the significance of various problems encountered in pharmacy business operations (Table 5). To gain insight into the overall challenges pharmacists face, a cumulative problem score was calculated for each respondent by summing individual ratings on the Likert scale. This cumulative score reflects the overall perception of business challenges—higher values indicate that

respondents experience more or more severe challenges. The results show that the biggest challenges pharmacists face are related to the shortage of qualified personnel and financial aspects of business operations. The highest average rating was given to the issue of a shortage of pharmacists in the labor market (4.11±1.016), indicating a significant workforce deficit in this profession. Other major challenges include difficulties in employee salary payments (3.91±1.164) and stock shortages (3.89±1.064), suggesting potential financial management and procurement challenges. Issues related to delayed supplier payments (3.65±1.176) and liquidity problems (3.74±1.080), while relevant, received slightly lower ratings compared to other challenges.

KEY CHALLENGES PHARMACISTS FACE IN PHARMACY BUSINESS OPERATIONS	***Mean±SD***
Liquidity issues	3.74±1.080
Difficulties in employee salary payments	3.91±1.164
Issues with delayed payments to suppliers	3.65±1.176
Problems related to inadequate discounts and cash rebates from suppliers	3.77±1.092
Stock shortages	3.89±1.064
Frequent regulatory changes affecting financial operations	3.84±1.072
Unfair competition	3.76±1.112
Intense market competition	3.80±1.111
Shortage of pharmacists in the labor market (workforce deficit)	4.11±1.016
Unfavorable market trends	3.85±1.001
Issues related to tax payment obligations	3.70±1.089
Lack of financially literate staff in the pharmacy	3.86±0.998
TOTAL SCORE	**42.00±9.486**

Table 5. Key Challenges Pharmacists Face in Pharmacy Business Operations

The results of the correlation analysis ($r = 0.478$, $p<0.001$) indicate a statistically significant and positive relationship between the score measuring awareness of the importance of financial and digital education and the score reflecting the perception of challenges in pharmacy business operations. This correlation suggests that pharmacists who recognize the importance of financial and digital literacy more strongly also perceive business challenges in pharmacies more intensely. Respondents who are more aware of the significance of financial management and technology also identify greater problems in their daily work, which may suggest that a lack of adequate knowledge contributes to the perception of business difficulties (Figure 5).

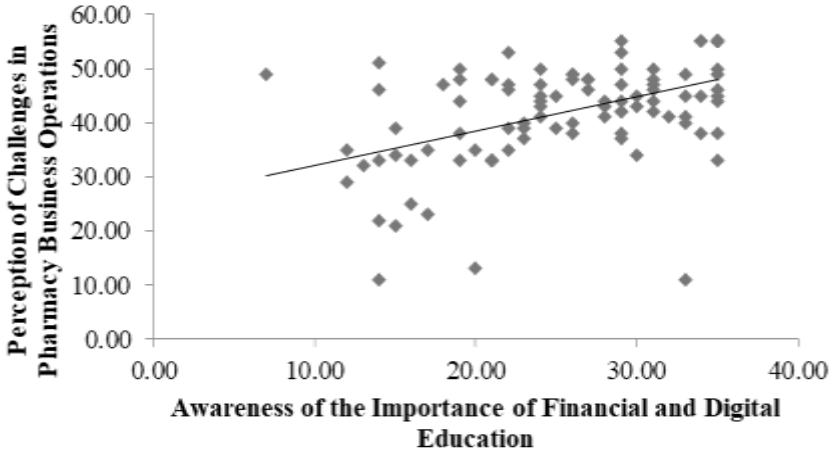

Figure 5. The relationship between awareness of financial and digital education and the perception of business challenges in pharmacies

The relationship between respondents' sociodemographic characteristics and their opinions on the importance of education, as well as their perception of challenges in pharmacy business operations, was analyzed. Statistical testing examined differences in the mean values of these two scores concerning gender, age, level of education, and years of work experience (Table 6). The results show that gender did not have a significant impact on the perception of the importance of education ($p = 0.148$) or the perception of challenges ($p = 0.215$). Regarding age, significant differences were found in both scores. Respondents from the youngest group (under 25 years) and those in the 25–34 age group had lower average scores for awareness of the importance of education (24.19±8.291 and 24.35±6.228), whereas the oldest group (55 years and older) had the highest value (31.00±4.618), indicating that awareness of the importance of education increases with age ($p = 0.011$). The perception of business challenges also showed significant differences ($p = 0.044$), with respondents aged 45–54 years reporting the highest perception of challenges (45.54±8.584), while the 35–44 age group had the lowest value (39.38±12.431). In terms of education level, respondents with different educational backgrounds significantly differed in their awareness of the importance of education ($p = 0.004$), with those holding a PhD scoring the highest (30.75±4.432). There was also a highly significant difference in the perception of challenges ($p = 0.000$), with respondents holding a bachelor's degree (45.65±7.194) and a PhD (45.75±2.314) reporting the highest perception of challenges, while those with "other" education had the lowest value (35.05±12.287). These findings suggest that a higher level of education contributes to greater awareness of the need for education, but also to a stronger recognition of challenges in pharmacy business operations. Years of work experience also showed significant differences in both scores ($p = 0.000$). Respondents with less than five years of experience had the lowest awareness of the importance of education (22.90±8.267), while those with more than 20 years of experience had the highest value (31.00±3.098). Similarly, the perception of challenges was lowest among respondents with the least experience (38.03±11.410), whereas pharmacists with over 20 years of experience reported the highest value (50.25±3.924).

SOCIODEMOGRAPHIC CHARACTERISTICS	**Awareness of the Importance of Education *(Mean±SD)***	**Perception of Challenges *(Mean±SD)***
Gender		
Female	26,15±7,139	43,12±9,850
Male	24,63±7,011	40,91±8,432
Age		
Under 25	24,19±8,291	43,67±6,365
25-34	24,35±6,228	42,12±7,781
35-44	26,16±6,638	39,38±12,431
45-54	29,15±7,352	45,54±8,584
55 and older	31,00±4,618	40,50±8,660
Education Level		
Undergraduate academic studies in pharmacy	26,93±6,820	45,65±7,194
Master’s degree in pharmacy	24,13±6,355	40,91±8,993

Specialist studies in pharmacy	26,70±6,473	42,00±5,005
Doctorate in pharmacy	30,75±4,432	45,75±2,314
Other	23,09±8,144	35,05±12,287
Years of Work Experience		
Less than 5 years	22,90±8,267	38,03±11,410
5-10 years	25,63±5,583	44,25±7,328
11-15 years	27,17±6,534	41,53±7,492
16-20 years	26,44±7,117	42,27±9,044
More than 20 years	31,00±3,098	50,25±3,924

Table 6. Relationship between sociodemographic characteristics, awareness of the importance of education, and perception of challenges in pharmacy business operations

The results show that there is no statistically significant difference in the awareness of the importance of education between employees in private and state-owned pharmacies (p=0.241). Although the average value suggests slightly higher awareness of education among pharmacists in private pharmacies (26.06±7.17) compared to those in state-owned pharmacies (24.83±6.99), this difference is not pronounced enough to be statistically significant. These results suggest that the type of pharmacy in which pharmacists work does not significantly influence their perception of the importance of financial and digital education (Figure 6). Additionally, the difference in the perception of challenges between pharmacists in private (41.23±10.99) and state-owned pharmacies (43.42±5.65) is not statistically significant (p=0.117). Although pharmacists in state-owned pharmacies have a slightly higher average score for problem perception, the results indicate that the type of pharmacy does not significantly affect how pharmacists perceive business challenges.

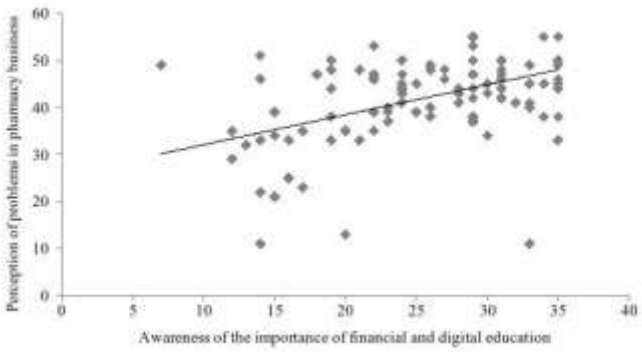

Figure 6. Awareness of Education and Perception of Challenges in Relation to the Type of Pharmacy

Discussions and Conclusions

The results of this study show that respondents moderately positively assess the importance of financial and digital education in the pharmacy profession, with higher levels of education and more years of work experience contributing to greater awareness of the need for continuous education. Pharmacists recognize various challenges, including liquidity issues, inventory management, delayed payments, and unfair competition. The perception of challenges is more pronounced among pharmacists with longer work experience and higher education. The type of pharmacy (private or state-owned) does not significantly impact pharmacists' awareness of the importance of education or their perception of business challenges. The positive correlation between awareness of the importance of education and the perception of problems in pharmacy business operations suggests that pharmacists who are more aware

of the importance of financial and digital education also better recognize the issues they face in business operations. This result indicates that education may play a key role in developing the ability to identify and address financial and operational challenges in pharmacy practice. In general, this study highlights the need to improve education in financial management and digital literacy in pharmacy, particularly through formal education and continuous professional training. Additionally, addressing key issues in pharmacy business operations requires systemic solutions, including better financial planning and regulatory reforms.

The findings highlight the importance of enhancing pharmacists' financial literacy and integrating financial management principles into pharmaceutical education. A lack of financial literacy significantly hinders the achievement of positive business and professional outcomes. Continuous professional development programs are essential for improving pharmacists' financial competence. More than ever, there is a need for collaborative efforts among policymakers, pharmaceutical faculties, and professional associations to advance financial education and promote research in this critical area. Financial literacy is crucial for every pharmacist, especially those who own or manage pharmacies. Pharmacists and pharmacy staff with financial knowledge will be better prepared to take on and execute tasks related to financial management.

Limitations and Direction for Future Research

It is essential to provide adequate education and training for all pharmacy technicians, pharmacists, and clinical pharmacists to ensure the efficiency and quality of services provided. However, the lack of focused research on these aspects may hinder the identification of specific educational needs and the development of effective training programs, limiting the implementation of new initiatives and their impact on healthcare. Future research should focus on developing specialized financial literacy programs tailored to the needs of different levels of pharmacists.

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