



## Research article

# Assessing pharmacists' awareness of financial indicators in community pharmacy management: A cross-sectional study

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## ABSTRACT

**Background:** Community pharmacists play a vital role in the healthcare system, serving as accessible healthcare providers and entrepreneurs. To effectively manage community pharmacies, pharmacists must possess financial literacy and utilize appropriate financial indicators. However, studies addressing community pharmacists' awareness of financial indicator concepts are scarce. This study assesses the awareness of community pharmacists in Jordan regarding financial indicators.

**Methods:** Employing a cross-sectional study design, we utilized a structured and validated questionnaire to collect data from 353 community pharmacy owners across Jordan. The questionnaire assessed pharmacists' awareness and utilization of financial indicators in pharmacy management. Descriptive statistics summarized demographic data, while analytical statistics examined associations between demographic factors and financial indicator awareness.

**Results:** The study revealed varying levels of awareness among pharmacists regarding financial indicators, with younger pharmacists exhibiting higher awareness levels. Factors such as educational background and years of experience were found to influence awareness. Furthermore, pharmacists predominantly utilize profitability indicators to assess financial performance.

**Conclusion:** The findings underscore the importance of enhancing pharmacists' financial literacy and integrating financial management principles into pharmacy education. Continuous professional development programs are essential to improve financial competence among pharmacists. This study provides valuable insights into the awareness of financial indicators among community pharmacists in Jordan, emphasizing the need for collaborative efforts from policymakers, pharmacy faculties, and associations to enhance financial education and promote research in this critical area.

## 1. Introduction

The role of community pharmacists has evolved significantly over the years, extending far beyond dispensing medications to

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encompass a broader spectrum of responsibilities [1,2]. While the primary focus remains on optimizing patient care and medication management, contemporary pharmacists are increasingly involved in the financial aspects of running community pharmacies [3]. As the healthcare landscape evolves in Jordan, encompassing the management of financial resources, profitability, and overall pharmacy performance becomes increasingly crucial for pharmacists [4–6]. Effectively managing financial resources within community pharmacies is integral to their sustainability and continued provision of high-quality healthcare services [7].

Community pharmacists are healthcare professionals and entrepreneurs who must navigate the complexities of financial management [8]. The financial health of a community pharmacy is a reflection of its operational efficiency, profitability, and ability to invest in quality improvements [9]. Thus, understanding and effectively utilizing financial indicators is imperative for pharmacists to make informed decisions and ensure the long-term viability of their businesses.

The allocation of public expenditures in Jordan's healthcare system has undergone significant changes over the years. In 2017, total pharmaceutical spending accounted for 2.88 % of the gross domestic product (GDP) and about 25.9 % of the total health expenditure in Jordan [10]. Despite their integral position within the healthcare system, community pharmacies in Jordan, like many counterparts in developing countries, often operate as small and medium-sized enterprises. This characteristic is fundamental in the Jordanian economy, which faces economic challenges associated with lower income levels [11–13]. Moreover, the COVID-19 pandemic has added a layer of complexity, introducing new economic challenges and underscoring the need to address the issue of financial indicators [14,15].

The concept of financial indicators pertains to a set of metrics and tools used to assess a business entity's financial performance and stability [16]. In the context of community pharmacies, these indicators encompass a wide array of financial metrics, including but not limited to gross profit margins, net profit margins, inventory turnover rates, and accounts receivable turnover. These metrics provide valuable insights into various aspects of financial performance, such as revenue generation, expense management, and liquidity, which empower pharmacists to make strategic decisions that optimize profitability while maintaining a high standard of patient care [13].

Community pharmacists' awareness and utilization of financial indicators are pivotal for several reasons. First and foremost, pharmacies, like any other business, operate in a competitive market where profit margins can be slim. Pharmacists must, therefore, possess the necessary financial acumen to make strategic decisions that optimize profitability while maintaining a high standard of patient care [8]. Furthermore, financial indicators serve as early warning signs for potential financial challenges [17]. By regularly monitoring these metrics, pharmacists can identify inefficiencies or unfavorable trends in their financial operations. For instance, a declining net profit margin may signify increased operating costs or pricing issues that require prompt attention. Thus, the timely use of financial indicators can help pharmacists proactively address financial challenges and safeguard the sustainability of their practices.

This multifaceted role of community pharmacists, which encompasses both healthcare and financial management, has been underscored in a comprehensive study [18]. It emphasizes that pharmacists are expected to be experts in managing various sectors, including human resources, finances, marketing, store inventory, and others. Consequently, pharmacists' proficiency in financial management is crucial, as it is intertwined with their broader responsibilities.

Against this backdrop, this study aims to assess the awareness of community pharmacists in Jordan regarding financial indicators relevant to community pharmacies. Specifically, we aim to evaluate the extent of awareness among community pharmacists in Jordan regarding the importance of financial indicators and to examine demographic factors that may influence pharmacists' awareness of financial indicators.

By doing so, we hope to contribute to a better understanding of the financial literacy and awareness of community pharmacists in Jordan, shedding light on areas where educational and training interventions may be necessary to enhance financial competence within this critical healthcare sector.

## 2. Material and methods

### 2.1. Study design

This cross-sectional study employed an online pre-tested, structured, and validated questionnaire as the primary tool for data collection. The questionnaire items were created with the help of an expert panel of at least ten subject-matter experts and based on social science methodological standards [19] and the literature review [13,20–22]. This panel included five academics specializing in clinical pharmacy, pharmacy practice, social and administrative pharmacy, business administration, and finance fields; three clinical pharmacists; two community pharmacists; and two non-pharmacist representatives from the health insurance sector. The questionnaire was divided into two parts. The first part was designed to obtain the socio-demographic characteristics of the respondents. The second part included 22 items and was dedicated to investigating the awareness of community pharmacists' owners and managers about financial indicators and their importance. The Likert's agreement five-point response scale (strongly disagree, which scores 1 point; agree strongly, which scores 5 points) was used. The study aimed to investigate the awareness of financial indicators among community pharmacists in Jordan.

### 2.2. Sample size and sample selection strategy

According to the Jordan Pharmacists Association (JPA), there are around 3700 community pharmacies, with approximately 8000 community pharmacists and pharmacy assistants [23]. The minimum sample size required was calculated via Raosoft, using a 95 % confidence level and a 5 % margin of error (significance  $\alpha = 0.05$ ) with a 50 % response distribution. It was found to be 349. To ensure the representativeness of the study, a sample of community pharmacy owners was selected from various regions across Jordan. This

stratified sampling approach aimed to capture insights from different geographic areas, accounting for potential variations in practice and demographics. A total of 450 community pharmacists participated in this study. Only pharmacists' owners and managers working in community pharmacies in Jordan were invited to participate, and other pharmacy staff members were excluded from this study.

### 2.3. Data collection

Data were collected through a structured questionnaire designed specifically for this study. The questionnaire was administered and distributed electronically to the selected community pharmacists, who voluntarily participated in the survey, through online channels such as WhatsApp and Facebook groups related to community pharmacies, ensuring accessibility to a diverse group of pharmacists. The anonymity of participants was maintained to encourage open and honest responses. The questionnaire consisted of two main sections: demographic information and awareness of financial indicators. Participants were asked to rate their familiarity with and understanding of these indicators.

### 2.4. Ethical considerations

The ethical approval for the study was obtained from the institutional review board (IRB) committee of the Clinical Pharmacy Department and the Scientific Research Ethics Committee at Zarqa University (approval number: February 1, 2021). Participants provided informed consent and participated on a voluntary basis.

### 2.5. Data analysis

Statistical analyses were performed using the Statistical Package for Social Science (SPSS) software, version 23. Data analysis was conducted in two main stages: demographic data, including age, years of experience, and education level, were summarized using descriptive statistics. The mean, median, standard deviation, frequencies, and percentages were calculated to provide an overview of the sample characteristics. Missing responses were excluded from the calculations of response percentages for the survey items. Analytical statistics were employed to examine potential associations between demographic factors and pharmacists' awareness of financial indicators. *Chi-squared* tests were used to assess the relationships between categorical variables, such as education level and awareness. A one-sample *t*-test was performed to assess the statistically significant difference in the awareness mean. Questionnaire consistency and reliability were measured using Cronbach's  $\alpha$  test, and the overall internal consistency of the study was excellent (Cronbach's  $\alpha = 0.947$ ). Additionally, regression analysis was conducted to explore any significant predictors of financial indicator awareness. A significance level of  $p < 0.05$  was set to determine statistical significance in all tests.

**Table 1**  
Demographic characteristics of study participants (N = 353).

Variables	Categories	N (%)
Gender	Male	164 (46.5)
	Female	189 (53.5)
Pharmacist age group	25–34 years	116 (32.9)
	35–44 years	94 (23.9)
	45 years or older	153 (43.3)
Last qualification obtained	Doctor of Pharmacy (PharmD)	18 (5.1)
	Bachelor of Pharmacy (BSc)	293 (83.0)
	Postgraduate studies	42 (11.9)
Location of Pharmacy	North Region	86 (24.4)
	Middle Region	233 (66.0)
	South Region	34 (9.6)
Type of the pharmacy ownership	Single pharmacy	324 (91.8)
	Chain pharmacy	29 (8.2)
Pharmacy's foundation age	Less than 5 years	103 (24.3)
	5–9 years	86 (29.2)
	10 years or older	164 (46.5)
Pharmacy financial management role	Owner	278 (78.8)
	Another authorized pharmacist	75 (21.2)
Years of practical (Field) experience	Less than 5 years	76 (21.5)
	5–9 years	77 (21.8)
	10 years or older	200 (56.7)
Software used for financial accounting	No software (Manually).	99 (28.0)
	• Yes: Falcon®	20 (5.7)
	• Yes: Galaxy®	41 (11.6)
	• Yes: Darwazeh®	3 (0.8)
	• Yes: Dawatech®	15 (4.2)
	• Yes: Smart®	147 (41.6)
	• Yes: Other software	28 (7.9)

### 3. Results

A total of 450 community pharmacies from ten governorates were approached to participate in the study, of which 353 answered the questionnaire, giving a response rate of 78.0 %. Table 1 summarizes the demographic characteristics of the participants. The study participants represented a diverse group of community pharmacists. Most participants were female (189, 53.5 %); had a BSc degree in pharmacy (293, 83.0 %); worked in independent pharmacies (324, 91.8 %); most of them were owners (278, 78.8 %); and the rest were authorized (25, 21.2 %); and had ten years or more of working experience in community pharmacies (200, 56.7 %) with more than ten years of establishment (164, 46.5 %). Regarding the particular question about financial accounting software, 28.0 % of the respondents did not use any accounting software programs (99, 28.0 %). Most of the reminders used Smart® (147, 41.6 %), followed by Galaxy® (41, 11.6 %).

Table 2 presents the findings on community pharmacists' awareness of financial indicators used in pharmacy management and their importance in their pharmacies. The study found varying levels of awareness among pharmacists regarding financial indicators used in pharmacy management. The total value shows that the community pharmacists had a relatively good awareness of the concept of financial indicators. The overall mean estimated for the 22 items is  $3.74 \pm 0.61$ .

Regarding the importance of financial analysis and financial indicators, most respondents (289, 81.9 %) agreed that the financial analysis helped assess the pharmacy's financial and monetary situation. Moreover, 288 respondents (81.6 %) agreed that financial performance indicators help make decisions logically and rationally. Regarding financial indicators, 75.1 % of the respondents (n = 265) stated they have sufficient awareness of profitability indicators, 70.0 % stated that they know liquidity, and only 38.8 % know leverage indicators. Around 77.9 % of respondents knew about the financial concept during their experience in pharmacy management. In contrast, only 24.4 % (n = 86) of the respondents got acquainted with evaluating the pharmacy's financial performance and indicators while studying pharmacy at the university. The descriptive was expressed by the sig values of t, which were all statistically significant compared to the 0.05 level.

### 4. Discussion

In the last three decades, literature has evidenced that pharmacy performance is a critical factor in the health system's success and significantly improves societal health outcomes [24,25]. The findings of this study have significant implications for the field of pharmacy management in Jordan and shed light on the financial literacy of community pharmacists. The study's exploratory nature and the scarcity of literature on this topic guided our aim to offer an initial understanding and exploration. These findings are valuable

**Table 2**  
Awareness of financial indicators and their importance (N = 353).

No.	Variables Statements	Agreed and strongly agreed	Sample's mean	Mean significance	
		N (%)	M ± SD	t <sup>a</sup>	Sig t
1	Have sufficient knowledge of profitability indicators.	265 (75.1)	3.82 ± 0.79	19.62	<0.001
2	Have sufficient knowledge of liquidity indicators.	247 (70.0)	3.72 ± 0.84	15.99	<0.001
3	Have sufficient knowledge of leverage indicators.	137 (38.8)	3.29 ± 0.88	6.23	<0.001
4	Have sufficient knowledge of financial efficiency indicators.	169 (47.9)	3.40 ± 0.90	8.32	<0.001
5	Learned about evaluating the pharmacy's financial performance and its indicators at the university.	86 (24.4)	2.77 ± 1.08	-3.99	<0.001
6	Learned about financial performance evaluation and its indicators through a training course.	93 (26.4)	2.92 ± 1.02	-1.51	0.131
7	Learned about the concept of financial performance evaluation and its indicators through the experience and practice of pharmacy management.	275 (77.9)	3.92 ± 0.89	19.49	<0.001
8	Financial analysis helps reach an accurate diagnosis of pharmacy strengths and weaknesses.	273 (77.3)	4.03 ± 0.89	21.72	<0.001
9	Financial analysis helps assess the pharmacy's financial and monetary situation.	289 (81.9)	4.15 ± 0.87	24.90	<0.001
10	Financial analysis helps evaluate investment outcomes and financing decisions.	267 (75.6)	4.00 ± 0.92	20.51	<0.001
11	Financial analysis helps compare actual and planned data and information.	272 (77.1)	3.99 ± 0.89	20.95	<0.001
12	Financial analysis helps predict the odds that the pharmacy will fail.	275 (77.9)	4.02 ± 0.88	21.82	<0.001
13	Financial performance indicators help to make logical and rational decisions.	288 (81.6)	4.09 ± 0.85	24.29	<0.001
14	The income statement expresses the result of the pharmacy's work and the profit or loss it leads.	287 (81.3)	4.08 ± 0.81	25.10	<0.001
15	The income statement shows more financial details than the balance sheet.	236 (66.9)	3.79 ± 0.88	16.89	<0.001
16	The income statement provides more information about trends in spending money.	254 (72.0)	3.86 ± 0.84	19.36	<0.001
17	The income statement provides more information about the performance of different revenue sources (such as sales of prescription drugs versus over-the-counter drugs).	261 (73.9)	3.86 ± 0.88	18.40	<0.001
18	The budget includes a statement of cash flows.	223 (63.2)	3.73 ± 0.88	15.49	<0.001
19	The trial balance is one of the basic financial statements of the pharmacy.	234 (66.3)	3.83 ± 0.87	17.96	<0.001
20	The inventory turnover ratio demonstrates a pharmacy's ability to make cash.	257 (72.8)	3.94 ± 0.85	20.73	<0.001
21	The current ratio indicator is more accurate than the quick ratio indicator in assessing the liquidity of a pharmacy.	193 (54.7)	3.63 ± 0.85	14.09	<0.001
22	The 1:2 quick ratio indicator indicates a financial problem.	133 (37.7)	3.36 ± 0.85	7.88	<0.001
Total		5014 (64.6)	3.74 ± 0.61	22.80	<0.001

<sup>a</sup> The critical (tabulated t) value is 1.98 at the 0.05 level.

for research and practice, providing the groundwork for potential innovations in community pharmacy models. Such innovations can offer high-quality pharmaceutical care while effectively navigating the complex financial challenges faced by community pharmacies in Jordan.

The results reveal that community pharmacists in Jordan exhibit a statistically significant degree of awareness regarding financial performance indicators. Notably, pharmacy owners displayed a high level of awareness (78.8 %) regarding the importance of financial indicators in their operations. This awareness is a positive development, considering pharmacists' multifaceted role in managing community pharmacies. The commercial aspect of pharmacy, involving the management of financial resources and striving for optimal profitability, is crucial for the sustainability of these healthcare establishments. These findings align with the notion that pharmacists are expected to be proficient in various domains, including financial management, human resources, marketing, and inventory control [18].

Increasing demand from pharmacy customers has pressured health systems worldwide, highlighting the necessity to assess the financial performance of the pharmacy sector to ensure optimal resource allocation [26,27]. This necessity underscores the importance of financial management within the health system [28]. Pharmacies depend on financial performance data to manage costs, monitor service quality, and publish information for internal and external use. Effective financial management in pharmacy is a dynamic process requiring adaptation to environmental and organizational changes to achieve strategic goals [21,27,29].

More broadly, community pharmacists have a consensus regarding the significance of financial analysis in their practice. Over 80 % (mean score of 4.15) of respondents affirmed that financial analysis and indicators assist in evaluating their pharmacy's financial health, enabling them to make informed and rational decisions. This aligns with Tootelian's assertion that financial analysis is pivotal in transforming financial data into actionable insights to monitor financial status, plan future funding, and assess capacity needs [30].

Financial analysis systematically determines how well a business manages and controls available funds. It allows pharmacy owners to evaluate their performance and make informed decisions to improve financial outcomes. Pharmacists use financial analysis to assess three primary objectives: management efficacy, identification of financial trends, and provision of essential data for business control mechanisms [31–33]. Countries employ different methods to organize pharmacy services, typically involving systematic data collection and consistent review to ensure efficient and standardized healthcare delivery [34].

Furthermore, the study demonstrates that younger pharmacists, particularly those who have recently graduated, display a higher level of awareness regarding financial indicators when compared to their more experienced counterparts. This trend may be attributed to updated study plans and training programs that better equip new pharmacists to meet the demands of financial management and healthcare. It underscores the importance of incorporating financial management courses into pharmacy curricula to prepare students comprehensively for their future roles as pharmacy practitioners and potential entrepreneurs [8,35].

Our findings align with existing literature on the need for financial management education in healthcare professions, including pharmacy. Adunlin and Pan (2022) noted a growing optimism among pharmacy students about the relevance of financial management education in their practice, highlighting the potential for students to acquire financial management competencies during their professional training [35]. Similarly, Mohamed N. Al-Arifi (2013) emphasized the importance of bridging the gap in management education for pharmacists and the need for formalized management education programs in the field in Saudi Arabia [36]. This study contributes to this body of knowledge by assessing the actual awareness and utilization of financial indicators among community pharmacists in Jordan.

However, it is disconcerting that most respondents (75.1 %) did not encounter financial performance and indicators during their pharmacy education. This deficiency in financial education within pharmacy curricula is a concern shared by various scholars, as management and financial education often take a back seat to clinical and pharmaceutical topics [37]. To address this gap, pharmacy faculties and academic institutions must emphasize the pivotal role of financial management skills in contemporary pharmacy practice, ensuring that students graduate well-prepared for clinical roles and managerial responsibilities.

In light of the COVID-19 pandemic, community pharmacies in Jordan, like those globally, are navigating challenging economic conditions, further emphasizing the need for financial acumen [38]. Increased costs related to personal protective equipment (PPE) procurement, COVID-19 safety measures, and hiring additional staff have exacerbated financial pressures. Additionally, pharmacies are providing essential COVID-related services, such as home deliveries for shielded patients [39]. However, a dearth of detailed studies exists regarding Jordanian community pharmacies' profitability and sales volume before and during the pandemic.

The findings highlight the need to incorporate financial management principles into the educational curriculum of pharmacy faculties. To ensure comprehensive awareness of financial indicators, particularly among pharmacy students in their final year, pharmacy schools should consider integrating courses that cover essential financial concepts and their application to pharmacy management. Continuous professional development programs organized by entities like the JPA can further enhance pharmacists' financial literacy and competence. Such programs should cater to both practicing pharmacists and recent graduates, equipping them with the skills necessary to effectively manage community pharmacies and succeed as entrepreneurs in the evolving healthcare landscape [21,40].

This study underscores the importance of pharmacy management skills in conjunction with patient care. It dispels the myth that good pharmacy practice and good business practice are inherently contradictory. Integrating good pharmacy practice with sound financial management is essential for meeting patient needs and ensuring the financial viability of community pharmacies [30,41].

The study's strengths lie in its originality, being the first in Jordan to evaluate community pharmacists' awareness of financial indicators. However, certain limitations must be acknowledged. Some pharmacy owners declined to participate in the survey, concerned about sharing financial information, despite assurances of confidentiality. Additionally, difficulties in accessing geographically remote areas in the South Region of Jordan limit data collection in this area. Future research should explore how financial literacy impacts pharmacy management and financial performance and compare practices with those in other countries to identify best

practices and long-term effects of financial education on pharmacists' ability to manage their pharmacies effectively and sustainably.

## 5. Conclusion

This study has provided valuable insights into financial literacy and awareness among community pharmacists in Jordan. The findings highlight a moderate level of awareness regarding financial indicators relevant to community pharmacy operations and sustainability, with variations based on education level and years of experience. Notably, pharmacists with higher education levels and more practical experience demonstrated greater awareness of financial indicators. These results underscore the importance of continuous professional development and the integration of financial management courses into pharmacy education curricula. By addressing these gaps, the pharmacy sector in Jordan can enhance its financial stability and continue to provide high-quality healthcare services. To ensure the long-term success of community pharmacies in Jordan, proactive measures, such as integrating financial management principles into pharmacy curricula and offering continuous professional development programs, are essential in preparing pharmacists to manage their practices in healthcare and financial aspects effectively.

## Data availability statement

All relevant data are fully available within the manuscript and its Supporting Information files without restriction.

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This research did not receive any specific grant from funding agencies in the public, commercial, or non-for-profit organizations.

## Ethics approval and consent to participate

This study was performed in line with the principles of the Declaration of Helsinki. The questionnaire and methodology for this study were approved by the Clinical Pharmacy Department and the Research Ethical Committee at Zarqa University under the reference number (February 1, 2021). Informed consent was obtained from all individual participants included in the study.

## CRediT authorship contribution statement

**Mohammad Abu Assab:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Hisham E. Hasan:** Writing – review & editing, Writing – original draft, Visualization, Software, Resources, Project administration. **Hamza Alhamad:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation. **Fares Albahar:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation. **Abdallah Alzayadneh:** Writing – review & editing, Writing – original draft, Validation, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Hanadi Abu Assab:** Writing – review & editing, Writing – original draft, Validation, Software, Data curation. **Wael Abu Dayyih:** Writing – review & editing, Writing – original draft, Validation, Project administration, Data curation. **Zainab Zakaraya:** Writing – review & editing, Writing – original draft, Validation, Formal analysis, Data curation.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.heliyon.2024.e33338>.

## References

- [1] A. Hermansyah, L. Wulandari, S.A. Kristina, S. Meilianti, Primary health care policy and vision for community pharmacy and pharmacists in Indonesia, *Pharm. Pract.* 18 (2020) 2085, <https://doi.org/10.18549/PharmPract.2020.3.2085>.
- [2] J.-V. Goode, J. Owen, A. Page, S. Gatewood, Community-based pharmacy practice innovation and the role of the community-based pharmacist practitioner in the United States, *Pharmacy* 7 (2019) 106, <https://doi.org/10.3390/pharmacy7030106>.

- [3] H. Komjathy, Financial aspects of community pharmacies in Slovakia (2009-2014) Finančné aspekty verejných lekární na Slovensku v rokoch 2009-2014, *Eur. Pharmaceut. J.* 63 (2016) 12–17, <https://doi.org/10.1515/afpuc-2016-0013>.
- [4] L.H. Nazer, H. Tuffaha, Health care and pharmacy practice in Jordan, *Can. J. Hosp. Pharm.* 70 (2017), <https://doi.org/10.4212/cjhp.v70i2.1649>.
- [5] E.A. Hammad, R.A. Qudah, A.A. Akour, The impact of clinical pharmacists in improving Jordanian patients' health outcomes, *Saudi Med. J.* 38 (2017) 1077–1089, <https://doi.org/10.15537/smj.2017.11.21453>.
- [6] S.P. Desselle, L.R. Moczygomba, A.B. Coe, K. Hess, D.P. Zgarrick, Applying contemporary management principles to implementing and evaluating value-added pharmacist services, *Pharmacy* 7 (2019) 99, <https://doi.org/10.3390/pharmacy7030099>.
- [7] C. Cavicchi, E. Vagnoni, Sustainable business models in hybrids: a conceptual framework for community pharmacies' business owners, *Sustainability* 12 (2020) 8125, <https://doi.org/10.3390/su12198125>.
- [8] M. Abu Assab, H.E. Hasan, H. Alhamad, F. Albahar, A. Alzayadneh, H. Abu Assab, W. Abu Dayyeh, Z. Zakaraya, Financial indicators utilization among community pharmacists: a comprehensive study for pharmacy management, *PLoS One* 19 (2024) e0299798, <https://doi.org/10.1371/journal.pone.0299798>.
- [9] D.D. Akinleye, L.-A. McNutt, V. Lazariu, C.C. McLaughlin, Correlation between hospital finances and quality and safety of patient care, *PLoS One* 14 (2019) e0219124, <https://doi.org/10.1371/journal.pone.0219124>.
- [10] E.A. Hammad, I. Alabbadi, F. Taissir, M. Hajjiwi, N.M. Obeidat, Q. Alefan, R. Mousa, Hospital unit costs in Jordan: insights from a country facing competing health demands and striving for universal health coverage, *Health Econ Rev* 12 (2022) 11, <https://doi.org/10.1186/s13561-022-00356-0>.
- [11] M. Ranghchian, S. Sehat, M. Akhgari, G. Mehralian, Performance model of community pharmacies in low-middle income countries: a societal perspective, *J. Retailing Consum. Serv.* 40 (2018) 241–248, <https://doi.org/10.1016/j.jretconser.2017.10.009>.
- [12] T. Tambunan, SME development, economic growth, and government intervention in a developing country: the Indonesian story, *J. Int. Entrepren.* 6 (2008) 147–167, <https://doi.org/10.1007/s10843-008-0025-7>.
- [13] L. Malovecká, D. Mináriková, L. Lehocká, V. Foltán, New types of assessments of community pharmacy technology business and their contribution towards prosperity of the community pharmacy, *Acta Fac Pharm Univ Comen* 60 (2013) 35–42, <https://doi.org/10.2478/afpuc-2013-0015>.
- [14] O. Brborović, H. Brborović, L. Hrain, The COVID-19 pandemic crisis and patient safety culture: a mixed-method study, *Int J Environ Res Public Health* 19 (2022) 2237, <https://doi.org/10.3390/ijerph19042237>.
- [15] T. Ibn-Mohammed, K.B. Mustapha, J. Godsell, Z. Adamu, K.A. Babatunde, D.D. Akintade, A. Acquaye, H. Fujii, M.M. Ndiaye, F.A. Yamoah, S.C.L. Koh, A critical analysis of the impacts of COVID-19 on the global economy and ecosystems and opportunities for circular economy strategies, *Resour. Conserv. Recycl.* 164 (2021) 105169, <https://doi.org/10.1016/j.resconrec.2020.105169>.
- [16] W. Jo, H. Nam, J. Choi, Opening the OTC drug market: the effect of deregulation on retail pharmacy's performance, *Int. J. Res. Market.* 39 (2022) 847–866, <https://doi.org/10.1016/j.ijresmar.2021.10.001>.
- [17] I. Klopota, J. Zoroja, M. Mesko, Early warning system in business, finance, and economics, *Int. J. Eng. Bus. Manag.* 10 (2018) 184797901879701, <https://doi.org/10.1177/1847979018797013>.
- [18] B.P. Kho, M.A. Hassali, C.J. Lim, F. Saleem, Challenges in the management of community pharmacies in Malaysia, *Pharm. Pract.* 15 (2017) 933, <https://doi.org/10.18549/PharmPract.2017.02.933>, 933.
- [19] R.M. Groves, F.J. Fowler, M.P. Couper, J.M. Lepkowski, E. Singer, R. Tourangeau, *Survey Methodology, second ed.*, John Wiley & Sons, New York City, 2011.
- [20] A. Boboia, C. Polinicencu, Research on the frequency of pharmaceutical preparations in the community pharmacies of Cluj-Napoca, *FARMACIA* 58 (2010) 779–786.
- [21] S.Ö. SAKINÇ, E. BİLGENER, The Financial Status of Community Pharmacies: Çorum Province, *Turk J Pharm Sci* 18 (2021) 695–701, <https://doi.org/10.4274/tjps.galenos.2021.63004>.
- [22] F.A. Marino, E.J. Zaboloski, Financial analysis and interpretation of pharmacy operations, *J. Am. Pharmaceut. Assoc.* 17 (1961) 307–311, [https://doi.org/10.1016/S0003-0465\(16\)34192-1](https://doi.org/10.1016/S0003-0465(16)34192-1), 1977.
- [23] E.A. Hammad, S. Al-Aqeel, E. Elayah, D. Jaber, Assessing content and factors influencing responses to information requests in community pharmacies in Jordan: a simulated patients study, *PLoS One* 17 (2022) e0264224, <https://doi.org/10.1371/journal.pone.0264224>.
- [24] E.A. Hammad, R.A. Qudah, A.A. Akour, The impact of clinical pharmacists in improving Jordanian patients' health outcomes, *Saudi Med. J.* 38 (2017) 1077–1089, <https://doi.org/10.15537/smj.2017.11.21453>.
- [25] M.G. Katoue, A.A. Cerda, L.Y. Garcia, M. Jakovljevic, Healthcare system development in the Middle East and North Africa region: challenges, endeavors and prospective opportunities, *Front. Public Health* 10 (2022), <https://doi.org/10.3389/fpubh.2022.1045739>.
- [26] G. Mehralian, P. Bastani, R. Dinarvand, Resource allocation and purchasing arrangements to improve accessibility of medicines: evidence from Iran, *J. Res. Pharm. Pract.* 4 (2015) 9, <https://doi.org/10.4103/2279-042X.150045>.
- [27] W.R. Doucette, R.P. McDonough, M.M. Mormann, R. Vaschevici, J.M. Urmie, B.J. Patterson, Three-year financial analysis of pharmacy services at an independent community pharmacy, *J. Am. Pharmaceut. Assoc.* 52 (2012) 181–187, <https://doi.org/10.1331/JAPhA.2012.11207>.
- [28] F.S. Tonin, I. Aznar-Lou, V.M. Pontinha, R. Pontarolo, F. Fernandez-Llimos, Principles of pharmacoeconomic analysis: the case of pharmacist-led interventions, *Pharm. Pract.* 19 (2021) 2302, <https://doi.org/10.18549/PharmPract.2021.1.2302>.
- [29] M. Jermini, C. Fonzo-Christe, K. Blondon, C. Milaire, J. Stirnemann, P. Bonnabry, B. Guignard, Financial impact of medication reviews by clinical pharmacists to reduce in-hospital adverse drug events: a return-on-investment analysis, *Int. J. Clin. Pharm.* 46 (2024) 496–505, <https://doi.org/10.1007/s11096-023-01683-w>.
- [30] D. Tootelian, A. Wertheimer, A. Mikhailitchenko, *Essentials of Pharmacy Management, second ed.*, Pharmaceutical Press, London, 2012.
- [31] Y.A. Alomi, G.Z. Aljumah, N.R. Alohlie, N.S. Alamri, M.H. Almadany, R.M. Alashban, A.A. Bahdailah, A.H. Almasoudi, Accounting and financial in pharmacy practice: education and training, *International Journal of Pharmacology and Clinical Sciences* 12 (2023) 101–114, <https://doi.org/10.5530/ijpcs.2023.12.13>.
- [32] Y.A. Alomi, G.Z. Aljumah, N.R. Alohlie, N.S. Alamri, M.H. Almadany, R.M. Alashban, A.H. Almasoudi, Accounting and financial in pharmacy practice: software and applications, *International Journal of Pharmacology and Clinical Sciences* 12 (2024) 152–163, <https://doi.org/10.5530/ijpcs.2023.12.20>.
- [33] A. Imani, A. Janati, M. Moghimi, M. Golestani, L. Doshmangir, Identification of indicators for evaluating the financial and economic performance of the pharmacy: a systematic review, *Pharmaceut. Sci.* 21 (2015) 111–124, <https://doi.org/10.15171/PS.2015.25>.
- [34] F. Smith, The quality of private pharmacy services in low and middle-income countries: a systematic review, *Pharm. World Sci.* 31 (2009) 351–361, <https://doi.org/10.1007/s11096-009-9294-z>.
- [35] G. Adunlin, K. Pan, Pharmacy students' attitudes and perceptions toward financial management education, *Healthcare* 10 (2022) 683, <https://doi.org/10.3390/healthcare10040683>.
- [36] M.N. Al-Arifi, The managerial role of pharmacist at community pharmacy setting in Saudi Arabia, *Pharmacology & Pharmacy* 04 (2013) 63–70, <https://doi.org/10.4236/pp.2013.41009>.
- [37] C.M. Mospan, Management education within pharmacy curricula: a need for innovation, *Curr Pharm Teach Learn* 9 (2017) 171–174, <https://doi.org/10.1016/j.cptl.2016.11.019>.
- [38] S.H. Hamed, Community pharmacy practice during COVID-19 pandemic: a perspective from the Middle East, *Global Journal on Quality and Safety in Healthcare* 3 (2020) 109–114, <https://doi.org/10.36401/JQSH-20-14>.
- [39] L.S. Wong, S. Ram, S. Scahill, Community pharmacists' beliefs about suboptimal practice during the times of COVID-19, *Pharmacy* 10 (2022) 140, <https://doi.org/10.3390/pharmacy10060140>.
- [40] M. Abu Assab, H. Alhamad, I. Almazari, B. Azzam, H. Abu Assab, Barriers to medication review process implementation—cross-sectional study among community pharmacists in Jordan, *Healthcare* 10 (2022) 651, <https://doi.org/10.3390/healthcare10040651>.
- [41] S.B. Banerjee, Corporate social responsibility: the good, the bad and the ugly, *Crit. Sociol.* 34 (2008) 51–79, <https://doi.org/10.1177/0896920507084623>.