

Review

Financial Literacy Among Healthcare Providers: A Systematic Review

Georgios Pakos and Panagiotis Mpogiatzidis *

Department of Midwifery, School of Health Sciences, University of Western Macedonia, 50100 Ptolemaida, Greece; dnmw00018@uowm.gr

* Correspondence: bogiatzidis@yahoo.com

Abstract: Since the effectiveness of hospital management is influenced by financial management, healthcare professionals' financial literacy has drawn the attention of researchers and policymakers. Previous research on medical students and healthcare professionals indicated that medical professionals frequently lack financial literacy; however, the evidence on the long-term status of financial literacy among healthcare providers throughout their careers is limited. In the current systematic review, we aim to examine the current evidence regarding financial literacy among healthcare providers throughout their career development. From the initial 1668 studies that were identified, 38 studies met the inclusion criteria and, thus, were included in the review. Twenty-eight studies evaluated financial literacy among either medical students or junior medical professionals, and ten studies were conducted on senior healthcare personnel. The body of evidence suggests that financial literacy is suboptimal in medical students and healthcare professionals, although it is of utmost importance for leading healthcare providers. Although senior healthcare providers or executive nurse leaders might be modestly financially literate, they are urged to cultivate skills and knowledge beyond their clinical expertise. Financial literacy depends on several factors, such as age, gender, qualification, or overall income. As the role of healthcare leaders is extended to their efficiency and participation in activities related to financial management, there is an urge for financial planning, financial monitoring, financial decision making, and financial control, while further studies are warranted to longitudinally explore the competencies of healthcare leaders in financial literacy.

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1. Introduction

Within the last few years, organizations have been more motivated to enhance health sector management (Singh et al., 2020). Since the effectiveness of hospital management is influenced by financial management (Khosravi et al., 2022; Sepehri, 2014; Sohrabi et al., 2021; Torkzad & Beheshtinia, 2019), healthcare professionals' financial literacy has drawn the attention of researchers and policymakers (Bar-Or et al., 2018; Cawyer et al., 2022; Connelly & List, 2018; Lall et al., 2019). Healthcare professionals are the best candidates for managerial positions in the healthcare sector because they have an extensive understanding of the field, even though financial literacy is crucial for effective management in the healthcare setting (Mtula et al., 2024a). Financial literacy is defined by the Organization for Economic Co-operation and Development (OECD) as the awareness, knowledge, skills, attitudes, and behaviors necessary to make wise financial choices and ultimately achieve personal financial well-being. In the healthcare industry, where professionals eventually move into management positions, incorporating financial knowledge becomes essential.

Previous research on medical students and healthcare professionals indicated that medical professionals frequently lack financial literacy despite having advanced degrees (Aery et al., 2017; Bhattacharya et al., 2023; Igu et al., 2022; Kovar et al., 2021; Royce et al., 2019; Sharma et al., 2021; Vengaloor Thomas et al., 2021). Research indicates that a large number of residents and medical students have low financial literacy (Ahmad et al., 2017; Bar-Or, 2015; Royce et al., 2019; Teichman et al., 2001), whereas even highly skilled medical personnel at prestigious hospitals are ignorant of the fundamentals of finance. Furthermore, medical professionals frequently have significant student loan debt, which makes their financial difficulties even worse (Jayakumar et al., 2017). Research that was conducted in the U.S. revealed that doctors had low levels of long-term savings, a poor credit score, and a lack of understanding of financial concepts. They were also discovered to be heavily indebted to college loans (Ahmad et al., 2017). Additionally, most surgical residents at one academic center had a moderate- to high-risk debt-to-asset ratio, indicating that the residents are overly indebted (Young et al., 2016). An international survey found that about 80% of residents in emergency medicine were not educated in financial planning during their training (Glaspy, 2005). Furthermore, from the standpoint of an educator, Lusco et al. showed that 92% of directors of surgical programs thought that residents lacked the necessary skills to manage their practices and personal money (Lusco et al., 2005).

In terms of financial education, studies also highlighted the policy and instructional gap. Formal financial education is not commonly included in the training programs of healthcare practitioners from undergraduate education to graduate school and beyond (Aery et al., 2017; Igu et al., 2022; Safarani et al., 2018; Vengaloor Thomas et al., 2021). This necessitates the inclusion of financial education in the medical curriculum (Millen & Stacey, 2022). Most doctors receive no formal training on how to handle and manage patient cost concerns, and many are unaware of intervention opportunities, despite the Accreditation Council for Graduate Medical Education's view that patient advocacy and cost-appropriate care are essential components of graduate medical education (Fischer et al., 2021; Schrag & Hanger, 2007).

Navigating this challenging condition in addition to other resident-related financial concerns without financial education may lead to burnout, low productivity, and sub-optimal patient care (Mirza et al., 2018). Numerous research has shown a correlation between physician resilience and wellness and financial well-being (Gianakos et al., 2023; Kovar et al., 2021). While the degree of burnout was linked to an increase in financial debt, financial pressure was linked to greater burnout severity and a detrimental effect on professionalism (Royce et al., 2019). Research revealed that increased medical residents' debt loads were associated with increased rates of emotional weariness, depersonalization, cynicism, depressive symptoms, and burnout (Raj, 2016). According to Cawyer et al., there was a favorable relationship between financial literacy and a feeling of well-being, while doctors were willing to increase their financial literacy if given the chance (Cawyer et al., 2022). Furthermore, it was demonstrated that a low sense of well-being was associated with inferior patient outcomes (Escribe et al., 2022). According to Hopkins et al. and Collins-Nakai et al., most doctors lack the necessary skills to handle the leadership responsibilities that healthcare systems face (Collins-Nakai, 2009; Hopkins et al., 2015). Though a previous meta-analysis revealed a slight impact of finance education on future financial behavior, general financial education programs have been created with differing degrees of success in influencing future financial behavior and success (Fernandes et al., 2014).

Recent advances in the modern role of nursing and medical leaders have underscored the importance of financial literacy among healthcare providers who should possess similar knowledge and skills in the financial management of hospitals. Making a transition from the secure environment of medical school to the regimented world of residency or independent

or licensed practice can be stressful and confusing (Grewal & Sweeney, 2021). The inability to adapt to one's function in a hierarchical healthcare system, feelings of unpreparedness, and new duties frequently make these transitional challenges worse. While prior research has assessed the level of financial literacy among healthcare professionals at various career phases, there is little evidence that financial literacy is changing as professionals advance in their roles. The medical professional roadmap's financial literacy gaps must be filled, and this requires an assessment of the available data to determine the learning gap and provide guidance on how to close it (Grant, 2002). The aim of this study was to explore the current state of financial literacy among healthcare professionals, from the early stages of medical school and residency to advanced professional practice.

2. Materials and Methods

This is a systematic review to provide a comprehensive investigation of financial literacy among healthcare providers throughout their career development. Specifically, this review aims (1) to present the basic principles of financial literacy and (2) to present the current evidence of published surveys exploring financial literacy among healthcare providers within their career, from the earliest phases of medical training and residency to the advanced professional practice.

2.1. Search Strategy

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were adopted for this systematic review (Page et al., 2021). Two authors (G.P. and P.M.) independently performed a literature search in the PubMed database. Articles published in PubMed without restriction on the year of publication and until March 2024 were considered. The literature search was performed with the filter "humans" and search terms "healthcare provider" OR "healthcare professional" OR "medical resident" OR "medical student" OR "resident" OR "doctor" OR "nurse" and, with the Boolean operator "AND," "financial literacy." Specifically, search terms with MeSH included "health personnel" OR "health" AND "personnel" OR "health personnel" OR "healthcare" AND "provider" OR "healthcare provider" OR "health personnel" OR "health" AND "personnel" OR "health personnel" OR "healthcare" AND "professional" OR "healthcare professional" OR "medic" OR "medical" OR "medicalization" OR "medicalization" OR "medicalizations" OR "medicalize" OR "medicalized" OR "medicalizes" OR "medicalizing" OR "medically" OR "medicals" OR "medicated" OR "medications" OR "medics" OR "pharmaceutical preparations" OR "pharmaceutical" AND "preparations" OR "pharmaceutical preparations" OR "medication" OR "medications" AND "internship and residency" OR "internship" AND "residency" OR "internship and residency" OR "residencies" OR "residency" OR "reside" OR "resided" OR "residence" OR "residences" OR "residences" OR "residencies" OR "resident" OR "residents" OR "residents" OR "resides" OR "residing" OR "students, medical" OR "students" AND "medical" OR "medical students" OR "medical" AND "student" OR "medical student" OR "internship and residency" OR "internship" AND "residency" OR "internship and residency" OR "residencies" OR "residency" OR "reside" OR "resided" OR "residence" OR "residences" OR "residences" OR "residencies" OR "resident" OR "residents" OR "residents" OR "resides" OR "residing" OR "doctors" OR "doctoral" OR "doctorally" OR "doctorate" OR "doctorates" OR "doctoring" OR "physicians" OR "physicians" OR "doctor" OR "doctors" OR "nurses" OR "nurses" OR "nurses" OR "nurse" OR "nurses" AND "economics" OR "economics" OR "financial" OR "financially" OR "financials" OR "financier" OR "financiers" AND "literacies" OR "literacy" OR "literacy" OR "literacies." In addition, the reference list of all electronically retrieved articles was carefully reviewed for potentially relevant articles that had not been identified. The current article

is based on previously published studies and does not include any studies performed by the authors.

2.2. Eligibility Criteria and Study Selection

We formulated eligibility criteria using the PICO (P—Populations, I—Intervention, C—Comparison, O—Outcome) worksheet and search strategy. Specifically, the population consisted of healthcare providers including medical and nursing students, nurses, and doctors, the intervention was defined by financial literacy evaluation, comparisons were between healthcare providers according to their financial literacy, and the outcome was the potential association between the financial literacy among healthcare providers and the healthcare management.

Eligible studies were those that included humans, with a full text available and published in English. Prospective, retrospective, longitudinal, and cross-sectional studies were included, whereas review articles and opinion articles not reporting original data were excluded.

2.3. Defining Financial Literacy

Over the years, the concept of financial literacy has been defined in a variety of ways. Financial literacy, according to the OECD and the International Network for Financial Education (OECD/INFE), is the set of awareness, knowledge, skills, attitudes, and behaviors required to make wise financial decisions and eventually attain personal financial well-being. Financial literacy includes the ‘knowledge of fundamental economic concepts, such as the compound function of interest, the distinction between nominal and real values, and the basic understanding of risk differentiation’ (Lusardi, 2008). Finally, debt literacy is a part of financial literacy and refers to ‘the ability to make decisions related to debt contracts, particularly applying basic knowledge in the intricate and measured context of everyday financial choices’ (Lusardi & Tufano, 2009). These definitions collectively underscore the multifaceted nature of financial literacy, encompassing not only theoretical knowledge but also the practical application of financial skills in real-world situations.

The conceptual model of financial literacy is based on financial behavior, attitude, and knowledge. There are several scales available for measuring financial literacy. Those scales are focused on measuring the understanding of the capital market, the financial institution’s system, the home cash flow, why emergency funds exist, and the basics of lending (Hung et al., 2009). Typically, the scales for assessing financial literacy include the assessment of financial knowledge, financial experiences, financial behavior, and debt confidence in a self-report manner. The OECD/INFE initiated the development of the OECD/INFE Toolkit for assessing financial literacy and financial inclusion (Kempson, 2009), which received endorsement from G20 leaders in September 2013. The Toolkit underwent a revision in 2015 and was utilized by approximately 40 countries and economies in 2015/16 for an international survey on adult financial literacy competencies. A subsequent update occurred in 2018 to refresh its content and expand its scope to cover subjective financial well-being. The Toolkit has also been applied to gather financial literacy data in various technical assistance projects by the OECD, with results featured in regional reports (OECD, 2018, 2020). While the financial literacy questions remain consistent, the 2022 version introduces new questions related to digital financial products and services, digital financial knowledge, attitudes, and behaviors, as well as sustainable finance products and attitudes. A harmonized questionnaire that addresses the determinants—attitude, knowledge, behavior, and social-demographic factors—is the OECD framework for assessing financial literacy. To cover each determinant, the instrument consists of 21 questions with different sections (Castañeda et al., 2022). It was initially created in 2010 and then updated in 2015 and 2018

to reflect studies conducted in 2019 and 2020. More recently, in 2022, the other questions were improved and updated to incorporate digital financial goods.

3. Results

3.1. Study Characteristics

Among the 1668 studies that were initially identified, 38 studies met the inclusion criteria and, thus, were included in the review (Agarwal & Biswas, 2022; Ahmad et al., 2017; Bar-Or et al., 2018; Boehnke et al., 2018; Brydges et al., 2019; Cawyer et al., 2022; Cone et al., 2022; Dehmoobad Sharifabadi et al., 2024; Dhaliwal & Chou, 2007; Garrett et al., 2022; Grewal & Sweeney, 2021; Huebinger et al., 2021; Jain et al., 2022; Jayakumar et al., 2017; Lee et al., 2024; McKillip et al., 2018; Millen & Stacey, 2022; Mtula et al., 2024a, 2024b; Mulligan et al., 2020; Naranjee et al., 2019; Nowotny, 2022; Ozyesil et al., 2024; Payne et al., 2020; Poon et al., 2022; Rehman et al., 2015; Shahriari et al., 2024; Shappell et al., 2018; Sharma & Rojek, 2019; Teichman et al., 2005, 2001; Tevis et al., 2018; Topa et al., 2018; Wang et al., 2021; Witek et al., 2014; Wong et al., 2018; Woolley et al., 2024; Zubair et al., 2023) (Figure 1). Twenty-eight studies evaluated the financial literacy among either medical students or junior medical professionals (residents or fellows) (Ahmad et al., 2017; Bar-Or et al., 2018; Boehnke et al., 2018; Cawyer et al., 2022; Cone et al., 2022; Dehmoobad Sharifabadi et al., 2024; Dhaliwal & Chou, 2007; Garrett et al., 2022; Grewal & Sweeney, 2021; Jain et al., 2022; Jayakumar et al., 2017; Lee et al., 2024; McKillip et al., 2018; Mulligan et al., 2020; Nowotny, 2022; Payne et al., 2020; Poon et al., 2022; Rehman et al., 2015; Shahriari et al., 2024; Shappell et al., 2018; Sharma & Rojek, 2019; Teichman et al., 2005, 2001; Tevis et al., 2018; Wang et al., 2021; Witek et al., 2014; Wong et al., 2018; Woolley et al., 2024), whereas ten studies were conducted on senior healthcare personnel (i.e., senior healthcare providers, senior nurses, and executive nurse leaders) (Agarwal & Biswas, 2022; Brydges et al., 2019; Huebinger et al., 2021; Millen & Stacey, 2022; Mtula et al., 2024a, 2024b; Naranjee et al., 2019; Ozyesil et al., 2024; Topa et al., 2018; Zubair et al., 2023). Twenty-five studies were conducted in the U.S. (Ahmad et al., 2017; Bar-Or et al., 2018; Boehnke et al., 2018; Brydges et al., 2019; Cawyer et al., 2022; Cone et al., 2022; Dhaliwal & Chou, 2007; Garrett et al., 2022; Grewal & Sweeney, 2021; Huebinger et al., 2021; Jayakumar et al., 2017; Lee et al., 2024; McKillip et al., 2018; Mulligan et al., 2020; Nowotny, 2022; Payne et al., 2020; Shahriari et al., 2024; Shappell et al., 2018; Sharma & Rojek, 2019; Tevis et al., 2018; Wang et al., 2021; Witek et al., 2014; Wong et al., 2018; Woolley et al., 2024; Zubair et al., 2023), four in Canada (Dehmoobad Sharifabadi et al., 2024; Poon et al., 2022; Teichman et al., 2005, 2001), two each in South Africa (Millen & Stacey, 2022; Naranjee et al., 2019), Kenya (Mtula et al., 2024a, 2024b), and India (Agarwal & Biswas, 2022; Jain et al., 2022), and one each in Spain (Topa et al., 2018), Turkey (Ozyesil et al., 2024), and Pakistan (Rehman et al., 2015). All the studies used predefined questionnaires to evaluate financial literacy and were either cross-sectional-designed or pre- and post-implementation-designed surveys.

3.2. Financial Literacy Among Healthcare Providers

Several studies explored the current level of financial literacy among either medical students or junior medical professionals, namely residents or fellows. The overview of the studies' characteristics and outcomes is depicted in Table 1. Since 2001 and 2005, Teichman et al. evaluated the financial literacy level among residents in Canadian universities and suggested that residents held a significantly higher median debt-to-household income ratio compared to the entire population (Teichman et al., 2005, 2001), while after graduation, residents expected to earn more than existing billings justified (Teichman et al., 2005). Increased student debt was consistent among medical students compared to the general population of the same age, as was reported in the studies by Wong et al., Wang et al., and

Garrett et al. that were conducted in the U.S. (Garrett et al., 2022; Wang et al., 2021; Wong et al., 2018), and the study by Dehmoobad Sharifabadi et al., that was conducted in Canada (Dehmoobad Sharifabadi et al., 2024).

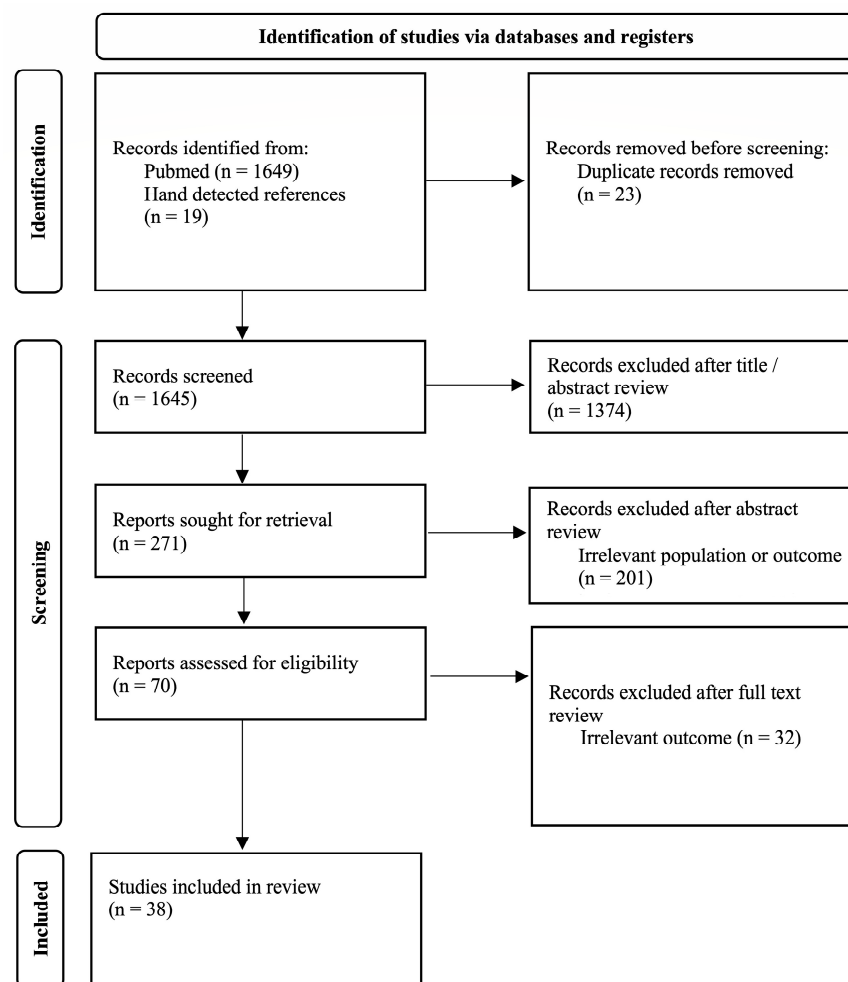


Figure 1. The PRISMA flow diagram for study selection.

Table 1. Characteristics of studies exploring the current financial literacy in medical students and junior healthcare providers.

Reference	Year	Country	Study Design and Instrument	Population	n	Outcomes
(Teichman et al., 2001)	2001	Canada	A modified and piloted version of the Federal Reserve Board's Survey of Consumer Finances was used to collect data on income, spending, saving, and demographics.	Urology residents.	151	The median debt to household income ratio was 2.38 compared to 0.64 for the entire population in the same age and income brackets. Residents had smaller savings, more non-educational debt, and more educational debt. At institutions with employer-matching plans, resident participation in retirement accounts was 100%; at institutions with nonmatching plans, it was 63%; and at institutions without resident retirement plans, it was 48%. Of the residents, 51% had paid interest on credit cards in the past year, 27% had low cash balances, 12% had moderately delinquent credit card balances, and 59% managed their expenses.

Table 1. Cont.

Reference	Year	Country	Study Design and Instrument	Population	n	Outcomes
(Teichman et al., 2005)	2005	Canada	Residents from three Canadian training institutions, the University of Toronto, Queen's University, and the University of Manitoba, were given the Survey of Household Spending and Survey of Financial Security to compare their financial situation with that of the wider public.	Residents.	338	A total of 62% of the population had student loan debt, 39% had outstanding credit card debt, 36% did not budget, 25% had low cash reserves, and 22% made neither retirement nor nonretirement investment contributions. Residents spent more on vehicles compared with members of the general public and on monthly housing. Residents were more likely to carry student loans than people in the general population (61% vs. 21%), more likely to carry vehicle loans (74% vs. 29%), and less likely to carry credit-card debts (39% vs. 50%). After graduation, surgical residents expected to earn more than existing billings justified. Compared to anesthesiology residents (88%, $p < 0.05$), fewer surgical residents (69%) made contributions to Registered Retirement Savings.
(Rehman et al., 2015)	2015	Pakistan	A survey using a cross-sectional questionnaire and a four-point Likert scale in a closed-ended questionnaire assessed many facets of financial well-being. A factor analysis was conducted to look into the participants' shared financial well-being.	First-year medical students.	736	Males had higher mean financial wellness scores (8.60 ± 3.04) than females (7.61 ± 3.12 , $p < 0.0005$). More males (44%) than females (36%) set both short- and long-term financial goals ($p = 0.03$). Compared to females, more males (34%) were spendthrifts ($p < 0.0001$) and 27% chose to store their savings in bank accounts. In terms of overall financial security well-being, males outperformed females ($p = 0.001$). According to comparative analysis, male students scored much better in 'Financial Security Wellness' ($p < 0.0001$), whereas "Care Towards Expenses Wellness" was comparable in both genders.
(Jayakumar et al., 2017)	2017	U.S.	A cross-sectional survey at seven geographically distributed U.S. medical schools (a 35-item questionnaire to evaluate self-assessment of financial and mathematical knowledge).	First- and fourth-year medical students.	1052	Students answered only 47.4% of the financial literacy questions properly. The following variables were linked to higher financial literacy performance: self-assessed financial knowledge (OR = 1.79, $p < 0.01$), confidence in personal financial management (OR = 1.19, $p = 0.05$), male gender (OR = 2.19, $p < 0.01$), joint MD/MBA degree (OR = 2.47, $p = 0.02$), and undergraduate major in finance (OR = 5.79, $p = 0.05$). The financial literacy of the fourth-year students who received personal financial counseling or information from the school was not statistically higher than that of those who did not receive it.

Table 1. Cont.

Reference	Year	Country	Study Design and Instrument	Population	n	Outcomes
(Ahmad et al., 2017)	2017	U.S.	A sample of fellows and residents from two university medical centers was given an anonymous, web-based, cross-sectional survey, including twenty personal finance questions and twenty-eight questions regarding their own debt, views, and financial plans. A 10-point rating system was employed for questions about investment risk tolerance and happiness with one's financial situation.	Residents and fellows.	299	The average score on the test was 52.0%. 144 respondents (48%) had a student loan debt of more than \$200,000. In addition to credit card debt, 86 (21%) of the respondents had other debt. Two hundred and twenty-two (52%) respondents had low retirement funds. The satisfaction of trainees with debt was lower than that of trainees without debt. The degree of knowledge was weakly connected with financial status satisfaction ($r = 0.23$, $p < 0.001$) and moderately associated with investment risk tolerance ($r = 0.41$, $p < 0.001$).
(McKillip et al., 2018)	2018	U.S.	A survey at an academic medical center, evaluating the level of residents in a range of personal finance subjects, such as retirement planning, house ownership, disability insurance, life insurance, budgeting, and loan repayment, using Likert-type answers.	Residents.	144	Most residents expressed discomfort with the majority of the issues and expressed curiosity in learning more about every topic covered in the survey. Several of the personal finance issues were easier for residents who reported having taken a course or attended a presentation on personal finance during their medical school or residency. Respondents showed a strong desire for additional education despite having greater comfort levels with the subjects of retirement planning, investing, disability insurance, life insurance, budgeting, and loan repayment.
(Shappell et al., 2018)	2018	U.S.	Semi-structured interviews evaluating the knowledge, attitudes, and experiences of residents in the field of personal finance in a qualitative method.	Residents.	12	Most residents reported that tight budgets and heavy debt load were a source of anxiety. The possibility of ending the federal PSLF program, which many people are depending on, added additional stress. Residents expressed a lack of financial literacy, a strong need for financial education, and apprehension about where to obtain trustworthy financial guidance.
(Tevis et al., 2018)	2018	U.S.	A comprehensive survey at one academic center. Debt, equity, cash flow, financial education, and fiscal factors were among the topics covered in the questions. Debt-to-income and debt-to-asset ratios were computed using the responses.	Residents.	105	Residents, in 38%, reported high student debt. In total, 82% of those surveyed had a debt-to-asset ratio that was either moderately or highly risky. There was no correlation between high-risk debt-to-asset ratio and residency program, year, sex, or perceived financial literacy. Compared to residents with low debt-to-asset ratios, those with high ratios were more likely to be highly concerned about debt (52% vs. 0%, $p < 0.001$). Most responders (79%) were convinced that more financial education should be incorporated into residency programs.

Table 1. Cont.

Reference	Year	Country	Study Design and Instrument	Population	n	Outcomes
(Wong et al., 2018)	2018	U.S.	A cross-sectional survey at the State University of New York, in Stony Brook, the University of Kansas, and the University of Pittsburgh. A modified FINRA version was used to measure respondents' satisfaction with their monthly income, emergency savings, retirement planning, and personal finances. A set of twelve questions was created to gather information about medical school education, training level, student loan amount, the significance of financial education during residency, the role of debt in career choice, disability, and life insurance, and the sources of previous financial advice.	Residents.	184	Eighty-one percent of respondents reported having college debt, and most of them owed more than \$100,000. Residents' financial habits varied, and according to how they dealt with debt and money management, they might be divided into three groups: concerned-engaged, concerned-unengaged, and unconcerned-unengaged. There was a bimodal distribution of respondents who strongly agreed and those who strongly disagreed that residents with significant debt were worried about debt.
(A. N. Sharma & Rojek, 2019)	2019	U.S.	Google Forms were used to create an electronic survey, based on questionnaires that were disseminated across the country.	Dermatology residents.	133	The great majority of responders (91.7%) were graduates of medical institutions that offered financial education for no more than five hours. In total, 30.8% of residents had debts above \$200,000, whereas 32.4% had no loans. Residents were most interested in learning about tax preparation (66.9%), investing (73.7%), negotiating salaries (88.7%), and buying insurance (63.9%). A financial education curriculum in residency would be of interest to over 95% of responders. A personal finance curriculum in dermatology residency should be built around financial considerations that are more pertinent during residency, such as negotiating compensation or buying insurance. Based on the study, the overwhelming interest in a formal curriculum probably reflected a lack of financial confidence.

Table 1. Cont.

Reference	Year	Country	Study Design and Instrument	Population	n	Outcomes
(Mulligan et al., 2020)	2020	U.S.	A cross-sectional survey comprising 43 items about financial habits, savings knowledge, credit and borrowing methods, and investing knowledge to evaluate financial literacy, self-efficacy, and career plans among graduate students in the health professions.	Health profession students.	134	The categories with the highest scores (50% correct) were financial habits, credit, and borrowing. With an average of 25% right answers, students received the lowest scores in the investment knowledge category. The mean score for self-efficacy was 15.5 ± 3.8 overall. Marital status, older age, and white non-Hispanic identity were the three independent variables that showed a significant association with total financial literacy. Similarly, financial self-efficacy and identification as white non-Hispanic were significantly correlated with determination; however, age and marital status did not significantly affect this relationship.
(Wang et al., 2021)	2021	U.S.	A cross-sectional, anonymous, web-based electronic survey among all of the U.S. nationally recognized psychiatry programs.	Psychiatry residents.	196	Most residents (80.1%) had college loans. Personal research was the main source of financial knowledge (49.4%). The majority of medical school residents (92.3%) received 0–5 h of formal finance education. Estate planning (88.8%), asset protection (86.8%), and compensation negotiations with a potential employer (78.6%) were the three areas where residents felt the least at ease. A comprehensive financial curriculum throughout residency training was something that nearly all residents (93.4%) wanted.
(Nowotny, 2022)	2022	U.S.	A questionnaire-based survey via email.	Medical students and residents.	261	With 60% of responders correctly answering all three of the “Big 3,” financial literacy was shown to be better than the national average (30%). The hardest questions were those that dealt with investments; only 16% of responders correctly predicted bond price movement and 70% predicted stock risk. A total of 93% of responders were receptive to learning about financial matters, indicating a high level of curiosity.
(Garrett et al., 2022)	2022	U.S.	Semi-structured interviews.	Residents.	59	Increasing medical school debt was seen by residents in all specialties as an unjust burden on trainees doing socially useful work, making them feel underappreciated and impairing their well-being. One group of residents explained how financial planning improved their financial well-being and gave them back some degree of agency. Residents offered suggestions on how educational programs might promote financial literacy.

Table 1. Cont.

Reference	Year	Country	Study Design and Instrument	Population	n	Outcomes
(Jain et al., 2022)	2022	India	A cross-sectional online survey with questions in financial knowledge, current financial position, and plans.	Residents.	215	Stocks, special student/doctor loans, tax planning, life insurance, professional compensation, and tax/financial planning were all unfamiliar to most. Most believed that investing and personal finance should be taught in medical school or residency. The hierarchy of requirements was used to propose a financial pyramid.
(Cone et al., 2022)	2022	U.S.	A 46-question anonymous survey via COERG (Collaborative Orthopaedic Educational Research Group) across the country.	Orthopedic surgery residents.	498	Orthopedic residents had an average financial literacy score of 60.9% (616.5%). Of orthopedic residents, 35.5% expressed satisfaction with their current financial status. Retirement savings and reduced loan loads were associated with higher levels of financial happiness. Orthopedic residents with higher levels of parent education, active retirement savings plans, no credit card debt, and higher childhood yearly household income scored higher.
(Lee et al., 2024)	2024	U.S.	A cross-sectional, anonymous, web-based survey at the University of Michigan Medical School (adapted from the Financial Industry Regulatory Authority Financial Literacy Quiz).	First-year to fourth-year medical students.	216	In all, 38% of the personal finance questions were answered correctly by respondents, and 19% of the students met the financial competency criteria. Age, debt, and gender were all substantially correlated with lower financial literacy scores. In total, 192 medical students (89%) said that financial literacy instruction should be provided during their time in medical school.
(Shahriari et al., 2024)	2024	U.S.	Using the Qualtrics platform, two surveys were made including questions about demographics, financial status, programs presented, and participation.	Radiology residents.	199	According to the research, retirement plans were provided through university-based programs more often than through other programs. Participation in the proposed retirement plan was greater in university-based programs, with 83.7% of resident respondents taking part overall. Compared to married residents, more single residents took part.
(Dehmoobad Sharifabadi et al., 2024)	2024	Canada	Using Google Forms, a survey was created to evaluate respondents' financial literacy and present financial situation.	Radiology residents.	104	The majority of residents (53%) reported having significant debts. The average score for residents on the financial test was 71%, and there was no correlation between the scores and training level. Eighty percent of residents preferred a physician-led curriculum, and the majority (89%) expressed a significant interest in a formal financial literacy curriculum.

U.S., United States; MD/MBA, Medical Degree/Master of Business Administration.

Exploring the impact of debt on well-being among participants, Ahmad et al. reported that the satisfaction of trainees with debt was lower than that of trainees without debt, whereas the degree of knowledge was weakly connected with financial status satisfaction

and moderately associated with investment-risk tolerance (Ahmad et al., 2017). Furthermore, Cone et al. demonstrated that retirement savings and reduced loan loads were associated with higher levels of financial happiness (Cone et al., 2022).

Among several factors that could influence the levels of financial literacy, self-assessed financial knowledge, confidence in personal financial management, male gender, joint MD/MBA degree, and undergraduate major in finance were all associated with a higher financial literacy performance (Jayakumar et al., 2017; Rehman et al., 2015). Males, overall, had higher mean financial wellness scores than females (Rehman et al., 2015). Male students also scored much better in 'Financial Security Wellness' compared to their female counterparts (Rehman et al., 2015). Marital status, older age, and white non-Hispanic identity were also independent variables that showed a significant association with total financial literacy (Mulligan et al., 2020).

Studies in the U.S. by McKillip et al., Shappell et al., and Tevis et al. concluded that most residents expressed a lack of financial literacy, discomfort with the majority of financial issues, a strong need for financial education, and apprehension about where to obtain trustworthy financial guidance (McKillip et al., 2018; Shappell et al., 2018; Tevis et al., 2018). Stocks, special student/doctor loans, tax planning, life insurance, professional compensation, and tax/financial planning were all unfamiliar to most of the responders (Jain et al., 2022). Overall, medical students scored suboptimal in the financial literacy surveys (Jayakumar et al., 2017; Lee et al., 2024; Mulligan et al., 2020), and the majority of medical students reported that financial literacy instruction should be provided during their time in medical school (Lee et al., 2024). Regarding residents, as reported by Wang et al., personal research was the main source of financial knowledge among psychiatry residents (Wang et al., 2021). According to Shahriari et al., the participation among residents in the proposed retirement plan was greater in university-based programs (Shahriari et al., 2024), whereas Nowotny reported that 93% of residents were receptive to learning about financial matters (Nowotny, 2022). Overall, most of the residents were convinced that more financial education should be incorporated into residency programs (Tevis et al., 2018). A financial education curriculum in residency would be of interest to most of the responders (Sharma & Rojek, 2019), while the majority of the residents expressed a significant interest in a formal financial literacy curriculum (Dehmoobad Sharifabadi et al., 2024).

Nine studies evaluated the impact of financial courses and workshops on improving financial literacy among medical students and junior healthcare providers, as depicted in Table 2. Dhallwat et al. and Witek et al. both reported that even short-term financial sessions were beneficial for interns and residents, respectively (Dhaliwal & Chou, 2007; Witek et al., 2014). The same findings were also reported in subsequent studies that were conducted on medical students (Grewal & Sweeney, 2021; Payne et al., 2020; Poon et al., 2022; Woolley et al., 2024), medical residents (Bar-Or et al., 2018; Boehnke et al., 2018; Cawyer et al., 2022; Poon et al., 2022), or fellows (Boehnke et al., 2018; Cawyer et al., 2022). The body of evidence suggested that financial literacy scores were improved after financial workshops, although the effect declined gradually after six months following the session (Boehnke et al., 2018).

Table 2. Characteristics of studies exploring financial literacy in medical students and junior health-care providers with pre- and post-workshop surveys.

Reference	Year	Country	Study Design and Instrument	Population	n	Outcomes
(Dhaliwal & Chou, 2007)	2007	U.S.	The baseline level of financial literacy was evaluated in a pre-seminar investor literacy test. After a 90 min interactive session on personal finance, with a focus on retirement savings, a survey was given to compare the real changes between seminar participants and non-attendees.	Interns.	46	The average investor literacy test score for interns was 40%, which is comparable to the overall population. With an average score of 5.0 on a 5-point Likert scale, interns strongly agreed that the session was beneficial. Interns who had previously attended the seminar were more likely than those who had not to have enrolled in the county hospital retirement plan (64 vs. 33%, $p = 0.07$) and to have moved their investments from low-yield to high-yield accounts at the university hospital (64 vs. 19%, $p = 0.003$).
(Witek et al., 2014)	2014	U.S.	After financial lectures that lasted between one and three hours annually, given by radiation oncology doctors and/or financial advisors, seven and nine-question surveys were given to the program directors and residents, respectively, via SurveyMonkey.	Radiation oncology residents.	60	Overall, 80% of respondents lacked the skills necessary to manage the financial decisions that would come up after graduation, both personally and professionally. Almost 90% of program directors might include lectures on financial subjects in the resident curriculum. Residents' lack of interest, scheduling issues, and trouble locating a lecturer were cited as barriers to including financial lectures in residency training. According to a survey, 69.2% of radiation oncology residents thought the financial education they received was beneficial.
(Bar-Or et al., 2018)	2018	U.S.	An interactive eight-hour personal finance workshop, by a business school professor with personal finance experience, over four weeks. A pre-class survey was filled out. Following the session, participants completed an exit survey that assessed the course and enquired about any concrete financial decisions they had made as a result of the knowledge they had gained.	Fellows in cardiovascular diseases, pulmonology, critical care, and infectious diseases.	18	The survey indicated that objective financial literacy instruction was beneficial to fellows. The study suggested that all graduating trainees in graduate medical education programs should receive thorough financial literacy instruction from an expert who has no financial stake in promoting financial goods and services.
(Payne et al., 2020)	2020	U.S.	A survey at the University of Nebraska Medical Center between students who attended and did not attend a seminar series.	Students.	326	Compared to their counterparts who did not attend, students who attended the seminars regarded themselves as much more comfortable with all four financial issues (e.g., debt management, budgeting, investing, and retirement).

Table 2. Cont.

Reference	Year	Country	Study Design and Instrument	Population	n	Outcomes
(Cawyer et al., 2022)	2022	U.S.	Questionnaires evaluated the improvements in financial stress and well-being after a five-part course on personal financial literacy, focused on financial terms and concepts, budgeting, debt planning, investing and giving, and financial education and its connection to personal well-being.	Obstetrician/Gynecologist resident and fellows.	35	Following the completion of the course, the individual's financial well-being significantly improved ($p < 0.05$), while their financial stress did not significantly improve ($p = 0.06$). Trainees concurred that financial literacy enhanced their level of well-being after finishing the training ($p = 0.018$).
(Grewal & Sweeney, 2021)	2021	U.S.	A questionnaire to assess the effectiveness of the elective 'Personal Finance for the New Physician', an online course on personal finance for fourth-year medical students, based on weekly video conferences, recorded lectures by financial experts, and online discussion boards.	Medical students.	120	The findings demonstrated notable gains in financial literacy and self-assurance in handling personal money. Those who finished the course saw an increase in their average financial competence score from 2.25/5 to 4.45/5.
(Poon et al., 2022)	2022	Canada	A pre- and post-survey, including 46 questions on financial literacy.	Medical students and residents.	179	After finishing the course, participants' financial literacy increased by $10.10/46.00 \pm 5.12$. Exam results for financial literacy and self-assessment of financial literacy had a positive correlation. There was no significant impact of gender, region, educational attainment, or first-degree relatives being physicians on financial literacy scores.
(Boehnke et al., 2018)	2018	U.S.	A pre- and post-test on financial literacy specifically for radiology residents using the fundamental framework of money basics, investing, borrowing, and resource protection.	Radiology residents and fellows.	20	On the pre- and post-tests, there were eight knowledge-based questions that were accurately answered by 60.0% and 84.8%, respectively. The same eight knowledge-based questions were included in an online survey that offered a 6-month follow-up exam. Responders who completed the survey correctly answered 76.8% of the questions. The study demonstrated that intervention increased short-term financial knowledge.
(Woolley et al., 2024)	2024	U.S.	A 40-question survey before and six months following a workshop in order to assess financial literacy, focused on student loan management, retirement account fundamentals, investing, budgeting, saving, and financial consensus.	Medical students.	69	Six months following the personal finance workshop, there was an overall improvement in financial literacy (62% vs. 54%, $p = 0.004$). Subjectively, students expressed greater confidence in their broad understanding of retirement savings (7% vs. 55%) and personal finance expertise (16% vs. 44%). Over 92% of students agreed or strongly agreed that the curriculum for medical school should include a basic course on personal finance.

U.S., United States.

Among the studies that explored financial literacy in senior healthcare professionals, three studies were conducted on nurses (Brydges et al., 2019; Naranjee et al., 2019; Topa et al., 2018) and seven studies on doctors (Agarwal & Biswas, 2022; Huebinger et al., 2021; Millen & Stacey, 2022; Mtula et al., 2024a, 2024b; Ozyesil et al., 2024; Zubair et al., 2023) (Table 3). Brydges et al. found a significant difference in the cutoff scores between the executive nurse leaders' financial literacy levels (Brydges et al., 2019), whereas Topa et al. reported significant gender disparities among nurses in relation to financial knowledge and public protection, with women having a weak but positive association (Topa et al., 2018). Finally, Naranjee et al. demonstrated that, in public healthcare institutions, nurse managers had financial management responsibility, but they needed more training due to a lack of requisite abilities, competencies, and knowledge (Naranjee et al., 2019). Studies in senior doctors reported inconsistent findings, demonstrating that the perceived confidence in financial literacy was relatively low (Huebinger et al., 2021), whereas Millen et al., Agarwal et al., and Mtula et al. reported that healthcare providers had a comparatively high level of financial knowledge (Agarwal & Biswas, 2022; Millen & Stacey, 2022; Mtula et al., 2024a). Variables like geographic location, work position, and degree of education had a discernible impact on financial literacy (Mtula et al., 2024a). Interestingly, Ozyesil et al. reported that younger healthcare professionals and males demonstrated higher financial literacy levels, which was probably attributed to the weak but positive relationship that was observed between financial literacy and digital assets (Ozyesil et al., 2024). Again, both junior and senior healthcare providers stated that their graduate education had not given them the skills necessary for their financial success (Zubair et al., 2023).

Table 3. Characteristics of studies exploring financial literacy in senior healthcare providers.

Reference	Year	Country	Study Design and Instrument	Population	n	Outcomes
(Topa et al., 2018)	2018	Spain	Two timeframes of financial literacy assessment that were separated by 3 months.	Nurses at five distinct public hospitals above 55 years of age.	132	There were found to be statistically significant gender disparities. There were gender differences in the pathways from financial literacy to self-insurance and public protection, as well as from goal clarity to public protection. The relation between financial knowledge and public protection was only negative for men and, while it was not very intense, it remained positive for women.
(Brydges et al., 2019)	2019	U.S.	An explanatory sequential mixed-method study focused on financial management competency self-assessment and financial knowledge assessment.	Executive nurse leaders.	178	There was a significant difference in the cutoff scores between the executive nurse leaders' financial literacy levels ($p < 0.001$). The application of financial knowledge, self-awareness, gaps in hospital and graduate nursing education, and a micro versus macro perspective were found to be significant themes in the qualitative analysis.
(Naranjee et al., 2019)	2019	South Africa	Data were collected through interviews.	Nurse managers.	18	In public healthcare institutions, nurse managers had financial management responsibility, but they needed more training due to a lack of requisite abilities, competencies, and knowledge. The study suggested the development of a competency framework to enhance nurse managers' financial management skills.

Table 3. Cont.

Reference	Year	Country	Study Design and Instrument	Population	n	Outcomes
(Huebinger et al., 2021)	2021	U.S.	A 49-question survey divided into four categories including demographics, Likert-scale questions measuring the importance of personal money, Likert-scale questions measuring perceived financial literacy, and a financial literacy test.	Emergency attendings and residents.	68	The majority of participants (73.5%) engaged in self-education, while prior formal financial education was rare (10.3%). Perceived confidence in financial literacy was low. Both residents and attendings found it difficult to answer questions on retirement and insurance and taxes, even though attendings outperformed residents overall, especially on the sections about investments and insurance and taxes.
(Millen & Stacey, 2022)	2022	South Africa	Anonymous and voluntary online survey using a validated questionnaire available from the Organisation for Economic Co-operation and Development.	Medical professionals between 18 and 65 years old.	570	Healthcare providers had a comparatively high level of financial knowledge (73%). Of the entire cohort, 24%, 27%, and 63%, respectively, did not meet the acceptable thresholds for financial behavior, attitudes, and knowledge. Financial awareness ratings were predicted by factors such as sex, medical specialty, and enrollment in private healthcare. Financial literacy was correlated with higher income and self-rated financial understanding. Business-specific financial literacy was low (51%), and there was no correlation between it and general financial literacy among business owners. Financial literacy ratings connected to businesses were predicted by economics and finance education.
(Agarwal & Biswas, 2022)	2022	India	An observational study, cross-sectionally designed using the Organization for Economic Co-operation and Development financial literacy questionnaire.	Healthcare providers including doctors, nurses, and interns.	524	Overall, 68.3% of the survey participants were financially literate. The general domain subdomain of financial literacy was found to have the highest level of knowledge (69.3%), followed by the investment and savings domains (63.7% and 58.0%). Higher age, qualification, and yearly family income were found to be positively connected with the overall financial literacy score. In addition, it was discovered that men, married men, and surgeons had higher financial literacy than other groups.
(Zubair et al., 2023)	2023	U.S.	A survey was devised with the assistance of a certified financial planner.	Residents, fellows, and attendings.	50	Over 70% of respondents stated that their graduate education had not given them the skills necessary for their own financial success, and the majority of respondents said they had no specific financial education.

Table 3. Cont.

Reference	Year	Country	Study Design and Instrument	Population	n	Outcomes
(Mtula et al., 2024b)	2024	Kenya	A structured questionnaire was used to collect quantitative information about financial literacy, based on the OECD/INFE questionnaire.	Healthcare professionals.	392	The findings demonstrated that variables like geographic location, work position, and degree of education had a discernible impact. Following financial attitude and financial behavior, financial knowledge was found to be a critical component that greatly impacted financial literacy. The study highlighted how crucial it was to incorporate financial education into medical education programs and tailor them to the needs of various age groups.
(Mtula et al., 2024a)	2024	Kenya	An online structured questionnaire focused on sociodemographic data, financial knowledge, financial behavior, and financial attitude, using Likert scales.	Doctors, dentists, and pharmacists.	339	Female physicians showed better financial behavior, attitude, and knowledge, indicating a more comprehensive level of financial competency than their male counterparts. In comparison to the OECD worldwide averages, the descriptive analysis at the global level showed that the Kenyan participating doctors had high financial knowledge, positive attitudes, and smart financial behaviors. The financial literacy of healthcare personnel appeared to be intimately influenced by sociodemographic characteristics as well as financial knowledge, attitudes, and behaviors.
(Ozyesil et al., 2024)	2024	Turkey	A cross-sectional online survey using the financial literacy scale to assess financial knowledge and competencies.	Healthcare professionals.	240	Younger healthcare professionals and males demonstrated higher financial literacy levels. Significant correlations were found between financial literacy and domains such as investment instruments, debt and risk management, and personal finance management. A weak but positive relationship was observed between financial literacy and digital assets, indicating emerging trends in digital finance awareness.

4. Discussion

The importance of financial literacy and financial education has been well established, underscoring the difficulties in making informed decisions about saving and investing when financial illiteracy exists (Lusardi & Mitchell, 2007). Current evidence also suggests that early financial education and financial literacy are associated with human well-being (Lusardi & Mitchell, 2014). Financial education refers to the process of improving the understanding of financial products, services, and concepts, and gives the possibility to make appropriate choices, avoid unnecessary risks, and take appropriate actions to improve financial well-being (OECD, 2006). There is a strong correlation between financial education and the possession of wealth, with general knowledge/education and specialized knowledge/economic literacy contributing similarly to better-informed financial decision making (Bernheim & Scholz, 1993).

However, the incorporation of financial education in healthcare education is lacking. Medical professionals should be adequately prepared to make wise financial decisions for themselves and their professional practices. Although medical students, residents, and

fellows reported a lower level of financial literacy and a higher level of financial stress (Jayakumar et al., 2017; Payne et al., 2020), given their role, they are typically only required to know how to use basic financial information in personal or limited institutional decision-making contexts. However, gaining essential knowledge for decision making should be ideally done before the urgent need for such decisions. Offering students a thorough foundation of financial literacy that they may modify to fit their situation would be the best course of action, and a critical mass of fundamental knowledge should be a part of that framework. In addition to enhancing financial health, there is growing evidence that financial literacy programs could benefit job performance and satisfaction in the workplace (Hira & Loibl, 2005). Medical school and graduate medical education curricula should include workshops on the fundamentals of personal financial planning as well as significant financial issues related to medical practice. Furthermore, evidence also suggests that even more senior healthcare professionals have suboptimal financial literacy. One independent factor influencing the level of healthcare professionals' financial literacy is a lack of financial education (Jayakumar et al., 2017; Millen & Stacey, 2022), whereas the requirements of the position and healthcare competency are not aligned. Financial education would therefore empower physicians, by enabling them to take charge of their financial resources and make proactive decisions regarding their financial destiny.

The findings of the current review suggest that financial literacy varies among healthcare providers, depending on several factors. Several studies that were performed on medical students, residents, or fellows, suggested that financial literacy was suboptimal (Jayakumar et al., 2017; Rehman et al., 2015; Teichman et al., 2001, 2005). The vast majority of studies were performed in the U.S., where the impact of student loans on the medical career is more prominent. The body of evidence suggested that attending courses and workshops that targeted gaps in financial literacy aided medical students in improving their financial education. Moreover, surveys performed on senior healthcare providers indicated that although senior doctors or executive nurse leaders might be modestly financially literate, they were urged to cultivate skills and knowledge beyond their clinical expertise. Gender and age were proven to impact financial literacy; male sex, marriage, higher age, qualification, medical specialty, and annual family income were all associated with higher financial literacy. Evidence also suggested that among healthcare professionals, the perceived financial literacy confidence was low, despite the body of data suggesting that financial literacy was valued (Huebinger et al., 2021). Both residents and attendings had trouble with retirement, insurance, and tax difficulties, even though attendings outperformed residents overall, especially in the sections on investments, insurance, and taxes. While there is a significant degree of interest in financial knowledge, self-perceived financial literacy is thought to be low, according to a few previous studies assessing financial literacy (Ahmad et al., 2017; Shappell et al., 2018; Young et al., 2016).

Remarkably, few colleges offer their medical students and residents an official, planned co-curriculum in financial literacy (Bar-Or et al., 2018; Jennings et al., 2019; Royce et al., 2019). In general, from the undergraduate level to advanced medical profession, there is no structured method of learning and mastering financial literacy, although there is a need for budgeting, expense management, revenue management and pricing efficiency, estate planning, investment strategies, and retirement planning (Adetayo et al., 2019; Ahmad et al., 2017; Bar-Or, 2015; Boehnke et al., 2018; Jayakumar et al., 2017; McKillip et al., 2018; Mizell et al., 2014; Pisaniello et al., 2019; Satiani, 2004; Sharma & Rojek, 2019; Wagner & Walstad, 2018). By including personal financial education as a co-curriculum in medical education, this significant gap could be closed and the long-term financial stability of residents who are financially unstable could be improved. The Accreditation Council for Graduate Medical Education only incorporates finance-related topics pertaining to patient

health decisions as a standard, not pertaining to resident career development, and the Royal College of Physicians and Surgeons of Canada does not include resident financial education as a requirement for residency program accreditation. The lack of financial literacy courses during university has been extensively reported in previous studies. The findings of previous surveys underscored the effectiveness of a small-scale, student-run initiative in enhancing financial literacy, to provide a foundation upon which to construct a formal personal and healthcare finance curriculum (Payne et al., 2020). Cumulative evidence suggests that a successful financial literacy curriculum must be tailored to specific, targeted groups, as there is variation in preferences and financial circumstances (Lusardi & Mitchell, 2014; Lusardi et al., 2010). Among numerous studies having evaluated financial literacy initiatives during residency training (Ahmad et al., 2017; Bar-Or et al., 2018; Mizell et al., 2014), Ahmad et al. proposed a mini-MBA 6-week program that emphasized teaching several areas, with variations in financial knowledge scores (Ahmad et al., 2017). Also, Mizell et al. used an 18 h curriculum during protected teaching time during grand rounds (Mizell et al., 2014), and Bar-Or et al., used four 2 h sessions over four weeks (Bar-Or et al., 2018). The studies demonstrated that both resident well-being and financial literacy increased after curricula were implemented. Gianakos et al., finally, suggested a five-year program that includes increasing and more specialized financial knowledge throughout residency (Gianakos et al., 2023).

In the modern era of the healthcare sector, the expertise of physicians is essential to daily management, providing high-quality care, conducting research, and developing new treatments, diagnostics, and health education initiatives. Among all healthcare professionals, doctors are the main human resource that supports the entire financial system (Bhattacharya et al., 2023). Making financial decisions and solving financial problems is a difficult task for doctors during their professional careers, and at the same time, they are incorrectly equipped (Ahmad et al., 2017; Boehnke et al., 2018; Jayakumar et al., 2017; Pisaniello et al., 2019; Satiani, 2004; Sharma & Rojek, 2019). However, high-level healthcare providers such as senior doctors or executive nurse leaders are required to know how to construct financial information and design financial plans for their institutions. Although evidence suggests that the financial literacy of high-level healthcare providers might be advanced, depending on their age and level of experience (Brydges et al., 2019; Topa et al., 2018), it might still be suboptimal to support their financial leading role (Gačić et al., 2023). It should be noted that the urge for financial education has been underscored, independent of the level of experience of the healthcare providers (Nowotny, 2022; Poon et al., 2022). Besides, the role of nursing leaders has changed significantly compared to 25 years ago when nursing leaders were trained. Currently, although financial management is not a mandatory function for nursing leaders, there is an expectation to understand and manage hospital finances once nurses take a leadership role (Waxman & Schaefer, 2010). However, nurses and nursing leaders might find it difficult to understand finances and take responsibility for the financial operation of nursing departments (Douglas, 2010), underscoring the significance of appropriate training in hospital financial management including fiscal control and financial planning, monitoring, and decision making (Asamani et al., 2013; Naranjee et al., 2019; Thew, 2015). Overall, from undergraduate medical school to a senior level of medical practice, healthcare professionals score low or suboptimal on financial literacy and education.

5. Future Perspectives

Although financial literacy increases with advanced clinical experience, medical professionals are urged to cultivate skills and knowledge beyond their clinical expertise. To address these issues, it could be proposed that medical institutions could offer financial

education and training through seminars, workshops, and online courses by healthcare organizations and associations, and financial planning services, beginning with the internship, including retirement planning, term insurance, systemic investment plans, and other investment advice. Furthermore, institutions should encourage medical professionals to participate in retirement plans and make financial advisors available to medical professionals. To confirm that medical professionals have a strong foundation in financial management skills prior to starting their careers or internships, medical schools should integrate financial literacy into medical training and curriculum, and finally, foster a culture of financial literacy by supporting financial literacy initiatives and promoting open discussions about finances among medical professionals (Bhattacharya et al., 2023).

The curriculum for medical school and residency programs should include coursework on the fundamentals of personal financial planning, and financial literacy should be incorporated into medical associations' official programs. Research indicates that residents with varying specializations and training years are highly motivated to pursue additional financial education (McKillip et al., 2018). Despite their broad appeal to trainees, there are not many experts on these subjects, thus virtual didactic material would be a good addition to on-site case discussions given by qualified local professors in academia or private practice. The promotion of financial literacy education among trainees might be the goal of special interest groups that interested academics and trainees could create within medical societies. Personal finance-related textual materials and online and in-person educational items should be eligible for continuing medical education credits. Retirement plans, life and disability insurance, tax-deferred flexible spending accounts for childcare and medical costs, and tuition benefits are common institutional offerings during training. While medical students can choose from a wide range of future careers with varying potential salaries, a more pertinent debate of financial possibilities may arise once in residency training due to the established range of predicted salaries. Investing, borrowing, budgeting, insurance, taxes, behavioral finance, retirement plans, estate planning, contract negotiations, and property purchasing are just a few of the subjects that should be covered. Business elements for managing a profitable private or academic practice could be included in addition to personal finance.

Future research is warranted to explore financial literacy in a more homogenous manner, expanded to many levels of experience and many other countries. Future studies are essential to identify the most efficient teaching and assessment methods. It is especially crucial to measure knowledge retention because the benefits of financial literacy programs diminish with time (Fernandes et al., 2014). The impact of financial literacy programs on wellness and decision making must be measured through rigorous longitudinal studies. Additionally, the needs of trainees, existing educational initiatives, and the long-term efficacy of financial literacy instruction require more investigation. Based on the results, a standardized curriculum that incorporates interactive learning should ideally be created. It is necessary to investigate whether asynchronous online presentations or webinars are more effective than traditional in-person instruction. Finding efficient alternate delivery strategies is crucial since new modalities may be able to solve scheduling issues. Additional research should evaluate the influence of personal financial education on medical students' specialty decisions, specifically their choice of primary care occupations.

6. Limitations

The limitations of our study should be acknowledged. It is critical to distinguish between the financial literacy of chief financial officers, accountants, and middle managers who need to know how to construct financial information, while doctors or nurses need to know how to use financial literacy as they advance in their careers and obtain more

significant managerial roles. The aim of our study was to evaluate the financial literacy among healthcare providers; therefore, we have limited our literature search to include only studies evaluating financial literacy among medical students, residents, fellows, physicians, or nurses throughout the advancement of their careers. Financial literacy plays a significant role in the new duties of healthcare providers. However, most of the surveys in the literature have explored financial literacy among medical students, whereas only limited studies have focused on senior healthcare providers, who nonetheless, face the challenge of the most significant financial decisions. Furthermore, there is heterogeneity in the evaluation of financial literacy, since different questionnaires have been used in different surveys. Thus, although gender, age, financial status, and qualification are among the factors that have been constantly associated with financial literacy, the differences in financial literacy evaluation make direct study comparison challenging. Moreover, in this systematic review, we have performed a literature search in the PubMed database. Although we have limited our research to one database, we have searched for articles without restriction on the year of publication, with a broad range of keywords. In addition, the reference list of all electronically retrieved articles was carefully reviewed for potentially relevant articles that had not been identified. Finally, our study included studies published only in the medical literature, excluding financial bloggers. Despite that the participation of financial advisors is favorable in terms of supplying pertinent content, their objectivity might be questionable as some of them receive funding from the financial services sector.

7. Conclusions

Financial literacy is suboptimal for medical students and healthcare professionals, although it is of utmost importance for leading healthcare providers. Although senior healthcare providers or executive nurse leaders might be modestly financially literate, they are urged to cultivate skills and knowledge beyond their clinical expertise. Financial literacy varies among healthcare providers, depending on several factors, such as age, gender, qualification, or overall income. Currently, the role of healthcare leaders is extended to their efficiency and participation in activities related to the financial management of their hospital duties. Thus, there is an urge for financial planning, financial monitoring, financial decision making, and financial control, while further studies are warranted to longitudinally explore the competencies of healthcare leaders in financial literacy.

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