

# Investigating Canadian Radiology Residents' Personal Financial Literacy: A Nation-Wide Assessment.

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## Research Article

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## Abstract

**Introduction:** Resident physicians throughout Canada carry large debt to finance their education. The literature suggests that debt and money management both play a large role in day-to-day life decisions and in deciding the future of physicians. The objective of this observational study is to assess the financial literacy of Canadian radiology residents through testing their financial knowledge and obtaining an understanding of their financial wellness.

**Methods:** A survey was designed to assess the financial literacy and current financial status of radiology residents. After a pilot run to ensure robustness, the survey was distributed nationally to Canadian radiology residents via Google Forms. Descriptive analyses on preliminary data and the association between level of training and financial quiz scores were obtained.

**Results:** In total, 104 valid responses from 16 universities were received. Respondents' levels of training were spread across the 5 training levels. The majority (53%) of residents indicated that their debt was greater than \$150,000, yet only 12% of residents stated they had a formal financial residency curriculum. The average score of residents on the financial literacy quiz was 71% and survey quiz scores were not associated with training level ( $p = 0.71$ ). The majority (89%) of residents indicated a strong interest in a formal financial literacy curriculum, with 80% stating they would like the curriculum delivered by other physicians.

**Conclusion:** Our findings demonstrate unique insight into the financial literacy and demographics of Canadian radiology residents. Overall, residents face a high debt burden and the majority feel that they do not have an adequate financial literacy curriculum in their program. Current resident physicians value a formal financial literacy curriculum as a part of their residency program despite existing financial knowledge. Most importantly, residents feel that a curriculum created with involvement of other physicians would be optimal.

## Introduction

Resident physicians throughout Canada face the burden of financing their costly education, often using loans to afford the medical school they attend. The Association of Faculties of Medicine of Canada has determined that the median debt of a medical school graduate is \$100,000 by the end of their medical school training (AFMC, 2022). This burden of debt has been shown to impact the lives of medical trainees, with the majority of residents indicating that their personal finances are a contributor to their overall well-being and rates of burnout (Connelly & List, 2018). In addition, high levels of debt may have other effects such as influencing decisions on future practice within the resident's specialty (Glauser, 2018; Harris et al., 2021; Kovar et al., 2021). Specifically, rising debt has been found to dissuade medical students' pursuit of primary care as a specialty and a systematic review found that the presence of significant debt was associated with choice of higher paying specialties (Grayson et al., 2012; Hsu & Caverzagie, 2013; Pisaniello et al., 2019). Even within residency, education debt has been shown to impact subspecialty career choices as well as the type of future practice (McDonald et al., 2008). These implications render financial literacy an important consideration for medical trainees.

Previous Canadian surveys have indicated that residents and practicing physicians each only score slightly better than 50% on a financial literacy quiz (MD, 2019). Multiple studies have demonstrated that residents from various specialties do not feel well prepared to manage their finances, especially given their high debt loads (Cone et al., 2022; Dhaliwal & Chou, 2007; Krasniak et al., 2023; Shappell et al., 2018). As well, from an educator's perspective, Lusco et al. demonstrated that 92% of surgery program directors believed that residents were inadequately prepared to handle practice management and personal finances (Lusco et al., 2005). One study by Teichman et al. in 2005, demonstrated that residents spend more than age- and income-matched members of the general public, raising more concern regarding their understanding of financial literacy (Teichman et al., 2005). The combination of lacking financial literacy and spending more, renders medical trainees in a worrisome position with regards to finances.

Despite the high financial burden of medical training, financial literacy is variably addressed in residency education (Ahmad et al., 2017; Collins & Yousem, 2021; Mizell et al., 2014). In a study by McKillip et al., a significant portion of current medical residents had reported that they had not received any financial education throughout their medical education, which is of particular concern (McKillip et al., 2018). Another systematic review by Gianakos et al. demonstrated that incorporation of formal financial

education in residency programs in USA ranged from 0% to 36.7% (Gianakos et al., 2023). The study also demonstrated that most residents obtain financial education through their own research, a family member or attending outside financial seminars. It does not help that the “taboo” nature of discussing finances is promoted by the overall culture of medical education. There is perhaps a conflict between the concept of personal gain through financial literacy with the altruistic aspect of becoming a physician (Collins & Yousem, 2021). This lack of financial knowledge renders medical trainees often stressed when it comes to financial decisions (MD, 2019).

From previous studies, there is an indication that both residents and practicing physicians desire more financial education either in residency or in medical school (Adetayo et al., 2019; McKillip et al., 2018; Wong et al., 2018). The desired topics of financial education do shift throughout a physician's career but are still greatly desired, no matter the time (MD, 2019). From prior studies, some topics of interests to residents include managing student loans, disability insurance, retirement savings, and general personal finance (Wesslund et al., 2023).

There have been several studies that examined various financial literacy curricula, particularly in the last 5 years (Gianakos et al., 2023; Wesslund et al., 2023). However, in the systematic review by Wesslund et al., only 4 out of 13 included studies specifically examined trainee needs with respect to financial topics prior to curriculum development (Wesslund et al., 2023). Ultimately, in order to meet the financial literacy gaps in the current curriculum, it is paramount to perform a targeted needs assessment prior to curriculum development not only to identify the learning gap, but also guides the best way to address it (Grant, 2002; Nyein & Gregory, 2023; Thomas et al., 2022). In the case of financial literacy, assessing the current financial knowledge of Canadian residents is crucial to identifying gaps in their understanding of specific financial services or concepts. This will help to serve a knowledge baseline and curate an appropriate level of complexity. In addition, identifying their current financial status such as their debt level would allow for assessing the need for teaching concepts such as debt management. This foundational understanding is particularly important when it comes to the Canadian financial landscape, as the majority of studies in this field have been done in the United States (Gianakos et al., 2023; Wesslund et al., 2023).

The primary objective of this observational study was to conduct a nationwide needs assessment of Canadian radiology residents with regards to their finances. The study incorporated two components: an in-depth national survey assessing demographics and current financial status, as well as a financial literacy quiz. Ultimately, the financial learning gap found in this study would provide information that can be used by education stakeholders to design and implement financial literacy interventions that can address areas of need.

## Methods

Local research ethics board approval was obtained for this study (REB Project Number 13541).

### *Population*

Participation was entirely voluntary, and all responses were recorded anonymously. The survey was disseminated via an email with a link to the online survey sent to all Canadian radiology residents by program administrators and program directors of each radiology residency program across Canada. Approval was obtained from each residency program to distribute the survey to all residents. Responses were collected from December 17, 2022-March 24, 2023.

### *Survey Structure*

The survey (Online Resource 1) consisted of 41 questions, divided in four general sections: 1) Demographics/ background, 2) Current financial status/financial inclination, 3) Quiz (Financial knowledge assessment), and 4) Moving forward. After obtaining demographics data, the second part of the survey focused on assessing the current participants' personal financial status, including current debt levels, satisfaction with their financial condition, as well as current and future financial management and planning. The financial quiz portion was an itemized assessment on personal finance derived from Statistics Canada (Canada, 2019). The “moving forward” component of the survey assessed what financial educational activities are currently being implemented at the participants' universities, if any, and what changes they would like to see in the future. Questions that required grading, such as interest in dedicated/formal financial literacy training during residency, used a 4-point Likert scale [1=lowest, 2=

mildly low, 3=mildly high, 4=highest]. All survey questions were reviewed for accuracy and clarity by a physician financial expert (AA), as well as a research and education expert (SM) before distribution. The survey was conducted through the Google Forms platform (Google, 2023).

### *Study Design*

The survey was initially piloted with a group of McMaster resident physicians (not exclusive to radiology or training level) to seek feedback on the survey design and wording. A cognitive analysis was completed with a junior trainee to ensure the survey is interpreted as intended. Lastly, prior to dissemination, the survey was piloted with a group of radiology residents at McMaster University to allow for further revisions, if deemed necessary. Three follow-up reminders were sent, and the completion of the survey was incentivized with a chance to win 1 of 6 gift cards.

### *Statistical Analysis*

Descriptive analysis was conducted for all survey responses and participant demographics. Pearson’s correlation coefficient was calculated for continuous variables for total knowledge scores versus postgraduate year of training, debt level and previous financial knowledge. Data analysis was conducted using Microsoft Excel Version 16.70 (Microsoft Corporation, King County WA).

## **Results**

### *Participants*

A total of 104 radiology residents, across 16 Canadian post-graduate institutions, completed the survey. Common demographic characteristics are summarized in Table 1.

**Table 1: Demographic data of the radiology residents participating in the survey.**

<b>LEVEL OF TRAINING</b>	<b>NUMBER OF RESPONDENTS</b>	<b>MARRIED OR COMMON-LAW PARTNERSHIP</b>	<b>RESPONSIBLE FOR CHILDREN</b>	<b>PREVIOUS FINANCIAL TRAINING/WORK</b>
PGY1	21	8	2	4
PGY2	20	11	8	2
PGY3	27	10	5	2
PGY4	15	8	0	0
PGY5	21	14	9	1
Total	104	51	24	9

### *Current Financial Status/Financial Inclination*

Responses for this section are provided in Table 2. Overall, 56% (n=58) of respondents stated having debt in excess of \$150,000. Only 9% (n=9) of respondents had received any form of financial training or have had previous experience in the financial workplace. Regarding retirement planning, only 23% (n=24) of respondents reported having taken major steps in their retirement planning or had a plan in place, with the majority of residents having not started planning or having only taken minor steps. Approximately 52% (n=33) of those that have not started retirement planning stated they are not able to currently afford this or do not have enough money to plan for this, and 50% (n=32) stated they have a high debt burden, significant bills, and/or other financial commitments to start retirement planning. Regarding investments, 88% (n=91) of residents have invested some of their savings in the stock market, real estate, or other forms of investment. Of the residents who did not invest, approximately 37%

(n=7) stated being confused by the innumerable investment options, with the next most common reason being high debt burden, significant bills, and/or other financial commitments.

With regards to financial advice, 96% (n=53) of respondents that had received financial advice, stated that this was free. The sources of financial advice are shown in Figure 1. When asked about which books, podcasts, or social media resources the respondents utilized, the majority (23%, n=12) stated using the Facebook group dedicated to physician finances. Other resources that were frequently cited were: books (e.g. Millionaire Teacher and Wealthy Barber), websites (e.g. Canadian Couch Potato blog), as well as podcasts (e.g. Canadian Investor and Rational Reminder).

**Table 2: Current financial status and financial advice.**

	Frequencies	Percentages	
<b>current financial status/financial inclination</b>	<b>On a scale of 1 to 4, how stressful do you find managing the finances in your daily life?</b>		
	1	25	24
	2	50	48
	3	25	24
	4	4	4
	<b>Thinking of the last 12 months, which of the following statements best describes your household?</b>		
	Keeping up with bills/financial commitments is not a problem	72	69
	Keeping up with bills/financial commitments is sometimes a struggle	29	28
	Keeping up with bills/financial commitments is always a struggle	3	3
	<b>Are you financially preparing for your retirement either on your own or through a government pension plan?</b>		
	Haven't started	29	28
	Minor steps taken	51	49
	Major steps taken but incompletely	15	14
	Well established retirement plan in place	9	9
	<b>If you have not started preparing for retirement, could you specify the reason: *</b>		
	Can't afford to, don't earn enough, income too low	33	52
	Too many debts, bills, financial commitments	32	50
	Don't think about it, haven't got around to it	19	30
	Don't think I'll live that long	3	5
	I'm young, lots of time	10	16
	I am confused by the multiple options available and feel I need more financial knowledge to start	19	30
	<b>Have you invested any of your money, be it in the stock market, real estate or others?</b>		
	Yes	91	88
	No	13	13
	<b>If no, then why not?</b>		
	Can't afford to, don't earn enough, income too low	3	18
	Too many debts, bills, financial commitments	3	18
	Don't think about it, haven't got around to it	1	6
	I am confused by the multiple options available and feel I need more financial knowledge to start	7	41
	<b>Do you currently have any of the following types of debts or liabilities? Please select all the options that apply to you.*</b>		
	Mortgages (include principal residence and other mortgages)	64	62
	Student loans [undergraduate and/or graduate]	58	56

Other loans (other than student loans)	22	21	
Outstanding credit card balances	14	14	
Outstanding balances on lines of credit	43	41	
I have no debts or liabilities	15	14	
<b>How much overall debt do you currently have?</b>			
More than 150K	58	56	
100K-150K	16	15	
50K-100K	6	6	
Less than 50K	9	9	
None	14	14	
<b>financial advice</b>	<b>In the past 12 months, did you make use of any advice, free or paid, on any financial products [such as retirement planning, insurance, debt counselling, taking out a mortgage or a loan, investment etc.]?</b>		
	Yes	55	53
	No	49	47
	<b>Was the financial advice that you received free or paid?</b>		
	Free	53	96
	Paid	2	4

\*More than one response could be selected on the survey.

### *Financial Quiz*

As part of the financial literacy survey, respondents underwent a 15-question financial knowledge quiz. The full results of the quiz are provided in Online Resource 2. The average score for the respondents was 71.2%  $\pm$  17.4. The two questions with the lowest percentage of correct answers included a question about whether an incorporated radiologist can contribute from their corporation to their Tax Free Savings Account (TFSA) (40.4% selecting False, which is the correct answer), and a question about the various options for withdrawing non-taxable income from a Registered Retirement Savings Plan (RRSP) (only 34.6% of respondents selected the correct combination of options). There were no statistically significant differences in the correlation between level of training ( $p = 0.71$ ) and previous financial knowledge ( $p = 0.15$ ) with levels of debt ( $p = 0.68$ ).

### *Moving Forward*

Responses to this section can be found in Table 3.

**Table 3: Responses to the moving forward section.**

		Frequencies	Percentages
moving forward	<b>Please choose the statement that applies to your residency/fellowship program:</b>		
	My residency/fellowship training has no financial training component	42	40
	I attended a financial talk/session organized by my program not as a formal training component of the curriculum	50	48
	My residency/fellowship has a formal recurrent financial training event that is part of the curriculum	12	12
	<b>How useful was this session on a scale from 1 to 4?</b>		
	1	1	2
	2	17	28
	3	33	54
	4	10	16
	<b>On a scale of 1 to 4, how prepared do you currently feel to handle financial decisions that will arise after completing residency?</b>		
	1	17	16
	2	38	37
	3	38	37
	4	11	11
	<b>On a scale of 1 to 4, how interested are you in having dedicated/formal financial literacy training during residency [in addition to what you currently receive]?</b>		
	1	4	4
	2	9	9
3	31	30	
4	60	58	

The majority of respondents (88%, n=91) indicated high interest in a formal financial literacy curriculum as part of their radiology residency training. Specific topics of interest to residents are described in Figure 2. The top three topics of interest, in descending order, are: incorporation, investing, and contract negotiation. Two of the residents stated that common topics such as basic financial knowledge and retirement planning are generally self-learned; however, they would be more interested in radiology specific topics such as finances pertaining to an academic versus community radiology career, partnership track jobs, as well as information on buy-ins to radiology practices. One learner also stated that they would not want another “mandatory” aspect of the curriculum, but rather a tailored curriculum with more latitude to one’s needs.

Importantly, the majority of residents (92%, n=94) stated that they are interested in receiving this curriculum from other physicians (radiologists or otherwise). Additionally, 73% (n=74) of residents stated wanting to receive components of this curriculum from financial advisors/experts. Four residents answered this question in free text, stating that they would want “non-bank affiliated financial advisors”, “experienced tax accountants and tax lawyers who are experienced in handling radiologists’ finances”, “financial advisors but only if they are not promoting their services”, and “financial advisors who are well-versed with medical training”.

## Discussion



On the journey of becoming a physician, finances play a large and often stressful role (Ahmad et al., 2017). However, despite the highly onerous academic and clinical training, financial literacy is often lacking or limited. Our study illustrated that while scoring high on the financial literacy questionnaire, there is still high demand for further financial literacy curriculum to be integrated into Canadian radiology residency training.

Our study found that more than half of respondents have debt in excess of 150,000 (56%, n=58). This is in keeping with reported average debts of Canadian medical graduates averaging \$84,172 for medical school expenses and \$80,516 of non-education related debt (MD, 2019). Interestingly however, 62% of residents (n=64) stated mortgage being a part of their debt. This is important as allocation of income to managing multifactorial debt is more complicated. This correlates to the finding that residents are interested in debt management as an important part of their curriculum as demonstrated by our study.

The average score of the Canadian radiology residents on the financial survey was approximately 71%. Radiology residents performed better on financial literacy assessments compared to the broader Canadian medical resident population, who scored on average 55% (MD, 2019). When compared to American medical residents, again Canadian radiology residents scored higher with studies reporting averages of 61% in American orthopedic surgery residents and 51% across all American residency specialties (Ahmad et al., 2017; Cone et al., 2022). Finally, compared to the general Canadian public, radiology residents again scored higher with the public scoring an average of 61% (Lorespub, 2019). Although unexpected, a similar finding was also demonstrated by Nowotny for American medical residents where financial literacy in a group of residents and medical students was higher than the general population (Nowotny, 2022). This is an interesting and unexpected finding and could be related to the high levels of stress associated with anticipated debt levels to complete residency training (Morra et al., 2008). Perhaps, the anticipated debt levels that accumulate throughout medical school and residency training in combination may in turn encourage trainees to independently seek financial literacy on their own time. This further explains the lack of significant correlation found in our study between training level and financial literacy, a finding that is in agreement with the existing literature (Cone et al., 2022).

In our sample of respondents, only 12% had a formal financial literacy curriculum as a mandatory component of their residency program. This is in agreement with multiple studies demonstrating an established residency curriculum deficit in financial literacy, recognized by educational experts (Gianakos et al., 2023). The Royal College [AD1] of Physicians and Surgeons of Canada does not include resident financial education as a standard for accreditation of residency programs and the Accreditation Council for Graduate Medical education only includes finance-related topics pertaining to patient health decisions as a standard rather than pertaining to resident career development (ACGME, 2023; CanRAC, 2020; Wang et al., 2022). An important step towards implementation of a financial literacy curriculum may be recognition by educational stakeholders regarding the importance of this topic towards accreditation of a program.

Importantly, our study demonstrates that residents are strongly interested in the implementation of a formal curriculum and that residents wish to have a physician perspective, radiologist or not. Two systematic reviews on current personal finance training programs for medical trainees demonstrated that the majority of the primary studies rely on physician instructors (Igu et al., 2022; Wesslund et al., 2023). It is probable that residents wish to be taught by physicians who have an implicit understanding of their training journey through medical training and can offer guidance as they start their career. However, physicians may not be able to have the time and resources to dedicate to financial literacy curricula. Instead, financial advisors may be a more accessible and cost-effective resource, however trainees may be opposed to the inherent conflict of interest and would receive commission from selling their financial products and services (Grewal & Sweeney, 2021; Igu et al., 2022; McKillip et al., 2018; Ogunkua et al., 2022). The preference of physicians as instructors also explains our findings that residents identified physician led financial blogs and Facebook groups as a major source of financial advice. Moving forward, this is a consideration when selecting instructors for financial literacy curricula; there is ongoing evidence that trainees wish to be taught by those who understanding medical training, physician payment models and are unbiased.

Residents were interested in a variety of topics in a financial literacy curriculum, such as medical incorporation, contract negotiations, and investments. However, while most residents selected these topics, some residents stated interest in radiology practice specific topics. It is also important to note that one resident stated that another "mandatory curriculum" to replace already strained training time would be problematic. Therefore, the mode of curriculum delivery (self-directed versus didactic versus synergistic/flipped classroom) is an important consideration. There have been multiple studies assessing financial

literacy interventions in residency training (Igu et al., 2022). For example, *Ahmad et al.* had suggested focusing on teaching monthly budgeting, debt management, savings and retirement planning, as well as insurance and estate planning, through a mini-MBA 6-week curriculum with demonstrated differences in financial knowledge scores (Ahmad et al., 2017). Other strategies included *Bar-or et al.* who implemented 4, 2-hour sessions over the span of 4 weeks, and *Mizell et al.* who implemented an 18 hour curriculum during protected teaching time at grand rounds (Bar-Or et al., 2018; Mizell et al., 2014). Implementation of both curricula was met with increased financial knowledge and increased resident satisfaction. Ginakos et al. suggest a 5-year curriculum throughout residency with progressive and more specific financial knowledge (Gianakos et al., 2023). Future research is warranted to assess a curriculum that assesses residents' baseline knowledge and provides for a tailored program in addition to specialty-specific practice knowledge.

In addition to a structured curriculum, one of the respondents discussed the possibility of a tailored curriculum for financial literacy. In the current climate of competency-based design, a tailored resource towards financial literacy in residency can be an important consideration. Trainees' financial needs are highly variable depending on their personal life stage and prior financial background. A targeted resource, such as a physician financial coach (similar to an academic advisor) can serve to provide additional support for residents besides a standardized blanket curriculum. The feasibility and resource burden of this type of program may be an area for future research.

There are several limitations to this study. This study only included participants from radiology and as such may not be generalizable to other residency programs or specialties. This was identified as a future research focus to provide more generalizable data across a wider range of programs. In addition, there also may be an element of sampling bias in participation, with residents who are not comfortable with their finances being possibly less likely to complete the survey. Finally, the questions were derived from a literature review and from Statistics Canada and therefore scores may not be generalizable to other trainee resident populations in other countries. The survey was also conducted on an online platform in an uncontrolled test environment rendering the possibility that a participant searched for the answers before responding to a question.

[AD1]<https://www.royalcollege.ca/content/dam/documents/accreditation/competence-by-design/non-resource-documents/canera/general-standards-accreditation-for-residency-programs-e.html>

## Conclusion

Overall, Canadian radiology residents face a high debt burden and the majority do not have an adequate financial literacy curriculum in their residency programs. Nearly all residents were interested in a formal financial literacy curriculum to further help them with their finances. Considering the implications of financial well-being on resident well-being, our survey analysis provides further data on a need for a physician-led financial literacy curriculum, which is tailored to the residents' current understanding of finances. The high existing financial knowledge of residents should serve as a baseline for dedicated physician financial literacy curriculum. Furthermore, a dedicated curriculum allows trainees to feel empowered to tackle financial challenges rather than further propagate the taboo culture surrounding financial discussions in medicine.

## Declarations

**Competing interests:** All authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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## Figures

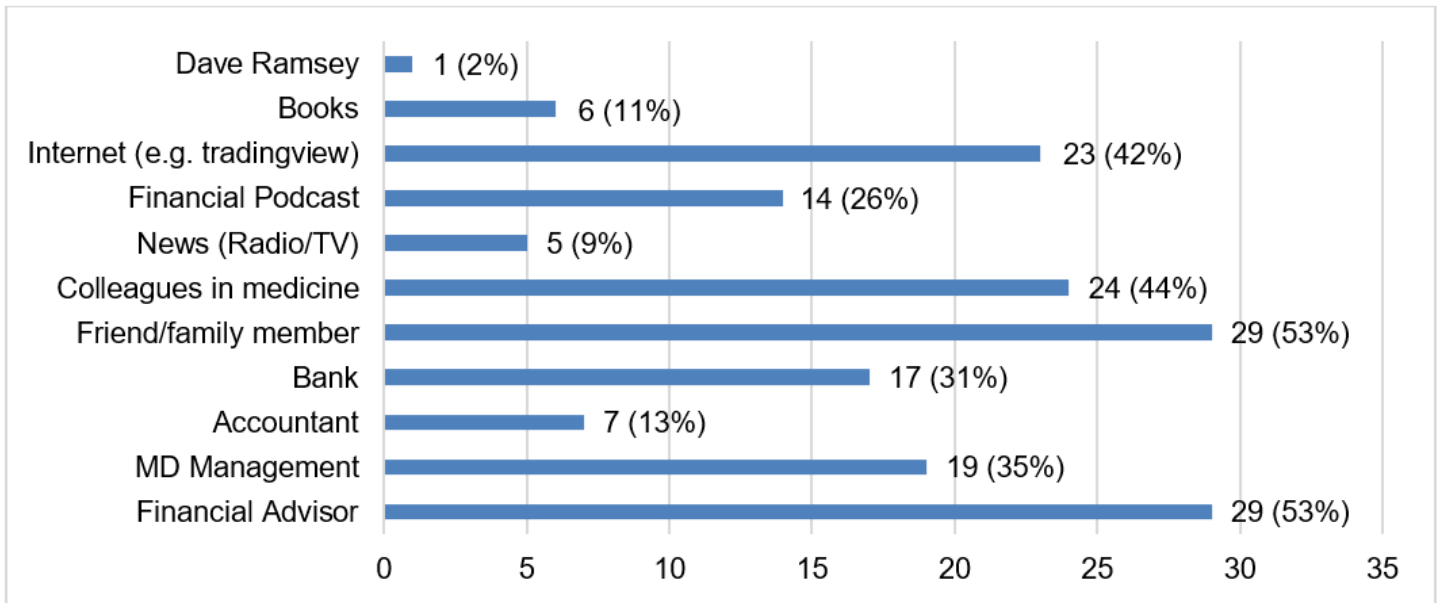


Figure 1

Sources of financial advice provided to residents.\*

\*More than one response could be selected on the survey.

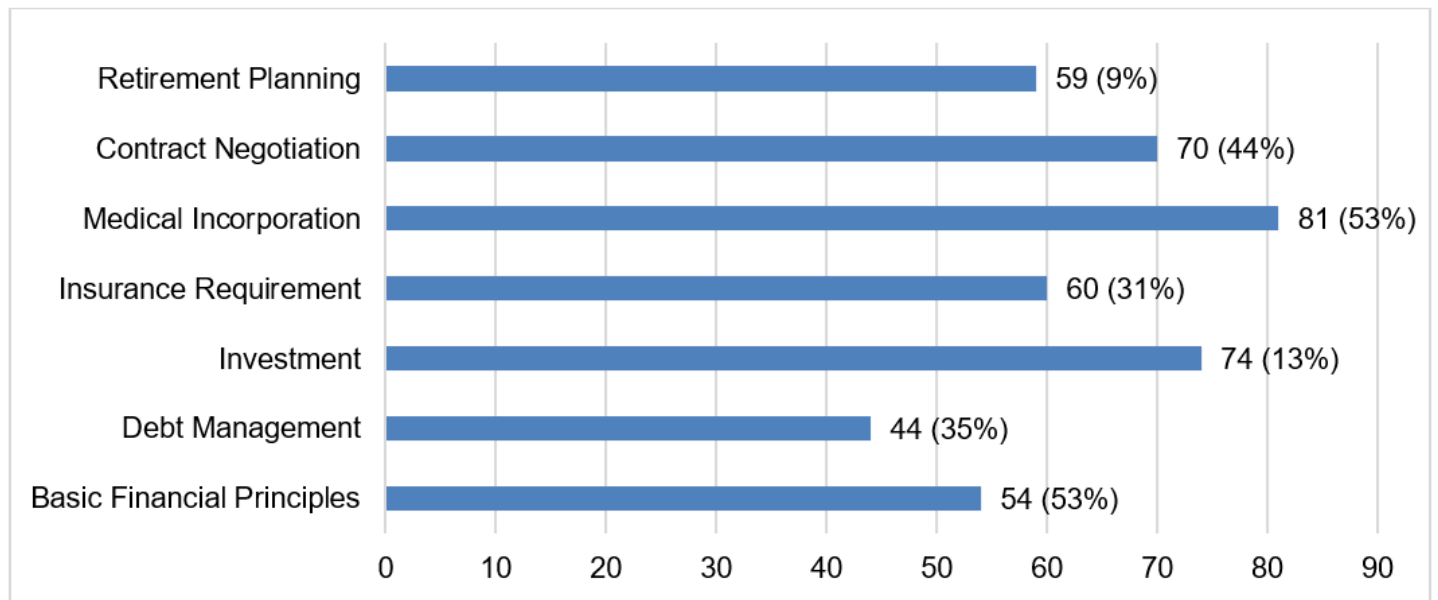


Figure 2

Areas of interest for residents for a financial literacy curriculum.\*

\*More than one response could be selected on the survey.

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