Financial Education for Radiology Residents: Significant Improvement in Measured Financial Literacy After a Targeted Intervention

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PROBLEM

Financial literacy is an important concept that has direct bearing on individuals' behavior and financial outcomes [1]. It is particularly relevant for students and trainees, as cumulative student loan debt is at record levels. For instance, in 2016, student loan debt for Americans reached $1.31 trillion, credit card debt $779 billion, and mortgage debt $8.48 trillion [2]. Moreover, median debt for medical school graduates in 2015 was $180,000 [3]. Despite these staggering numbers, disproportionately lower financial literacy has been demonstrated in numerous groups, including those with lower educational attainment, younger age, female gender, and African American and Hispanic ethnicity [4]. This lack of financial literacy has quantifiable effects, resulting in households demonstrating lower financial literacy shown to have less wealth, to be less likely to plan for retirement, to be less likely to invest in the stock market, and to be more likely to accumulate debt with high interest rates [4].

Not only have these findings been demonstrated in the generalized population worldwide but they also pertain directly to radiology residents. One study demonstrated that medical interns had rates of financial literacy on par with those of the general population [5,6]. Indeed, financial literacy has particular relevance to medical trainees because financial stressors are correlated with burnout [7,8]. One group found that medical students in their cohort who had more than $100,000 in debt had an odds ratio of 1.47 for suicidal ideation compared with medical students with less than $49,999 in debt [9]. Another group found that financial stress during the first year of medical school was a significant predictor of burnout symptoms exhibited in the third year of training [10]. The association between financial stress and burnout in medical trainees is not limited to the United States, as similar correlations have been shown in New Zealand despite their junior house staff having significantly lower absolute debt burdens compared with those in the United States [11].

Interventions with the goal of improving financial literacy have been developed, although the evidence suggests that the effectiveness of such interventions declines during the time between education and action [12]. One group examined the effect of a 90-min seminar on the financial literacy and behaviors of a class of medical interns in California. They found that after the seminar, interns made changes in allocation of tax-deferred retirement savings [6]. We believe that we are the first group to assess the effect of a similar intervention on the financial literacy of radiology residents.

WHAT WE DID

We reviewed the literature to isolate the key concepts on which to focus our financial literacy survey instrument. An analysis by Huston [13] of 71 prior surveys of financial literacy emphasized four main topics: money basics (eg, the time value of money and numeracy), investing (eg, stocks, bonds, mutual funds), borrowing (eg, mortgages and consumer debt), and protecting resources (eg, insurance) [13]. Using these topics as a basic framework, we created a pre- and posttest pertaining to financial literacy targeted specifically to radiology residents, with domain-specific content added including discussion of student loan forgiveness programs such as Public Service Loan Forgiveness. To test retention of knowledge, we planned a 6-month follow-up test using the same list of questions.

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We obtained institutional review board approval of our survey instrument and our plan to administer the survey to a representative sample of radiology residents and fellows at our institution. Particular care was made in the materials to emphasize that the results of this survey would not be used in the residents' formal rotation evaluations and that participation was entirely voluntary. We created a 60-min noninterpretative skills lecture covering the core financial literacy topics from the survey in more depth. This presentation is available from the corresponding author upon request and was distributed via e-mail to attendees after the lecture. All residents and fellows onsite were invited to the presentation. Specific topics covered in the lecture included the time value of money, mortgages, investment, tax-preferred retirement vehicles, student loan forgiveness programs, life insurance, and health insurance. Pre- and posttest survey questions are presented in Appendix 1.

OUTCOMES

A total of 23 residents and fellows attended the resident finance lecture, with 3 declining to complete the pre- and posttest evaluations. There were eight knowledge-based questions assessed on both the pre- and posttests, which were answered correctly 60.0% ± 25.3% on the pretest and 84.8% ± 15.8% on the posttest. A 6-month follow-up test was made available through an online survey using the same eight knowledge-based questions (Appendix 1). A total of 7 of the original 20 respondents responded to the survey and answered 76.8% ± 20.1% of the questions correctly. A graphic representation of these results is shown in Figure 1.

Although our data are limited because of the small sample size, our results are concordant with the literature: a targeted intervention can help increase basic financial literacy among radiology residents when measured in the short term. The evidence suggests that the effectiveness of such a strategy decreases with increased time between intervention and action. However, our intervention's effectiveness may be amplified in that it may have increased these subjects' self-awareness about their lack of knowledge in this domain and, through this, inspired a course of subsequent self-directed learning [12]. Relevant to this is that on the posttest, 13 of 20 respondents answered that they "definitely will" and 5 of 20 respondents answered that they "probably will" apply strategies and knowledge acquired during the lecture to their own finances.

General financial education programs have been developed in the past, with varying levels of success in affecting future financial behavior and success. One meta-analysis showed a small effect of finance education on future financial behavior [12]. Timing of the information may be important; one study suggested that providing prepurchase counseling (eg, before a home purchase) may have a greater chance of affecting behavioral change [14]. Applying this to radiology resident education, offering on-demand educational materials on student loan refinancing, mortgage basics, or insurance products may be helpful for residents considering the same. Given that we made our slides freely available to the attendees after the fact, our one-time intervention may also serve a dual role as a just-in-time resource in the future.

A single intervention cannot address the systemic lack of financial literacy in the general population, including radiology trainees. Future studies using larger sample sizes may better elucidate the effects that resident-specific financial education has on financial literacy, and follow-up testing at intervals greater than 6 months would be useful to demonstrate long-term knowledge retention and concrete effects on personal finance behaviors. Increasing financial literacy is a desirable goal in that it may positively affect residents' well-being, reduce financial stress, and thus

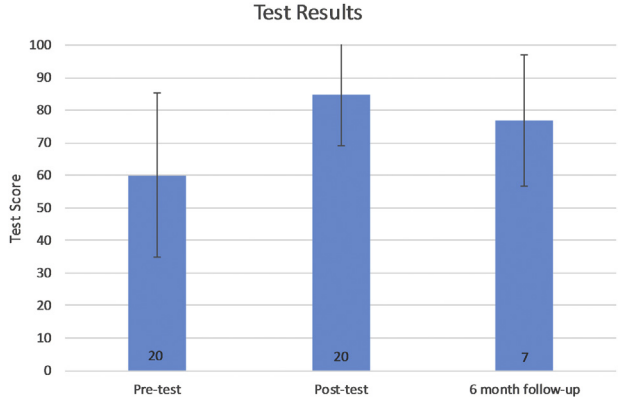

Fig 1. Percentage of correct answers on the pretest, posttest (immediately after the financial education lecture), and 6 months after the administration of the lecture.