

An Evidence-Based Personal Finance Education Curriculum for Physicians and Medical Students

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Abstract

Background

Many physicians complete medical school and graduate medical education (GME) burdened by high debt and financial illiteracy. This places them at higher risk for ill-informed financial decisions, which can result in increased stress and anxiety and a lower quality of life. In response, medical wellness programs have increasingly sought to offer personal finance education, but there is little guidance on optimal curricula. Our objective is to systematically review the existing literature examining physician financial literacy curricula and to recommend a standardized curriculum.

Methods

This review utilized the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) 2009 checklist to conduct literature searches in PubMed, ERIC, MedEdPortal, EBSCO, JSTOR, and Google Scholar. Three researchers used predetermined inclusion and exclusion criteria to select articles, including a focus on financial concepts applicable in the United States. Articles were assessed using modified Côté-Turgeon and Kirkpatrick qualitative analyses tools.

Results

38 articles met all inclusion criteria. Six specifically described personal finance literacy curricula for medical students or GME trainees, with varied criteria for selecting instructors, topics, and outcomes. All studies reported that audiences were ill-prepared for making financial decisions but strongly desired financial literacy education. Qualitative analysis revealed Strength of Findings summary scores ranging from 2-4, while applicable Kirkpatrick Model scores were all 3 or greater.

Conclusions

Although medical students and GME trainees value financial literacy, few publications report the impact of actual curricula. These efforts vary in depth, breadth, and measured impact. Future research should focus on development of valid testing instruments, content standardization, selection of credible instructors, and country-specific financial concepts.

Background

A lack of personal finance literacy makes financial decision-making difficult among medical trainees and practitioners.(1–8) Medical students, trainees, and early career physicians are often unable to make optimal choices regarding budgeting, saving, investing, insurance, and other financial decisions at a time when their finances are especially constrained by high debt.(4–7, 9–16) As a result, these groups may experience increased stress and anxiety and a lower quality of life.(12, 14, 15, 17, 18) Accordingly, the UME and GME communities have recommended financial literacy training to reduce debt-related anxiety,(19, 20) decrease burnout,(21, 22) and improve physician wellness.(23) In addition, most surveyed medical trainees and some medical training programs recognize trainee lack of personal finance knowledge and want financial skills as part of their training.(1, 12, 18, 24–26)

UME and GME institutions are not mandated by accrediting organizations (such as the Accreditation Council for Graduate Medical Education or the Liaison Committee on Medical Education) to provide personal finance literacy training.(27) Few programs offer structured courses in personal finance because there are no standardized curricula, few qualified unbiased instructors, and limited time and resources for teaching sessions.(23, 25) Instead, many institutions have invited or allowed credentialled financial industry professionals, such as financial advisors, brokers and insurance agents, to lead finance education trainings.(28) However, many of these invitees also sell financial products and services to participants.(17, 23, 28, 29) Thus, medical students and trainees distrust these educational attempts.(23, 28, 29) Since trainees prefer expert and unbiased sources to address their unmet financial training needs, there has been a recent rise in the number of peer reviewed publications addressing objective and impactful personal finance literacy.

This article proposes a personal finance curriculum that can be adopted or modified to address the personal finance needs of medical trainees and practitioners. Our proposed curriculum is based on a systematic review of personal finance curricula in the published literature, with a focus on studies that detail the needs of trainees, the execution of a personal finance curriculum, and the impact of these curricula.

Methods

We used the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) 2009 checklist to begin this qualitative systematic review, which assessed and collected all the literature on physician personal financial literacy programs for medical students or physician-trainees in the United States. All articles meeting our inclusion criteria were subjected to qualitative analysis, and the subset of articles that reported the implementation of financial literacy curricula were analyzed further using a modified Côté-Turgeon tool,(30) and a general assessment of curricula using the Kirkpatrick Model.(31)

PRISMA Guided Publication Selection

We identified all published literature on personal financial literacy training programs for physicians and trainees in the United States from 2000-2020. We generated a list of keywords associated with medical students, medical personnel, financial literacy, and education (Appendix Table A1). Search terms included: "curriculum," "debt," "doctor," "financial decision," "financial literacy," "financial management," "financial planning," "undergraduate medical education (UME)," "graduate medical education (GME)," "medical personnel," "medical staff," "personal finance," and "physician," We applied available Medical Subject Headings (MeSH) terms corresponding to these search terms, and initiated article searches using Boolean operators. Databases searched included PubMed, ERIC, MedEdPortal, EBSCO, JSTOR, EMBASE, and Cochrane Central. For all articles found using the above search strategy, we used a snowball approach to

identify more relevant articles in each article's reference section by reviewing every reference in each article for additional articles that fit our inclusion criteria, until saturation was achieved. This search spanned all UME and GME training programs with available publications.

All included article information was compiled in a Microsoft Excel (Microsoft Corporation, Redmond, WA) spreadsheet. Article acquisition was performed by all three co-authors with the help of an informationist, and full text analysis was performed by all authors.

Inclusion and Exclusion Criteria

The included articles satisfied the following requirements:

- English language articles
- Published between Jan 1, 2000 and September 1, 2020
- Described curriculum or curricula
- Targeted UME or GME participants

Since the included articles used a variety of words to describe financial literacy topics, we categorized them using more general terms. For example, "financial planning" referred to general financial literacy content; "retirement accounts" was included in the "retirement planning" topic; "education debt," "credit cards," "home purchase," and "home mortgages" were all categorized into the "debt" topic; and "salary and benefits" was included in "contract negotiation."

Articles that were excluded did not fit our inclusion criteria or displayed the following characteristics:

- Articles authored by financial industry professionals, such as financial advisors, insurance agents, brokers, or financial consultants, (all of whom could have an inherent financial interest in encouraging the sale of financial instruments and thus harbor potential conflicts of interest.)
- Articles whose authors appeared to have received significant compensation from the financial services industry (which we determined through review of author disclosures and personal websites).
- Articles that addressed retired physicians.
- Articles that focused primarily on debt, a topic which has been well discussed in other articles.(14, 32–42)

Modified Côté-Turgeon Tool and Kirkpatrick Model

Descriptive statistics were employed for all included articles. Studies that implemented financial literacy curricula were also assessed qualitatively using a BEME-guided Strength of Findings approach,(43) the Kirkpatrick Model which examined the reactions, learning, behavior, and results for each curriculum,(31) and a modified Côté-Turgeon tool, which critically assessed multiple characteristics for each qualitative medical education article.(30) Modifications to these rating tools included splitting Item 7 on the Côté-Turgeon tool "Data analysis is credible," into three fields: triangulation, referring to whether researchers used multiple methods or data sources to support findings(44); internal validity; and external validity. Additional fields assessed the depth and breadth of curricula. Breadth considered the number of financial literacy topics covered while depth reflected the total time allocated for the number of addressed topics.

All items in the modified Côté-Turgeon tool were independently ranked by each author on a scale of one to five, with one being "poor," three being "neutral," and five being "excellent." Strength of Findings scores were determined, with Grade 1 indicating non-significant findings and Grade 5 signifying unequivocal results. For all assessment scores, inter-rater reliability was maintained by standardizing tool assessments prior to use. Reconciliation was performed if authors deviated by more than one point on any rating by discussions and score revisions. For each criterion, scores were averaged following reconciliation. The number of conflicts requiring reconciliation varied: Dhaliwal 1 conflict,(22) Boehnke 2 conflicts,(2) Bar-Or 3 conflicts,(28) Mizell 5 conflicts,(23) Liebrecht 7 conflicts,(45) and Meleca 10 conflicts,(46). Of note, one of the papers was authored by two of the authors (YB and SZ).(28) This study was reviewed last, to help the authors anchor scores based on similar criteria as the other studies. To avoid conformity bias, the independent author (JI) provided rankings results first.

Results

As summarized in Figure 1, the search strategy yielded 38 articles. In total, the initial search yielded 193 publications and of these, 155 were excluded. Articles were excluded because they focused on private practice management or business finance (50), had a primary focus on student debt (44), focused on nurses, pharmacists, chiropractors, or non-US physicians (30), primarily addressed moonlighting (8), were authored solely by financial advisors, bankers, or others with potential conflicts of interest (10), referred only tangentially to finance but focused on medical curricula (7), were only abstracts or posters (4), or addressed the needs of retired physicians (2). The remaining articles included six peer-reviewed reports of financial literacy curricula (Table 1), 17 reports of cross-sectional surveys, and 15 opinion pieces (Appendix Table A2).

Table 1: Characteristics and qualitative assessments of studies offering curricula

Article	Methodology	Key Findings	Participants (N)	Strength of Findings Grade	Kirkpatrick Model Scores
Haliwal (2007) <i>Journal of General Internal Medicine</i> (2)	90-minute, faculty-led personal finance seminar; Pre-intervention financial literacy test and attitude assessment. Post-intervention assessment followed 2-10 months later by a behavior change assessment of retirement account choices.	Seminar attendees were more likely to switch from a default low-yield savings account to a higher-yield mutual fund investment.	Internal medicine residents (52)	4	Reaction 5 Learning - Behavior 4 Results -
Leibzeit (2011) <i>Medical Education</i> (5)	3.5-hour workshop led by the associate director of the financial aid and scholarships and a physician with expertise in personal finance. Workshop utilized a quiz show format. Post-intervention survey administered online.	71% felt capable of crafting a budget and improving credit and identity protections. 79% intended to develop a saving strategy.	Senior medical students (117)	2	Reaction 4 Learning 3 Behavior - Results -
Witzell (2014) <i>Journal of Surgical Research</i> (3)	18-hour curriculum spanning practice management and personal finance topics delivered by a physician who is also a certified financial planner, a surgeon with coding and reimbursement knowledge, a hospital attorney, and others. Practice management topics were delivered monthly during the daytime. Personal finance topics were delivered monthly in the evenings. Self-assessment surveys at onset and conclusion of the curriculum. Pre- and post-tests administered after each session.	Participants showed increased interest, knowledge, and responsible behavior relating to personal and practice financial management. Participant self-assessed learning overestimated actual learning as assessed by objective quiz results. Tangents from planned lecture content led to engaging and useful conversations.	Surgery residents (28 involved; 16 paired responses)	3	Reaction 5 Learning 3 Behavior - Results -
Eleca (2014) <i>Medical Student Research Journal</i> (6)	10-hour, student initiated elective curriculum spanning personal finance and medical business topics. Each 1-hour lecture was led by physicians, business owners, or financial counsellors. Pre- and post-education surveys	Self-assessed personal and business financial literacy nearly doubled. 90% expressed interest in a business and finance elective. 85% felt they benefited from participation. Difficult to maintain a student-led course due to leadership turnover.	Medical students (48)	2	Reaction 5 Learning 3 Behavior - Results -
Johnke (2018) <i>Journal of the American College of Radiology</i> ()	60-minute lecture designed and delivered by physicians. Pre- and 6-month post-test surveys obtained.	Six-month basic financial literacy knowledge increased. 90% “definitely” or “probably” will apply acquired knowledge to their own finances.	Radiology residents and fellows (23 (attended lecture); 20 (completed pre- and post-tests))	3	Reaction 4 Learning 4 Behavior - Results -
Bar-Or (2018) <i>Diabetes Care</i> (8)	8-hour curriculum delivered in four 2-hour sessions by a business professor with expertise in physician personal finance with input from three physicians involved in GME. Participants also received online spreadsheet templates and resources. Pre-intervention and 2-week post-intervention surveys.	Self-reported proactive decisions made in areas including retirement planning, investing, insurance, contracting, and debt management.	Cardiovascular disease, pulmonary and critical care, and infectious disease fellows (18)	4	Reaction 5 Learning - Behavior 3 Results -

Strength of Findings determined per BEME Guides 10 and 13.(43, 53)

Grade 1 No clear conclusions can be drawn. Not significant.

Grade 2 Results ambiguous, but there appears to be a trend.

Grade 3 Conclusions can probably be based on the results.

Grade 4 Results are clear and very likely to be true.

Grade 5 Results are unequivocal.

Kirkpatrick Model categories assessed on a 1 to 5-point scale, with 1 representing the least favorable outcome and 5 the most favorable impact. Dash indicates inability to assess.

Level 1 Reaction – measures participant reaction to the training (e.g., satisfaction).

Level 2 Learning – measures participant understanding of the training (e.g., change in attitude, increase in knowledge or skills).

Level 3 Behavior – measures whether participants utilized what they learned (e.g., change in behaviors)

Level 4 Results – measures whether the material had a positive impact on participants' work and personal environments/organizations, e.g., a hospital, private practice, or household.

Most of the 38 included articles focused on GME trainees in a variety of specialty areas, although some addressed UME needs. All 38 articles (100%) reported that participants were ill-prepared to make financial decisions and 31 articles (82%) recommended that UME or GME institutions provide financial literacy education for their medical students and trainees.

As shown in Table 2, each of these articles addressed general financial planning principles and/or a variable number of finance topics, such as debt/liabilities, savings/assets, investing, budgeting, money basics (e.g., time-value, discounting, and compounding), contract negotiation, selecting and interacting with financial advisors, children's college savings plans, insurance, retirement planning, estate planning, and taxes. The amount of topics discussed in each article varied, with two articles addressing only general financial planning,(25, 29) while four covered 10 or more topics.(16, 28, 47, 48) The most covered topic was debt (89%), followed by retirement planning (76%), budgeting (66%), savings (58%), investing (58%), and insurance (53%). Contract negotiation (11%), money basics (11%), children's college planning (11%), and estate planning (13%) were least popular.

Table 2: Financial literacy topics included in prior curricula or in prior surveys/commentaries

Study	Debt / Liabilities	Savings / Assets	Investing	Budgeting (Income and Expenses)	Money Basics	Contract Negotiation	Selecting / Interacting with Advisors	Children's College	Insurance	Retirement Planning
Financial literacy topics covered in prior curricula										
Dhaliwal 2007 (22)	x	-	-	x	x	-	-	-	x	x
Liebzeit 2011 (45)	x	x	x	x	-	-	-	-	x	-
Mizell 2014 (23)	x	-	x	-	-	-	x	-	x	x
Meleca 2014 (46)	x	-	x	-	-	-	-	-	x	x
Boehnke 2018 (2)	x	-	x	-	x	-	-	-	x	x
Bar-Or 2018 (28)	x	x	x	x	x	x	x	x	x	x
Financial literacy topics mentioned in survey-based studies										
Teichman 2001 (7)	x	x		x						x
Burg 2001 (26)		x	x						x	x
Teichman 2005 (10)	x	x	x	x						x
Glaspy 2005 (11)	x			x						
Brown 2010 (54)	x			x						
Witek 2014 (25)										
Ahmad 2017 (18)	x	x	x	x						x
Jayakumar 2017 (1)	x	x	x		x					x
Yoo 2017 (55)	x								x	
Shappell 2018 (8)	x	x	x	x					x	x
McKillip 2018 (12)	x		x	x			x		x	x
Tevis 2018 (6)	x	x	x	x						x
Wong 2018 (5)	x	x		x					x	x
Connelly 2018 (15)	x	x								x
Mizell 2019 (48)	x	x	x	x		x			x	x
Jennings 2019 (27)	x	x								
Adetayo 2019 (20)	x	x	x				x		x	x
Financial literacy topics mentioned in commentary/opinion articles										
Greene 2002 (24)	x		x	x						x
Prabhakaran 2011 (56)	x								x	x
Thacker 2014 (17)	x	x		x						x
Bar-Or 2015 (29)										
Johnson 2016 (47)	x	x	x	x		x	x	x	x	x
Borrelli 2017 (3)	x	x	x	x						
Daily 2017 (16)	x	x	x	x			x	x	x	x
Mills 2018 (57)	x			x			x	x	x	x
Lundgren 2018 (4)	x	x	x	x					x	x
Daily 2018 (58)	x		x	x		x			x	x
Poppler 2019 (59)	x	x		x	x				x	x
Daily 2019 (19)	x			x			x			
Ivy 2020 (60)	x	x	x	x						x
Heilman 2020 (61)	x	x		x			x			x
Moriarity			x	x						x

2020 (21)										
No. of times topic appears in studies	34	22	22	25	4	4	9	4	20	29
Frequency of topic appearing in studies (% of 38 studies)	89	58	58	66	11	11	24	11	53	76

Six studies discussed financial literacy curricula, which were analyzed using the BEME-guided Strength of Findings approach. Table 1 summarizes the study characteristics, key findings, and Strength of Findings scores. For the Strength of Findings summary scores, two articles were graded a 2,(45, 46) two articles received a 3,(2, 23) and the remaining two articles received a 4.(22, 28) Appendix Table A3 lists the reconciled scores for each criterion of the modified Côté-Turgeon assessment tool as well as the total score for each study. In general, individual scores ranged from 2-5, and were higher for components assessing research question definition, study objectives, and participant selection. All studies had lower scores for components assessing validity and generalizability.

For the Kirkpatrick Model grades, all applicable scores were 3 or greater, with all studies reporting favorable participant reactions to personal finance literacy education (Reaction).(2, 22, 23, 28, 45, 46) Most studies also reported increased knowledge (Learning),(2, 23, 45, 46) with two studies demonstrating increased retention of knowledge in the following months.(2, 46) One of these studies found that self-assessed learning overestimated actual learning as assessed by objective quiz results.(23) Finally, two studies showed an increased utilization of knowledge (Behavior).(22, 28) However, no study revealed the impact of the curricula on participant organizations, employers, or households (Results).

The six curricula studies covered multiple topics, with one study particularly focused on retirement plans.(22) Curriculum content selection varied across the studies. For example, one study identified topics through review of the general academic literature supplemented with topics specific to GME trainees.(2) In another study, an expert financial literacy educator collated a topic list, which was then modified based on participant feedback.(28) Two studies appeared to rely on author consensus to determine content.(22, 45) The remaining two studies heavily relied on participant input.(23, 46) One of these studies found that holding sessions during protected time slots helped to increase attendance.(23)

Instructor selection also varied. Three studies utilized faculty members with a personal interest in finance but with unclear levels of expertise.(2, 22, 45) One of those studies was led by the medical school's associate director of financial aid and scholarships.(45) The fourth utilized an academician with expertise in the field of physician personal finance.(28) The fifth and sixth used a combination of faculty and credentialed financial-services professionals.(23, 46)

Discussion

Despite the importance attributed to personal finance literacy training by medical students and GME trainees, we found only six publications describing actual curricula. All six curricula were highly regarded by attendees, and most studies reported increased financial knowledge and beneficial effects on financial decision-making. While only two of the six studies assessed post-intervention financial decision-making, there were tangible effects on retirement account choices and subjective improvements in financial decision-making. However, none of the six studies assessed unequivocal and lasting long-term impacts. Also, the studies had issues with validation and generalizability, differences in instructor selection, and variations in curriculum selection, all of which are discussed in more detail below.

Validation and Generalizability

None of the studies utilized validated pre- or post-intervention surveys and knowledge tests. Due to this lack of validation, some questions measuring participant knowledge and attitudes could have been unclear or may have overestimated learning. In fact, one of the studies compared self-assessments with tests of financial concepts and found a significant discrepancy between the two.(23) Reliable assessment of long-term knowledge was also uncertain, because the two studies that reported long-term outcomes lacked controls.(2, 22)

Also, the reviewed studies may not have had generalizable results. For example, one study focused on California-specific retirement plans, which are unlikely to be relevant for residents in other states. Further, all six studies had relatively small sample sizes, which also constrained the significance of results.

Instructor Selection

Studies varied in selecting instructors. One study recommended using credentialed financial industry professionals as a cost-saving measure.(23) However, reliance on these types of professionals, such as insurance agents, brokers, and financial advisors, is problematic. Although they are a cheaper resource willing to volunteer their time, they have an inherent interest in selling and marketing financial products, and are therefore distrusted by participants.(8, 12, 17, 23, 28, 29) This spotlights a key dilemma for UME and GME programs: delivering a low-cost curriculum utilizing industry professionals versus expending more resources to secure instructors who have no conflicts. The choice is further complicated by the relative scarcity of unbiased, expert instructors. Local business schools may be a good source of instructors, but are likely in limited numbers since more faculty examine the financial services profession from a corporate perspective rather than from the perspective of consumers. The most feasible method for instructor recruitment is the "train-the-trainer" model, in which interested physicians learn the material from qualified, unbiased sources and then utilize that knowledge to deliver curricula at their home institutions.

Curriculum Content

Curriculum content selection varied across studies, with some emphasizing participant input,(23, 46) and others with topics selected by instructors or provided by external sources. Regardless of the method of topic selection, all six studies covered debt management, investing, insurance, retirement planning,

and taxes. In contrast, fewer addressed contract negotiation, children's college planning, or estate planning. The latter topics may reflect a relative lack of interest by medical students and trainees. For example, contract negotiation is only applicable to trainees who are poised to take their first full-time jobs. Similarly, children's college planning and estate planning are less relevant for younger trainees, who are less likely to have families or assets requiring protection. Nonetheless, more comprehensive financial literacy curricula included these topics, since financial needs can quickly change due to life events.

Development of Curriculum

Since there are strong benefits for comprehensive, standardized financial literacy curricula for physicians, we compiled a sample curriculum encompassing all the financial themes identified in this review. The recommended curriculum is described in Appendix Table A4. Learning objectives are compiled in Appendix Table A5. The curriculum topics are all derived from the studies summarized in Table 2, and are also considered core subjects in a standard personal financial planning textbook.(49)

This model curriculum may be delivered over the course of a semester or in a more concentrated fashion. If there are time constraints, the topics labeled as optional can be dropped as necessary. Of note, the curricula can be delivered in-person or virtually learning as recommended by Shappell,(8) In particular, virtual content can be delivered either synchronously or asynchronously. The latter may be particularly advantageous due to common scheduling challenges faced by medical students and trainees. Based on prior studies, we hypothesize that the comprehensive curriculum will improve Kirkpatrick model (31) Learning scores, and an exclusion of potentially biased instructors will likely lead to better Behavior scores. Ultimately, there will also be improved Results scores.

Limitations

This review highlights a number of challenges, including a paucity of validated measures to evaluate curricula and the lack of higher-level Kirkpatrick (Results) scores. In addition, it was difficult to compare the relative merits of the six studies due to varied depths of reporting, especially for two studies that were brief reports.(2, 45) Furthermore, participants varied from medical students to residents and fellows and spanned many specialties. Consequently, the resulting curricula were heterogenous, shaped by a variety of scheduling challenges, time constraints, and objectives. Also, we were unable to assess the quality or accuracy of the content offered to participants. We could not observe the researchers in action, so our Côté-Turgeon and Kirkpatrick Model assessments are based only on what we were able to glean from the written word.

Finally, our review may have excluded relevant articles by limiting our attention to physicians and medical trainees, even though dentists, nurses, and pharmacists, to name a few professions, have similar personal finance concerns. Also, we omitted articles from outside the US which may have useful recommendations, including two high-quality Canadian studies. Although some terminology and accounting rules differ across national jurisdictions, concepts such as financial planning, saving, investing, budgeting, taxation, retirement planning, insurance coverage, estate planning, and dealing with financial advisors are important for professionals worldwide.

Future Research

Further research is critical to determine the most effective modes of instruction and assessment. Quantifying knowledge retention is particularly important because the value of financial literacy interventions dissipates over time.(52) Also, rigorous longitudinal studies are needed to quantify the impact of financial literacy curricula on decision-making and wellness; and to explore whether alternative instructional modalities, such as webinars or asynchronous online presentations, are more effective than traditional in-person instruction. Identification of effective alternative delivery methods is especially important because novel modalities could help overcome scheduling challenges.

Conclusions

Our study is the first review of existing research on personal finance literacy for medical students and physician trainees. It is also the first study that proposes a curriculum guided by extensive review of published curricula. Our review confirms strong interest in financial literacy among medical students and physician trainees in a variety of specialties and highlights the importance of financial decision-making as a necessary personal skill. Further research is needed to quantitatively examine longitudinal outcomes, including changes in quality and quantity of actual financial decisions, and impact on physician wellness. Our proposed curriculum, if implemented and evaluated over time, may provide the opportunity to investigate these areas through impact evaluation.

Declarations

Ethical approval and consent to participate: Not applicable.

Consent for publication: Not applicable.

Availability of data and materials: Not applicable.

Competing interests: Drs. Igu and Zakaria declare that they have no competing interests. Dr. Bar-Or reports that he has written books on financial literacy and is occasionally paid to teach financial literacy.

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Figures

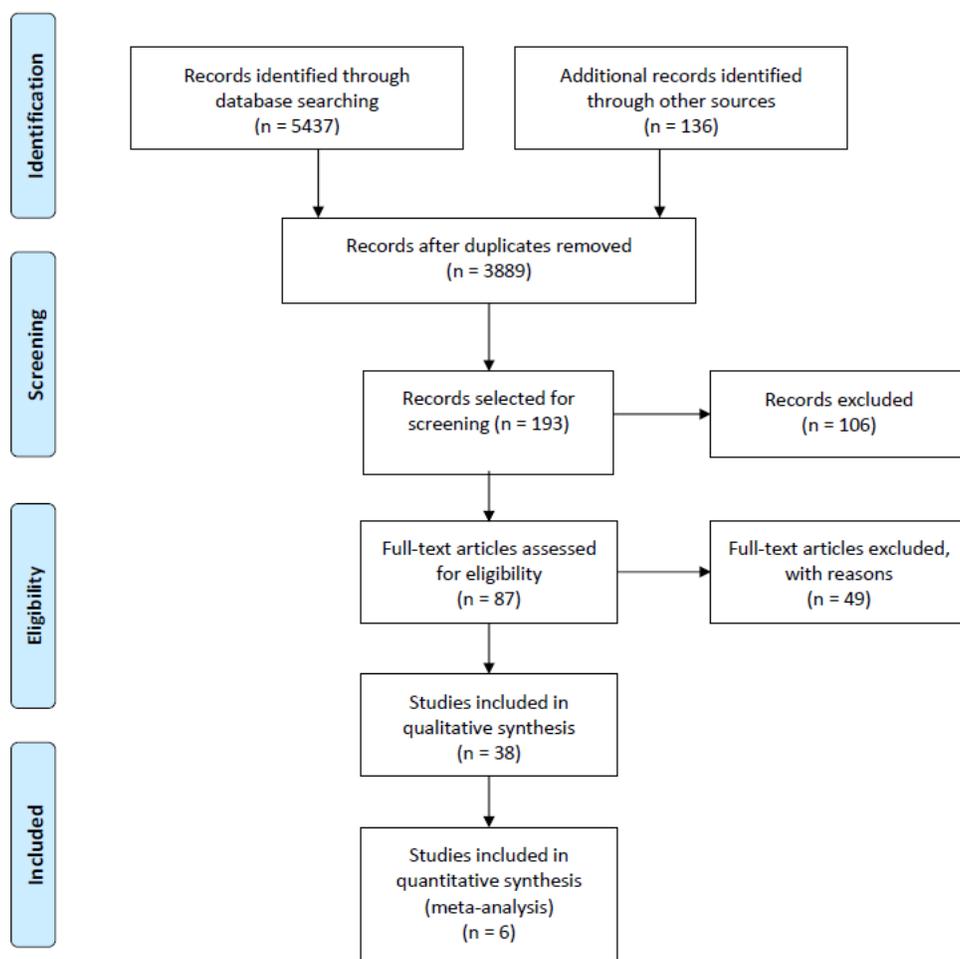


Figure 1

PRISMA Protocol literature search results

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