



OPEN ACCESS

What benefits do healthcare organisations receive from leadership and management development programmes? A systematic review of the evidence

Gabriel Seidman ,¹ Laurie Pascal,² John McDonough²

¹Global Health and Population, Harvard T H Chan School of Public Health, Boston, Massachusetts, USA

²Health Policy and Management, Harvard T H Chan School of Public Health, Boston, Massachusetts, USA

Correspondence to

Dr Gabriel Seidman, Global Health and Population, Harvard T H Chan School of Public Health, Boston, MA 02115, USA; gabriel.seidman@gmail.com

Received 14 February 2019

Revised 13 August 2019

Accepted 12 October 2019

Published Online First

4 February 2020

ABSTRACT

Introduction Leadership and management training/development programmes have gained increasing institutional attention in healthcare organisations, and they have a wide variety of formats and approaches. However, limited evidence exists about effects of these programmes for the organisations that sponsor them. A minority of healthcare systems in the USA measure the impact of these programmes on organisational metrics such as staff turnover or cost savings. This systematic review sought to answer the question, 'What evidence exists that leadership and/or management development and training programs yield benefits for health care organizations?' These benefits could include return on investment, improved productivity/cohesion/teaming, or increased use of specific management skills (eg, strategic planning) that would directly benefit the organisation.

Methods We followed Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines to conduct a systematic review of the relevant literature. We conducted two searches in PubMed and one in ABI/Inform, a business literature database. All articles included for the study were further categorised according to their relevance for answering the research questions, using predefined criteria based on their methodology and reported findings.

Results Our search included 2462 studies, of which 55 met criteria for inclusion. We identified four potential organisation-level benefits to leadership and management training programmes: benefits to other staff (besides those who participate in the programmes), improved patient safety and satisfaction, tangible benefits from projects that were part of the programme and improved ability/confidence using leadership-related skills by programme participants. However, the research base on this topic is limited.

Conclusion Although this research identified potential benefits of leadership and management programmes at the organisation level, additional research is needed to make definitive conclusions about their impact.

INTRODUCTION

The topic of leadership and management development in healthcare, both for clinical and non-clinical leaders, has gained increasing attention in recent decades as healthcare systems face new challenges and complexities.^{1 2} For example, between April 2014 and March 2015, over 35 000 people had enrolled in one of four programmes offered by the UK's National Health Service Leadership Academy.³ A survey in 2010 of 104 healthcare systems in the USA found that over 50% had

some kind of executive leadership development programme.⁴

Leadership programmes for healthcare professionals can focus on a wide range of topics, including foundational knowledge (eg, healthcare economics, regulatory and compliance issues), execution of projects, managing people and transforming organisations.² They can also take on a wide variety of formats, lengths and other design criteria. This breadth of topics and formats is unsurprising given the multiple levels of leadership needed in healthcare (team, organisational and national) and the different types of competencies and behaviours required for leadership.⁵

Evidence suggests that factors specific to an individual organisation, such as the management team (as opposed to industry and corporate-parent effects), can account for up to one-third of the variation in its profitability.⁶ Further evidence also suggests that investment in human resource management more broadly can reduce turnover and improve profits.⁷

Therefore, as healthcare organisations invest in leadership and management development and training programmes, it is critical to understand the types of potential benefits from these programmes for the individual and for the sponsoring organisation.⁸ Healthcare organisations should have a clear understanding of the kinds of impact that they may expect to achieve from leadership and management development programmes in order to design them appropriately and assess their impact over time. Yet a minority of healthcare systems in the USA measure the impact of their programmes on organisational metrics such as turnover, cost savings or market share.⁴ Accordingly, this review aims to answer the research question: 'What evidence exists that leadership and/or management development and training programs yield benefits for health care organizations?'

To date, at least one systematic review has addressed a similar topic. Frich *et al*⁹ examined the impact of leadership development programmes for physicians on four outcomes: reactions to the programme, knowledge, behaviour/expertise and system results/performance. Frich *et al* found that 'physician leadership development programs are associated with increased self-assessed knowledge and expertise; however, few studies have examined outcomes at a system level' (p 656).

Our systematic review builds on this important work by Frich *et al* and differs from it in two critical ways. First, our research looks at leadership and management development programmes across all



© Author(s) (or their employer(s)) 2020. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

To cite: Seidman G, Pascal L, McDonough J. *BMJ Leader* 2020;4:21–36.

types of professionals working in healthcare, not just physicians. These could include nurse leaders, administrators, public health professionals and academics (ie, in academic medical centres). Second, our review aims to answer a more targeted question than Frich *et al* by specifically looking at the organisational benefits of these types of programmes. Given the investment required to undertake leadership development programmes and the importance of different types of professionals working in healthcare systems, this review can supplement the findings documented by Frich *et al* for healthcare administrators considering whether to undertake leadership or management development programmes.

METHODS

We conducted a systematic review consistent with Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines.¹⁰

Search process and criteria

This search relied on an internal protocol developed by GS in partnership with two librarians at Harvard University (one affiliated with Harvard Medical School and one affiliated with Harvard Business School). The protocol was not registered externally. We conducted two separate searches in PubMed and one in ABI/Inform, a business literature database, on 5 January 2016 and a third search in PubMed in response to reviewer comments on 28 August 2017. Any references from these searches published before this date were eligible for inclusion. The earliest article that was included in this search was published in 1969.¹¹ The search terms for the primary search in PubMed were as follows:

(‘Education, Medical, Continuing’[mesh] OR ‘Staff Development’[Mesh] OR ‘Education, Nursing, Continuing’[MeSH Terms] OR ‘Leadership/education’[Mesh] OR education[tiab] OR training[tiab]) AND (‘Leadership’[mesh] OR leadership[tiab]) AND (‘Physician Executives’[Mesh] OR ‘Nurse Administrators’[Mesh] OR ‘Health Facility Administrators’[Mesh] OR executive*[tiab] OR administrator*[tiab] OR manager*) AND (‘Program Evaluation’ OR ‘Organizational Objectives’[MeSH Terms] OR ‘Cost Benefit Analysis’[mesh] OR evaluat*[tiab] OR cost benefit*[tiab])

We searched reference lists from literature reviews and other highly relevant papers identified during the database searches, including reference lists from all publications by one author (A McAlearney^{4 12 13}) whose work was highly pertinent for this review. We also reviewed any paper included in the Frich *et al* systematic review which had as its evaluation objective knowledge, behaviour/expertise (subjective or objective), or system results/performance (subjective or objective).⁹ (Papers included in Frich *et al* only evaluating participants’ reactions to a leadership programme or subjective knowledge were excluded.) We also conducted consultations with managers focused on leadership development at three academic medical centres in Boston (Beth Israel Deaconess Medical Center, Brigham and Women’s Hospital and Massachusetts General Hospital) and searched the websites of three top executive search firms (Korn Ferry, Boyden and Egon Zehnder), four management consulting firms (McKinsey, BCG, Bain and Deloitte) and the National Center for Healthcare Leadership for published literature on this topic.

Study selection and eligibility criteria

After conducting our search, all titles were reviewed for relevance. After excluding irrelevant titles, we read all abstracts and, when appropriate, full articles to determine both the relevance of the article for our research question and the availability of

relevant data for inclusion. To be included in the review, the reference had to:

- ▶ Analyse or document effects of a leadership or management development programme to an organisation, such as return on investment (ROI), improved productivity/cohesion/teaming, or increased use of specific management skills (eg, strategic planning) that would directly benefit the organisation.
- ▶ Report on a programme which trained executive, practitioner or management-level staff.
- ▶ Report on a programme which did not take place full-time at a college or university (ie, a degree programme); programmes which engaged professionals working full-time but which also culminated in them receiving a degree (eg, a leadership programme for residents that also resulted in the completion of an Masters of Public Health degree) were not excluded.
- ▶ Focus on the healthcare/public health sectors.
- ▶ Be original research with a full article in English available (as opposed to literature reviews, editorials, commentaries, interviews, research abstracts, and so on). In cases where only a research abstract was available but the corresponding full article was not available, the abstract was excluded from our review.

It is worth noting that leadership is critical for supporting quality improvement (QI) initiatives, and leadership and management development programmes often include a component specifically focused on QI.¹⁴ That being said, not all QI strategies specifically require leadership or management development/training. For example, some strategies, such as provider reminder systems, involve more task or process-oriented changes to the organisation, rather than leadership or management training.¹⁵ Therefore, to maintain an appropriate scope which addressed our research question, we did not include a broader review of all types of QI initiatives.

Data collection process

To extract the data for this review, we piloted an Excel-based data collection tool that was used to capture the results, including the author, title, year, journal, abstract, training programme type, relevant outcome metric, outcome result and quality of article data for answering our research question. We categorised articles based on their relevance for answering our research question based on a combination of methodological approach, methodological quality and findings, using the following five categories and corresponding definitions:

- ▶ Articles with quantitative results
 - High relevance: Articles which tested for statistical significance against a control group to evaluate effects on or benefits to the organisation. Effects/benefits were quantified using some methodology other than self-report (eg, peer review, third-party observer, cost savings, and so on).
 - Medium relevance: Articles which used quantitative methods to identify effects on or benefits to the organisation but did not include measure of statistical significance against a control group. Benefits to the organisation quantified using some methodology other than self-report (eg, peer review, third-party observer, cost savings, and so on).
 - Low relevance: Articles which used quantitative methods based on self-report, with or without statistical significance against a control group, to determine effects on/

benefits to the organisation, OR article focused only on reports of increased skills which could be construed as benefitting the organisation (eg, managers' direct reports stating that their employees used conflict resolution skills more frequently) but which were not a direct measure of the organisation's performance.

- Null results: Articles whose methodology qualified as high or medium but found null results for benefits to the organisation.
- ▶ Articles with qualitative results: Articles which explicitly sought to identify benefits beyond those that accrued to programme participants, and which included interviews with individuals other than participants in the development programme, were included in this review. In other words, articles using a qualitative methodology with self-report only were excluded. Descriptive studies of programmes without a summary of benefits for the organisation were (eg, case studies) excluded.

Preliminary results were first presented at a workshop with representatives from leading healthcare institutions including Harvard T H Chan School of Public Health, Harvard Medical School, three affiliated academic medical centres and KPMG. Presenting these preliminary results in this forum allowed us to validate our findings and identify research articles that we had missed during the initial review.

Risk of bias

As with any systematic review, this research has the potential for several forms of bias. First, there is a risk that organisations are more likely to publish results that reflect well on their organisations or programmes, and they are unlikely to publish information with negative results. Organisations are unlikely to publish proprietary financial data relating to their programmes. In addition, evaluations that rely on self-report, which are common for collecting participants' feedback on training programmes, will have self-report bias. Accordingly, although studies with self-report are important for understanding the total evidence base on this topic, they are considered low relevance for making final conclusions about the impact of leadership and management training programmes, as described earlier.

RESULTS

Study selection and study characteristics

Our search strategy identified 2462 articles for review. Of these, we excluded 2063 based on initial title/abstract review and included 399 for detailed review. Of these 399, we ultimately included 55 articles that met inclusion criteria. We excluded two articles that focused on leadership training but whose programmes also had a significant focus on clinical skills, which made disaggregating the impacts of the leadership training from the clinical training impossible.^{16 17} Of these 55 articles, 5 had high relevance, 12 had medium relevance, 30 had low relevance, 2 quantitative articles had null results and 6 articles used qualitative methods relevant for answering our research question. Of the articles with high relevance or null results, only two used a randomised controlled trial design.^{18 19} See figure 1 for the flow chart of study selection for inclusion in the systematic review, and table 1 for the full list of studies included in the systematic review.

Of the 21 articles included in Frich *et al*, 12 met inclusion criteria for our study. Of the nine included in Frich *et al* that we excluded, four were excluded because the outcomes measured were not applicable to our research question (eg, programme participants' ratings of programme quality), and five were

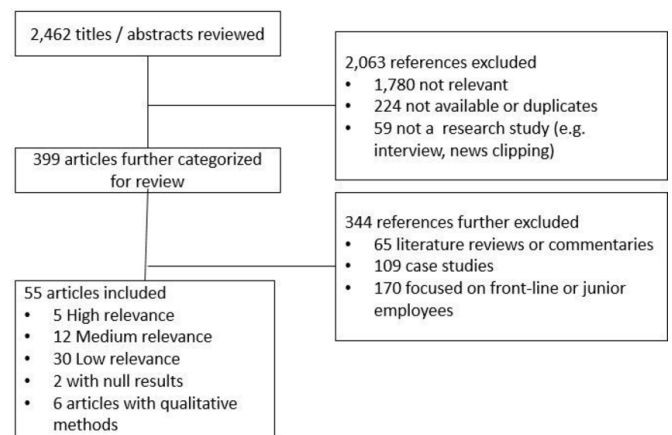


Figure 1 Flow chart of studies included in this review.

excluded because we were unable to find full copies of the articles after searching two academic libraries.^{20–22} The fact that only 12 of the 55 articles in our review were also included by Frich *et al* indicates that our search strategy achieved its goal of reviewing studies for a broader group of participants (eg, nurses and non-clinical managers).

Synthesis of results

The review found a wide range of types of programmes for leadership and management development and training, which included, among others: programmes specifically associated with QIs^{18 23}; programmes focused on training women in leadership positions^{24 25}; trainings for professionals working in specific clinical specialties^{26 27} or public health programmes²⁸; and programmes focused on multidisciplinary teams and cross-team communication.²⁹ These programme types were not necessarily mutually exclusive, and many programmes had multiple training components or multiple intended outcomes.

A limited number of high-relevance articles have attempted to determine the benefits of leadership and management training programmes for organisations. Low-relevance articles tended to use self-report by individuals who participated in training programmes on their changes in leadership-related skills or competencies. While these self-reported improvements in leadership behaviours could translate into other benefits for the organisation (such as increased profits or improved retention of staff), it would be premature to draw any conclusions of this sort from the available literature.

Of the four high-relevance studies, two found statistically significant evidence of improved workplace communication and teaming,^{18 29} one found higher retention rates for women who participated in a career development programme³⁰ and one found improved performance of workshop participants on management skills that impacted their teams (eg, assigning roles).³¹ Across all studies included in our review, four key areas emerged as potential benefits that an organisation might receive from a leadership/management development or training programme. All findings reported below are from studies deemed to have high or medium-quality evidence unless otherwise specified. We also report here several miscellaneous positive effects and several null results.

1. *Benefits to other staff in the organisation, such as increased staff support by leaders/managers or more effective teaming.* This set of benefits had the greatest amount of evidence in the literature reviewed. Benefits to other staff took many different forms, which are not mutually exclusive and which may actually reinforce each other. For example, after

Table 1 Studies included in systematic review

Author	Title	Year	Journal	Relevance	Programme type	Outcome metric	Outcome result
High relevance							
Boyle and Kochinda ²⁹	Enhancing collaborative communication of nurse and physician leadership in two intensive care units	2004	<i>J Nurs Adm</i>	High	Intervention to enhance collaborative communication among nurse and physician leaders in two diverse ICUs.	Changes in unit staff perceptions on collaborative communication before and after interventions; changes in unit staff perceptions of ICU outcomes.	Staff perceived improvement on 5 dimensions of collaborative communication measured, with statistically significant improvement (p<0.05) for problem solving between groups and nursing leadership; staff perceived improvements on ICU outcomes that were not statistically significant.
Chang <i>et al</i> ³⁰	Retaining faculty in academic medicine: the impact of career development programs for women	2016	<i>J Womens Health</i>	High	Evaluation of three Career Development Programs (CDP) aiming to support women faculty at academic medical centres, including by preparing them for leadership roles.	Retention rates of CDP women compared with non-CDP women and CDP men.	Higher retention rates for CDP women compared with non-CDP women and men (p<0.001).
Gilfoyle <i>et al</i> ²¹	Development of a leadership skills workshop in paediatric advanced resuscitation	2007	<i>Med Teach</i>	High	Workshop designed to train residents in leadership specifically relevant to patient resuscitation.	Performance on a 20-item checklist that evaluated specific leadership skills (assigning roles, limitations of team, communication and overall team atmosphere); self-assessment of confidence in leadership role.	Workshop participants scored significantly better on checklists 6 months after workshop compared with controls (p<0.01); participants self-reported statistically significant increases in their competencies.
Jeon <i>et al</i> ¹⁸	Cluster randomized controlled trial of an aged care specific leadership and management program to improve work environment, staff turnover, and care quality	2015	<i>J Am Med Dir Assoc</i>	High	Evaluation of the Clinical Leadership in Aged Care (CLiAC) programme in Australian aged care services.	Measures of workplace environment behaviours using the Work Environment Scale-R (WED-R) and the Multifactor Leadership Questionnaire (MLQ) Rater Form	Statistically significant improvement on transformation leadership, reduction in transactional leadership and passive avoidant behaviour, and improved outcomes of leadership (extra effort, effectiveness and satisfaction).
Shirazi <i>et al</i> ¹⁹	The effects of intervention based on supportive leadership behaviour on Iranian nursing leadership performance: a randomized controlled trial	2016	<i>J Nurs Manag</i>	High	Workshop on supportive leadership behaviour for head nurses.	Demonstration of supportive leadership behaviours, as reported by head nurses' subordinates.	Statistically significant increase in supportive leadership behaviours (p<0.0001) among workshop participants compared with control group.
Medium relevance							
Anonymous ⁴⁰	Assessment tool helps hospital conquer challenges	2006	<i>T+D</i>	Medium	Three-pronged approach to improving leadership in a hospital, including top-down dissemination of training, annual leadership forums and the use of personality-type tests to enhance communication.	Improvement on patient satisfaction scores across 7 metrics, such as 'nurses took time to listen' and 'doctor's concern for comfort'.	Per cent of patients reporting positive experience in creased 4.5%–9.0% across seven different metrics.

Continued

Table 1 Continued

Author	Title	Year	Journal	Relevance	Programme type	Outcome metric	Outcome result
Dannels <i>et al</i> ²⁵	Medical school deans' perceptions of organizational climate: useful indicators for advancement of women faculty and evaluation of a leadership program's impact	2009	<i>Acad Med</i>	Medium	Survey of medical school deans' perceptions of ELAM and its impacts.	Perceptions of ELAM programme, including agreement with the statement, 'I am confident that our ELAM alumnae are more likely to stay at our institution than other women faculty here.'	Average score of 5.11 on Likert scale of 7 (with 7 indicating 'strongly agree').
Foster <i>et al</i> ²³	Residency education, preventive medicine, and population health care improvement: the Dartmouth-Hitchcock leadership preventive medicine approach	2008	<i>Acad Med</i>	Medium	Leadership Preventive Medicine residency, which focuses on leadership of small systems in healthcare, measurement of illness burden in individuals and populations, measurement of the outcomes of health service interventions, leadership of change for improvement of quality, value and safety of healthcare of individuals and populations, and reflection on personal professional practice enabling personal and professional development.	Results of the participant-led practicum projects.	Of the 12 graduates of the programme, the article reports on 8 which achieved positive results (other 4 not reported on).
Green and Plsek ⁴³	Coaching and leadership for the diffusion of innovation in health care: a different type of multi-organization improvement collaborative	2002	<i>Journal on Quality Improvement</i>	Medium	Coaching and leadership initiative to develop new methods of collaborating for organisational learning of best practices, with a focus on generalisable change and deliberate leadership support for deployment, diffusion and sustainability.	Improvement on management indicators for various topics (eg, reduction time from abnormal mammogram findings to definitive diagnosis, reduce patient registration time, improvement in patient experience/self-reported pain, and so on).	Improvement across multiple management and performance indicators.
Haseman <i>et al</i> ³⁹	Practising inspired leadership: the use of applied theatre 'prophetic' in the executive Leadership Development Program for Queensland Health	2009	<i>Aust Health Rev</i>	Medium	Leadership Program including residential workshop for executives, non-residential workshop for managers and supervisors, 360° feedback, executive coaching, web-based support and online learning modules.	Changes in formal grievances, consumer complaints, absenteeism, retention of staff and other metrics.	56% reduction in formal grievances; 28% reduction in consumer complaints; 14% improvement in absenteeism; 17% improvement in retention.
Hultman <i>et al</i> ³²	Sometimes you can't make it on your own: the impact of a professionalism curriculum on the attitudes, knowledge, and behaviors of an academic plastic surgery practice	2013	<i>J Surg Res</i>	Medium	Course on professionalism in plastic surgery for professionals of all levels (faculty, residents, nurses and medical students).	Number of unprofessional behaviours requiring involvement by senior administrators during the 6 months before and after the course.	Number of events reduced from 12 to 3.

Continued

Table 1 Continued

Author	Title	Year	Journal	Relevance	Programme type	Outcome metric	Outcome result
Levine <i>et al</i> ⁴²	Chief resident immersion training in the care of older adults: an innovative interspecialty education and leadership intervention	2008	<i>J Am Geriatr Soc</i>	Medium	Two-day Chief Resident Immersion Training programme formally preparing chief residents for their role; programme required chief residents to develop an action project focused on the management of complex older patients over the following year.	Per cent of participants completing their action projects (paper also reports self-report data related to role performance; these data are not summarised here).	60% of chief residents had completed at least half of their action project, and 18% of chief residents had completed their entire project.
Mansour <i>et al</i> ⁴⁴	Scaling up proven public health interventions through a locally owned and sustained leadership development programme in rural Upper Egypt	2010	<i>Hum Resour Health</i>	Medium	Leadership Development Program in three districts in Egypt aimed to improve health services by increasing managers' ability to create high-performing teams and lead them to achieve results.	Achievement of teams' intended population health goals.	Eight of the 10 health teams achieved 95% of more of their desired results, and family planning visits increased by 20%–68% in the three districts where the programme took place.
Orton <i>et al</i> ⁴¹	Management academy for public health: creating entrepreneurial managers	2007	<i>Am J Public Health</i>	Medium	Trainings for teams, often from local public health agencies, to conduct an action-learning project where teams develop a public health business plan for a sustainable new programme.	Per cent of plans fully implemented, implemented midway, or at initial stages of implementation; per cent of team generating revenue after 2 years.	22%, 17% and 15%, respectively; 38% generating revenue (28 teams generating a total of \$4 million).
Terzic-Supic <i>et al</i> ⁴⁵	Training hospital managers for strategic planning and management: a prospective study	2015	<i>BMC Med Educ</i>	Medium	Training sessions for multidisciplinary teams in Serbia on basic health management, hospital management, health information management and total quality management.	Third-party experts' evaluations of SWOT analyses before and after the training programme.	Statistically significant ($p < 0.001$) improvement on all 16 components of the SWOT analysis.
Tumerman and Carlson ³⁶	Increasing medical team cohesion and leadership behaviors using a 360 degree evaluation process	2012	<i>WMJ</i>	Medium	360° evaluation process.	Per cent of staff seeing changes for the better in physician behaviours in connection to the process (willingness to change, respect, quality of care, support of team members, compassion, efficiency, teamwork).	Per cent of staff seeing improvements ranged from 17% for quality of care to 63% for respect and teamwork.
West <i>et al</i> ³⁵	Evaluation of a clinical leadership initiative	2004	<i>Nurs Stand</i>	Medium	System of mentorship, education and training to address issues with treating mental health issues and care of older people.	Multiple measures by participants' colleagues, including changes in direct care management, decision-making, communication processes, clinical nursing care, reporting and evaluation, and support strategies and processes.	Majority of results suggested that all skills improved.

Low relevance

Continued

Table 1 Continued

Author	Title	Year	Journal	Relevance	Programme type	Outcome metric	Outcome result
Anderson and Lavoie-Tremblay ⁶⁵	Evaluation of the Executive Training for Research Application (EXTRA) program: design and early findings	2008	<i>Health Policy</i>	Low	Programme 'to support evidence-informed decision-making in the organization, management and delivery of health services through funding research, building capacity and transferring knowledge' for health service professionals in senior management positions.	Per cent of participants who believed their knowledge of change management was 'very good' or 'excellent'.	Increase from 37% before the programme to 95% 2 years into the programme.
Bowles and Bowles ⁴⁶	A comparative study of transformational leadership in nursing development units and conventional clinical settings	2000	<i>J Nurs Manag</i>	Low	Nursing development units (NDU) to serve as centres of nursing excellence, innovation and leadership development.	Total leadership score on Leadership Practice Inventory (LPI) by observers.	8% higher score on LPI among NDU nurses than non-NDU nurses.
Brandon and Mullan ⁴⁹	Teaching medical management and operations engineering for systems-based practice to radiology	2013	<i>Acad Radiol</i>	Low	Programme to enhance resident's knowledge and ability to apply concepts from medical management and industrial/operations engineering to radiology practice.	Knowledge of seven domains taught in the programme.	Participants showed statistically significant improvement on all seven domains tested.
Brinkert ⁵⁰	Conflict coaching training for nurse managers: a case study of a two-hospital health system	2011	<i>J Nurs Manag</i>	Low	Training of nurse managers as conflict coaches to improve conflict understanding, interaction strategies and/or interaction skills.	Response to question: To what degree have your goals for the conflict coaching training programme been met?	95% reporting high or moderately high at 3 and 6 months' follow-up.
Burns and Papa ⁵¹	Self-reported changes in nurse manager proficiency resulting from participation in the Rising Star Leadership Program	2008	<i>Pa Nurse</i>	Low	Three-day programme to assist nurses to improve the quality of their individual work environments and units, advocate for health employee lifestyles, become vigilant about patient safety and develop oneself and develop others.	Per cent of nurse managers rating training as useful for their work 3 and 6 months after the training (response of 'high' or 'moderately high').	95% at 3 and 6 months.
Cooper ⁶⁶	An evaluation of the Leading an Empowered Organisation programme	2003	<i>Nurs Stand</i>	Low	NHS leadership development programme Leading an Empowered Organisation (LEO).	Change in self-rating of performance on five leadership behaviours (articulating the goal, maintaining organisational objectives, exhibiting trust, presenting challenging opportunities and getting outside support) before and after the programme.	P<0.05 for four out of five behaviours, and p=0.052 for exhibiting trust.
Crites and Schuster ²⁶	A preliminary report of an educational intervention in practice management	2004	<i>BMC Medical Education</i>	Low	Exploratory study on a practice management curriculum for primary care residents.	Practice knowledge on 12 management topics, including revenue management, dynamics of group practice and risk management.	Mean correct score on the practice knowledge test increased from 71% before participating in the curriculum to 91% after the curriculum.

Continued

Table 1 Continued

Author	Title	Year	Journal	Relevance	Programme type	Outcome metric	Outcome result
Dannels <i>et al</i> ⁶²	Evaluating a leadership program: a comparative, longitudinal study to assess the impact of the Executive Leadership in Academic Medicine (ELAM) program for women	2008	<i>Acad Med</i>	Low	Executive Leadership in Academic Medicine (ELAM)—yearlong development programme for senior women faculty in US and Canadian medical schools.	Comparison of self-report of leadership competencies between ELAM participants and controls: knowledge of theory, environmental scanning, financial management, communication skills, conflict management, diversity competence, tolerance for demands of leadership and leadership positioning.	ELAM participants self-reported higher scores for all competencies, with $p<0.001$ for all except for conflict management ($p<0.05$) and diversity competence (not statistically significant).
Day <i>et al</i> ²⁷	Effectiveness of the AAOS leadership fellows program for orthopaedic surgeons	2010	<i>The Journal of Bone & Joint Surgery</i>	Low	One-year programme designed to train young orthopaedic surgeons to become future leaders in orthopaedics.	Comparison of self-reported confidence on knowledge of theory, environmental scanning, financial management, communication skills, conflict management, diversity competence, tolerance for demands of leadership and leadership positioning between programme participants and rejected applicants.	Higher confidence by programme participants on all dimensions except financial management, with statistically significant differences ($p<0.05$) for knowledge of theory, tolerance for demands of leadership and leadership positioning.
Duygulu and Kublay ³³	Transformational leadership training programme for charge nurses	2011	<i>J Adv Nurs</i>	Low	Transformational leadership training programme on unit charge nurses' leadership practices.	Scores on LPI for five traits (model the way, inspire a shared vision, challenge the process, enabling others to act and encourage the heart) over the course of four evaluations by observers (colleagues).	Nurses showed statistically significant improvement ($p=0.001$) for all five traits.
Edler <i>et al</i> ⁶⁷	Leadership lessons from military education for postgraduate medical curricular improvement	2010	<i>The Clinical Teacher</i>	Low	Leadership Education and Development Program for paediatric anaesthesia residents.	'Leadership evaluation' of residents by faculty (scored from 1 to 9).	Preintervention score 6.8; postintervention score 7.6 ($p<0.05$).
Fiset <i>et al</i> ⁵⁹	Clinical nursing leadership education in long-term care: intervention design and evaluation	2017	<i>J Gerontol Nurs</i>	Low	Targeted intervention on leadership education for RNs, registered practical nurses and nursing administrators.	Self-reported perceptions of improvement on various competencies, such as 'self-awareness and personal insight' and 'ability to give feedback to others' in survey 3 months after intervention.	All nurses agreed that they had improved along all dimensions measured.
Group Health Research Institute ⁵³	NLAPH cohort 2 evaluation report: executive summary	2014		Low	Team-based applied leadership programmes that use real-world community health improvement projects to provide opportunities for participants to apply new leadership skills and approaches in a multisector operating environment.	Self-reported scores on five domains: individual leadership mastery, effectively work across sectors, application of continuous QI, appropriately use data and public health perspective.	Participants reported improvements on all five domains.

Continued

Table 1 Continued

Author	Title	Year	Journal	Relevance	Programme type	Outcome metric	Outcome result
Hanna <i>et al</i> ⁵⁴	Training future surgeons for management roles: the resident-surgeon-manager conference	2012	<i>Arch Surg</i>	Low	1-day management seminar for senior surgical residents.	Self-report of competence levels for nine managerial skills required for efficient management of a surgical service or practice (% rating themselves 'Good' or 'Excellent').	Statistically significant improvement on 7 of 9 skills.
Hartley and Garrett ⁶⁰	Impact of a management assessment centre in developing proficient health managers	1997	<i>Aust Health Rev</i>	Low	Australian Management Competencies Assessment Centre, which assesses participants on 10 leadership/management dimensions and allows them practice skills in those dimensions.	Self-report by programme participants on management competencies, use of a professional development plan and use of continuing professional education, compared with non-programme participants.	Programme participants self-rated high on four dimensions: leadership, achievement, strategic planning and innovation ($p<0.05$), completed more work using their personal development plan ($p<0.05$), and accessed more continuing education resources ($p<0.05$).
Korschun <i>et al</i> ⁶⁸	Realizing the vision of leadership development in an academic health center: the Woodruff Leadership Academy	2007	<i>Academic Medicine</i>	Low	Leadership academy including physicians, PhD faculty, academic administrators and other staff focused on developing leadership skills relevant to the Woodruff Health Sciences Center (WHSC).	Self-report in response to various questions about the impact of the leadership academy.	Select results: 98% of participants agreed or strongly agreed that the academy increased their commitment to and support of the vision and strategies of WHSC; 96% of participants strongly agreed, agreed, or slightly agreed that participation in the academy made the more likely to stay at WHSC.
Krejci and Malin ⁵⁵	Impact of leadership development on competencies	1997	<i>Nurs Econ</i>	Low	Leadership programme designed to train nurse managers to improve outcomes in a cost-effective manner.	Self-reported ability on 12 competencies, including change, communication and systems thinking.	Statistically significant ($p<0.01$) improvement on self-report ability for all 12 competencies.
Leslie <i>et al</i> ⁶¹	Training young paediatricians as leaders for the 21st century	2005	<i>Pediatrics</i>	Low	Training programme for young paediatricians focused on self-management skills, systems management skills and leadership competencies within the context of a team.	Self-reported competencies on taught domains and achievement of personal goals in one or more of the domains.	Statistically significant increase in self-rated performance on all 20 competencies measured; 87% of respondents reported that they had at least partially achieved their goal.
LoPresti <i>et al</i> ⁴⁸	Using a simulated practice to improve practice management learning	2009	<i>Family Medicine</i>	Low	'Simulated practice' with 20 modules on specific practice management tasks for residents.	Pretest/post-test comparison (between-group compared with control and within-group analysis) on a practice management examination.	Programme participants showed better performance on examination compared with controls ($p=0.006$) and in within-group pretest/post-test analysis ($p=0.0060$).

Continued

Table 1 Continued

Author	Title	Year	Journal	Relevance	Programme type	Outcome metric	Outcome result
Martin <i>et al</i> ⁴⁷	Evaluation of a clinical leadership programme for nurse leaders	2012	<i>J Nurs Manag</i>	Low	Clinical leadership programme focused on leadership competencies for nurse leaders in Switzerland.	Observer-reported scores on five leadership competencies over time: model the way, inspire a shared vision, challenge the process, enable others to act and encourage the heart.	Statistically significant improvement on observer-reported scores for Inspire a Shared Vision and Challenge the Process.
McAlearney <i>et al</i> ¹³	Developing effective physician leaders: changing cultures and transforming organizations	2005	<i>Hospital Topics</i>	Low	Medical leadership development programme for academic and community physicians at a hospital in Ohio.	Self-report by participants on their current leadership, their ability to lead teams, their ability to work in teams and several other dimensions, before and after the programme.	Increases in self-report on all dimensions.
McDade <i>et al</i> ⁶⁹	Effects of participation in the Executive Leadership in Academic Medicine (ELAM) program on women faculty's perceived leadership capabilities	2004	<i>Academic Medicine</i>	Low	Leadership skill development, mentoring and networking for women faculty members in medical and dental schools.	Changes in self-report on 10 constructs/skills related to leadership.	Statistically significant improvement ($p < 0.001$) on all 10 constructs.
Omar <i>et al</i> ⁶⁶	Training evaluation: a case study of training Iranian health managers	2009	<i>Hum Resour Health</i>	Low	Trainings for lower level managers given new roles and responsibilities in a newly decentralised health system in Iran.	Self-report of participants stating that knowledge was used 'often' for 12 skills.	Respondents saying they used knowledge often ranged from ~25% for 'leadership role' to ~77% for 'work effectively in a group'.
Patel <i>et al</i>	Building the pipeline: the creation of a residency training for future physician leaders in health care quality	2015	<i>Acad Med</i>	Low	Healthcare Leadership in Quality (HLQ) programme that included integration into an interprofessional healthcare leadership team.	Knowledge of the Quality Improvement Knowledge Assessment Tool before and after training.	Statistically significant increase ($p < 0.05$) in knowledge as assessed by this tool.
Pollitt ⁷⁰	Guinness Northern Counties begins to build a coaching culture	2012	<i>Training & Management Development Methods</i>	Low	Training for middle managers on modern leadership, team branding, value for money, influencing, team development and management change.	Cost savings identified during training of middle managers.	£900 000 (compared with £108 000 investment in training programme).
Porter <i>et al</i> ⁵⁷	The management academy for public health: a new paradigm for public health management development	2002	<i>J Public Health Manag Pract</i>	Low	Curriculum designed to train teams of managers on skills such as managing money, people and data.	Self-reported skill levels for 10 competencies, such as managing and executing strategies, managing people and communication.	Statistically significant improvement ($p < 0.0001$) on all 10 competencies.

Continued

Table 1 Continued

Author	Title	Year	Journal	Relevance	Programme type	Outcome metric	Outcome result
Richman <i>et al</i> ²⁴	Advancing women and closing the leadership gap: the Executive Leadership in Academic Medicine (ELAM) program experience	2001	<i>Journal of Women's Health and Gender-Based Medicine</i>	Low	Evaluation of ELAM across participating schools.	Self-report of performance on six curricular areas from the first three ELAM classes (financial management, career advancement, personal leadership, converging paradigms of academic and corporate leadership, emerging issues and strategic planning).	Increase in self-reported performance on all six curricular areas ($p < 0.0001$).
Richter <i>et al</i> ²⁸	Evaluation results of the CDC/ASPH Institute for HIV Prevention Leadership: a capacity-building educational program for HIV prevention program managers	2007	<i>J Public Health Manag Pract</i>	Low	Capacity-building programme for HIV prevention programme managers in minority-based, community-based organisations.	Self-reported frequency of and confidence performing 11 relevant public health prevention and strategic planning and management activities, such as community assessments, advocacy and creating a learning environment.	Statistically significant increase in self-reported frequency and confidence on all activities.
Saleh <i>et al</i> ⁵⁸	Evaluating the effectiveness of public health leadership training: the NEPHLI experience	2004	<i>American Journal of Public Health</i>	Low	Yearlong experiential programme aimed at building and improving the leadership skills of current and future public health practitioners.	Self-reported competency levels and frequency of use of 15 leadership practices, including 'cope with and lead changes in public health practice' and 'mobilize resources in the community needed to increase access to public health services'.	Statistically significant ($p < 0.05$) increase on self-reported competence for all practices and on self-reported frequency of use for four practices (cope with and lead changes in public health practice; deal with cultural and ethnic diversity in the context of access to health services; understand the administrative, social and political implications of alternative policy options; use visual representation of data to identify public health problems).
Talbot <i>et al</i> ⁷¹	Five Weekend National Family Medicine Fellowship Program for faculty development	1997	<i>Can Fam Physician</i>	Low	Five Weekend National Family Medicine Fellowship which focuses on the essentials of education, management, communication, critical appraisal skills and the principles of family medicine to develop leadership and team-building skills for faculty and community-based physicians.	Results of projects completed as part of the programme.	>20 presentations at College of Family Physicians of Canada (CFPC), >10 publications being developed and various other applications of projects (out of a total 34 projects).
Null effect							

Continued

Table 1 Continued

Author	Title	Year	Journal	Relevance	Programme type	Outcome metric	Outcome result
Cummings <i>et al</i> ⁶⁴	Worklife improvement and leadership development study: a learning experience in leadership development and 'Planned' organizational change	2013	<i>Health Care Management Review</i>	Null effect	Leadership Development Initiative to facilitate organisational learning among healthcare managers at the Alberta Cancer Board.	Six subscales on the Areas of Worklife Survey: workload, control, reward, community, fairness and values.	No statistically significant changes in self-reported worklife by initiative participants.
Wallen <i>et al</i> ⁶³	Implementing evidence-based practice: effectiveness of a structured multifaceted mentorship programme	2010	<i>J Adv Nurs</i>	Null effect	Structured multifaceted mentorship programme designed to implement evidence-based practice (EBP).	Comparison of Mentorship Program Group and Comparison Group on EBP beliefs, organisational culture and readiness, EBP implementation, job satisfaction, group cohesion, nurse retention index and intent to leave.	No statistically significant differences between control and intervention groups except for an improvement on EBP beliefs in the intervention group.
Qualitative study							
Boomer and McCormack ³⁴	Creating the conditions for growth: a collaborative practice development programme for clinical nurse leaders	2010	<i>J Nurs Manag</i>	Qualitative	Leadership practice development using work-based and action learning.	N/A	Reports indicated progress towards various leadership skills, including becoming reflexive, becoming proactive, valuing teamwork, becoming a facilitator and nursing processes.
Champagne <i>et al</i> ⁷²	Organizational impact of evidence-informed decision making training initiatives: a case study comparison of two approaches	2014	<i>Implement Sci</i>	Qualitative	Impact of two programmes on evidence-informed decision-making (EIDM).	N/A	Training programmes can improve attitudes towards EIDM and, to a lesser extent, conversion of these attitudes into skills.
Dierckx de Casterle <i>et al</i> ³⁸	Impact of clinical leadership development on the clinical leader, nursing team and care-giving process: a case study	2008	<i>J Nurs Manag</i>	Qualitative	Clinical leadership programme (CLP) for nurses in a large academic hospital.	N/A	Leadership learning seen as iterative, ongoing process which can increase personal effectiveness, self-awareness, communication skills and other relevant skills.
Enterkin <i>et al</i> ⁷³	Clinical leadership for high-quality care: developing future ward leaders	2013	<i>J Nurs Manag</i>	Qualitative	Series of workshops for improving personal influencing skills, high-impact communication, creating a positive ward environment, leading service and practice innovation, managing change, quality improvement and managing staff among ward leaders (nurses).	N/A	Participants reported increased political, organisational and self-awareness, increased confidence, feelings of empowerment and the ability to empower others.

Continued

Table 1 Continued

Author	Title	Year	Journal	Relevance	Programme type	Outcome metric	Outcome result
Singer <i>et al</i> ³⁷	A case for safety leadership team training of hospital managers	2011	<i>Health Care Management Review</i>	Qualitative	Safety Leadership Team Training with modules on (1) introduction and appreciative inquiry, (2) theoretical framework and employee survey, (3) simulation exercise and debrief, (4) the 'Game Plan' project management exercise, and (5) a follow-up programme.	N/A	Respondents reported that the training increased behaviours such as 'showing you really care', 'demonstrating a welcoming/nondefensive attitude', 'encouraging speaking up', 'facilitating teamwork and communication', 'taking action', 'mobilizing information' and 'seeking input'.
Singer <i>et al</i> ⁷⁴	Making time for learning-oriented leadership in multidisciplinary hospital management groups	2015	<i>Health Care Management Review</i>	Qualitative	Safety Leadership Team Training with modules on (1) introduction and appreciative inquiry, (2) theoretical framework and employee survey, (3) simulation exercise and debrief, (4) the 'Game Plan' project management exercise, and (5) a follow-up programme.	N/A	Learning-oriented leadership which promoted a mutually supportive environment and which specifically made time for learning facilitated achievement of these outcomes.

ICU, intensive care unit; N/A, not applicable; NHS, National Health Service; QI, quality improvement; RN, registered nurse; SWOT, strengths, weaknesses, opportunities and threats.

the implementation of the programme in one of the high-relevance articles mentioned earlier, staff reported a statistically significant increase in support from their supervisors and in transformational (as opposed to transactional) leadership behaviours among programme participants, while also reporting a statistically significant decrease in 'passive avoidant' and 'laissez-faire' management styles.¹⁸ Similar benefits found in other studies included improved problem solving between groups and nursing leadership²⁹; a reduction in the number of unprofessional behaviours that required intervention by the chair of a medical department or someone of similar stature³²; increased practice of 'enabling others to act' by a leader³³; increased valuing or practising of teamwork/collaboration^{34–37}; increased respect or caring for staff^{36 37}; increased availability and support to employees^{34 36}; increased clarity of communication to staff³⁸; increased demonstration of supportive leadership behaviours towards subordinates¹⁹; and increased general workplace culture and morale.³⁹ The majority of these studies did not test for statistical significance, and several used qualitative, rather than quantitative, research methodologies.

2. *Improvements in patient satisfaction or other patient-related metrics.* Several studies found improved patient satisfaction scores on Press Ganey surveys, with improved metrics including 'how well pain was controlled',⁴⁰ 'nurses took time to listen'⁴⁰ and general satisfaction with services.³² Studies also found that various programmes were associated with a reduction in patient complaints³²; improved communication between staff and patients^{34 35 38}; and improved continuity of care.³⁸ None of these studies tested for statistical significance and some used qualitative research methodologies.
3. *Achievement of a specific tangible benefit to the organisation associated with a project in the programme.* Several development or training programmes included specific projects,

- and the success of these projects could directly benefit the sponsoring organisation. In one programme that focused on creating revenue-generating projects, 38% of all teams had generated revenue from their projects within 5 years after the training programme (for a total \$4 million across all projects),⁴¹ and another programme focused on training middle managers helped identify £900 000 in cost savings (compared with £108 000 investment in the training programme). Several programmes focused on improving management indicators for various clinical topics (eg, reduction in time from abnormal mammogram findings to definitive diagnosis, reduction in patient registration time, improvement in patient experience, and so on) found that programme participants had completed their projects^{23 42} or achieved improvements on key indicators.⁴³ A leadership development programme in Egypt taught local health managers and their teams leadership and management skills with the aim to 'improve the quality and accessibility of health services' through performance improvement projects. In the first year of the programme, 8 of the 10 projects in the programme had achieved 95% of their self-determined health performance targets.⁴⁴
4. *Increased confidence/use of leadership and management skills by programme participants.* Although the demonstration of and/or confidence in leadership/management competencies are not necessarily tangible benefits to an organisation, an improvement on these dimensions after training programmes could lead directly or indirectly to more tangible benefits. For example, one study identified a statistically significant improvement in the ability of managers to use a specific management tool (strengths, weaknesses, opportunities and threats analysis) after training.⁴⁵ Similarly, other studies found managers increasingly being proactive in leadership roles,³⁴ acting as a facilitator after their training,^{34 37} 'inspiring a shared vision' among staff,^{46 47} becoming more com-

portable with the demands expected of a leader²⁷ and having more concrete knowledge of management practice^{26 48 49} or QI techniques. One high-relevance study found statistically significant improvement in an objective measure of team leadership skills by paediatric residents participating in a leadership workshop.³¹ Various other studies using self-report to measure confidence or use of specific leadership/management skills also found improvements after a training programme.^{50–62} Note that all articles relying only on self-report were considered ‘low relevance’ for the purposes of answering the research question and should not be considered strong evidence of a benefit to the organisation.

5. *Miscellaneous effects/benefits.* In addition to the four themes mentioned above, several articles identified miscellaneous effects or benefits. These effects were not normally documented across multiple studies. One study found that participants in leadership development programmes were more likely to hold a role as the chair of a national committee (eg, committees associated with professional associations), which could benefit the organisation by increasing its prestige.²⁷ One study found that deans of academic medical centres who were more confident than female faculty who had participated in a leadership development programme were more likely than other female faculty to stay at their institution, although this finding was strictly a perception and not an actual observed effect.²⁵ One study found a statistically significant increase in staff retention among participants in the training programme.³⁰
6. *Null results.* Several studies found no statistically significant impact of leadership training on outcomes such as retention,^{18 63} job satisfaction,^{18 63} clinical outcomes¹⁸ or ‘work-life’ (ie, workload, control, fairness, and so on).⁶⁴

DISCUSSION

This research identified limited evidence of several benefits to organisations from leadership/management development and training programmes. However, there was not substantial, quantified evidence that such programmes have direct, tangible benefits for organisations in the form of ROI, reduced turnover or other potentially desired outcomes. This finding is consistent with the finding by Frich *et al* that ‘the majority of studies [on this topic] relied on learner satisfaction scores and self-assessed knowledge or behavioral change’ (p 656).⁹ Nonetheless, the absence of evidence does not necessarily equate to the absence of an effect. Rather, this review suggests that further research and more robust evaluation methodologies are needed, since a low percentage of training programmes use organisational metrics to measure their impact,⁴ and since our review found a limited research base on this topic.

This review included a diverse array of programmes designed for a variety of executives and managers in many different types of organisations, with potentially different goals in mind. Given the broad range of types of programmes, it would be difficult to develop a cohesive framework that would effectively categorise all the different types of programmes. The findings suggest that no single programme format will provide a ‘silver bullet’ to address the needs of all executive leaders or managers in all organisations and that different training goals require different designs. In the absence of very clear evidence for a single way to deliver training programmes, programmes should consider various factors to help promote clarity in the design and evaluation process. These factors include organisational context in which the leaders/managers operate, the goals of the programme given that organisational context, the knowledge, skills and abilities that will most benefit

the participants and the organisation in achieving these goals, the pedagogical modes (eg, didactic training, experiential exercise, simulation) that will best facilitate retention and application of the learning and the evaluation mechanisms to be used in measuring programme outcomes against stated goals.

Limitations of this research and risk of bias

As already noted, the ability to draw conclusions about the impact of leadership and management training programmes at the organisational level is limited by the restricted evidence base on this topic. In addition to the fact that the research base and associated methods are limited in general (with only two randomised controlled trials), there are several risks for bias in the literature. First, institutions, particularly for-profit companies, are unlikely to publish ROI analyses or other financial data about their programmes. Among the information that is published, institutions are more likely to publish findings with positive results that reflect well on themselves. Indeed, while we found two articles with null results, we found that negative results were rarely if ever reported. Self-report introduces considerable bias into the evaluation of programmes’ effectiveness, which is why all articles relying solely on self-report were considered low relevance for our study.

Directions for future research

More research is needed on the impact of leadership and management training programmes at the organisation level. Although research on the direct financial implications of programmes at private institutions may be difficult to conduct or report publicly, research on other benefits to the organisation which could indirectly have positive financial impacts would also be relevant for the literature. Possible outcomes of interest include patient satisfaction, patient safety and other outcomes, staff retention and performance on quality criteria. In addition, research efforts should continue to analyse the various factors which promote or impede the success of leadership and management training programmes, and how these factors have differential impact on different types of outcomes. Academic medical centres could be particularly well positioned to conduct further research on this topic. Finally, despite the complex nature of evaluating programmatic effectiveness in large organisations, it is important for researchers to use rigorous methods in assessing leadership/management development programmes, given only two high-relevance articles included in this review used a randomised controlled trial design.

CONCLUSION

Although leadership and management training programmes are widespread, the research on their tangible impacts at the organisational level, such as a ROI, is very limited right now. Our research identified at least four potential effects/benefits of these types of programmes at the organisational level: benefits to other staff in the organisation, improvements in patient satisfaction or safety, achievement of specific project-related goals and increased confidence using leadership-related skills by programme participants. However, given the limited evidence base on this topic, more research is needed to identify the institution-level benefits of investing in these types of programmes.

Acknowledgements The authors thank Jonty Roland at KPMG for his input in structuring the research question and overall approach. The authors thank Nancy Kane and Sara Singer at Harvard T H Chan School of Public Health for their extensive

input into the research approach, multiple drafts of the manuscript and the list of articles to include in the review.

Contributors GS, LP and JM all conceived the research question and overall approach. GS designed the research protocol with two Harvard librarians. GS conducted a first review all articles in the database and wrote the first draft of the manuscript. GS, LP and JM all edited subsequent versions of the manuscript and recommended additional articles not originally included in the first database search.

Funding An original draft of this paper was commissioned by KPMG.

Competing interests None declared.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement All data relevant to the study are included in the article or uploaded as supplementary information.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iD

Gabriel Seidman <http://orcid.org/0000-0002-9167-2595>

REFERENCES

- Dubinsky I, Feerasta N, Lash R. A model for physician leadership development and succession planning. *Healthc Q* 2015;18:38–42.
- National Center for Healthcare Leadership. Physician leadership development programs: best practices in healthcare organizations, 2014. Available: http://www.nchl.org/Documents/Ctrl_Hyperlink/NCHL_Physician_Leadership_Development_White_Paper_Final_05.14_uid9142015803251.pdf
- NHS Leadership Academy. *Annual review: 2014-2015*, 2015.
- McAlearney AS. Executive leadership development in U.S. health systems. *J Healthc Manag* 2010;55:206–24. discussion 223–204.
- West M, Armit K, Loewenthal L, et al. *Leadership and leadership development in healthcare: the evidence base*. London: Faculty of Medical Leadership and Management, 2015.
- McGahan AM, Porter ME. What do we know about variance in accounting profitability? *Manage Sci* 2002;48:834–51.
- Huselid MA. The impact of human resource management practices on turnover, productivity, and corporate financial performance. *Academy of Management J* 1995;38:635–72.
- Anderson MM, Garman AN. *Leadership development in healthcare systems: towards an evidence-based approach*, 2014.
- Frich JC, Brewster AL, Cherlin EJ, et al. Leadership development programs for physicians: a systematic review. *J Gen Intern Med* 2015;30:656–74.
- PRISMA. PRISMA: transparent reporting of systematic reviews and meta-analyses, 2015. Available: <http://www.prisma-statement.org/> [Accessed 6 Sep 2016].
- Whitsell LJ. Learning disorders as a school health problem. Neurological and psychiatric aspects. *Calif Med* 1969;111:433–45.
- McAlearney AS. Leadership development in healthcare: a qualitative study. *J Organ Behav* 2006;27:967–82.
- McAlearney AS, Fisher D, Heiser K, et al. Developing effective physician leaders: changing cultures and transforming organizations. *Hosp Top* 2005;83:11–18.
- Hardacre J, Cragg R, Shapiro J, et al. *What's leadership go to do with it? exploring links between quality improvement and leadership in the NHS*. The Health Foundation, 2011.
- Hughes RG. Chapter 44 Tools and Strategies for Quality Improvement and Patient Safety. In: Hughes RG, ed. *Patient safety and quality: an evidence-based Handbook for nurses*. Rockville (MD): Agency for Healthcare Research and Quality (US), 2008.
- Ellard DR, Chimwaza W, Davies D, et al. Can training in advanced clinical skills in obstetrics, neonatal care and leadership, of Non-physician clinicians in Malawi impact on clinical services improvements (the ETATMBA project): a process evaluation. *BMJ Open* 2014;4:e005751.
- Ellard DR, Shemdoe A, Mazuguni F, et al. Can training Non-physician clinicians/associate clinicians (NPCs/ACs) in emergency obstetric, neonatal care and clinical leadership make a difference to practice and help towards reductions in maternal and neonatal mortality in rural Tanzania? the ETATMBA project. *BMJ Open* 2016;6:e008999.
- Jeon Y-H, Simpson JM, Li Z, et al. Cluster randomized controlled trial of an aged care specific leadership and management program to improve work environment, staff turnover, and care quality. *J Am Med Dir Assoc* 2015;16:629.e19–e28.
- Shirazi M, Emami AH, Mirmoosavi SJ, et al. The effects of intervention based on supportive leadership behaviour on Iranian nursing leadership performance: a randomized controlled trial. *J Nurs Manag* 2016;24:400–8.
- Cordes DH, Rea DF, Rea J, et al. A program of management training for residents. *Acad Med* 1989;64:45–6.
- Stoller JK, Rose M, Lee R, et al. Teambuilding and leadership training in an internal medicine residency training program. *J Gen Intern Med* 2004;19:692–7.
- Weiss RL. A clinical laboratory management elective for pathology residents. *Arch Pathol Lab Med* 1992;116:108–10.
- Foster T, Regan-Smith M, Murray C, et al. Residency education, preventive medicine, and population health care improvement: the Dartmouth-Hitchcock leadership preventive medicine approach. *Acad Med* 2008;83:390–8.
- Richman RC, Morahan PS, Cohen DW, et al. Advancing women and closing the leadership gap: the executive leadership in academic medicine (ELAM) program experience. *J Womens Health Gend Based Med* 2001;10:271–7.
- Dannels S, McLaughlin J, Gleason KA, et al. Medical school deans' perceptions of organizational climate: useful indicators for advancement of women faculty and evaluation of a leadership program's impact. *Acad Med* 2009;84:67–79.
- Crites GE, Schuster RJ. A preliminary report of an educational intervention in practice management. *BMC Med Educ* 2004;4.
- Day CS, Tabrizi S, Kramer J, et al. Effectiveness of the AAOs leadership fellows program for orthopaedic surgeons. *J Bone Joint Surg Am* 2010;92:2700–8.
- Richter DL, Dauner KN, Lindley LL, et al. Evaluation results of the CDC/ASPH Institute for HIV prevention leadership: a capacity-building educational program for HIV prevention program managers. *J Public Health Manag Pract* 2007;Suppl:S64–71.
- Boyle DK, Kochinda C. Enhancing collaborative communication of nurse and physician leadership in two intensive care units. *J Nurs Adm* 2004;34:60–70.
- Chang S, Morahan PS, Magrane D, et al. Retaining faculty in academic medicine: the impact of career development programs for women. *J Womens Health* 2016;25:687–96. 2002.
- Gilfoyle E, Gottesman R, Razack S. Development of a leadership skills workshop in paediatric advanced resuscitation. *Med Teach* 2007;29:e276–83.
- Hultman CS, Halvorson EG, Kaye D, et al. Sometimes you can't make it on your own: the impact of a professionalism curriculum on the attitudes, knowledge, and behaviors of an academic plastic surgery practice. *J Surg Res* 2013;180:8–14.
- Duygulu S, Kublay G. Transformational leadership training programme for charge nurses. *J Adv Nurs* 2011;67:633–42.
- Boomer CA, McCORMACK B. Creating the conditions for growth: a collaborative practice development programme for clinical nurse leaders. *J Nurs Manag* 2010;18:633–44.
- West B, Lyon MH, McBain M, et al. Evaluation of a clinical leadership initiative. *Nurs Stand* 2004;19:33–41.
- Turnerman M, Carlson LMH. Increasing medical team cohesion and leadership behaviors using a 360-degree evaluation process. *WJM* 2012;111:33–7.
- Singer SJ, Hayes J, Cooper JB, et al. A case for safety leadership team training of hospital managers. *Health Care Manage Rev* 2011;36:188–200.
- DIERCKX de CASTERLÉ B, Willems AN, Verschuere M, et al. Impact of clinical leadership development on the clinical leader, nursing team and care-giving process: a case study. *J Nurs Manag* 2008;16:753–63.
- Haseman BC, Crethar MP, Phillips JN, et al. Practising inspired leadership: the use of applied theatre "prophetic" in the executive Leadership Development Program for Queensland Health. *Aust Health Rev* 2009;33:377–81.
- Anonymous. Assessment tool helps Hospital conquer challenges. *T + D* 2006;60:68–9.
- Orton S, Umble K, Zelt S, et al. Management Academy for public health: creating entrepreneurial managers. *Am J Public Health* 2007;97:601–5.
- Levine SA, Chao SH, Brett B, et al. Chief resident immersion training in the care of older adults: an innovative interspecialty education and leadership intervention. *J Am Geriatr Soc* 2008;56:1140–5.
- Green PL, Plsek PE. Coaching and leadership for the diffusion of innovation in health care: a different type of multi-organization improvement collaborative. *Jt Comm J Qual Improv* 2002;28:55–71.
- Mansour M, Mansour JB, Swesy AHE. Scaling up proven public health interventions through a locally owned and sustained leadership development programme in rural upper Egypt. *Hum Resour Health* 2010;8:1.
- Terzic-Supic Z, Bjegovic-Mikanovic V, Vukovic D, et al. Training Hospital managers for strategic planning and management: a prospective study. *BMC Med Educ* 2015;15:25.
- Bowles A, Bowles NB. A comparative study of transformational leadership in nursing development units and conventional clinical settings. *J Nurs Manag* 2000;8:69–76.
- Martin JS, McCormack B, Fitzsimons D, et al. Evaluation of a clinical leadership programme for nurse leaders. *J Nurs Manag* 2012;20:72–80.
- LoPresti L, Ginn P, Treat R. Using a simulated practice to improve practice management learning. *Fam Med* 2009;41:640–5.
- Brandon CJ, Mullan PB. Teaching medical management and operations engineering for systems-based practice to radiology residents. *Acad Radiol* 2013;20:345–50.
- Brinkert R. Conflict coaching training for nurse managers: a case study of a two-hospital health system. *J Nurs Manag* 2011;19:80–91.
- Burns M, Papa A. Self-Reported changes in nurse manager proficiency resulting from participation in the rising STAR leadership program. *Pa Nurse* 2008;63:12.

- 52 Dannels SA, Yamagata H, McDade SA, *et al.* Evaluating a leadership program: a comparative, longitudinal study to assess the impact of the executive leadership in academic medicine (ELAM) program for women. *Acad Med* 2008;83:488–95.
- 53 Group Health Research Institute. *NLAPH Cohort 2 evaluation report: executive summary*. National Leadership Academy for the Public's Health, 2014.
- 54 Hanna WC, Mulder DS, Fried GM, *et al.* Training future surgeons for management roles: the resident-surgeon-manager conference. *Arch Surg* 2012;147:940–4.
- 55 Krejci JW, Malin S. Impact of leadership development on competencies. *Nurs Econ* 1997;15:235–41.
- 56 Omar M, Gerein N, Tarin E, *et al.* Training evaluation: a case study of training Iranian health managers. *Hum Resour Health* 2009;7:20.
- 57 Porter J, Johnson J, Upshaw VM, *et al.* The management Academy for public health: a new paradigm for public health management development. *J Public Health Manag Pract* 2002;8:66–78.
- 58 Saleh SS, Williams D, Balougan M. Evaluating the effectiveness of public health leadership training: the NEPHLI experience. *Am J Public Health* 2004;94:1245–9.
- 59 Fiset V, Luciani T, Hurtubise A, *et al.* Clinical nursing leadership education in long-term care: intervention design and evaluation. *J Gerontol Nurs* 2017;43:49–56.
- 60 Hartley R, Garrett W. Impact of a management assessment centre in developing proficient health managers. *Aust Health Rev* 1997;20:119–27.
- 61 Leslie LK, Miotto MB, Liu GC, *et al.* Training young pediatricians as leaders for the 21st century. *Pediatrics* 2005;115:765–73.
- 62 Farver CF, Smalling S, Stoller JK. Developing leadership competencies among medical trainees: five-year experience at the Cleveland clinic with a chief residents' training course. *Australas Psychiatry* 2016;24:499–505.
- 63 Wallen GR, Mitchell SA, Melnyk B, *et al.* Implementing evidence-based practice: effectiveness of a structured multifaceted mentorship programme. *J Adv Nurs* 2010;66:2761–71.
- 64 Cummings GG, Spiers JA, Sharlow J, *et al.* Worklife Improvement and Leadership Development study: a learning experience in leadership development and "planned" organizational change. *Health Care Manage Rev* 2013;38:81–93.
- 65 Anderson M, Lavoie-Tremblay M. Evaluation of the executive training for research application (extra) program: design and early findings. *Hcpol* 2008;4:e136–48.
- 66 Cooper SJ. An evaluation of the leading an empowered organisation programme. *Nurs Stand* 2003;17:33–9.
- 67 Edler A, Adamshick M, Fanning R, *et al.* Leadership lessons from military education for postgraduate medical curricular improvement. *Clin Teach* 2010;7:26–31.
- 68 Korschun HW, Redding D, Teal GL, *et al.* Realizing the vision of leadership development in an academic health center: the Woodruff leadership Academy. *Acad Med* 2007;82:264–71.
- 69 McDade SA, Richman RC, Jackson GB, *et al.* Effects of participation in the executive leadership in academic medicine (ELAM) program on women faculty's perceived leadership capabilities. *Acad Med* 2004;79:302–9.
- 70 Pollitt D. Guinness Northern counties begins to build a coaching culture. *Training & Management Development Methods* 2012;26:585–90.
- 71 Talbot Y, Batty H, Rosser WW. Five weekend national family medicine fellowship program for faculty development. *Can Fam Physician* 1997;43:2151–7.
- 72 Champagne F, Lemieux-Charles L, Duranceau M-F, *et al.* Organizational impact of evidence-informed decision making training initiatives: a case study comparison of two approaches. *Implement Sci* 2014;9.
- 73 Enterkin J, Robb E, McLaren S. Clinical leadership for high-quality care: developing future ward leaders. *J Nurs Manag* 2013;21:206–16.
- 74 Singer SJ, Hayes JE, Gray GC, *et al.* Making time for learning-oriented leadership in multidisciplinary hospital management groups. *Health Care Manage Rev* 2015;40:300–12.