Leadership in Health Services

Leadership in evidence-based practice: a systematic review

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Abstract

Purpose – This study aims to systematically review published empirical research on leadership as a determinant for the implementation of evidence-based practice (EBP) and to investigate leadership conceptualization and operationalization in this field.

Design/methodology/approach – A systematic review with narrative synthesis was conducted. Relevant electronic bibliographic databases and reference lists of pertinent review articles were searched. To be included, a study had to involve empirical research and refer to both leadership and EBP in health care. Study quality was assessed with a structured instrument based on study design.

Findings – A total of 17 studies were included. Leadership was mostly viewed as a modifier for implementation success, acting through leadership support. Yet, there was definitional imprecision as well as conceptual inconsistency, and studies seemed to inadequately address situational and contextual factors. Although referring to an organizational factor, the concept was mostly analysed at the individual or group level.

Research limitations/implications – The concept of leadership in implementation science seems to be not fully developed. It is unclear whether attempts to tap the concept of leadership in available instruments truly capture and measure the full range of the diverse leadership elements at various levels. Research in implementation science would benefit from a better integration of research findings from other disciplinary fields. Once a more mature concept has been established, researchers in implementation science could proceed to further elaborate operationalization and measurement.

Originality/value – Although the relevance of leadership in implementation science has been acknowledged, the conceptual base of leadership in this field has received only limited attention.

Keywords Evidence-based practice, Leadership, Measurement, Systematic review, Conceptualization, Conceptual inconsistency

Paper type Literature review

Background

Despite widespread acceptance of the importance of implementing evidence-based practice (EBP) and the use of findings from scientific research in clinical practice, many patients still do not receive treatments with proven effectiveness or may receive care that is of little benefit or harmful (Dopson *et al.*, 2002; Greenhalgh *et al.*, 2004; Oxman *et al.*, 1995). Implementation science has emerged as a vital interdisciplinary research field to address the challenges associated with the gap identified between the production and use of evidence in various settings. Explanations for this gap have largely focused on the characteristics of the individual provider, such as limited access to research, poor confidence in identifying and critically appraising evidence and perceived time restrictions to integrate research into clinical practice (Rycroft-Malone, 2008; Estabrooks *et al.*, 2003; Squires *et al.*, 2011).

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However, within the field of implementation science, there has been increasing recognition of the role of the organizational context in the implementation of EBP (Durlak and DuPre, 2008; Greenhalgh *et al.*, 2004; Fixsen *et al.*, 2005). Leadership has been identified as an important contextual dimension (Taylor *et al.*, 2011; Stetler *et al.*, 2011; Newton *et al.*, 2003); leadership commitment and active interest are behaviours that can positively affect the effectiveness of implementation (Helfrich *et al.*, 2007). In addition, leaders' influence on the subjective norms of potential adopters through interpersonal networks and communication must be considered (Leeman *et al.*, 2007). Although there is no universally agreed definition of leadership, many conceptualizations reflect the assumption that leadership involves a process of exerting intentional influence by one person over another person or group to achieve a certain outcome in a group or organization (Gill, 2012; Yukl, 2006). There is evidence from outside the health care field of the influence of leadership on organizational culture, organizational performance (Ogbonna, 2000), organizational change (Battilana *et al.*, 2010) and organizational innovation (Denti and Hemlin, 2012; Siegel and Kaemmerer, 1978).

Although the relevance of leadership in implementation science has been acknowledged, there seems to have been little empirical research on this concept in this field. Thus, the role of leadership in the implementation of EBP and the processes through which leaders can affect implementation success are largely unknown (Long *et al.*, 2013; Rycroft-Malone *et al.*, 2011; Wallin *et al.*, 2006; Wong *et al.*, 2013; Aarons *et al.*, 2014). Therefore, the aim of this study was to systematically review published empirical research on leadership as a determinant for the implementation of EBP in health care and to investigate the conceptualization and operationalization of leadership in the field of implementation science.

Methods

Our approach is based on a conceptual scoping review (Levac *et al.*, 2010), where we attempt to examine the range of research and identify potential research gaps in the existing literature. The research question was formulated as follows: based on an exploratory systematic review of empirical health-care implementation studies on the concept of leadership, how is the leadership concept applied and contextualized? How do study authors define and specify the concept of leadership or its essential components and how is the construct measured?

The electronic databases PubMed and The Cochrane Library including the Cochrane Database of Systematic Reviews were searched, and a separate search was conducted via the search function at the *Implementation Science* journal website (see Electronic Supplementary Material, Table S1, for search history). Medical Subject Headings as search terms when available were used or key words when appropriate. Search terms for leadership and research utilization or EBP were combined. All electronic searches were limited to "English language", "German language" or "Swedish language" In addition, reference lists of pertinent review articles, key publications and commentaries were searched manually. All searches were conducted in October and November 2013. Owing to limited resources, abstracts and full-text articles could not be screened independently. Studies available in abstract form were only excluded. Eligibility criteria with respect to study design, publication type, study aim, setting, participants and outcomes were developed.

To be eligible for inclusion, a study had to explicitly refer to leadership as a construct (or leaders or leaders' characteristics or leadership skills) in relation to the outcome of EBP or research use (research utilization, knowledge transfer, knowledge translation, knowledge utilization) in health care. Thus, studies exploring only general barriers or organizational factors affecting implementation outcomes were excluded. In addition, studies on instrument development or validation related to leadership and studies focusing only on conducting research (as opposed to research use or knowledge translation) were excluded. Studies exploring the effect of knowledge brokers, local opinion leaders, external facilitators, facilitation or change agents, as well as studies on leadership interventions (e.g. leadership development interventions, leadership training programmes) were also excluded. No limitations with respect to a specific study design were applied.

One member of the research team (UR) was responsible for reading the abstracts of all the articles identified in this first search and applying the inclusion/exclusion criteria using an abstract screening tool. Inclusion/exclusion criteria were developed and discussed by all members of the research team (UR, SC, PN) and UR piloted the inclusion/exclusion criteria with a subset of abstracts retrieved from PubMed. Two members of the research team (SC and PN) reviewed the search terms, the search strategy, the abstract screening strategy and the data abstraction criteria.

Data were abstracted from each included study by one member of the research team (UR) using predefined criteria (study aims, study design and methods; study participants; type of outcomes; health-care setting and country where the study was conducted; main findings with respect to leadership: underlying theory, concept or framework; leadership construct; leadership operationalization and measurement; outcomes; type of data analysis; level of analysis; and stage of change process, i.e. pre-implementation, implementation, post-implementation).

Study quality or study reporting quality was assessed with a structured instrument based on the design of the individual study: Critical Appraisal Skills Program for qualitative studies (Critical Appraisal Skills, 2013), the Assessment of Multiple Systematic Reviews tool for systematic reviews (Shea *et al.*, 2007) and the Mixed Methods Appraisal Tool for mixed methods studies (Pluye *et al.*, 2011). As there is currently no consensus guideline for survey research available, the data abstraction form in Bennett *et al.* (Bennett *et al.*, 2010) was utilized. The operationalization of the concept was analysed based on all studies using a survey approach and on qualitative studies providing published information on the respective interview guides.

Results

Our searches identified 1,149 citations. We screened 144 full-text articles for eligibility, of which 17 were included in the study (Figure 1) (Aarons, 2006; Bergstrom *et al.*, 2012; Boström *et al.*, 2007; Brown and McCormack, 2011; Cummings *et al.*, 2010; Damschroder *et al.*, 2011; Estabrooks *et al.*, 2007; Forsman *et al.*, 2012; Gifford *et al.*, 2007, 2006; Hagedorn and Heideman, 2010; Ring *et al.*, 2005; Sandstrom *et al.*, 2011; Schultz and Kitson, 2010; Sharp *et al.*, 2004; Stetler *et al.*, 2009; Williams *et al.*, 2011). Of these, two studies were assessed as high quality, nine were rated moderate quality and five studies were of poor quality (methodological and/or reporting quality). The quality of a study using an action research approach could not be reliably determined with the available instruments.

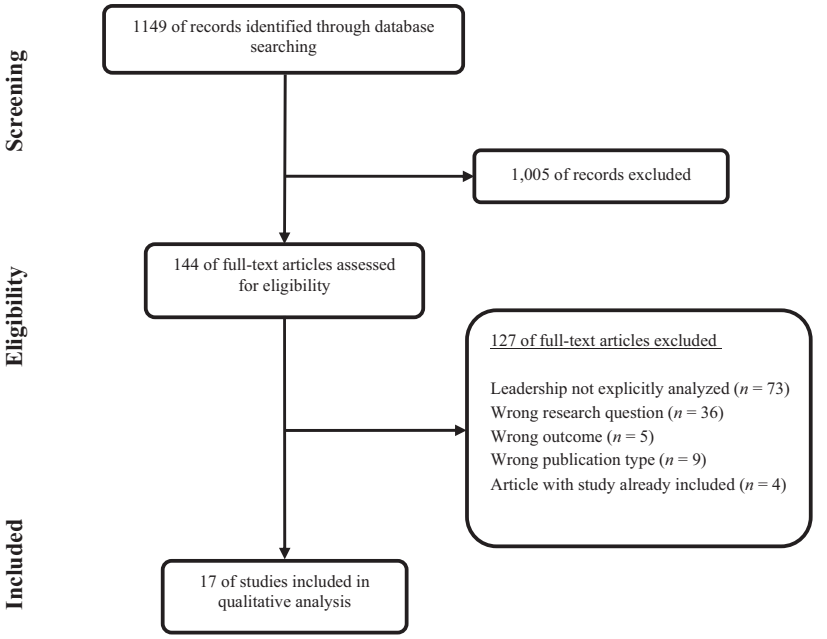

Figure 1.
Flow diagram of study selection process

Study characteristics

With regard to the professional groups involved, we found that 11 of the 17 studies (65 per cent) referred to nursing; the remaining studies involved a variety of health professionals (physicians, clinical pharmacists, physical therapists, behavioural, nutritional and mental health-care practitioners). One of the studies was conducted by a multinational team in Uganda; the other studies were conducted in industrialized countries (Australia, Canada, Sweden, United Kingdom, USA). Seven of the 17 studies used a survey research approach, 3 were conducted with a mixed methods approach, 5 were qualitative studies and 2 were (narrative) systematic reviews (Table I summarizes the main characteristics of the 17 studies included).

A clear classification of the outcome was possible for 15 of the 17 studies; 6 referred to implementation effectiveness (defined by a variety of measures, e.g. use of clinical guidelines, adoption, fidelity or maintenance of a specific evidence-based programme), 7 referred to health professionals' self-reported research use (or knowledge translation into practice, or attitudes towards research use, or attitudes towards adoption of EBPs) and 2 included both research use and implementation effectiveness.

Most of the study authors used an implementation model, conceptual framework or a theory for making assumptions on how determinants related to the outcome. In eight of the studies (Bergstrom *et al.*, 2012; Boström *et al.*, 2007; Brown and McCormack, 2011; Cummings *et al.*, 2010; Estabrooks *et al.*, 2007; Hagedorn and Heideman, 2010; Schultz and Kitson, 2010; Sharp *et al.*, 2004), the authors referred to the Promoting Action on Research Implementation in Health Services (PARiHS) framework (Kitson *et al.*, 1998). The PARiHS framework was used as an organizing or mapping tool in all of these studies, either for data structuring and selection of variables, as a heuristic for coding

Table I. Characteristics of the studies included

Author	Participants and setting	Study design	Underlying theory, model or framework	Outcome measures	Comments
(Aarons, 2006)	Mental health clinicians in child and adolescent mental health services, United States	Cross-sectional; web survey (81% response)	Transformational leadership theory	Attitudes to EBP measured by the Evidence-Based Practice Attitude Scale	Instrument to measure leadership as developed not specific to EBP
(Bergstrom *et al.*, 2012)	18 midwives and five managers at community health centres and a hospital in Uganda	Qualitative study; two focus group discussions, ten semi-structured interviews)	The PARiHS framework	Process of changing practice, uptake of new knowledge into practice	Study carried out in a district where efforts to improve neonatal health and survival was ongoing
(Boström *et al.*, 2007)	Nurses; rehabilitation/nursing homes; 11 units; large municipality in Sweden	Cross-sectional; postal survey; response 67% (n = 89/132); 97% of respondents female	The PARiHS framework	Research use including attitudes towards research, research use in daily practice (the Research Utilization Questionnaire [RUQ]) and the Creative Climate Questionnaire (CCQ)	Small sample size; very wide confidence interval in multivariate model; culture measured by CCQ
(Brown and McCormack, 2011)	Nurses; abdominal surgical unit with two wards; country not reported	Qualitative study using Emancipatory Action Research approach: ethnographic study with non-participant observation, focus group discussions and interviews; survey (83% response)	The PARiHS framework	Putting research into practice, enhanced and effective patient management; the Revised Nursing Work Index	
(Cummings *et al.*, 2010)	Paediatric and neonatal nurses; three paediatric units at two academic hospitals in Alberta, Canada	Cross-sectional study, the ACT, adapted to paediatric setting, survey (paper-based and electronic; 69% response)	The PARiHS framework	Self-reported research use behaviour: instrumental and conceptual research use; measures developed by Wallin *et al.* (2006)	Cross-sectional analysis; generalizability unclear
(Damschroder *et al.*, 2011)	Coordinators, physicians, nursing staff, physical therapy, mental and behavioural health, nutritional health; 24 participants at five medical facilities; United States	Mixed methods study: semi-structured telephone interviews	Adapted model developed by Klein and Sorra (1996)	Implementation effectiveness (operationalization based on programme adoption/implementation and fidelity)	
(Estabrooks *et al.*, 2007)	Nurses; various medical, surgical, rehabilitative, palliative, chronic care and emergency care specialties, Alberta, Canada	Secondary data analysis from the Alberta Registered Nurse survey; mailed province-wide survey; subsample of n = 4421 respondents (53% response)	Context according to the PARiHS framework; conceptual model by Greenhalgh *et al.* (2004) and Dopson and Fitzgerald (2005)	Research use (self-reported general- as opposed to innovation- or guideline-specific); assessment of research use; not directly measured, but derived variable; based on Wallin *et al.* (2006)	
(Forsman *et al.*, 2012)	Registered nurses two years after graduation; Sweden	Survey (wave 2007 within a longitudinal survey: the Longitudinal Analysis of Nursing Education) (n = 845); data on organizational factors QPSNordic	Adapted model based on National Health Service (NHS) staff survey model by Michie and West (2003)	Research use, using three single items representing instrumental (direct), conceptual (indirect) and persuasive (symbolic) research use (Swedish version), based on Estabrooks (1999)	National sample, high generalizability

(*continued*)

Table I.

Author	Participants and setting	Study design	Underlying theory, model or framework	Outcome measures	Comments
(Gifford *et al.*, 2007)	Nurses from various settings, diverse countries (United States, Canada, Australia, Taiwan, Sweden, United Kingdom)	Systematic review, 12 studies included (8 quantitative, 4 qualitative), narrative synthesis	Not applicable	EBP and research use	
(Gifford *et al.*, 2006)	Nurses (nursing managers, administrators and clinical resource nurses); nine facilities (various specialties) in Ontario, Canada	Qualitative secondary data analysis, purposeful sampling; audio taped and transcribed, individual semi-structured telephone interviews ($n = 32$); group interviews ($n = 3$), document analysis	Not specified	Clinical practice guideline use (implementation and maintenance)	
(Hagedorn and Heideman, 2010)	Substance abuse practitioners; nine substance use disorder clinics, one team leader from each clinic, United States	Uncontrolled before–after study, survey (ORCA questionnaire)	Organizational readiness to change based on the PARiHS framework	Implementation of EBP/recommended practices (score according to self-reported survey statements at each facility)	
(Ring *et al.*, 2005)	Nurses; various nursing units across Scotland	Semi-structured telephone interviews (13-criterion interview guide); criterion-based purposive sampling; $n = 15$ nurses	Various references, strategies need to address individual, team and organizational factors in guideline implementation	Implementation of evidence-based nursing practice	
(Sandstrom *et al.*, 2011)	Nurses from various settings; Canada, Sweden, United Kingdom	Systematic review with narrative synthesis ($n = 7$ studies included: two quantitative, two qualitative, three integrative reviews)	Not applicable	EBP and research use	Not all studies included focus on leadership, various study designs
(Schultz and Kitson, 2010)	Nurses; various wards at one large tertiary acute care hospital in South Australia	Cross-sectional survey (ACT, nursing, paper-based, slightly adapted to Australian context, $n = 422$); 62% response; six wards after evidence implementation vs six control wards	Organizational context based on the PARiHS framework	Research use (comparing units that have undergone an evidence implementation process with control units)	Study falsely claims causal relationships (yet no baseline assessment, intervention not randomized)
(Sharp *et al.*, 2004)	Various health-care practitioners, six medical centres (teaching and non-teaching tertiary hospitals, outpatient clinics), United States	Qualitative study (face-to-face structured interviews) conceptual content analysis; one primary interviewer and one observer; interview guide with mostly open-ended questions; key players ($n = 51$)	The PARiHS framework (as a heuristic for qualitative data analysis)	EBP (evidence-based programme including guidelines, reminders, audit/feedback)	Interview guide not available; saturation for specific topics? Unclear how key player was defined

(*continued*)

Table I.

Author	Participants and setting	Study design	Underlying theory, model or framework	Outcome measures	Comments
(Stetler *et al.*, 2009)	Nurses (at various levels, both formal and informal leaders); two sites (community hospital, academic medical centre, three units at each site), United States	Mixed methods study, explanatory case study; comparison of two contrasting sites; 14 focus group discussions, 59 leadership interviews, group observations; document analysis; two separate surveys	The Content, Context and Process model of the strategic management of change; differentiation between receptive and non-receptive context	Successful implementation, sustainment, and normalization of EBP activity	
(Williams *et al.*, 2011)	Health-care practitioners at five child asthma programme sites (no details given), United States (including Puerto Rico)	Mixed methods study: self-developed survey ($n = 48$); case-studies and informal interviews mentioned in methods section but no information or results presented	Not specified	Not further specified (translation of evidence-based interventions, no details reported)	Study aims unclear; poor reporting; informal interviews not defined; survey methods not described generalizability unclear; small sample size

Notes: PARiHS: Promoting Action on Research Implementation in Health Services; EBP: evidence-based practice; RU: research use/utilization

qualitative data, in instruments based on the framework, or in interview guide development.

Conceptualization of leadership

In all of the included 17 studies, leadership was understood as a modifier of implementation effectiveness or research use, where leaders' positive influences and direct or indirect facilitative behaviours on implementation success were emphasized. Most studies explored leadership within a range of other contextual or organizational factors. In a few studies, the terms leadership, leader and management were used interchangeably (Boström *et al.*, 2007; Damschroder *et al.*, 2011; Forsman *et al.*, 2012; Gifford *et al.*, 2007; Sandstrom *et al.*, 2011). Leadership was mostly conceptualized as leadership support (or management support). In 9 of the 17 studies, the authors described leadership behaviours referring to the concept of transformational leadership (Table II gives an overview of the main findings).

All studies referred to the importance of leadership, although they varied in the selection of specific dimensions from the whole range of leadership functions. Authors addressed both task-oriented leadership (goal emphasis, work facilitation, strategic thinking) and relations-oriented leadership (interaction facilitation, support, team building); the change-oriented leadership dimension (driving innovation, visionary thinking) was addressed less often. Nine of the 17 studies (Aarons, 2006; Bergstrom *et al.*, 2012; Boström *et al.*, 2007; Brown and McCormack, 2011; Cummings *et al.*, 2010; Estabrooks *et al.*, 2007; Hagedorn and Heideman, 2010; Schultz and Kitson, 2010; Stetler *et al.*, 2009) addressed transformational leadership. Only one study addressed leadership in connection with specific or desirable attributes of a leader, distinguishing trainable skills from innate traits (Williams *et al.*, 2011).

There was some variation with respect to the level of formal authority of leadership, yet all of the studies referred to some formally assigned hierarchical role. Only one study analysed leadership at the dyadic level of leader-follower (or supervisor-supervisee level), thus reflecting a close and supervisory relationship (Aarons, 2006). With a few exceptions, authors referred to the group or unit level as the formal authority for leadership, involving various titles (nurse manager, nursing manager, unit manager, ward manager, unit directors, administrators, clinical resource nurses, programme manager) (Bergstrom *et al.*, 2012; Boström *et al.*, 2007; Brown and McCormack, 2011; Cummings *et al.*, 2010; Damschroder *et al.*, 2011; Gifford *et al.*, 2007, 2006; Ring *et al.*, 2005; Sandstrom *et al.*, 2011; Schultz and Kitson, 2010; Sharp *et al.*, 2004). One study referred to both the dyadic and the organizational level (Estabrooks *et al.*, 2007) and one to a range of upper and lower management levels (from unit nurse director to chief nurse) (Stetler *et al.*, 2009). One of the few studies truly exploring leadership at the organizational level used the Organizational Readiness to Change Assessment (ORCA) instrument, where leadership was assessed at the senior leadership level in a respondent's organization (Hagedorn and Heideman, 2010).

Operationalization of leadership

Nine of the 17 studies provided information that allowed assessment of how leadership was operationalized (Aarons, 2006; Boström *et al.*, 2007; Brown and McCormack, 2011; Cummings *et al.*, 2010; Estabrooks *et al.*, 2007; Forsman *et al.*, 2012; Hagedorn and

Table II. Overview of review findings

Author	Reporting quality/study quality	Conceptualization	Operationalization
(Aarons, 2006)	Poor reporting quality	Behavioural characteristics of a leader-specific leader–follower interactions	The Multifactor Leadership Questionnaire (MLQ-45 item 5X); respondents' assessment of their supervisors; meso level (unit); measured at individual level
(Bergstrom *et al.*, 2012)	No major deficiencies (high-quality)	Based on the PARiHS framework (role clarity, effective teamwork, effective organizational structures, democratic decision-making)	Interview guide probes into leadership support, openness to discuss problems, hierarchies; meso level (unit)
(Boström *et al.*, 2007)	Intermediate reporting quality	Leadership as a sub-element of context (leadership support according to the PARiHS framework)	Survey items were used to operationalize these organizational factors; leadership as absence or presence of support; as given by items of the RUQ: "my unit director supports research utilization"
(Brown and McCormack, 2011)	Reporting of research aims and study design unclear; assessment tool not suitable for study approach	Leadership support as a sub-element of context (PARiHS): clarity of decision-making processes, patterns of power and authority, information and feedback mechanisms, active management of competing priorities	Leadership not defined a priori (e.g. interview guide not reported); not clear how/whether PARiHS was used for interview guide or data analysis; data from unit levels
(Cummings *et al.*, 2010)	Intermediate reporting quality	Not elaborated in the article, but based on the literature on act development: emotionally intelligent leadership, actions of formal leaders	Providing general support: "leader handles stressful situation calmly"; "looks for feedback"; "focuses on successes"; "actively mentors and coaches" (see act); assessment at organizational level; scores measured at individual level
(Damschroder *et al.*, 2011)	Intermediate study quality	Leadership as management support: active interest and commitment; engagement of management	Interview guide: management support by mentoring, problem-solving, training; close-ended questions: "managers and supervisors take an active interest in …"; "are strongly committed to the successful implementation measured at unit level"
(Estabrooks *et al.*, 2007)	Poor reporting quality	Leadership as a sub-element of context (leadership support)	Various survey items: "support for new and innovative ideas about patient care"; "administration that listens and responds to employee concerns"; "active staff development or continuing education program for nurses"); measured both at organizational and at unit level
(Forsman *et al.*, 2012)	Intermediate reporting quality	Not clearly stated in the article: management role re staff policies, competence development	Item wording not clear from article, data presented in negative wording ("deficient leadership", "role ambiguity"); "staffing and skills management" (NHS model); QPSNordic, organizational module: experience of leadership support from a superior (fair leadership, empowering leadership)

(*continued*)

Author	Reporting quality/study quality	Conceptualization	Operationalization
(Gifford *et al.*, 2007)	High risk of bias	Managerial leadership; behaviours and activities of managers (direct and indirect influence on individuals, their environment and organizational infrastructures)	Managers as individuals in formal management roles (includes administrators, directors, executives, head nurses and managers); leadership as nurse managers' roles, behaviours or activities and their influence on clinical nurses' research use
(Gifford *et al.*, 2006)	Not all components of assessment tool applicable; some deficiencies	Behaviours and activities of nursing managers, administrators and clinical resource nurses	From data analysis: nursing leaders roles providing support by addressing concerns, encouraging staff and creating opportunities for education; good communication skills; creating a positive milieu of best practices (influences change); meso level (unit) and organizational level
(Hagedorn and Heideman, 2010)	Intermediate reporting quality	Leadership as an organizational capability to implement change (aspect of organizational culture; facilitation practices; leadership implementation roles)	Leadership culture, leadership (staffing policies, communication, clear definition of roles/responsibilities); leadership facilitation (practices); leadership implementation roles (engagement, commitment, support); data analysed at unit level
(Ring *et al.*, 2005)	Few deficiencies	Leadership support, not specified	Interview guide probes into barriers of implementation; from data analysis: personal authority to make changes within organization and ability to motivate others; opinion vs clinical leadership: change both professional attitudes and the clinical context for implementation
(Sandstrom *et al.*, 2011)	High risk of bias	Task- and relations-oriented leadership; behaviours	"... the role of the person in charge, that is, the leader, and how he or she can promote the process of implementing EBP in nursing"
(Schultz and Kitson, 2010)	Intermediate reporting quality	Not elaborated in the article	Providing general support, leader seeking feedback, acknowledges, "leader handles stressful situation calmly"; data analysed at organizational level
(Sharp *et al.*, 2004)	Some deficiencies (intermediate study quality)	Not elaborated in the article	From data analysis: leadership as a theme of facilitation (not context): mediator between interventions, communication mechanisms, regularity of meetings, team processes
(Stetler *et al.*, 2009)	Intermediate study quality	Leadership as an element of receptivity, strategic vs operational influence	Key people leading change: influencing others to behave in certain ways towards preconceived group goals, in this case, EBP in a department of nursing; individual and organizational level
(Williams *et al.*, 2011)	Poor study quality	Not clearly defined; according to cited references: relations-oriented leadership skills/behaviour and leader traits	From survey items: innate attributes vs trainable skills and learn on the job; data gathered at unit level

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Table II.

Heideman, 2010; Schultz and Kitson, 2010; Stetler *et al.*, 2009). The studies varied greatly with respect to how leadership was measured and how instruments were used.

Leadership as a supporting or hindering factor in direct relation to EBP was assessed in seven studies (Boström *et al.*, 2007; Brown and McCormack, 2011; Cummings *et al.*, 2010; Hagedorn and Heideman, 2010; Schultz and Kitson, 2010; Estabrooks *et al.*, 2007; Forsman *et al.*, 2012). However, validated instruments were used in only three of those studies: two studies (Cummings *et al.*, 2010; Schultz and Kitson, 2010) used the Alberta Context Tool (ACT) (Estabrooks *et al.*, 2009), and one study (Hagedorn and Heideman, 2010) used the ORCA (Helfrich *et al.*, 2009). In addition, two further studies (Aarons, 2006; Forsman *et al.*, 2012) used instruments with a different approach in which leadership was addressed in relation to an outcome other than EBP; the authors then used data from this instrument in combination with an additional instrument developed to measure some aspect of EBP. In one of these two studies (Forsman *et al.*, 2012), leadership dimensions were measured with the General Nordic Questionnaire for Psychological and Social Factors at Work (QPSNordic), a validated instrument to assess psychological, social and organizational work conditions (Wannstrom *et al.*, 2009). Data from this instrument were then related to information on the outcome, research use, measured by a non-validated instrument. Similarly, in the study by Aarons (Aarons, 2006), the Multifactor Leadership Questionnaire (Avolio *et al.*, 1999), a validated scale of transformational leadership, was used to analyse the association with providers' attitudes towards EBP.

Diverse leadership behaviours were tapped in the instruments administered; most of them addressed some form of support (at various levels), such as relations-oriented behaviours (i.e. solicits opinions; enhances collaboration; promotes team building; empowers, mentors and coaches; facilitates staff development), task-oriented behaviours (i.e. provides adequate staffing and resources; establishes project schedule and clarifies deliverables; sets clear goals and establishes role clarity; supervises and instructs) or, rarely, change-oriented behaviours (sets high priorities on success of innovation; is accessible, visible and available during implementation; describes clear strategic vision; appoints champions; rewards innovation and creativity, motivates change, sets high priority on successes). In three studies (Boström *et al.*, 2007; Estabrooks *et al.*, 2007; Gifford *et al.*, 2007), leadership was analysed using only one or two (rather generically worded) items.

Discussion

This literature synthesis was undertaken to investigate how leadership has been conceptualized and operationalized in implementation science. We identified 17 studies that fulfilled the inclusion criteria. The nursing field dominated, and all but one study were conducted in industrialized countries in a variety of health-care settings. No experimental study was identified.

The authors of the 17 studies predominantly discussed leadership as a modifier or an intermediate factor for implementation success, yet the hypothesized mechanisms to affect outcomes were not specified and could not be tested with the study designs that were applied. Leadership was mostly used with a positive connotation; the studies addressed it as a potential supporting factor, rather than viewing lack of such support as a hindering factor.

Overall, the authors seemed to conceptualize leadership as supervisory or managerial leadership, thus not differentiating between the concepts of leadership and management. There has been some controversy in leadership theory whether leadership and management are essentially different concepts (Zaleznik, 2004), implicating mutually exclusive roles of leaders, but newer leadership theories argue for a more flexible model integrating both, albeit distinct, functions carried out by one person, depending on situational and contextual factors (Yukl and Lepsinger, 2005; Kotter, 1990). In the leadership literature, supervisory leadership refers to behaviours aiming to provide guidance, support and feedback in day-to-day situations at the work unit level; management, however, is understood as the function implementing leaders' strategy but mainly deals with coordinative and administrative tasks (House and Aditya, 1997; Yukl, 1989). Thus, by not differentiating between managerial and leadership functions, the authors did not adequately address the situational and contextual factors relevant to understand the processes of how leadership might affect successful implementation. While managerial and leadership functions can complement each other and show some overlap, not adequately differentiating between these two distinct functions has research implications in that it obfuscates leadership's conceptual base; moreover, it can have practical impacts when designing leadership development programmes.

Many studies lacked a precise definition of the term leadership, and there was conceptual inconsistency among the studies. The vagueness of conceptual definitions of leadership in the implementation science literature somewhat reflects the discourse within leadership research (Kempster and Parry, 2011). The concept of leadership is continually evolving, but leadership theories, specifically transformational and charismatic leadership theories, have been criticized for their conceptual and measurement weaknesses (Kelloway *et al.*, 2000; Yukl, 1999a).

Nine of the 17 studies addressed transformational leadership, but the authors mostly referred to facilitative functions, such as general support, mentoring or participative decision-making. Hence, the authors' conceptualizations reflected only a segment of leader behaviour described in transformational leadership theories (Avolio and Bass, 1988; Avolio *et al.*, 1999; Podsakoff *et al.*, 1996). According to transformational leadership theories, a transformational leader's effect on followers' motivation and performance can be explained by his or her attributes and behaviours (Avolio *et al.*, 1999; Yukl, 1999b). In an idealized manner, the leader transforms and motivates followers through his or her idealized influence (or charisma), intellectual stimulation and individual consideration (Avolio and Bass, 1988). A transformational leader articulates a vision that is appealing and inspiring to followers, provides a role model for highly ethical behaviour, is able to raise follower awareness for transcendent collective interests and helps followers achieve extraordinary goals (Avolio and Bass, 1988; Bass and Avolio, 1994). However, transformational leadership as used in the 17 implementation science studies referred to more mundane and practical functions. According to this conceptualization, transformational leader behaviours were described as communicating organizational values, clarifying roles or showing personal support, and less on being visionary.

Although most of the study authors stressed the importance of leadership as an organizational factor, the concept was mostly analysed at the individual or group level; the authors did not address the larger organizational environment in which the unit was embedded. Thus, there was a mismatch with respect to the level at which leadership was

conceptualized and the level at which it was measured. Although it has been observed in organizational and management research that leadership operates differently at the individual, group and organizational levels (Day and Harrison, 2007), such complexity was not captured in the 17 studies. It has been stated elsewhere that factors influencing implementation success are thought to interact dynamically (Helfrich *et al.*, 2010) and that effects of leadership on organizational outcomes can result from multiple levels of leadership simultaneously (O'Reilly *et al.*, 2010), requiring coordination and collaboration between the different leadership levels and units (Yukl and Lepsinger, 2005). Furthermore, recent developments in leadership theory calling for an understanding of leadership more appropriate for collaborative contexts seem to reflect a move away from the traditional view on leadership "as commanding, telling, persuading, influencing, motivating – conceived as activities in which there is a point of origin (leaders) and a point of reception (followers)" (Drath *et al.*, 2008, p. 651). In the same vein, collaborative leadership has been described as a new leadership style embedded in a collective leadership culture, including formal and informal leadership roles, requiring individual and collective leadership skills depending on situational and contextual circumstances (West *et al.*, 2014).

Thus, to better understand a hypothesized supporting factor, authors should be more specific when describing context factors, potential dynamics and different types of leadership behaviour and relationships in future studies.

The maturity of a concept can be assessed critically in a qualitative process against a set of four criteria:

(1) clarity of definition;

(2) characteristics or attributes;

(3) preconditions and outcomes of the described concept; and

(4) delineation of concept boundaries (Morse *et al.*, 1996).

Judged against these criteria, the concept of leadership in implementation science does not seem to have been fully developed, given the inconsistencies in its use, unclear definition, that its distinguishing features have not been fully identified and conceptual boundaries not clearly demarcated. It is unclear whether attempts to tap the concept of leadership in available instruments truly capture and measure the full range of the diverse elements of leadership at various levels relevant to implementation success.

Several of the studies included in this literature synthesis had obvious methodological deficiencies. Some of the survey instruments did not assess criterion and construct validity with respect to measuring leadership. Furthermore, data from instruments with sufficient psychometric properties to measure leadership were related to outcome data from an instrument lacking appropriate psychometric properties. Many instruments measuring the outcome (mostly research use) used self-reported measures without demonstrated validity. Not all of the mixed methods studies appropriately considered the relevance of this approach with respect to the research question or effectively integrated qualitative and quantitative data. Some of the qualitative data lacked a clear conceptual framework and used small samples selected only from a specific group, making it impossible to explore a full range of responses. One study was conducted as a secondary analysis of qualitative data not generated for the research questions addressed.

This literature synthesis has limitations that have to be acknowledged when interpreting the results. We did not conduct a comprehensive literature search. We restricted searches to primary research published in peer-reviewed journals in only two bibliographic (although relevant and large) databases. Thus, we did not search grey literature and might have missed relevant but unpublished research. A further limitation of our work is that study selection and quality assessment were not done independently. Also, we did not define or specify specific outcomes of EBP a priori, so that potentially relevant studies could have been missed, also due to poor indexing of this concept in medical bibliographic databases.

Conclusions

Based on the 17 studies analysed, our narrative synthesis on leadership found that there is considerable variety in how leadership is addressed in current implementation science studies conducted in health-care settings. Conceptualization of leadership in implementation science is characterized by imprecise definitions and inconsistent use of terms, thereby hindering a clear understanding of this concept's role as a determinant of EBP and putting into question efforts of operationalization in this field. One example is the poor differentiation between management and leadership, a subject that needs further elaboration. The weak conceptual base has also practical implications affecting leadership development initiatives.

The findings of this study have a number of implications for future implementation science research. We identified conceptual gaps suggesting a need for theoretical advancement of the concept of leadership within implementation science. Because the concept of leadership does not seem to be sufficiently developed, differentiated and clearly positioned within the field of implementation science, it is unclear how useful its application in research and practice is at this point in time. Ongoing efforts to establish and refine terms and definitions as well as to promote consistent use of these terms and definitions of leadership within implementation science would benefit from a better integration of research findings from other disciplinary fields (e.g. organizational science). When a more mature concept has been established, researchers in implementation science could then proceed to further elaborate operationalization and measurement.

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