

The Quality Implementation Framework: A Synthesis of Critical Steps in the Implementation Process

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Abstract Implementation science is growing in importance among funders, researchers, and practitioners as an approach to bridging the gap between science and practice. We addressed three goals to contribute to the understanding of the complex and dynamic nature of implementation. Our first goal was to provide a conceptual overview of the process of implementation by synthesizing information from 25 implementation frameworks. The synthesis extends prior work by focusing on specific actions (i.e., the “how to”) that can be employed to foster high quality implementation. The synthesis identified 14 critical steps that were used to construct the Quality Implementation Framework (QIF). These steps comprise four QIF phases: Initial Considerations Regarding the Host Setting, Creating a Structure for Implementation, Ongoing Structure Once Implementation Begins, and Improving Future Applications. Our second goal was to summarize research support for each of the 14 QIF steps and to offer suggestions to direct future research efforts. Our third goal was to outline practical implications of our findings for improving future implementation efforts in the world of practice. The QIF’s critical steps can serve as a useful blueprint for future research and practice. Applying the collective guidance synthesized by the QIF to the Interactive Systems Framework for Dissemination and Implementation (ISF) emphasizes that accountability for quality implementation does not rest with the practitioner Delivery System alone.

Instead, all three ISF systems are mutually accountable for quality implementation.

Keywords Implementation · Knowledge utilization · Implementation framework · Implementation science

Introduction

Numerous reviews have investigated the process of implementation and have advanced our understanding of how it unfolds (e.g., Fixsen et al. 2005; Greenhalgh et al. 2004; Hall and Hord 2006; Rogers 2003). We now have a growing body of: (1) evidence which clearly indicates that implementation influences desired outcomes (e.g., Aarons et al. 2009; DuBois et al. 2002; Durlak and DuPre 2008; Smith et al. 2004; Tobler 1986; Wilson et al. 2003) and (2) several frameworks that provide an overview of ideas and practices that shape the complex implementation process (e.g., Damschroder et al. 2009; Greenberg et al. 2005). In recognition of its critical importance, various professional groups have determined that one of the criteria related to identifying evidence-based interventions should involve documentation of effective implementation (e.g., Society for Prevention Research, Division 16 of the American Psychological Association). In addition, various funders are emphasizing implementation research and making more funds available to address implementation in research proposals (e.g., The William T. Grant Foundation, National Cancer Institute, National Institute of Mental Health).

Prominent research agencies have intensified their role in the advancement of implementation science. For example, the National Institutes for Health (NIH) has an initiative that involves 13 of its 27 Institutes and the Office of Behavioral and Social Sciences Research in funding

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research to identify, develop, and refine effective methods for disseminating and implementing effective treatments (NIH 2011). The Centers for Disease Control and Prevention (CDC) is currently playing a key role in improving the quality and efficiency of a global public health initiative through addressing operational questions related to program implementation within existing and developing health systems infrastructures (CDC 2010). In the United Kingdom, the National Health System has established the National Institute for Health Research (NIHR) which aims to use research to improve national health outcomes. The NIHR has built infrastructure through the creation of Collaborations for Leadership in Applied Health Research and Care (CLAHRC) which investigate methods of translating implementation research evidence to practice (Baker et al. 2009).

These recent developments have been described as “stepping stones” that reflect the beginnings of an organized and resourced approach to bridging research and practice (Proctor et al. 2009). New developments bring new ideas, and these ideas have found their way into recent dissemination- and implementation-related frameworks. For example, the Interactive Systems Framework for Dissemination and Implementation (ISF) recognized that quality implementation is a critical aspect of widespread successful innovation (Wandersman et al. 2008). While the original special issue on the ISF (*American Journal of Community Psychology* 2008) recognized the importance of implementation, it provided relatively little detail on implementation frameworks per se (with the notable exception of the review on implementation performed by Durlak and Dupre 2008). In this article, we were motivated to incorporate implementation research and related concepts into the ISF to a greater degree, which, in turn, can contribute to the field of implementation science. Given the growing recognition of the importance of implementation, its quickly expanding evidence base, and the numerous implementation frameworks that are emerging, we sought to increase understanding of the critical steps of the implementation process by undertaking a conceptual synthesis of relevant literature.

Implementation and the Interactive Systems Framework

The ISF (Wandersman et al. 2008) is a framework that describes the systems and processes involved in moving from research development and testing of innovations to their widespread use. It has a practical focus on infrastructure, innovation capacities, and three systems needed to carry out the functions necessary for dissemination and implementation (Synthesis and Translation System,

Support System, Delivery System). The role of the *Synthesis and Translation System* is to distill theory and evidence and translate this knowledge into user-friendly innovations (an idea, practice, or object that is perceived as new by an individual or an organization/community (Rogers 2003)). To increase the user-friendliness of these innovations, this system may create manuals, guides, worksheets, or other tools to aid in the dissemination of the innovation. This system may strive to develop evidence-based strategies for implementing a given innovation in diverse contexts (e.g., Mazzucchelli and Sanders 2010; Schoenwald 2008). Worthwhile innovations developed by the Synthesis and Translation System need to be put into practice, and actual use of these innovations is accomplished primarily by the Delivery System.

The *Delivery System* is comprised of the individuals, organizations, and communities that can carry out activities that use the innovations that the Synthesis and Translation develops. Implementation in the Delivery System is supported by the *Support System*. To increase the likelihood that innovation use will lead to desired outcomes, the Support System works directly with the members of the Delivery System to help them implement with quality. The Support System does this by building two types of capacities through training, technical assistance, and/or monitoring progress: (1) *innovation-specific capacity*—the necessary knowledge, skills, and motivation that are required for effective use of the innovation; and (2) *general capacity*—effective structural and functional factors (e.g., infrastructure, aspects of overall organizational functioning such as effective communication and establishing relationships with key community partners) (Flaspohler et al. 2008b).

Each of the three systems in the ISF are linked with bi-directional relationships. The stakeholders in each system (e.g., funders, practitioners, trainers, and researchers) should communicate and collaborate to achieve desired outcomes. In the original ISF special issue, there was an emphasis on building capacity for quality implementation (e.g., Chinman et al. 2008; Fagan et al. 2008). This article seeks to enhance the ISF’s emphasis on implementation using a synthesis of implementation frameworks to further inform the types of structures and functions that are important for quality implementation per se. More specifically, this collective guidance can be applied to the ISF systems by creating more explicit links (both within and between systems) that detail specific actions that can be used to collaboratively foster high quality implementation.

Overview of the Article

This article has conceptual, empirical research, and practical goals. Our first goal was to provide a conceptual

overview of the implementation process through a synthesis of the literature. The literature synthesis was designed to develop a new implementation meta-framework which we call the Quality Implementation Framework (QIF). The QIF identifies the critical steps in the implementation process along with specific actions related to these steps that can be utilized to achieve quality implementation.

Our research goal was to summarize the research support that exists for the different steps in the newly-developed QIF and to offer some suggestions for future research efforts. Our practical goal was to outline the practical implications of our findings in terms of improving future implementation efforts in the world of practice.

Progress toward these goals will enhance theory related to implementation research and practice. Theoretical contributions will also be applied to the ISF, since the framework synthesis will identify actions and strategies that the three “mutually accountable” ISF systems can employ to collaboratively foster quality implementation. Wandersman and Florin (2003) discussed the importance of interactive accountability in which funders, researchers/evaluators, and practitioners are mutually accountable and work together to help each other achieve results. The ISF helps operationalize how these stakeholders can work together. When collaborating for quality implementation, these systems should strive to increase the likelihood that the necessary standards of the innovation (e.g., active ingredients, core components, critical features, essential elements) are met and that the innovation’s desired outcomes are achieved.

We hypothesized that our literature synthesis would yield convergent evidence regarding many of the important steps associated with quality implementation. Our framework review differs from other recent framework reviews, since we focus on literature relating specifically to the “how-to” of implementation (i.e., specific procedures and strategies). Systematically identifying these action-oriented steps can serve as practical guidance related to specific tasks to include in the planning and/or execution of implementation efforts. Another difference is that we sought to develop a framework that spans multiple research and practice areas as opposed to focusing on a specific field such as healthcare (e.g., Damschroder et al. 2009; Greenhalgh et al. 2004). We believed our explicit focus on specific steps and strategies that can be used to operationalize “how to” implement would make a useful contribution to the literature.

In the following section, we provide a brief overview of prior implementation research that places implementation in context, discuss issues related to terminology, and describe prior work depicting the implementation process. We then describe our literature synthesis and apply its

results to the advancement of the ISF and implementation theory and practice.

Brief Overview of Implementation Research

In many fields, such as education, health care, mental health treatment, and prevention and promotion, program evaluations did not historically include any mention or systematic study of implementation (Durlak and Dupre 2008). However, beginning in the 1980s, many empirical studies began appearing that indicated how important quality implementation was to intended outcomes (e.g., Abbott et al. 1998; Basch et al. 1985; Gottfredson et al. 1993; Grimshaw and Russell 1993; Tobler 1986).

As research on implementation evolved, so did our understanding of its complexity. For example, authors have identified eight different aspects to implementation such as fidelity, dosage, and program differentiation, and at least 23 personal, organizational, or community factors that affect one or more aspects of implementation (Dane and Schneider 1998; Durlak and Dupre 2008). Because implementation often involves studying innovations in real world contexts, rigorous experimental designs encompassing all of the possible influential variables are impossible to execute. Individual or multiple case studies have been the primary vehicle for learning about factors that affect the implementation process, yet the methodological rigor and generalizability of these reports varies. Nevertheless, there has been a steady improvement in the number and quality of studies investigating implementation, and there are now more carefully done quantitative and qualitative reports that shed light on the implementation process (e.g., Domitrovich et al. 2010; Fagan et al. 2008; Saunders et al. 2006; Walker and Koroloff 2007).

Although there is extensive empirical evidence on the importance of implementation and a growing literature on the multiple contextual factors that can influence implementation (e.g., Aarons et al. 2011; Domitrovich et al. 2008), there is a need for knowing how to increase the likelihood of quality implementation. Can a systematic, comprehensive overview of implementation be developed? If so, what would be its major elements? Could specific steps be identified to aid future research and practice on implementation? Our review helps to address these questions and focuses on issues related to high quality implementation.

Context

Using Rogers’ (2003) classic model, implementation is one of five crucial stages in the wide-scale diffusion of innovations: (1) dissemination (conveying information about

the existence of an innovation to potentially interested parties), (2) adoption (an explicit decision by a local unit or organization to try the innovation), (3) implementation (executing the innovation effectively when it is put in place), (4) evaluation (assessing how well the innovation achieved its intended goals), and (5) institutionalization (the unit incorporates the innovation into its continuing practices). While there can be overlap among Rogers' stages, our discussion of implementation assumes that the first two stages (dissemination of information and explicit adoption) have already occurred.

Terminology

There has yet to be a standardized language for describing and assessing implementation. For example, the extent to which an innovation that is put into practice corresponds to the originally intended innovation has been called fidelity, compliance, integrity, or faithful replication. Our focus is on *quality implementation*—which we define as putting an innovation into practice in such a way that it meets the necessary standards to achieve the innovation's desired outcomes (Meyers et al. 2012). This definition is consistent with how the International Organization for Standardization (ISO) views quality as a set of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs (ISO/IEC 1998). Implementation is not an all-or-none construct, but exists in degrees. For example, one may eventually judge that the execution of some innovations was of low quality, medium quality, or high quality (e.g., Saunders et al. 2006). This article focuses on issues related to high quality implementation.

Implementation Frameworks

Implementation scholars have made gains in describing the process of implementation. These efforts have taken different forms. Sometimes, they are descriptions of the major steps involved in implementation and at other times they are more refined conceptual frameworks based on research literature and practical experiences (e.g., theoretical frameworks, conceptual models). Miles and Huberman (1994) define a conceptual framework as a representation of a given phenomenon that “explains, either graphically or in narrative form, the main things to be studied—the key factors, concepts, or variables” (p. 18) that comprise the phenomenon. Conceptual frameworks organize a set of coherent ideas or concepts in a manner that makes them easy to communicate to others. Often, the structure and overall coherence of frameworks are “built” and borrow elements from elsewhere (Maxwell 2005).

Implementation frameworks have been described as windows into the key attributes, facilitators, and challenges related to promoting implementation (Flaspoehler et al. 2008a). They provide an overview of ideas and practices that shape the complex implementation process and can help researchers and practitioners use the ideas of others who have implemented similar projects. Some frameworks are able to provide practical guidance by describing specific steps to include in the planning and/or execution of implementation efforts, as well as mistakes that should be avoided.

Toward a Synthesis of Implementation Frameworks: A Review of Implementation Frameworks

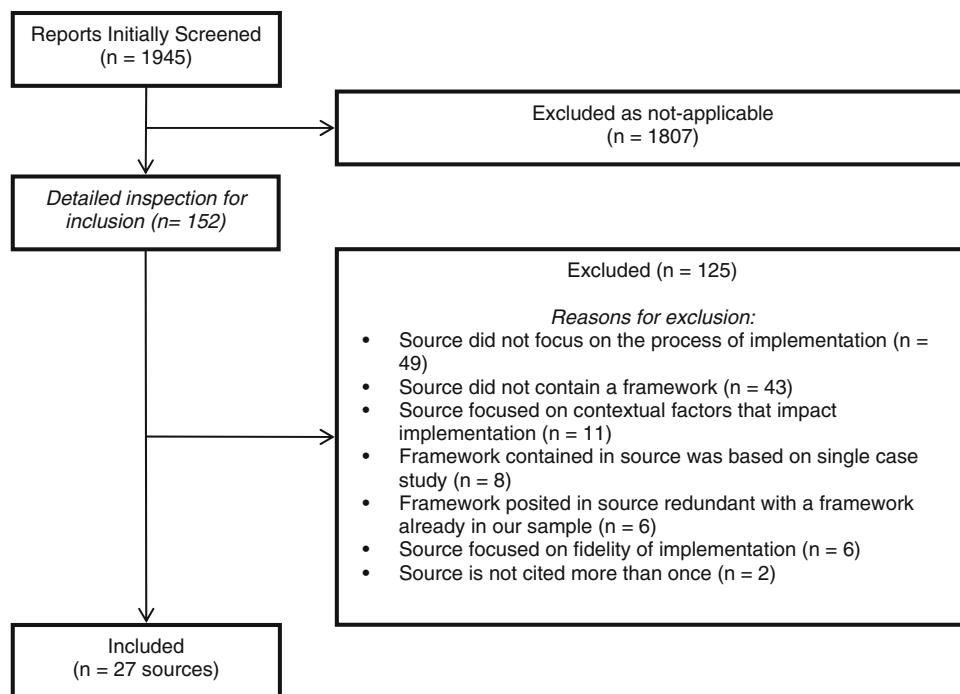
In this section, we describe our work on our conceptual goal. We use the term *implementation framework* to describe reports that focus on the “how-to” of implementation; that is, sources that offer details on the specific procedures and strategies that various authors believe are important for quality implementation. By synthesizing these frameworks, we are able to cross-walk the critical themes from the available literature to suggest actions that practitioners and those who work with them can employ to ensure quality implementation.

Inclusion Criteria and Literature Search Procedures

To be included in our review of implementation frameworks, a document about implementation had to meet two main criteria: (1) contain a framework that describes the main actions and strategies believed to constitute an effective implementation process related to using innovations in new settings, and (2) be a published or unpublished report that appeared in English by the end of June 2011. The framework could be based on empirical research or be a theoretical or conceptual analysis of what is important in implementation based on experience or a literature review. We placed no restrictions on the content area, population of interest, or type of innovation being considered; however, to be retained, the framework needed to focus on specific details of the implementation process.

Three strategies were used to locate relevant reports: (1) computer searches of six databases (Business Source Premier, Dissertation Abstracts, Google Scholar, MEDLINE, PsycINFO, and Web of Science) using variants of multiple search terms in various configurations (e.g., “implementation,” “framework”, “model”, “approach”, and “strategy”), (2) hand searches over the last 5 years of four journals that we judged were likely to contain relevant publications (*American Journal of Community Psychology*, *American Journal of Evaluation*, *Implementation Science*,

Fig. 1 Flow diagram of selected sources for the implementation framework synthesis. While there were a total of 27 sources that were used to comprise our sample, only 25 frameworks were described in these sources (two additional sources were retained to allow for a greater level of detail for the Communities That Care framework and the PROSPER framework)



Prevention Science), and (3) inspection of the reference lists of each relevant report and review of implementation research (e.g., Durlak and DuPre 2008; Fixsen et al. 2005; Greenhalgh et al. 2004).

We did not include reports about implementation based on a single implementation trial (e.g., Chakravorty 2009), articles with implementation frameworks that have not been cited more than once in the literature (e.g., Chinowsky 2008; Spence and Henderson-Smart 2011), articles that focus on contextual factors that can influence implementation (e.g., Aarons et al. 2011; Domitrovich et al. 2008), articles that focus more on fidelity (i.e., adherence, integrity) and less on the implementation process as a whole (e.g., Bellg et al. 2004;), articles that do not contain an implementation framework (e.g., Chorpita et al. 2002), articles that focus on a framework that is redundant with another source, or articles that do not put enough focus on the process of implementation and instead focus on a more expansive process (e.g., Simpson 2002). Instead, we only included reports in which authors attempted to offer a framework for implementation that was intended to be applied generally across one or more areas of research or practice, has been utilized over extended periods of time, and has been cited more than once in the literature (e.g., Kilbourne et al. 2007; Klein and Sorra 1996). Figure 1 is a flow diagram depicting our study selection for the implementation framework synthesis. The diagram was created in light of reporting guidance from the preferred reporting items for systematic reviews and meta-analyses (PRISMA; Liberati et al. 2009).

Once the sample of frameworks was established, we examined each one and distilled what appeared to be distinct critical steps for quality implementation, and we identified specific actions and strategies associated with each step. We then created broad categories to group similar steps and actions from the different frameworks to depict what appears to constitute quality implementation from beginning to end. Although authors used different terminology in many cases, the activities they described greatly assisted the categorization process. Few issues arose in placing elements in categories, and these were resolved through discussion among the authors.

Results

A total of 25 frameworks contained in 27 different sources were retained for the current synthesis. Two sources each were used for the Communities That Care and the PROSPER frameworks, since combining these sources provided a more elaborate description of the main steps and actions of each framework. All the sources are listed in Table 1, which also describes how each framework was based on a particular literature area, target population, and type of innovation.

Most of the 25 frameworks were based on the implementation of evidence-based programs via community-based planning approaches ($n = 6$) or health care delivery ($n = 5$), while others are specifically related to prevention/promotion ($n = 4$), evidence-based programs and/or

Table 1 Sources for implementation frameworks included in the review

Source	Primary literature areas examined as basis for framework	Target population
CASEL (2011)	School-based social and emotional learning	Children and adolescents
Chinman et al. (2004)—GTO	Community-based substance abuse prevention planning	Children and adolescents
Damschroder et al. (2009)—CFIR	Evidence-based health care	Not specified
Durlak and DuPre (2008)	Prevention and health promotion programs	Children and adolescents
Feldstein and Glasgow (2008)—PRISM	Evidence-based health care	Not specified
Fixsen et al. (2005)	Implementation of evidence-based practices including human services (e.g., mental health, social services, juvenile justice, education, employment services, substance abuse prevention and treatment), agriculture, business, engineering, medicine, manufacturing, and marketing	Not specified
Glisson and Schoenwald (2005)—ARC	Evidence-based treatments	Children, adolescents, and their families
Greenberg et al. (2005)	School-based preventive and mental health promotion interventions	Children and adolescents
Greenhalgh et al. (2004)	Health care	Not specified
Guldbrandsson (2008)	Health promotion and disease prevention	Not specified
Hall and Hord (2006)	School-based innovations	Children and adolescents
Hawkins et al. (2002)—CTC; Mihalic et al. (2004)—Blueprints	Evidence-based violence and drug prevention programs	Children and adolescents
Kilbourne et al. (2007)—REP	Community-based behavioral and treatment interventions for HIV	Not specified
Klein and Sorra (1996)	Management	Organizational managers
Okumus (2003)	Management	Organizational managers
PfS (2003)	Community-based prevention planning	Children and adolescents
Rogers (2003)	Diffusion of innovations in organizations	Not specified
Rycroft-Malone (2004)—PARIHS	Evidence-based healthcare	Not specified
Spoth et al. (2004); Spoth and Greenberg (2005)—PROSPER	Population-based youth development and reduction of youth problem behaviors (e.g., substance use, violence, and other conduct problems)	Children and adolescents
Sandler et al. (2005)	Community-based prevention services	Children and adolescents
Stetler et al. (2008)—QUERI	Evidence-based health care	United States Veterans
Stith et al. (2006)	Community-based programs for violence prevention and substance abuse prevention	Children and adolescents
Van de Ven et al. (1989)	Technological innovations	Organizational managers and stakeholders
Walker and Koroloff (2007)	Comprehensive, individualized, family-driven mental health services	Children, adolescents, and their families
Wandersman et al. (2008)—ISF	Injury and violence prevention	Children and adolescents

ARC Availability, Responsiveness, Continuity community intervention model, *Blueprints* for Violence Prevention, *CASEL* Collaborative for Academic, Social, and Emotional Learning, *CFIR* Consolidated Framework for Implementation Research, *CTC* Communities That Care, *GTO* Getting To Outcomes, *PfS* Partnerships for Success, *ISF* Interactive Systems Framework, *PARIHS* Promoting Action on Research Implementation in Health Services, *PRISM* Practical, Robust Implementation and Sustainability Model, *PROSPER* PROmoting School/Community-University Partnerships to Enhance Resilience, *QUERI* Quality Enhancement Research Initiative, *REP* Replicating Effective Programs

treatments ($n = 3$), specific to school-based innovations ($n = 3$), implementing non-specific innovations in organizations ($n = 2$), or are related to management ($n = 2$). Most of the evidence-based programs/treatments targeted children and adolescents. Many of the health care

innovations were related to integrating different aspects of evidence-based medicine into routine practice.

The synthesis of the critical steps associated with quality implementation is summarized in Table 2. Table 3 contains important questions to answer at each step and the overall

Table 2 Summary of the four implementation phases and 14 critical steps in the Quality Implementation Framework that are associated with quality implementation

Phase One: Initial considerations regarding the host setting
Assessment strategies
1. Conducting a needs and resources assessment
2. Conducting a fit assessment
3. Conducting a capacity/readiness assessment
Decisions about adaptation
4. Possibility for adaptation
Capacity-building strategies
5. Obtaining explicit buy-in from critical stakeholders and fostering a supportive community/organizational climate
6. Building general/organizational capacity
7. Staff recruitment/maintenance
8. Effective pre-innovation staff training
Phase Two: Creating a structure for implementation
Structural features for implementation
9. Creating implementation teams
10. Developing an implementation plan
Phase Three: Ongoing structure once implementation begins
Ongoing implementation support strategies
11. Technical assistance/coaching/supervision
12. Process evaluation
13. Supportive feedback mechanism
Phase Four: Improving future applications
14. Learning from experience

frequency with which each step was included in the sampled frameworks. We call the results of our synthesis the *Quality Implementation Framework (QIF)* because it focuses on important elements (critical steps and actions) believed to constitute quality implementation. Four important findings emerged from our synthesis: (1) it was possible to identify 14 distinct steps comprising quality implementation; (2) these steps could be logically divided into four temporal phases; (3) there was considerable agreement among the various sources on many of these steps; and (4) the overall conceptualization of implementation that emerged suggests that quality implementation is a systematic process that involves a coordinated series of related elements. These findings offer a useful blueprint for future research and practice.

For example, the information in Table 3 indicates that quality implementation can be viewed conceptually as a systematic, step-by-step, four-phase sequence that contains over one dozen steps. Most of these steps (10 of the 14) should be addressed *before* implementation begins, and they suggest that quality implementation is best achieved through a combination of multiple activities that include assessment, negotiation and collaboration, organized planning and structuring, and, finally, personal reflection and critical analysis.

The four phase conceptualization that appears in Table 3 suggests when and where to focus one's attention in order to achieve quality implementation. The first phase, *Initial Considerations Regarding the Host Setting*, contains eight critical steps and focuses on the host setting. Activities in this phase involve various assessment strategies related to organizational needs, innovation-organizational fit, and a capacity or readiness assessment. Each implementation effort also raises the critical question regarding if and how the innovation should be adapted to fit the host setting. In other words, work in the first phase of implementation focuses primarily on the ecological fit between the innovation and the host setting.

Although it is not noted in Table 3, a clear explanation and definition of the specified standards for implementation (e.g., active ingredients, core components, critical features, or essential elements) should be agreed on by all involved parties. Therefore, decisions about whether any adaptations are to be made should occur *before* explicit buy-in for the innovation is obtained so all stakeholders understand what the innovation consists of and what using it entails. If the core components of the innovation are clearly known, many of the framework authors emphasized that any adaptations should preserve these components to maintain the integrity of the innovation.

An emerging strategy for adaptation calls upon innovation developers and researchers to identify which components of innovations can be adapted. Unless practitioners have a deep understanding of effective implementation and program theory, they need support and guidance when adapting innovations to new contexts and populations. Such support must rely on the local knowledge that these practitioners have about the setting that hosts the innovation. Multiple frameworks in this review state that innovation developers should provide a foundation for adaptations by identifying what can be modified (e.g., surface structure modifications that are intended to boost engagement and retention) and what should never be modified (e.g., an innovation's core components) as part of their dissemination strategy. Approaches have been developed to help resolve the tension between the need for fidelity and adaptation (e.g., Lee et al. 2008), and such guidance can foster adherence to an innovation's protocol for use while also enhancing its fit and relevance to the organization/community (Forehand et al. 2010).

In addition, all but two frameworks indicated that steps should be taken to foster a supportive climate for implementation and secure buy-in from key leaders and front-line staff in the organization/community. Some of the specific strategies suggested in this critical step include: (1) assuring key opinion leaders and decision-makers are engaged in the implementation process and perceive that the innovation is needed and will benefit organizational

Table 3 Critical steps in implementation, important questions to answer at each step in the Quality Implementation Framework, and the frequency with which each step was included in the 25 reviewed frameworks

Phases and steps of the quality implementation framework	Frequency
<i>Phase one: Initial considerations regarding the host setting</i>	
Assessment strategies	
1. Conducting a needs and resources assessment:	14 (56 %)
Why are we doing this?	
What problems or conditions will the innovation address (i.e., the need for the innovation)?	
What part(s) of the organization and who in the organization will benefit from improvement efforts?	
2. Conducting a fit assessment:	14 (56 %)
Does the innovation fit the setting?	
How well does the innovation match the:	
Identified needs of the organization/community?	
Organization's mission, priorities, values, and strategy for growth?	
Cultural preferences of groups/consumers who participate in activities/services provided by the organization/community?	
3. Conducting a capacity/readiness assessment:	11 (44 %)
Are we ready for this?	
To what degree does the organization/community have the will and the means (i.e., adequate resources, skills and motivation) to implement the innovation?	
Is the organization/community ready for change?	
Decisions about adaptation	
4. Possibility for adaptation	19 (76 %)
Should the planned innovation be modified in any way to fit the host setting and target group?	
What feedback can the host staff offer regarding how the proposed innovation needs to be changed to make it successful in a new setting and for its intended audience?	
How will changes to the innovation be documented and monitored during implementation?	
Capacity Building Strategies (may be optional depending on the results of previous elements)	
5. Obtaining explicit buy-in from critical stakeholders and fostering a supportive community/organizational climate:	23 (92 %)
Do we have genuine and explicit buy-in for this innovation from:	
Leadership with decision-making power in the organization/community?	
From front-line staff who will deliver the innovation?	
The local community (if applicable)?	
Have we effectively dealt with important concerns, questions, or resistance to this innovation? What possible barriers to implementation need to be lessened or removed?	
Can we identify and recruit an innovation champion(s)?	
Are there one or more individuals who can inspire and lead others to implement the innovation and its associated practices?	
How can the organization/community assist the champion in the effort to foster and maintain buy-in for change?	
<i>Note.</i> Fostering a supportive climate is also important after implementation begins and can be maintained or enhanced through such strategies as organizational policies favoring the innovation and providing incentives for use and disincentives for non-use of the innovation	
6. Building general/organizational capacity:	15 (60 %)
What infrastructure, skills, and motivation of the organization/community need enhancement in order to ensure the innovation will be implemented with quality?	
Of note is that this type of capacity does not directly assist with the implementation of the innovation, but instead enables the organization to function better in a number of its activities (e.g., improved communication within the organization and/or with other agencies; enhanced partnerships and linkages with other agencies and/or community stakeholders).	
7. Staff recruitment/maintenance:	13 (52 %)
Who will implement the innovation?	
Initially, those recruited do not necessarily need to have knowledge or expertise related to use of the innovation; however, they will ultimately need to build their capacity to use the innovation through training and on-going support	
Who will support the practitioners who implement the innovation?	
These individuals need expertise related to (a) the innovation, (b) its use, (c) implementation science, and (d) process evaluation so they can support the implementation effort effectively	
Might roles of some existing staff need realignment to ensure that adequate person-power is put towards implementation?	

Table 3 continued

Phases and steps of the quality implementation framework	Frequency
8. Effective pre-innovation staff training Can we provide sufficient training to teach the why, what, when, where, and how regarding the intended innovation? How can we ensure that the training covers the theory, philosophy, values of the innovation, and the skill-based competencies needed for practitioners to achieve self-efficacy, proficiency, and correct application of the innovation?	22 (88 %)
<i>Phase two: Creating a structure for implementation</i>	
Structural features for implementation	
9. Creating implementation teams: Who will have organizational responsibility for implementation? Can we develop a support team of qualified staff to work with front-line workers who are delivering the innovation? Can we specify the roles, processes, and responsibilities of these team members?	17 (68 %)
10. Developing an implementation plan: Can we create a clear plan that includes specific tasks and timelines to enhance accountability during implementation? What challenges to effective implementation can we foresee that we can address proactively?	13 (52 %)
<i>Phase three: Ongoing structure once implementation begins</i>	
Ongoing implementation support strategies	
11. Technical assistance/coaching/supervision: Can we provide the necessary technical assistance to help the organization/community and practitioners deal with the inevitable practical problems that will develop once the innovation begins? These problems might involve a need for further training and practice in administering more challenging parts of the innovation, resolving administrative or scheduling conflicts that arise, acquiring more support or resources, or making some required changes in the application of the innovation	20 (80 %)
12. Process evaluation Do we have a plan to evaluate the relative strengths and limitations in the innovation's implementation as it unfolds over time? Data are needed on how well different aspects of the innovation are being conducted as well as the performance of different individuals implementing the innovation	24 (96 %)
13. Supportive feedback mechanism Is there an effective process through which key findings from process data related to implementation are communicated, discussed, and acted upon? How will process data on implementation be shared with all those involved in the innovation (e.g., stakeholders, administrators, implementation support staff, and front-line practitioners)? This feedback should be offered in the spirit of providing opportunities for further personal learning and skill development and organizational growth that leads to quality improvement in implementation	18 (72 %)
<i>Phase four: Improving future applications</i>	
14. Learning from experience What lessons have been learned about implementing this innovation that we can share with others who have an interest in its use? Researchers and innovation developers can learn how to improve future implementation efforts if they critically reflect on their experiences and create genuine collaborative relationships with those in the host setting Collaborative relationships appreciate the perspectives and insights of those in the host setting and create open avenues for constructive feedback from practitioners on such potentially important matters as: (a) the use, modification, or application of the innovation; and (b) factors that may have affected the quality of its implementation	7 (28 %)

functioning; (2) aligning the innovation with the setting's broader mission and values; (3) identifying policies that create incentives for innovation use, disincentives for non-use, and/or reduce barriers to innovation use; and (4) identifying champions for the innovation who will advocate for its use and support others in using it properly.

Advocates for the innovation should be able to answer the following questions before proceeding further: How well does the innovation (either as originally intended or in a modified format) fit this setting? To what extent does

staff understand what the innovation entails? In what ways will the innovation address important perceived needs of the organization? Does staff have a realistic view of what the innovation may accomplish, and are they ready and able to sponsor, support, and use the innovation with quality?

The second phase of quality implementation, *Creating a Structure for Implementation*, suggests that an organized structure should be developed to oversee the process. At a minimum, this structure includes having a clear plan for

implementing the innovation and identifying a team of qualified individuals who will take responsibility for these issues. Two important questions to answer before this phase concludes are: (1) Is there a clear plan for what will happen, and when it should occur; and (2) who will accomplish the different tasks related to delivering the innovation and overseeing its implementation?

The work involved in the first two phases is in preparation for beginning implementation (i.e., planning implementation). Implementation actually begins in phase three of our framework: *Ongoing Structure Once Implementation Begins*. There are three important tasks in this phase: (1) providing needed on-going technical assistance to front-line providers; (2) monitoring on-going implementation; and (3) creating feedback mechanisms so involved parties understand how the implementation process is progressing. Therefore, the corresponding questions that require answers involve: (1) Do we have a sound plan in place to provide needed technical assistance? (2) Will we be able to assess the strengths and limitations that occur during implementation? (3) Will the feedback system be rapid, accurate, and specific enough so that successes in implementation can be recognized and changes to improve implementation can be made quickly?

The fourth phase, *Improving Future Applications*, indicates that retrospective analysis and self-reflection coupled with feedback from the host setting can identify particular strengths and weaknesses that occurred during implementation. The primary question is: “What has this effort taught us about quality implementation?” This phase only includes one critical step—learning from experience—which appears because it was implicit in many of the frameworks and explicit in a few of them. For example, many authors implied that they learned about implementation from practical experience and from the feedback received from host staff. This is understandable because in the absence of systematic theory and research on implementation in many fields of inquiry, learning by doing was the primary initial vehicle for developing knowledge about implementation. Several authors revised their frameworks over time by adding elements or modifying earlier notions about implementation. While there have been instances of researchers empirically testing their implementation framework and modifying it based on data (Klein et al. 2001), modifications were often shaped by: feedback received from a host setting about ineffective and effective strategies, considering what others were beginning to report in the literature, and/or by critical self-reflection about one’s effort. In sum, over time, based on their own or others’ experiences, both mistakes and successes in the field coalesced to shape various conceptualizations of what quality implementation should look like (e.g., Grol and Jones 2000; Van de Ven et al. 1989).

Convergent Evidence for Specific Elements

Table 4 indicates how many of the 25 reviewed frameworks included each of the 14 steps. As we hypothesized, there was substantial agreement about many of the steps. We did not expect perfect agreement on each critical step because the individual frameworks appeared at different times in the history of implementation research, and the frameworks came from different content areas (health care, prevention and promotion, mental health treatment, education, and industry) served different populations (adults or children) and had different goals (e.g., promotion, treatment, or increased organizational effectiveness). Nevertheless, there was near universal agreement on the importance of monitoring implementation (critical step 12; present in 96 % of the reviewed reports) and strong agreement on the value of developing buy-in and a supportive organizational climate (critical step 5; 92 %), training (critical step 8; 88 %), technical assistance (critical step 11; 80 %), feedback mechanisms (critical step 13; 72 %), the creation of implementation teams (critical step 9; 68 %), and the importance of building organizational capacity (critical step 6; 60 %). Several other steps were present in more than half of the frameworks (e.g., critical steps 1 and 2; assessing the need for the innovation and the fit of the innovation, respectively).

Research Support for Different Elements

Which elements in our framework have received research support? It is difficult to make exact comparisons between our synthesis and the findings from specific research investigations. Some critical steps represent a combination of behaviors and actions that may address multiple targets and constructs and that can be applied somewhat differently across different contexts. Most research on implementation has not focused on critical steps for quality implementation as we define them here, but instead on specific factors that influence the overall success of implementation such as challenges inherent in the implementation process (e.g., Aarons et al. 2011) or contextual factors that influence quality of implementation (e.g., Domitrovich et al. 2008). However, several research studies have examined issues that relate to one or more activities within the scope of different critical steps.

Given these considerations, with one exception, there is some support for each of the QIF critical steps. This support varies in strength and character depending on the step, and is discussed in several sources (Durlak and Dupre 2008; Fixsen et al. 2005; Greenhalgh et al. 2004). The strongest support, in terms of the quantity and quality of empirical studies, exists for the importance of training and on-going technical assistance (critical steps 8 and 11,

Table 4 Steps included in each reviewed framework

Framework phases and steps	Van de Ven et al. (1989)	Klein and Sorra (1996)	Hawkins et al. (2002); Mihalic et al. (2004)	Okumus (2003)	Rogers (2003)	PfS (2003)	Chinman et al. (2004)	Greenhalgh et al. (2004)	Rycroft-Malone (2004)
<i>Phase One: Initial considerations</i>									
1. Needs and resources assessment			X		X	X	X	X	X
2. Fit assessment	X		X		X	X	X	X	X
3. Capacity/readiness assessment		X	X			X	X	X	X
4. Possibility for adaptation	X		X			X	X	X	X
5. Buy-in; supportive climate	X	X	X			X	X	X	X
6. General org. capacity building			X			X	X	X	X
7. Staff recruitment/maintenance			X			X	X	X	X
8. Pre-innovation training			X			X	X	X	X
9. Implementation teams	X		X			X	X	X	X
10. Implementation plan		X	X			X	X	X	X
<i>Phase Three: Ongoing support strategies</i>									
11. TA/coaching/supervision	X	X	X			X	X	X	X
12. Process evaluation	X	X	X			X	X	X	X
13. Feedback mechanism			X			X	X	X	X
<i>Phase Four: Improving future applications</i>									
14. Learning from experience		X					X		
Framework phases and steps	Spoth et al. (2004); Spoth and Greenberg (2005)		Fixsen et al. (2005)	Glisson and Schoenwald (2005)	Greenberg et al. (2005)	Sandler et al. (2005)	Hall and Hord (2006)	Stith et al. (2006)	Kilbourne et al. (2007)
<i>Phase One: Initial considerations</i>									
1. Needs and resources assessment	X		X		X		X	X	X
2. Fit assessment		X	X		X		X	X	X
3. Capacity/readiness assessment		X	X		X		X	X	X
4. Possibility for adaptation	X		X			X		X	X
5. Buy-in; supportive climate		X	X		X		X	X	X
6. General org. capacity building	X		X			X		X	X
7. Staff recruitment/maintenance	X		X			X		X	X
8. Pre-innovation training	X		X			X		X	X
9. Implementation teams	X		X			X		X	X
10. Implementation plan		X				X		X	X
<i>Phase Three: Ongoing support strategies</i>									
11. TA/coaching/supervision	X		X			X		X	X

Table 4 continued

Framework phases and steps	Spoth et al. (2004); Spoth and Greenberg (2005)	Fixsen et al. (2005)	Glisson and Schoenwald (2005)	Greenberg et al. (2005)	Sandler et al. (2005)	Hall and Hord (2006)	Stith et al. (2006)	Kilbourne et al. (2007)
12. Process evaluation	X	X	X	X	X	X	X	X
13. Feedback mechanism	X	X	X	X	X	X	X	
<i>Phase Four: Improving future applications</i>								
14. Learning from experience			X	X				X
Framework phases and steps	Walker and Koroloff (2007)	Durlak and DuPre (2008)	Feldstein and Glasgow (2008)	Guldbrandsson (2008)	Stettler et al. (2008)	Wandersman et al. (2008)	Damschroder et al. (2009)	CASEI (2011)
<i>Phase One: Initial considerations</i>								
1. Needs and resources assessment			X				X	X
2. Fit assessment	X	X						
3. Capacity/readiness assessment		X	X				X	X
4. Possibility for adaptation	X	X	X				X	X
5. Buy-in; supportive climate	X	X	X				X	X
6. General org. capacity building	X	X	X				X	X
7. Staff recruitment/maintenance		X	X				X	X
8. Pre-innovation training	X	X	X				X	X
<i>Phase Two: Structure for implementation</i>								
9. Implementation Teams	X	X	X				X	X
10. Implementation plan	X		X				X	X
<i>Phase Three: Ongoing support strategies</i>								
11. TA/coaching/supervision	X	X	X				X	X
12. Process evaluation	X	X	X				X	X
13. Feedback mechanism	X	X	X				X	X
<i>Phase Four: Improving future applications</i>								
14. Learning from experience			X				X	

respectively); the evidence indicates that it is the *combination* of training and on-going support that enhances learning outcomes (Miller et al. 2004; Sholomskas et al. 2005). Historically, work on implementation focused only on training, and it was only later as a result of both research findings and experiences from the field that the necessary added value of supportive technical assistance was noted (e.g., Fixsen et al. 2005; Joyce and Showers 2002).

Using an approach similar to Durlak and DuPre (2008), we interpreted research support to mean the existence of at least five reports that generally agree on the importance of the step. Using this metric indicates that there is research support for the importance of studying the needs of the host setting (critical step 1), determining the degree of fit between the innovation and the setting and target population (critical step 2), taking steps to foster a supportive organizational climate for implementation and having champions on hand to advocate for the program (critical step 5), the importance of capacity building (critical step 6), and for monitoring the process of implementation (critical step 12). There is also both quantitative and qualitative support for the value of adaptation (critical step 4).

Support for other elements rests upon conclusions from the field based mainly on a few individual qualitative case studies rather than quantitative studies. This refers to importance of developing an implementation team and plan (critical steps 9 and 10), and instituting a feedback system regarding how well the implementation process is proceeding (critical step 13). These qualitative investigations are important because it would be difficult to arrange an experimental or quasi-experimental study in which these elements were missing in one program condition but present in another. Nevertheless, empirical studies have documented how early monitoring of implementation can identify those having difficulties, and that subsequent retraining and assistance can lead to dramatic improvements in implementation (DuFrene et al. 2005; Greenwood et al. 2003).

Step 7, which involves recruiting staff to deliver the intervention, does not require research confirmation per se, but rests on the obvious consideration that someone must provide the innovation. Most support for the importance of learning from experience (step 14) is largely implicit and was inferred from several reports. For example, data from multi-year interventions indicated how implementation improves over time (Cook et al. 1999; Elder et al. 1996; Riley et al. 2001), presumably because authors have seen the need for and have acted to enhance implementation in one fashion or another. In other cases, authors recognized strengths or weaknesses in their implementation efforts—either in retrospect or as the innovation was being delivered—that offered important lessons for improving future

trials. There are reports in which suggestions about better subsequent implementation might occur through improving communication among stakeholders (Sobo et al. 2008), changing aspects of training or technical assistance (Wandersman et al. 2012), or modifying the innovation itself to fit the host setting (Blakely et al. 1987; Kerr et al. 1985; McGraw et al. 1996; Mihalic et al. 2004).

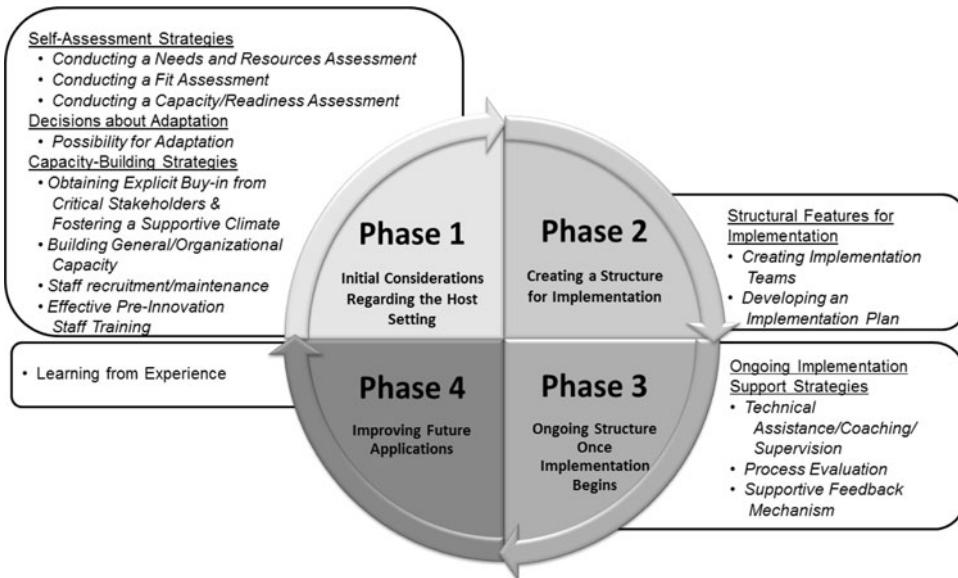
Temporal Ordering of Elements

Our synthesis suggests there is a temporal order to the critical steps of quality implementation. Some steps need attention prior to the beginning of any innovation (namely, critical steps 1–10), some are ascendant as implementation unfolds (critical steps 11–13), and the last element offers opportunities for learning once the first innovation trial is complete (critical step 14).

The temporal ordering of implementation steps suggests why some innovations may have failed to achieve their intended effects because of poor implementation. In some cases, researchers realized only after the fact that they had not sufficiently addressed one or more steps in the implementation process. The need to be proactive about possible implementation barriers is reported by Mihalic et al. (2004) in their description of the Blueprints for Violence Prevention initiative. They found that lack of staff buy-in usually resulted in generalized low morale and eventually led to staff turnover. Moreover, lack of administrative support was present in every case of failed implementation. Proactive monitoring systems can be developed to identify such challenges as they arise during implementation and provide feedback to stakeholders so they can take action. An example of a proactive monitoring system's benefit is described in Fagan et al. (2008). The proactive system was developed to ensure high-fidelity prevention program implementation in the Community Youth Development Study. In this study, local input was sought for how to modify the implementation procedures to increase ownership and buy-in. Together, actively fostering this buy-in and administrative support, providing training and technical assistance, and developing a proactive monitoring system helped support 12 communities in replicating prevention programs with high rates of adherence to the programs' core components. Therefore, the sequence offered in Table 2 may assist other practitioners and researchers in preventing future problems in implementation, if they attend to its critical steps.

The temporal order suggested in Table 2 is not invariant because implementation is a dynamic process. Quality implementation does not always occur in the exact sequence of steps illustrated in Table 2. In some cases, individuals must revisit some of the steps at a later time (e.g., if necessary, to gather more support and resources, to

Fig. 2 Dynamic interplay among the critical steps of the QIF. The arrows from one phase to the next are intended to suggest that the steps in each of the phases should continue to be addressed throughout the implementation process. Steps in each of the phases may need to be strengthened, revisited, or adapted throughout the use of an innovation in an organization/community. While a logical order in which the critical steps unfold was needed to develop a coherent framework, we believe the manner in which they are implemented in practice will depend on many factors (e.g., context, resources, logistical concerns)



re-train some staff, to re-secure genuine buy-in from critical stakeholders). In other cases, some steps might be skipped, for example, if evidence exists that the organization already has sufficient capacity to conduct the innovation, or if champions are already apparent and have advocated for the innovation. Furthermore, some steps may need to be addressed simultaneously because of time, financial, or administrative pressures. In addition, it may be more efficient to conduct some steps simultaneously (e.g., the self-assessment strategies in Phase 1).

The dynamic nature of the implementation process is such that some of the phases in Table 2 overlap. For example, step 5 relates to gaining buy-in and fostering a climate that is supportive of appropriate use of the innovation. We have included this critical step as part of our first phase of the QIF, yet our literature review indicated that this element could also be viewed as part of creating a supportive structure in the second phase (e.g., enacting policies that remove barriers to implementation and enable practitioners to implement an innovation with greater ease), or in the third phase related to maintaining ongoing support (e.g., monitoring the enforcement of policies and evaluating their benefit). We had to make a final decision to place each step into one of the four phases. In order to display the dynamic nature of the phases and critical steps of the QIF, we have provided a figure that suggests the dynamic interplay (see Fig. 2).

Modifications in implementation might be necessary because of the complexities of the host setting. Context is always important. Innovations are introduced into settings for many reasons and via different routes. Organizations/communities might become involved because of true perceived needs, because of administrative fiat, or as a result of political or financial pressures. Such entities also have

varied histories in terms of their ability to promote change and work effectively together. If the above circumstances are not clarified, it is likely that their importance will not emerge until after contact with the host organization or community has been established. As a result, some critical steps in implementation might have to be prioritized and periodically revisited to confirm the process is on a successful track. Nevertheless, the QIF can serve as a cross-walk that can offer guidance in the form of an ordered sequence of activities that should be considered and accomplished to increase the odds of successful implementation.

Discussion

Our findings reflected success in achieving our main conceptual, research, and practical goals. Based on our literature synthesis, we developed the QIF, which provides a conceptual overview of the critical steps that comprise the process of quality implementation. The QIF contains four temporal phases and 14 distinct steps and offers a useful blueprint for future research and practice. For example, the QIF indicates that quality implementation is best achieved by thinking about the implementation process systematically as a series of coordinated steps and that multiple activities that include assessment, collaboration and negotiation, monitoring, and self-reflection are required to enhance the likelihood that the desired goals of the innovation will be achieved.

Our review of existing frameworks, which the QIF is based upon, is different from previous reviews because its sample of frameworks (1) were from multiple domains (e.g., school-based prevention programs, health care

innovations, management) and (2) focused on the “how to” of implementation (i.e., details on the specific actions and strategies that authors believe are important). There was considerable convergence on many elements in the QIF, which is an important finding. Science frequently advances through the identification of principles with broad applicability. Our findings suggest that there are similar steps in the implementation process regardless of the type of innovation, target population, and desired outcomes, and thus offers guidance to others working in many different fields. The QIF can assist those interested in incorporating more evidence-based innovations into everyday practice by offering assistance on how to approach implementation in a systematic fashion.

Our second goal was to summarize the research support that exists for the QIF’s critical steps for quality implementation. While support exists in varying degrees for each of the synthesized elements of implementation presented here, there are still many unknowns. The strongest empirical support is for the critical steps related to training and on-going technical assistance (Wandersman et al. 2012). These support strategies are often essential to quality implementation and using both is recommended. Other steps which have empirical support include assessing the needs and resources of the host setting when planning for implementation, assessing how the innovation aligns and fits with this setting, fostering and maintaining buy-in, and building organizational capacity. Also, it is apparent that implementation should always be monitored.

Our findings also suggest implementation-related research questions that require careful study. Research questions about the host setting where implementation will take place (Phase One of the QIF) include: How comprehensively should we conduct assessments of organizational needs and the degree of fit between the innovation and each setting? Who should provide this information and how can it be obtained most reliably, validly, and efficiently? Which dimensions of “innovation fit” (e.g., cultural preferences, organizational mission and values) are most important? How do we know whether an innovation fits sufficiently with the host setting? Questions related to capacity are also relevant, including: How can we best capture the current and future capacity of host organizations? What criteria should be used to assess when this capacity is sufficient to mount an innovation? How can we assess the relative effectiveness of different training strategies, and how do we measure staff mastery of required skills before we launch the innovation?

In the first phase of the QIF, we need to better understand the conditions when adaptations are necessary and which criteria should be used to make this determination. If adaptations are planned, they need to be operationalized and carefully assessed during implementation, or else the nature of the new innovation is unclear. What are the most

effective methods to ensure we have clear data on adaptation and its effects? How do we judge if the adaptation improved the innovation or lessened its impact? Is it possible to conduct an experiment in which the relative influence of the originally intended and adapted forms of an innovation can be compared?

In Phase Two, we need more information on what forms of on-going technical assistance are most successful for different purposes and how we can accurately measure the impact of this support. In past research, it seems many authors have assumed that training or on-going technical assistance leads to uniform mastery among front-line staff; yet the empirical literature is now clear that substantial variability in implementation usually occurs among program providers (Durlak and Dupre 2008). There is a need to develop the evidence base for effective training and technical assistance (Wandersman et al. 2012).

Additional questions about the QIF include: How can it be applied to learn more about the degree to which its use improves implementation, the value and specifics of each critical step, and the connections and interactions among these steps? Are there important these steps in the current framework that are missing? Should some steps in the framework be revised?

Our third goal was to discuss the practical implications of our findings. We will discuss these implications by applying the elements of quality implementation from the QIF to the three ISF systems. First we will specify the roles that the systems of the ISF have in ensuring quality implementation. Second, we will apply the collective guidance synthesized via the QIF by making explicit links between and within these systems, and detail specific actions that can be used to collaboratively foster high quality implementation.

In the ISF, innovations are processed by the Synthesis and Translation System. This system promotes innovations that can achieve their intended outcomes. The Delivery System is comprised of the end-implementers (practitioners) of innovations; therefore, quality implementation by the Delivery System is crucial since this is where innovations are used in real-world settings. In order to ensure quality implementation by the Delivery System, the Support System provides ongoing assistance to build and strengthen the necessary capacities for effective innovation use. In other words, the Support System aims to build and help maintain an adequate level of capacity in the Delivery System, and the Delivery System utilizes its capacities to put the innovation into practice so that outcomes are likely to be achieved. In this way, the three systems in the ISF are mutually accountable for quality implementation and need to work together to make sure it happens.

The QIF can facilitate how these systems work together, and the Support System can use this framework to help

plan for how it will provide support to the Delivery System during implementation. For example, in Phase One, the Support System can facilitate the assessment of key aspects of the Delivery System's environment (e.g., needs and resources, how the innovation "fits" with the setting, and whether the organization/community is ready to implement), help identify appropriate adaptations to the innovation (e.g., cultural or other modifications required by local circumstances, changes in the manner or intensity of delivery of program components), ensure adequate buy-in from key leaders and staff members, and provide necessary training so the innovation is used properly. Given the interactive nature of this process, there is a need to foster and maintain positive relationships among these systems and the QIF can help identify key issues that require collaboration.

In regard to adaptation, our review indicated that the Synthesis and Translation System plays a critical role in deciding whether and how to modify an innovation. Given that this system is charged with developing user-friendly evidence-based innovations, several frameworks in our review indicated that this system is accountable for providing information relevant to adaptation as a critical aspect of their dissemination strategy. Such information guides practitioners in the process of adapting programs to new contexts: this may include consulting at the initial stages where planning for implementation is taking place. Such consultation could be considered part of the innovation itself—an innovation that can be tailored to better fit within the host setting. This is a much more involved process than disseminating packaged program materials (e.g., manuals and other tools) that lack guidance on what can be adapted and what should never be adapted.

In Phase Two, the QIF indicates that the Delivery and Support systems should work together to develop a structure that can support implementation. A key component of this structure is a team that is accountable for implementation. An implementation plan needs to be created that serves to guide implementation and anticipate challenges that may be encountered. This plan can be strengthened by incorporating the Delivery System's local knowledge of the host setting with the Support System's knowledge of effective support strategies (e.g., effective methods for technical assistance) and of the innovation.

During Phase Three (when actual implementation transpires), the Support System may assure that implementation by the Delivery System is supported. It is fundamental that sufficient funding be in place during this phase to ensure that adequate resources are available for innovation use and support, and this has implications for important implementation support policy considerations. A major mechanism for support is technical assistance which is

intended to maintain the self-efficacy and skill proficiency that were developed through training (Durlak and DuPre 2008). The key notion here is that support is on-going, including monitoring and evaluating the implementation process: Durlak and DuPre (2008) argue that this is necessary for implementing innovations. If appropriate adaptations were identified during Phase One, then the Support System may assure that monitoring and evaluation activities are tailored to these adaptations. Then, the Support System may assess the extent to which the adaptations impact the implementation process and resulting outcomes. Other aspects of the process that should be monitored include the extent to which tasks in the implementation plan are accomplished in a timely manner, whether practitioners are actually using the innovation (adherence), as well as performance data related to the quality of innovation delivery. This information can be used by the Support System to enhance quality assurance and should be fed back to the Delivery System.

Some researchers are beginning to develop more specific guidelines on how to monitor the implementation process. The Collaborative for Academic, Social, and Emotional Learning (CASEL 2011) has categorized each of the elements in their implementation framework into one of five ascending levels. For example, with respect to availability of human resources, the CASEL guidelines ask change agents to consider whether there is no staff for the program (level one), some staff are present (level two) up through level five (whether there are formal organizational structures in place that institutionalize adequate human resources including leadership positions). Such delineations can help determine where more work is needed for quality implementation to occur.

During Phase Four, the Support System engages with the Delivery System to reflect on the implementation process. Reflection can illuminate what lessons have been learned about implementing this innovation that can be used to improve future applications and can be shared with others who have similar interests. Researchers and program developers are encouraged to form genuine collaborative relationships that appreciate the perspectives and insights of those in the Delivery System. Constructive feedback from practitioners in the Delivery System can be important to the use, modification, or application of the innovation, and factors that may have affected the quality of implementation.

A practical application of our findings was the synthesis and translation of QIF concepts into a tool that can be used to guide the implementation process. The tool, called the Quality Implementation Tool, is described in Meyers et al. (2012); the article also discusses how this instrument was applied to foster implementation in two different projects.

Limitations

Although we searched carefully for relevant articles, it is likely that some reports were overlooked. The different terminology used among reviewed authors led us to focus more on the activities they were describing rather than what the activities were called. For example, sometimes notions about obtaining critical support were being used in the same way that others were discussing the importance of having local champions, and terminology related to capacity and capacity-building has yet to achieve universal acceptance. As a result, we had to make judgments about how best to categorize the features of different frameworks. Although our synthesis identified 14 steps related to quality implementation, it is possible that others might construe the literature differently and derive fewer or more steps. As already noted, some steps consist of multiple actions that might be broken down further into separate, related steps.

The frameworks we reviewed were based on innovations for adults or children—with or without adjustment or medical problems—in diverse fields such as health care, mental health, industry, and primary education. Although there was convergent evidence for many QIF critical steps, whether our findings can be generalized to diverse fields of study needs to be explicitly tested. Whether the QIF can be used effectively in all these settings to achieve diverse goals needs empirical support. Such investigation can identify which conditions might affect its application and whether its critical steps require modifications to suit particular circumstances.

Another issue is that we included both peer-reviewed and non-peer reviewed sources. It could be argued that peer-reviewed sources have a higher level of rigor when compared to those which have not been subject to such a process. In addition, one of the ways that we limited our sample was to exclude sources that had not been cited more than once. This opens up the possibility of having a time effect since those more recently published are less likely to be cited.

Conclusion

Our findings suggest that the implementation process can be viewed systematically in terms of a temporal series of linked steps that should be effectively addressed to enhance the likelihood of quality implementation. Past research indicated that quality implementation is an important element of any effective innovation, and that many factors may affect the ultimate level of implementation attained. The current synthesis and resulting QIF suggest a conceptual overview of the critical steps of quality implementation that can be used as a guide for future research and practice.

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