Implementation science facilitates bridging the gap between research and clinical practice for speech-language pathologists (SLPs), audiologists, and researchers in communication sciences and disorders. As part of this forum, the following article will first briefly discuss implementation science’s pertinent definitions and history. Then, information will be highlighted pertaining to the position of implementation science within the larger realm of clinical practice research. In addition, an exemplar study will be reviewed to inform clinical researchers in communication sciences and disorders. Finally, the importance of implementation science will be emphasized by outlining ways that SLPs and audiologists can use implementation science to both inform their clinical practice and contribute to the evidence base of the disciplines.

Definition of Implementation Science

Implementation science is the study of methods used to promote systematic uptake of research into routine clinical practice and to improve patient outcomes and service quality (Eccles & Mittman, 2006). Stated simply, it is the examination of methods that promote use of well-researched interventions in “real-world” settings. Implementation science is different than traditional research as it seeks to examine factors surrounding implementation (e.g., processes and outcomes), rather than or in addition to intervention outcomes (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005). One goal of implementation research is to determine which aspects of interventions can be modified or enhanced to promote their use and sustainability in routine practice. Fundamental to implementation science is recognizing that real-world settings are complex systems, influenced by policy, organizations, and intended users of a particular intervention. Therefore, a central tenant of this research is collaboration between researchers and clinicians to determine the best ways to adopt and integrate innovations in care (Goldstein & McKenna, 2019; Olswang & Goldstein, 2017; Olswang & Prelock, 2015). Although new to the discipline of communication sciences and disorders, implementation science has a rich history in mental health and education service provision.

Disclosures

Financial: Natalie F. Douglas has no relevant financial interests to disclose. Vanessa L. Burshnic has no relevant financial interests to disclose.

Nonfinancial: Natalie F. Douglas has no relevant nonfinancial interests to disclose. Vanessa L. Burshnic has no relevant nonfinancial interests to disclose.
History of Implementation Science

The advent of implementation science is said to have stemmed from questioning a number of “traditional assumptions” for how scientific advancements would reach real-world practice (Goldstein & Olswang, 2018, p. 56). For instance, it was once assumed that, if research was more readily available, practitioners and policy makers would automatically apply evidence in their everyday practice and decision making (Harvey & Kitson, 2015). Thus, efforts were made to make research more accessible and understandable to the public by publishing systematic reviews and clinical guidelines. This form of disseminating evidence, however, relies on the clinicians to read, accurately interpret, and apply findings in their everyday practice. Such skills may not be practical considering competing time demands on most providers (Olswang & Prelock, 2015).

According to Goldstein and Olswang (2018), another faulty assumption was that basic clinical research would result in applied evidence-based practices (EBPs), also known as the traditional research pipeline (p. 56). In other words, research designed with a focus on intervention outcomes, without considering application in real-world settings, would eventually result in successful implementation in practice. It is now known, however, that it takes an average of 17 years for only 14% of research findings to be adapted into every practice using this traditional approach (Balas & Boren, 2000; Green, Ottoson, Garcia, & Hiatt, 2009). Thus, historically, dissemination and basic research were not enough to ensure adequate and timely implementation of EBPs. These factors resulted in the genesis of implementation science.

This genesis coincided with the understanding that interventions should be developed with their intended users in mind and then systematically modified to fit a diverse array of clinical contexts. This process provides the opportunity to address potential barriers to implementation, including resources, knowledge, skills, and the competing demands on providers. Implementation science was formed out of a clear need to develop specific processes and guidelines to promote uptake of research in practice, accounting for the diversity within care contexts and among care professionals (Bauer, Damschroder, Hagedorn, Smith, & Kilbourne, 2015).

As the world’s population grows in both age and diversity, governing bodies and global health networks are demanding services that are not only supported by evidence but also proven feasible in practice. Implementation science is a field that holds promise for researchers and clinicians who wish to study interventions beyond the controlled environment. These collaborations have the potential to influence multiple levels of practice and policy and fit well within the larger context of clinical practice research.

How Does Implementation Science Fit Into the Larger Context of Clinical Practice Research?

The National Institutes of Health describes clinical research as research used to improve the understanding of disease patterns, causes, and effects; the understanding of human behavior–related health outcomes; the costs and level of access associated with health care; and the effects of interventions on health outcomes (National Institutes of Health, 2017). Implementation science fits into the landscape of clinical research as it employs specific methods to assess which portions of an EBP or program can be adapted to the local context, for example, and still maintain the positive effects. Typically, clinical practice research happens under ideal conditions such as a laboratory setting or an otherwise highly controlled environment, thus making it difficult to translate resulting innovations into routine care. Implementation science assesses the procedures of controlled interventions and determines which aspects should be modified or enhanced to translate research to practice. In the last decade, over 60 frameworks have been developed to support the implementation of EBPs and programs into routine practice (Nilsen, 2015).

These frameworks can be summarized into three main categories: (a) describing and/or guiding the process of translating research into practice, (b) understanding and/or explaining what influences implementation outcomes, and (c) evaluating implementation efforts (Nilsen, 2015). Although nuances of the frameworks differ according to discipline or specific research question, most frameworks address aspects of the intervention or treatment to be implemented, the providers of the intervention or treatment (e.g., clinicians or teachers), the attributes of end users (e.g., students, clients, or patients), and the context where the innovation may be implemented (e.g., schools, hospitals, or clinics). Most implementation science frameworks also include a mechanism (e.g., focus groups, surveys) to evaluate an implementation strategy designed to support the uptake of the intervention.

Indeed, implementation science provides systematic procedures not only to lessen the gap between research and practice but also to provide language to further explain this fissure and, ultimately, help advance our professions. The following study outlines an approach to implementation that focused on aspects of providing aphasia-friendly information and collaborative goal setting in the acute phases of stroke. Perspectives of the SLPs implementing these interventions and the overall means of facilitating uptake of the use of these recommended practices in the hospital setting were studied (Shrubsole, Worrall, Power, & O’Connor, 2018a).

An Example of Implementation Science Research

Although providing aphasia-friendly education and collaborative goal setting in the acute phases of stroke is considered best practice (National Institute for Health and Care Excellence, 2013), this practice is not implemented routinely, consistently, or with any measure of fidelity by SLPs (Hubbard et al., 2012). This study was informed by a commonly used implementation science framework, the
Theoretical Domains Framework (TDF). This framework was derived from 128 explanatory constructs impacting behavior change across 33 psychological theories (Michie et al., 2005). Twelve domains that explain human behavior change were identified to ultimately support the implementation of EBPs: knowledge, skills, social/professional role and identity, beliefs about capabilities, beliefs about consequences, motivation and goals, memory, attention and decision processes, environmental context and resources, social influences, emotional regulation, behavioral regulation, and nature of the behavior to be implemented.

In this particular study, a cluster randomized controlled design (see Morris, Oshita, & Stransky, 2019) was used to study the influence of a targeted implementation workshop, on two areas of aphasia practice in the acute care setting, providing aphasia-friendly information and collaborative goal setting. Prior work identified the reported barriers to the implementation of these practices according to practicing SLPs in this particular context (Shrubsole, Worrall, Power, & O’Connor, 2018b), and these barriers were targeted within the implementation workshop.

The study took place within four different hospitals, including a total of 37 SLP participants. Hospitals were assigned to the aphasia-friendly education condition or the collaborative goal setting condition. All four groups received a targeted implementation workshop and key implementation components. Individualized feedback was given to the SLPs participating in this workshop according to baseline audits that assessed the current level of implementation of aphasia-friendly education provision or collaborative goal setting (see Table 1).

After review of the baseline audits, specific elements of the workshop were executed to include factors that have been shown to positively influence the uptake of behavioral interventions such as these recommended aphasia practices (Michie et al., 2013). Behavioral change techniques are outlined by Michie et al., are noted in italics, and are summarized in Table 1 with their connection to the TDF. To employ the implementation strategy of persuasion, TDF domains of motivation and goals and social influences, a video was presented with a person with aphasia describing the importance of receiving aphasia-friendly information and collaborative goal setting. In addition, case studies were provided to the participants to illustrate positive outcomes associated with using aphasia-friendly information and collaborative goal setting. The workshop also included informing the SLPs about environmental restructuring, TDF domain of environmental context and resources, to promote the use of the intervention. In this instance, the aphasia-friendly information and collaborative goal setting materials were readily available in an easily delivered package entitled, “What’s Happening to Me Now.” The package included detailed instructions, such as “starter” phrases for how to initiate provision of these materials to patients. For example, instead of being hidden in a drawer on the hospital unit, the materials were readily visible and accessible to the clinicians. The starter phrases included suggested scripts for how to initiate either the aphasia education or goal collaboration discussions with the patients and their families. Checklists and protocols were also placed into the environment to support implementing the interventions with fidelity.

**Table 1. Implementation components of workshop noted in Shrubsole et al. (2018a).**

<table>
<thead>
<tr>
<th>Theoretical Domains Framework domain</th>
<th>Implementation component of workshop related to influencing practice change</th>
<th>Example</th>
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</thead>
<tbody>
<tr>
<td>Motivation and goals Social influences</td>
<td>Persuasion</td>
<td>Personal stories of persons with aphasia and their families; case studies with compelling outcomes when practice is implemented</td>
</tr>
<tr>
<td>Environmental context and resources</td>
<td>Environmental restructuring</td>
<td>Physical environment modified to allow easy access to materials that support the practice change; packaging of intervention materials with key “starter” phrases to support implementation</td>
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<tr>
<td>Knowledge, skills, and beliefs about capabilities</td>
<td>Modeling</td>
<td>Modeling and role-playing simulating the delivery of the interventions</td>
</tr>
<tr>
<td>Beliefs about capabilities Beliefs about consequences</td>
<td>Enablement</td>
<td>Interactive and collaborative problem solving and brainstorming of strategies for intervention implementation</td>
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increased 33% from a baseline medical audit. The majority of the SLPs also found the implementation workshop to be feasible and acceptable according to survey data, and the concluding focus groups elucidated more feedback from the participants. Focus group feedback included suggestions for improvement such as a shorter time commitment (implementation workshop was 2.5 hr), the introduction of an online component, and the provision of more demonstrations. Most participants enjoyed having the audit results and the opportunity for group discussion, reflection, and targeted problem-solving. Continued barriers were noted including busy caseloads, staff shortages, short length of stay, and the complex medical needs of patients. Feedback also included that participants appreciated having the intervention materials more readily available and starter phrases to initiate the intervention process.

In summary, this targeted implementation workshop and supplementary materials significantly increased the uptake of best practices for people with aphasia in the acute stages of stroke. In addition, the feedback solicited from the intervention targets (the SLPs) provided valuable information for modifying this training in the future. This particular study highlights how implementation science can facilitate clinical research for researchers in communication sciences and disorders and also empower clinicians to contribute to the evidence base with their much needed perspectives.

The Importance of Implementation Science

Implementation science holds opportunities for researchers and clinicians to improve the quality and outcomes of their care. The long-standing gap between research and practice is unacceptable, and individuals with complex communication and swallowing needs deserve a scientific and clinical community committed to providing best practices. The methodologies of implementation science provide a way for creating positive change in routine practice, while incorporating the valuable perspectives of key stakeholders, such as clinical providers, policy makers, and third-party payers. Because implementation research requires time, commitment, and mutual interests among clinicians, researchers, and other stakeholders, it can be challenging to conduct. This article, however, concludes by highlighting three ways that implementation science can help both clinicians and researchers achieve common goals, despite the potential complexity of the work.

Informing Clinical Practice

As noted in the exemplar above, the SLPs in the study started implementing the recommended practices in a way that was more conducive to their setting. As opposed to attending a traditional continuing education opportunity, the tailored implementation workshop was designed to specifically facilitate practice change. The SLPs in the study agreed that their own contributions helped them adhere more to the recommended practice guidelines, thus having a positive change on their clinical practice. Implementation science can allow clinicians to move beyond awareness of a particular EBP into adoption in routine practice.

Clinicians Contributing to the Evidence Base

Clinicians can also contribute their experiences and clinical data to the evidence base to speed research-to-practice transfer. For example, clinicians may have valuable insight that is not known from the researcher perspective, such as the feedback provided by SLPs in the example study. Information provided by clinicians can inform treatment research earlier in the research pipeline and prevent backtracking during implementation efforts.

The Opportunity for a More Engaged Membership

It is the perception of clinicians that most research is inapplicable to their clinical practice (Walls, 2012). If clinicians are more engaged in the research process and understand that researchers want and value their input, they will likely be champions for the implementation of the innovation in their practice settings. As the research-to-practice and practice-to-research lines blur, implementation of sustainable EBPs is possible. The American Speech-Language-Hearing Association has almost 200,000 members, and the engagement of such a membership will have positive impacts on the field and the population at large.

Conclusions

Implementation science allows researchers and clinicians in communication sciences and disorders to speed up the transfer of research to practice, and it also accounts for the many and seemingly uncontrollable factors that are often present in behavioral intervention studies. Researchers in communication sciences and disorders have the opportunity to advance both the disciplines of speech-language pathology and audiology while contributing to the emerging implementation science literature when employing these methods. Clinicians have the opportunity to participate in engaging clinical education opportunities that are designed specifically to change their practice and contribute to the evidence base for a particular treatment. As the community of clinical scholars continues to burgeon, may this new launch of Perspectives of the ASHA Special Interest Groups put feet to the flame of our desires to improve communication access for one and all.

References


