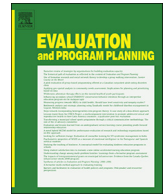




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A protocol for designing online training to support the implementation of community-based interventions

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ABSTRACT

Training program implementers through online methods represents a way of facilitating the widespread implementation of community-based interventions that is more financially and logistically feasible than traditional in-person training methods. However, there are few evidence-informed protocols or models that can guide the development of online training content in a way that is consistent with instructional best practices. This paper presents an evidence-informed protocol for developing a training website, or online training platform, to support the implementation of community-based interventions at scale, which was informed by a critical analysis of the instructional design literature and our experiences developing an online training platform for the HealtheSteps™ Lifestyle Prescription Program. The protocol is an operationalization of the ADDIE model of instructional design, and details the analysis, design, development, implementation, and evaluation stages of the process. Examples from the HealtheSteps™ program are used to illustrate the use of the protocol in practice. The protocol emphasizes the need for rigorous analysis of the target audience and a multidisciplinary literature base drawing from instructional design and implementation science. It can be used by researchers to guide the development of online training platforms to support the widespread implementation of evidence-based health interventions, thus increasing their public health impact.

1. Introduction

There have been comparatively few community-based health interventions that have moved past the efficacy/effectiveness stage and become the subject of dissemination research, the focus of which is the process leading to the widespread use of an intervention (Milat, Bauman, Redman, & Curac, 2011). Although it may be necessary, or even desirable, for an intervention to be adapted to fit local contexts, successfully scaling up an intervention must also achieve a requisite level of fidelity to the protocol under which the intervention was evaluated (Aarons et al., 2012; Chambers & Norton, 2016; Fixen, Blase, & Fixen, 2017). Dissemination research is often conceptualized as occurring after the feasibility, safety, and effectiveness of the program has been established (Bopp, Saunders, & Lattimore, 2013), but the extent to which a program can be implemented at scale with fidelity is a critical aspect of a program's potential population health impact (Brownson, Jacobs, Tabak, Hoehner, & Stamatakis, 2013).

Although critically important, there may be salient logistical and financial barriers to conducting dissemination research, given that it often requires implementing an intervention in diverse real-world settings across a geographically dispersed area. One such barrier may be the process by which program implementers are trained how to deliver the intervention. For the purposes of this paper, the term “program implementer” will be used to describe any individual who is responsible for implementing any aspect of an intervention when it is delivered in a real-world setting. With respect to community-based interventions, program implementers could include a diverse range of individuals including healthcare providers, early childhood educators, pastors, barbers, students, and volunteers, among others (Larson, Ward, Neelon, & Story, 2011; Linnan, D'Angelo, & Harrington, 2014; Peterson, Atwood, & Yates, 2002; Petrella, Lattanzio, & Overend, 2007). Although training has been identified as a critical determinant of implementation success (Rohrbach, Grana, Sussman, & Valente, 2006; Wandersman, Chien, & Katz, 2012), it has traditionally been delivered

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through in-person workshops, which, due to the human and financial resources required, are not feasible at scale given the typical size of research teams and their funding. This is particularly the case when multiple training sessions need to be delivered, either to improve implementation outcomes or to address the high levels of staff turnover that often plague the organizations in which interventions are delivered (Mihalic & Irwin, 2003; Rohrbach et al., 2006). A train-the-trainer approach has been proposed as a way to reduce costs when implementing an intervention across a broader area, but this method is still quite costly and depends on the extent to which the trainers deliver the training with fidelity or at all (Fairburn & Wilson, 2013; Hahn, Noland, Rayens, & Christie, 2002; Orfaly et al., 2005).

More recent approaches have leveraged the internet to deliver all or some of the training through specialized websites, or online training platforms (Holt et al., 2015; Renfro, Johnson, Lambert, Wingood, & DiClemente, 2018; Sage, 2014). This affords the opportunity for training to be accessed by program implementers without requiring the research team to travel to each site or requiring that trainers travel to a centralized train-the-trainer workshop. Furthermore, program implementers can complete the training at their convenience over a number of shorter intervals, which increases training effectiveness (Cook, Levinson, & Garside, 2010), and training can easily be deployed to new hires in the case of staff turnover (Ballew et al., 2013). Finally, internet technologies can support training content that is consistent with adult learning principles, including interactive multimedia simulations to provide program implementers with the opportunity to practice applying the skills and knowledge that will be required for implementation (Gagne, Wager, Golas, & Keller, 2005; Kardas & O'Brien, 2018).

Although internet-based or internet-enhanced training represents a promising approach to support the dissemination of evidence-based health interventions, there are few evidence-informed frameworks or protocols that can inform the systematic development of online training platforms (Abd-Hamid & Walkner, 2017; Renfro et al., 2018). Researchers may be tempted to simply use the content from previous workshops and modify it to be delivered via read-only or narrated PowerPoints, but analyzing training needs and considering how online technologies could be used to achieve instructional best practices in a more systematic manner may increase training effectiveness. This paper extends the literature specific to training for intervention delivery (Renfro et al., 2018; Sage, 2014) and training in the public health field more broadly (Abd-Hamid & Walkner, 2017; Ballew et al., 2013; Kenefick et al., 2014) by presenting an evidence-informed protocol for developing online training for community-based health interventions, based on our operationalization of the ADDIE model of instructional design. ADDIE, which outlines the process of analyzing, designing, developing, implementing, and evaluating instructional content, is one of the most commonly used instructional design models (Walter, Carey, & Carey, 2005). It can be used to develop bespoke online training or translate existing in-person training to an online medium using a variety of technologies, a level of flexibility that expands upon prior models. This protocol was informed by our experiences developing the online training platform (i.e., website) for the HealtheSteps™ Lifestyle Prescription Program, a health coaching intervention delivered in primary care and health services settings focused on increasing exercise, reducing sedentary behavior, and improving diet. HealtheSteps™ was evidence-based and has been shown to reduce behavioral risk factors for chronic disease (Gill et al., 2018; Petrella et al., 2018). The program is described in more detail elsewhere (Gill et al., 2017). Coaches for the program are typically health care professionals such as Physicians, Registered Nurses, Registered Dietitians, and Pharmacists, but have also included students, trainees, and other individuals with a background in health promotion. The effectiveness of HealtheSteps™ was evaluated through a community trial across Canada and a pragmatic randomized controlled trial (pRCT) conducted in Southwestern Ontario. Coaches were trained through a half-day in-person workshop with research staff.

Based on our findings from the pRCT, providers indicated that they would have preferred refresher trainings over the course of the 8-month implementation period (Blunt, Gill, Riggan, Brown, & Petrella, 2018). Furthermore, high staff turnover in rural primary healthcare settings meant that it was challenging for new staff to be adequately trained during the program (Simmavong, Hillier, & Petrella, 2018). Based on this feedback, it was decided that an online training platform would be more suitable for meeting coaches' needs and could support the broader dissemination of the HealtheSteps™ program to other communities. After developing the online training platform, we revised our protocol based on lessons learned and a critical analysis of the instructional design literature detailing the ADDIE model (Gagne et al., 2005; Walter et al., 2005). The protocol can be considered evidence-informed as it builds on an existing body of literature supporting the use of the ADDIE model for developing health-related educational content (Hsu, Lee-Hsieh, Turton, & Cheng, 2014; Reinbold, 2013; Robinson & Dearmon, 2013). Given this protocol was also guided by the lessons learnt from the HealtheSteps™ online training platform, some steps in the protocol were added *post hoc* based on an informal reflection on our experience developing the platform. As such, it has not yet been the subject of formal evaluation. The sections that follow outline the five phases of the ADDIE model and the operationalized steps therein. Examples from the HealtheSteps™ program will be used to illustrate this protocol in practice.

2. Analysis

Conducting an analysis to inform the development of online training is analogous to the needs assessment phase of intervention design (Bartholomew, Parcel, & Kok, 1998). It involves a series of steps that will inform the rest of the design process.

2.1. Step 1: What is the overall goal of the training?

The first step within the analysis stage is to establish the overall goal of the training (Gagne et al., 2005). Whatever the goal, it should be clearly stated from the outset, as all design decisions will be in service of this. For the HealtheSteps™ program, the goal of training was to teach prospective coaches (i.e., Physicians, Registered Nurses, Registered Dietitians, public health professionals, etc.) how to deliver the program with fidelity. This goal is likely consistent across all interventions, although some may have additional goals. For example, researchers may expect or plan for some level of intervention adaptation to occur at the local level, such that there are identified core components and adaptable elements of the program (Chambers & Norton, 2016). In this case, the overall goal may be to train implementers how to deliver the core components with fidelity *and* effectively adapt the other characteristics to best fit their unique context.

2.2. Step 2: What do program implementers need to do to achieve the goals of training?

The second step is to determine the specific behaviors, actions, or tasks that program implementers need to complete to achieve the overall goal. This step seeks to answer the question, "What does the program implementer need to *do* to achieve the overall goal of training?" An intervention manual should be the primary data source for this step. The HealtheSteps™ program consists of a single screening session followed by a number of program sessions in which the coach and participant collaboratively set goals related to the participant's physical activity and diet. To identify the specific behaviors that the coach needed to complete, we split up the tasks into sections (participant screening and program sessions), referred to the program manual, and made an exhaustive list. As an example, see Table 1 for a list of the activities that coaches need to complete during the screening session for implementation to be consistent with the manual (i.e., achieve high

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