

ASSESSING THE UTILITY OF FIXSEN ET AL.'S MODEL: A TEST OF CONCEPT STUDY

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Background: Improving the effect of evidence based programs (EBP) has great public health relevance. Improving implementation strategies is a good way to enhance the effect of EBP's. This paper is a test of concept study that assesses the utility of Fixsen et al. implementation model to research implementation. Fixsen et al.'s model consists of seven implementation drivers proposed to be relevant and important to the successful implementation of an EBP. An organization deemed to have successfully implemented an EBP was used to examine the relevance of Fixsen et al.'s implementation model.

Results: All seven implementation drivers, as proposed by Fixsen et al., were identified within the organization that has successfully implemented an EBP.

Discussion: It was determined by this test of concept study that Fixsen et al.'s model was useful and relevant to the research of implementation.

Conclusion: Fixsen et al.'s model of implementation provided a logical and strategic framework on which to approach implementation research. There is still much work to be done to assess the validity and utility of this model. Likewise, there is still much research to be done in implementation science in order to more clearly determine what components and strategies are important to successful implementation and what are not.

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1.0 INTRODUCTION

Modern research has long been capable of identifying efficacious treatment behaviors and developing Evidence Based Programs (EBP) to improve health services. Service areas where programs are created include: mental health, social services, juvenile justice, education, early childhood education, employment services, substance abuse prevention, and chronic disease (Fixsen, Naoom, Blase, Friedman & Wallace, 2005). However, research is lacking when it comes to deciphering how to effectively and efficiently transfer these innovations into the service population for which they were intended. The treatments identified through modern research will not be effective unless health services and healthcare professionals can adopt and sustain the findings into practice (Eccles & Mittman, 2006). Accordingly, more attention is being given to developing knowledge and methods that will improve implementation strategies and assure better program outcomes (Goodman, 2000).

This paper was a test of concept. A test of concept, also known as proof of concept, is typically done to determine the value of a given concept in terms of future research or practice efforts. These future efforts justified by tests of concept include different things, depending on who conducted the test of concept. For example, future efforts in the business industry often include developing a product to sell (Smith, 2010). Future efforts in research include conducting more rigorous examinations. According to the International AIDS Vaccine Initiative (IAVI), test

of concepts are done to help researchers determine if a particular vaccine concept is worth investing in larger studies (IAVI Report, 2003).

This test of concept paper was a retrospective case study that used an organization, which had successfully implemented an EBP to examine the utility of an implementation model proposed by Fixsen and colleagues, in 2005. The following paper applies core implementation concepts, taken from the Fixsen et al., (2005) University of South Florida monograph, onto a currently existing implementation effort. The purpose of doing this examination was to help conceptualize the practice, organization, and system level elements important to successfully implement an Evidence Based Program (EBP). The overarching goal of this paper was to expand the knowledge base of implementation science by identifying measurable components important to successful implementation. One empirical model of successful implementation was selected and examined for its utility to operationalize an organization that has successfully implemented an EBP. If this model is practical and relevant to implementation success it is expected that concepts from the Fixsen et al. (2005) model will be identified within an organization that has successfully implemented an EBP.

This paper was designed to provide a framework on which to approach the analysis of implementation. The background section described the literature review that led to the inception of Fixsen et al.'s implementation model. Next, a contextual framework was provided using concepts from Fixsen et al.'s 2005 monograph and supplemental literature, on which to approach the analysis of the organization's implementation. The background was devoted to defining terminology (i.e. evidence based, implementation, & fidelity) useful in discussing the implementation of an EBP. The background section also provided a descriptive summary of the stages of implementation and Fixsen et al.'s model for implementation. The last three sections

of the background described: the organization implementing the EBP, the EBP being implemented, and the strategies used to implement that EBP. Subsequent sections of this paper included: methods of analysis, results of analysis, discussion of results, limitations of study, implications for future research and conclusions.

2.0 BACKGROUND

2.1 THE IMPLEMENTATION SCIENCE LITERATURE REVIEW

In 2005, researchers at the Louis de la Parte Florida Mental Health Institute at the University of South Florida conducted a review of the implementation literature. The goal of this literature review was to synthesize research in the area of implementation science in order to determine what is known about the relevant components and conditions of implementation efforts (Fixsen et al., 2005). Final results from this literature review were synthesized from nearly 2000 articles retrieved from: PsycINFO, Medline, Sociological Abstracts, CINAHL, Emerald, JSTOR, Project Muse, Current Contents, and Web of Science databases. To create an iterative and more standardized search process, researchers were trained by a university librarian and created a controlled vocabulary list on which to search the previously stated databases (Fixsen et al., 2005).

Articles that were included within the first 2000 citations matched the following criteria: published in English no earlier than 1970, the title or abstract contained one or more of the search terms, and it was an empirical study, meta-analysis, or literature review. The research team then examined these 2000 citations to identify: (1) experimental evaluations of implementation factors, (2) reviews of the implementation literature, and (3) theoretical discussions of implementation factors (Fixsen et al., 2005). The main goal of this review step

was to identify articles containing information that pertained to some analysis of specific implementation factors or had theoretical summaries for implementation.

As a result of this examination, Fixsen and colleagues eliminated 946 articles from further analysis, leaving 1,054 citations for a full-text review. The full text review eliminated 311 articles that had mentioned implementation in the title or abstract but failed to evaluate implementation factors in the body of the article (Fixsen et al., 2005). Nearly half of these 743 remaining articles were found by the research team to be articles on implementation. Finally, of these 377 articles, 22 reported the results of experimental analyses (randomized group or within subject study designs) or meta-analyses of implementation variables (Fixsen et al., 2005).

2.2 WHAT DOES IT MEAN TO BE EVIDENCE BASED

An EBP is a strategy to deliver health services in an environment where a health professional uses the best evidence possible (McKibbin, 1998). According to the National Institute of Health (NIH) an EBP is defined as a way to provide health care that is guided by a thoughtful integration of the best available scientific knowledge and clinical expertise (NIH, 2009). Applying scientifically evidenced guidelines does not mean replacing current practices. Participating in EBP can be thought of as building upon what already exists within an organization in the way of providing health services (Chapman & Hough, 1998). Some authors suggest that an EBP is the application of empirically generated knowledge into the practice

environment (Eriksson, Nga, Målqvist, Persson, Ewald & Wallin, 2009). According to the Substance Abuse and Mental Health Services Administration's (SAMHSA) National Registry of Evidence-based Programs and Practices (NREPP), evidence based refers to something that has been scientifically evidenced and documented to work (SAMHSA, 2010).

In human services, EBP's usually begin in one location (Fixsen et al., 2005). EBP's exist within a wide range of fields (i.e. agriculture, economics, business, education, & health sciences) and across vocations (i.e. automobile industry, school systems, & hospitals). EBP's are systematic interventions comprised of agents shown to change behavior in a way that will elucidate positive health outcomes. A useful definition of an EBP, that resonated well with the program in this case study, was an organized multi-faceted intervention that is designed to serve consumers with complex problems (Fixsen et al., 2005).

2.3 THE SCIENCE BEHIND EVIDENCE BASED

How does one determine with confidence that an intervention and its respective components will lead to behavior change and improved health outcomes? In other words, how does an intervention program become evidence based? To become evidence based, a program must undergo the scientific rigors of a randomized controlled trial (RCT). RCT's are considered to be the gold standard of scientific research. The specific details of the techniques involved in an RCT is beyond the scope of this paper, however, a general description of the methodology will serve a purpose to understanding the challenges of implementation.

The main purpose of an RCT is to show with a very high degree of confidence that some dependent variable (output) is caused by some independent variable (input). To do this, three things must occur. First, the group receiving the intervention (experimental group) must be compared to a group not receiving the intervention (control group). Second, these two groups must be randomly selected and randomly assigned to the intervention or control group. Random selection and assignment allows for the theoretically smallest chance that the groups (experimental and control) would differ significantly in anything other than receiving the intervention. This act of randomization is also known as controlling for confounding variables. Along these same lines, creating a controlled and monitored environment in which confounding variables are minimized is necessary to demonstrate the efficacy of an intervention (Gordis, 2009).

2.4 EFFICACY VERSUS EFFECTIVENESS

Highly controlled environments of an RCT, which are necessary to create evidence based programs, are different from the less controlled real world. EBP's are the result of a systematic process. They must be tested multiple times and demonstrate significant positive outcomes in a scientifically rigid environment. The ability for a program to achieve desired patient outcomes within the RCT is known as efficacy. The environment in which EBP's are created is very different from the service environment for which EBP's are designed. Within an RCT, there is particular protocol followed with high fidelity throughout, by the staff and the participants. This same protocol is rarely identified in the practice setting. Therein lies the problem and the

inevitable need for implementation science and research. The rigid world of an RCT, which is necessary to identify significant causality of patient outcomes, does not practically reflect the world where the causative program components are to be delivered. The ability for a program to achieve desired patient outcomes in the community setting is known as effectiveness. It is important that programs are implemented with fidelity in order to achieve the patient outcomes in the community practice setting (effectiveness) that were achieved in the RCT (efficacy). To do this, implementation researchers must identify the factors that lead to positive implementation outcomes and those factors that do not.

2.5 IMPLEMENTATION DEFINED

The word implementation is used in a multitude of academic and scientific lexica, however, somewhat inconsistently. Even within the implementation science literature, definitions of implementation are not always congruent from one article to the next (Fixsen et al., 2005). However, one word was quite common across definitions: plan. In common language, implementation means to put something into effect according to or by means of a definite plan or procedure (Random House Inc., 2010). In regards to EBP's, implementation is the systematic uptake of an EBP into the practice setting (Eccles & Mittman, 2006). Fixsen and colleagues defined implementation as a plan, and the activities that comprise it, which are designed to put into practice a program of known dimensions (Fixsen et al., 2005). Implementation, as discussed in this paper, strictly refers to the systematic and purported incorporation (plan) of an EBP into

an organizational setting. This means developing a plan that is concise, transparent, and well articulated. Transparent in this context means that the intentions, as well as the plan, are understood by those carrying it out. The next step is to systematically carry out the plan to achieve unambiguous goals. In the timeline of EBP's, implementation is the phase that is to succeed design and is very similar to the dictionary definition stated above. The processes involved in implementation are purposeful and should be described in enough detail so that observers, not affiliated with the program, could detect the presence and strength of the specific set of activities (Fixsen et al., 2005). The previous statement is important to consider as we progress through the analysis of the implementation case study.

2.6 FIDELITY: ACCURACY & INTENSITY

Referring to the definition of implementation, an important part to consider is the “definite plan or procedure.” Before we can begin to discuss whether or not a program’s components are being implemented with fidelity, we must assure that these components and their intended uses are explicitly defined. Fidelity, in terms of implementation, refers to the accuracy and degree to which the core intervention components (components identified in RCT to produce greatest effect or most significant results) are being delivered.

There are two classes of fidelity, as was touched on in the previous sentence, which are often indicative of one another. The first class is accuracy, which denotes how close the intervention components being delivered at an implementation site match the core components

that were identified in the RCT. The second class, or measure of fidelity, is the intensity of implementation. This asks how much and what kind of effort is being given to implementing an EBP. Variables included in the assessment of fidelity intensity often include things like commitment and devotion. Assessments of implementation intensity often have the ability to predict and explain progressions through the stages of implementation, and the ultimate success or failure of implementation initiatives (Fixsen et al., 2005). Without fidelity measures, there are no clues regarding the functional or dysfunctional ways in which implementation activities are carried out at any given site (McGrew, Bond, Dietzen & Sayers, 1994). In the experimental analysis attempting to determine the effectiveness of a program, fidelity is important to internal validity and can enhance the statistical power by explaining the variance of program outcomes (Mowbray, Holter, Teague & Bybee, 2003).

2.7 CONCEPTUAL FRAMEWORK FOR IMPLEMENTATION

To make it easier to understand the implementation of an EBP, Fixsen and colleagues developed a conceptual framework consisting of these interactive elements below:

- **Source:** the evidence based program that is to be implemented
- **Destination:** the organization that will be implementing the EBP
- **Communication link:** person or persons assisting organization with implementation to assure quality and fidelity

- ***Feedback mechanisms:*** communication channels designated to monitor and improve staff performance where necessary
- ***Sphere of influence:*** the social, political, & ecological climate in which the organization implementing the EBP exists (Fixsen et al., 2005).

These are the parts that help to bring programs and practices in contact with practitioners who can deliver these services directly to the local consumers (Fixsen et al., 2005). The *source* is the EBP or components of the intervention that are to be implemented. The *destination* is the practitioner or organization that will adopt, fund, and support the implementation of the program. *Communication link* is the individual or group of individuals that will support and ensure the fidelity of program implementation. Some programs that have been evidence based for a while have engineered sites devoted to assisting organizations with the implementation of that EBP. For example, Multisystemic Treatment (MST) was developed in the late 1970s and is an EBP for treating youth antisocial disorders that is consistent with the guiding principles of the Socio-ecological model (Borduin, Schaeffer & Heiblum, 2009). MST Inc. offers comprehensive services for the full development of MST program implementation that includes start-up assistance, initial and ongoing clinical training, and program quality assurance support services (Multisystemic Treatment Inc., 2007). MST Inc. is an example of a purveyor to the implementation of the MST program. Purveyors are essentially individuals or a group of individuals positioned to assure that a program is being implemented as it was intended.

Feedback mechanisms are the next interactive pieces of implementation. Feedback mechanisms represent communication systems that are put in place to monitor the performance of staff during implementation, in order to make appropriate changes when necessary. Feedback

mechanisms are a form of quality assurance. Performance parameters should be predetermined, clearly articulated, and based off what is best for the successful implementation of the program. Mechanisms of feedback can have many forms (i.e. written, verbal, email etc.) and many formats (i.e. individual or group setting) and can be both formal and informal processes. Regardless of form or format, feedback should be soon after the behavior and it should be followed up on. As a supervisor, manager, or anyone who is to be giving feedback, it is important to chose formats that will be receptive to those you will be giving feedback to and to be willing to change strategies if recipients of feedback are not responsive. For example, if your staff is not computer savvy or is infrequently on a computer, email feedback may not be appropriate. A study in 2003 found that the key features of effective feedback were that it should be provided in a timely fashion, recurring, delivered personally, accompanied by written material and matched the motivations of the audience (Forthman, Wooster, Hill, Homa-Lowry & DesHarnais, 2003).

Finally, the *sphere of influence* refers to the socio-ecological, or system level factors that dictate the existence and interactive relationship of the previous four constituents. The idea behind the sphere of influence is to recognize that organizations are not closed silos, but instead are open systems inevitably and continuously interacting with their environment (Katz & Kahn, 1978). The organization itself has system characteristics and can be considered an encapsulated micro-system. This micro-system is constantly interacting and being influenced by its macro-system. The external socio-ecological environment (i.e. culture, norms, policy, economic status, weather etc.) of the macro-system is also simultaneously influenced by the micro-system, but typically to a lesser degree. This school of social systems thinking is analogous to biological systems. For example, consider a single human cell to be an organization. To the human body it is a micro-system comprised of working parts (mitochondria, ribosomes, nucleus etc.) with

specific roles and functions. This cell is largely influenced by the current status and conditions of the human body (macro-system) and conversely, the body is being influenced by actions of the single cell.

2.8 STAGES OF IMPLEMENTATION

- ***Exploration and Adoption*** – researching, getting buy-in, selecting EBP
- ***Installation*** – getting your ducks in a row, accounting for, allocation
- ***Initial Implementation*** – changing practices, cultures, and norms, delivering components
- ***Full Operation*** – “doing business,” full staffing, full client loads, routinized
- ***Innovation*** – making appropriate changes to intervention and/or implementation
- ***Sustainability*** – maintaining fidelity through changes in the sphere of influence (Fixsen et al., 2005).

Throughout the exploration of the literature, Fixsen and colleagues noticed that implementation was not an event, or something that occurred rapidly, but more of a multifaceted process that progressed through developmental stages. These stages or levels of implementation acted on a continuum with each new stage succeeding the previous. It is rational to consider these stages as building on top of one another in a sort of graduating manner. Each stage should theoretically contain more observable components of active implementation than the previous. It is important when examining an implementation effort to be cognizant of what stage of

implementation the organization has achieved (Fixsen et al., 2005). Understanding the stages of implementation also gives perspective to implementation science.

2.8.1 **Exploration and Adoption**

The first stage of implementation, and arguably the most important, is the *exploration and adoption* stage. This stage is beginning to manifest itself right around the time when an organization has identified a need in their community and has begun researching solutions. When an organization is exploring they are trying to determine how well an evidence based program meets the needs of the community, and how well available resources meet the needs of that evidence based program (Fixsen et al., 2005). It is critical to the initial and long term success of the program that the organization explores and researches solutions in a non-insular manner. The organization should try to do everything they can to engage their community in the identification of the need and the exploration of potential solutions (Baker & Goodman, 2003). Formative evaluations or needs assessments are a good way to identify perceived needs, solutions and likelihood of fit. These can include surveying community residents, businesses, partners, and other stakeholders, observing patients in a clinic, or piloting a juvenile behavior program and holding a focus group to identify reactions. If efforts are not made to learn about the target population and the communities in which they reside an organization may be left severely under-resourced, severely over-resourced, or trying to deliver a program that does not fit the needs of the target population (Baker & Goodman, 2003).

To assist in understanding the exploration and adoption phase, there is an exhaustive body of literature devoted to the adoption of any innovation, not just an EBP. Diffusion theory focuses on adoption as a process and further breaks the adoption stage down into five subsequent stages (Rogers, 2003). Individuals, or in this case organizations, do not spontaneously decide to adopt a program. Instead, they move through stages in a linear fashion and with each advancement comes an increased likelihood that an organization will adopt a program. This understanding is particularly useful for purveyors or program developers when determining which organizations are most likely to adopt a program. These stages of adoption, as described in Roger's (2003) diffusion theory, resemble those described in the transtheoretical model of change (Prochaska & Velicer, 1997). The transtheoretical model, or stages of change, is often used to explain the adoption of health behaviors on an individual level like smoking cessation, or diet and exercise. These theories, diffusion and transtheoretical, can be used to explain why some organizations adopt a program right away and others do not. Details of these five stages of adoption are beyond the scope of this paper, mostly because the organization being described in this case study is well beyond the adoption stage of implementation. However, to show the complexity and contextual breadth of implementation it is worth highlighting.

2.8.2 **Program Installation**

Once an organization has selected an EBP they think will fulfill the needs of their service population, they will begin to enter the *program installation* stage. This is essentially the stage where resources (i.e. policy, funding, & human etc.) are being appropriately identified and allocated, and organizational and systematic changes are beginning to take place (Fixsen et al.,

2005). For example, hiring new staff, installing new computers, or building an annex are events that may occur during this stage. This stage is used to organize the processes and activities that are required to implement the EBP. The organization and those key personnel responsible for carrying out the implementation must take this time to know explicitly what the core components of the intervention are, who is going to do what, and how they are going to keep track (Blase & Fixsen, 2003). It is critical, and perhaps imperative, that a flexible plan has been developed to coordinate the necessary changes and conflict that will take place during implementation.

2.8.3 Initial Implementation

The next stage of implementation, as proposed by Fixsen and colleagues, is *initial implementation*. This is when the organization first begins to deliver the intervention to the target population and they are still feeling out the program. This is perhaps the stage of implementation that most researchers and policy-makers are familiar with. This is a very turbulent stage and many personnel within an organization can become overwhelmed with the constant tug-of-war between required change and manifested conflict. Not to mention all of this is occurring against the backdrop of doubt and a lack of confidence in the decision to adopt (Macallair & Males, 2004). There are personality (will & skill), organizational (reinforcements & leadership), and system (fluid funding & stakeholder support) characteristics that can facilitate advancement to sequential stages. It is likely that many programs during *initial implementation* will inevitably be modified to the organizational and structural needs of that implementation site.

2.8.4 Full Operation

Fixsen et al.'s next stage of implementation is *full operation*. Essentially, this is when the EBP has become accepted and "routinized." According to Fixsen et al., (2005) "Once an implemented program is fully operational, referrals are flowing according to the agreed upon inclusion and exclusion criteria, practitioners carry out the evidence-based practice or program with proficiency and skill, managers and administrators support and facilitate the new practices, and the community has adapted to the presence of the innovation." (p. 16). Full operation is the place that all policy-makers, organizations, practitioners, community members, and other stakeholders should envision an EBP reaching when they buy-in to the process. If not, the implementation effort could be destined for failure.

2.8.5 Innovation

The *innovation* stage is the next stage of implementation proposed by Fixsen and colleagues. Organizations exist in constantly changing environments. Accordingly, as time progresses around the implementation of an EBP, changes will occur that will test the fidelity of the implementation. Fixsen and colleagues believe that each attempted implementation of an EBP provides an opportunity for implementers to learn something new (Fixsen et al., 2005). The *innovation* stage features changes in personnel, policy, and community needs that will present challenges to the integrity of the EBP. This will also provide an opportunity for an organization to create innovations that are tailored towards the changing demands while following the model of care proposed by the EBP.

2.8.6 Sustainability

The next stage of implementation proposed by Fixsen et al. is the *sustainability* stage. The idea behind the *sustainability* stage is that the socioecological environment surrounding an organization is going to change, for better or for worse, and an organization will need to put itself into a position in which resources devoted to the EBP remain intact. This can include developing multiple partnerships and funding outlets to support the EBP. To succeed in the *sustainability* stage does not happen by chance and requires good planning, anticipation, and effective reactivity (Fixsen et al., 2005).

2.9 IMPLEMENTATION DRIVERS

Fixsen and colleagues (2005) described seven core components that are involved, in some capacity, to successful implementation. Fixsen and colleagues refers to them as “implementation drivers” and so this terminology will be used throughout this paper. These seven implementation drivers are: *staff selection, pre-service training, consultation & coaching, staff evaluation, program evaluation, facilitative administration, & systems interventions*. The applicability of these seven implementation drivers to the implementation of an EBP in an organizational setting is the main focus of this research paper. Characteristics of these drivers will be placed strictly in the context of organizational implementation of an EBP and in regard to the stages previously

mentioned. Below is a brief description of each implementation driver. These brief descriptions are followed by more detailed summary paragraphs.

- **Staff selection-** who is qualified to carry out the EBP at the practice level; what characteristics will they need to be effective; it is important for following sections that these qualifications are explicitly known at least on the administrative and supervisory levels.
- **Training** – both before service and during services; set staff up with background knowledge of EBP components; opportunity to instill the vision
- **Consultant/Coach-** providing on-site support and ensuring EBP components are being administered initially and continuously through feedback mechanisms and other behavior change strategies. This is like the COMMUNICATION LINK (*see framework for implementation*)
- **Staff Evaluation-** assuring existence of skills from original selection criteria, training, and reinforced or enhanced through consultation; fidelity at the practice level
- **Program evaluation-** or organization evaluation; quality improvement measures to help assure the continuous implementation of EBP core components; fidelity at the organizational level
- **Facilitative Administrations-** administrative level business, management and support, leadership and vision, keep staff motivated and project components organized, the brain of the program; critical to reaching late implementation stages and sustainment of EBP
- **Systems Interventions-** establishing and continuously refreshing relationships with external resources, these include funders and other stakeholders, being aware of any shifts in service environment; critical to all stages of implementation, sustainability, and expansion of EBP services (Fixsen et al., 2005).

2.9.1 Staff Selection

Staff selection has been proposed as an implementation driver although it is not discussed often and is even less often evaluated in health service programs (Fixsen et al., 2005). Somewhere around the *exploration & adoption* stage, an organization will begin to identify those personnel who will be responsible for implementing the EBP. Here, individuals that will interact on the ground level and deliver the EBP components directly to the consumer should be selected based on some pre-defined criteria. There should also be individuals selected that will be responsible for other aspects of implementation including training, evaluation, and administrative supports.

Depending on preferences, demands of the EBP, and perhaps funds these personnel could already exist internally to the organization or will be brought in from the outside (Fixsen et al., 2005). There are many system level variables that will influence who an organization needs to select and also who they can select. The current, poor economy is a good example of how an organization may be limited in who they can select to implement a program. The organization may need someone with a lot of skills and experience in the area to serve their consumers, however, they may only be able to afford to train up someone internally.

The idea behind the *staff selection* driver is that organizations, in order to achieve high fidelity, should be looking for specific criteria within individuals depending on the nature of the EBP components and the responsibilities they want them to fulfill. For example, when hiring a trainer, an organization may want someone with charisma and creativity. For evaluators, they may be looking for someone with strong analytical skills and an ability to think outside the box. Coaches may need strong people skills and patience. Next, they should be interviewing or

screening people based on the set criteria. One study found that education and background (criteria) role/play behavior vignettes (interviewing) were effective methods of selection and led to positive work outcomes (McDaniel, Whetzel, Schmidt & Maurer, 1994). Matching the right people to the job on multiple levels is critical and can save an organization a lot of time and strife if done thoroughly.

2.9.2 Pre-service Training

Fixsen et al.'s next implementation driver is *pre-service training*. Implementation is a process of change (Kitson, Harvey & McCormack, 1998). Fundamental behavioral changes at the practice level involve changes in knowledge, skills, and attitudes (Eccles & Mittman, 2006; Fixsen et al, 2005). To achieve these changes, it is important to have effective training. During this driver is the time to introduce staff to the essential elements of a new set of skills (Fixsen et al., 2005). In a 2001 study looking at multiple implementations of the Teaching-Family Model, 85% of treatment programs with systematically trained site staff were sustained compared to about 15% of treatment programs that operated without systematically trained site staff (Fixsen, Blase, Timbers & Wolf, 2001). The content of training varied considerably depending on the contents of the EBP and the structure and setting of the organization (Fixsen et al., 2005). On the other hand, many of the strategies found to be effective (achieve desired behavior) were similar across EBP's. Effective strategies include: discussion, interaction, practice & role-play (Joyce & Showers, 2002). Constructive feedback was also mentioned as an effective training strategy. *Pre-service training* is a good opportunity to restructure the values and philosophies of

the practitioner to fit the principles of the EBP and is an essential element of implementation (Fixsen et al., 2005; Blase et al., 2003).

2.9.3 Consultation & Coaching

The next implementation driver proposed by Fixsen and colleagues is *consultation & coaching*. This driver is very supplemental and compensatory to the *pre-service training* driver, which is often necessary but not sufficient to achieving desired outcomes. Training without coaching was coined as the “train and hope” approach and has been found numerous times to be ineffective at creating sustainable behavior change (Stokes & Baer, 1977). In one study, four roles of a coach were found to be effective at inducing desired behavior change: supervision, teaching while engaged in practice activities, assessment and feedback, and emotional support (Spouse, 2001). One factor that has been reported to affect coaching effectiveness is the amount of time devoted to each trainee (Diamond, 2002). Apart from time devoted to coaching, having coaches who are themselves competent in the EBP is very useful (Denton, Vaughn & Fletcher, 2003). Some personality characteristics found to be effective in coaching practices include supportive, flexibility, respect, & enthusiasm (McCormick & Brennan, 2001).

2.9.4 **Staff Evaluation**

Staff evaluation is the next critical component to implementation proposed Fixsen et al. After practitioners begin delivering services in real time to real patients, it is important to make sure that these services are being delivered with fidelity. Evaluations should be conducted to ensure these practitioners are delivering the components they way in which they were intended to be delivered. Fixsen and his colleagues described staff evaluation as the process to assess the use and outcomes of skills that are reflected in the selection criteria, taught in the training, and reinforced and expanded in consultation and coaching.” *Staff Evaluation* and fidelity is part of the training and coaching sequence that includes direct observation to assess: knowledge of intervention, skills in communicating, and efficient use of time that is followed by prompt verbal feedback and a write up with recommendations (Fixsen et al., 2005). The *staff* evaluation driver is intimately connected to the *consultation & coaching* driver as it provides information that can be directly used during coaching activities (Davis, Warfel, Fixsen, Maloney & Blase, 1978). In the Teaching-Family Model practitioners were evaluated not just on staff performance and fidelity, but also the satisfaction of the consumers they were in contact with (Wineman & Fixsen, 1979). Lastly, it is important to make sure that staff evaluations are practical and can be routinely integrated into an organization’s day to day activities (Blase, Fixsen & Phillips, 1984).

2.9.5 **Program Evaluation**

Program evaluation is a broader, more system level evaluation of organizational climate and fidelity within the context of the program being implemented. This driver aims to determine

how well an EBP has been implemented and what effects are being incurred within the target population. The *Program evaluation* driver involves the more traditional view of program evaluation which includes both process measures (i.e. selection, training, coaching etc.) and consumer level outcomes (i.e. quality of life, hospitalizations, incidence of chronic disease etc.) *Program evaluation* is an overall performance measure of the organization and makes use of a range of data points to inform decision making and is to be used for quality improvement initiatives (Fixsen et al., 2005). Due to the high correlations that have been found between implementation fidelity and positive consumer outcomes, the *program evaluation* driver is designed to determine how well the previous implementation drivers (selection, training, coaching etc.) have been developed as well as what effect is this program having on the target population. These evaluations and subsequent feedback systems are imperative to keeping the implementation on track and in many cases receiving future funding for the program. This is an important driver because it not only determines the effect of the program on the target population, but it is used to help explain (via process measures) variability in consumer level outcomes across implementation sites and across multiple implementations within the same site (Fixsen et al., 2005).

2.9.6 **Facilitative Administrations**

Facilitative administrations involve leadership, vision, and managerial support. Without leadership and administrative structuring, the previous core implementation drivers cannot be installed (Fixsen et al., 2005). This driver is there to support the overall processes of

implementation (selection, training, coaching, & evaluation) to provide fresh incentives and to maintain organization focus among the staff in regard to desired clinical outcomes (Fixsen et al., 2005). *Facilitative administrations* are also imperative to the sustainment of any EBP. Some *facilitative administrations* include: financial compensations, space for program activities, supervisors, and evaluators. It is important to practitioner fidelity that administrative staffs are competent in EBP components and have a transparent belief in the effects of the EBP on the consumer (Fixsen et al., 2005). Overall an administration that is facilitative, with regard to the implementation of an EBP, creates an environment in which the processes involved in the implementation of an EBP can be continuously carried out with fidelity.

2.9.7 **Systems Interventions**

The last implementation driver proposed by Fixsen is *systems interventions*. These are strategies at the organizational level and involve interactions between the organization and its surrounding community. *Systems interventions* involves forming relationships and establishing partnerships with external contributors to ensure the availability of the financial, organizational, and human resources required to support the work of implementation (Fixsen et al., 2005). It has been demonstrated that many patient level outcomes are influenced by the functions of broader organizational and financial structures (Wensing, Wollersheim & Grol, 2006). The surrounding political environment will influence the systems interventions an organization is able to obtain. Supportive policy can facilitate the dissemination of an EBP, thus creating an opportunity to implement. Policy can also be restrictive and narrow an organizations ability to form

relationships and establish funding sources. In the case of EBP's designed to reduce rates of HIV, system level policy has posed a formidable barrier to implementation of EBP's (Norton, Amico, Cornman & Fisher, 2009).

Note that any and all EBP's will attempt to be implemented in a fluid environment with constantly morphing and shifting components (i.e. staff turnover, new technology, changes in local and state level policies). Communication plays a critical role within and across all of these components. The ability to anticipate and timely communicate information on any level (practice, administrative, or system) and with any direction (top to bottom or bottom to top) to make appropriate changes is essential to implementation at all stages. It is important to understand that Fixsen and colleagues did not suggest that all of these drivers must be fully developed for successful implementation. Instead, Fixsen et al. believed that the implementation drivers are compensatory and that extensive coverage in one driver can cancel out drivers that may be lacking (Fixsen et al., 2005).

2.10 STANFORD UNIVERSITY CHRONIC DISEASE SELF MANAGEMENT PROGRAM

The evidence based program that was implemented is the Chronic Disease Self Management Program (CDSMP), which was developed at Stanford Universities Patient Education Research Center. The CDSMP has been implemented both nationally and internationally. CDSMP is a participatory educational workshop aimed at improving confidence and skills for managing a

range of chronic diseases. The CDSMP workshops, which are typically held in community settings like senior centers, churches, and hospitals, are intended to be two and a half hours in length and are to be given once a week for six weeks. Workshop topics include: (1) dealing with frustration, fatigue, and pain, (2) exercise to strengthen muscle, (3) medication adherence, (4) communicating effectively, (5) nutrition, and (6) evaluating new treatments (Stanford University School of Medicine, 2010). The theoretical construct, created by Albert Bandura, which inspired the development of program components, was self-efficacy. Self-efficacy, a construct of the Social Cognitive Theory, is the confidence and perceived ability to have control over variables in your life (Bandura, 1997). The Leaders delivering the intervention components are not practitioners or health professionals. Rather, it is highly recommended that Leaders are individuals who have been able to successfully manage a chronic condition. Program developers at Stanford University believe that this elicits greater receptivity from participants. It is believed that participants in the CDSMP workshops would relate well, develop a rapport, and show trust toward the Leaders and their message.

Workshops are delivered by Leaders who are initially trained by Stanford University program staff, either on-site or at a Stanford University facility, on the core components of the intervention and how to effectively lead a workshop. Trainings are four and a half to five days in length. Developers of the program believe that it is the way in which workshops are led, that makes them effective (Stanford University School of Medicine, 2010). Another unique feature of the CDSMP is that it is set up in a way that facilitates the dissemination of the program. The CDSMP offers an opportunity by which implementation site staff can be trained to qualify as trainers themselves (Master Trainers), upon which they can train new Leaders without the assistance of the University of Stanford. Implications of this program characteristic, particularly

in regard to the stages of implementation, will be more thoroughly discussed in the results section.

To identify the effectiveness of the CDSMP, an RCT was conducted with 1,000 people with heart, lung, & cerebrovascular disease and arthritis being followed for three years. Researchers measured changes in health outcomes including: health status, physical comfort, fatigue, shortness of breath, depression, healthcare utilization, & self-management skills (Stanford University School of Medicine, 2010). The results of the RCT found that those who participated in the program had improved self-efficacy, increased skills in self-management, improved health outcomes, and reduce costs due to reduced healthcare utilization (Lorig, Sobel, Stewart, Brown, Ritter, González, Laurent & Holman. 1999). The CDSMP offers a series of tools, free to the implementer, on which to evaluate the impact of the program on their participants.

In 2008, personnel from the Stanford University CDSMP developed an Implementation Manual to assist organizations and Master Trainers with the implementation of the CDSMP. This manual contains information on: the program, what is needed for implementation (e.g. program coordinator, Master Trainer, & trained Leaders), Leaders (e.g. recruiting, training, monitoring etc.), how to recruit participants, and scheduling workshops, working with different cultures, and evaluation (Stanford University School of Medicine, 2010).

2.11 THE ORGANIZATION – VINTAGE, INC.

The organization being used to examine the utility of the Fixsen et al. (2005) implementation drivers as well as practice, organizational, and system level characteristics to full implementation of an EBP will be Vintage, Inc. Vintage, incorporated in 1973, is a 501 (C) (3) non-profit human services organization located in a metropolitan area of approximately 2.4 million people. Vintage provides day care services for older adults (60 years and above) in the county. The Adult Day-Care at Vintage is licensed by the Pennsylvania Department of Aging and provides services to older adults and their families.

One of Vintage's trademark services is the individually tailored day-to-day care plan. Individualized care plans are designed through consultation with the Vintage director, a registered nurse, and an activity specialist. During this consultation participants and families can select daily activities that suit participant interests. It is also during this time that medical and dietary needs are discussed. These care plans are updated at least every six months but can be updated more often if needed. Vintage also has a Senior Center which serves as a space where older adults can socialize and interact during daily activities and programs. Some of these activities and programs include: driver safety, bible study, bingo, and drama club. According to the Vintage Inc. 2009 annual report, the mission of the Vintage organization is "to improve and influence the experience of aging in our community" (p. 1). The vision of the Vintage organization, as stated in the 2009 annual report is that "Vintage will be the model for senior wellness in community based living" (p. 1).

Vintage has established multiple relationships with funding agencies, individual donors, Universities, and other stakeholders including United Way of Allegheny County and Allegheny

County Human Services. Vintage has multiple funding sources. According to their 2008-2009 annual report, Vintage had \$1,518,260 in operating revenue. This revenue was supplied from: government contracts (37%), government in-kind support (4%), program fees (24%), assets released from restrictions (16%), the United Way (15%) and monetary contributions from over 150 individual and 26 organizational donors (4%). Around \$560,000 of this operating revenue goes toward management and supportive services and programming supplies (Vintage Inc. Annual Report, 2009).

2.12 THE IMPLEMENTATION PROCESS

In 2008, Vintage adopted the Stanford University Chronic Disease Self-Management Program and is now one of ten CDSMP licensed organizations in the state of Pennsylvania. Since this time Vintage has delivered components from the CDSMP to over 100 community participants over the course of nine series. The implementation of the CDSMP at the Vintage organization is being funded from two sources and a third funding source from the state through the county health department is being anticipated within the administration.

During the program installation stage Vintage selected two internal supervisory staff members to go to Stanford University and receive training on the CDSMP. This accomplished two things for Vintage. First it gave staff, at the administrative level, an opportunity to become competent on the program they would be supervising. Second it gave staff, at the administrative level, an opportunity to become Master Trainers. Master Trainers are permitted, by CDSMP developers at Stanford University, to train future Leaders on site at Vintage. Before a Master

Trainer can begin training Leaders, Stanford University CDSMP requires that Master Trainers lead a minimum of two workshops. Master Trainers are also required by the CDSMP to lead a workshop once a year in order to retain the Master Trainer designation. Vintage's Master Trainers led four workshops before they began to train other Leaders.

Individuals selected by the Master Trainers, to be Leaders of future workshops, were identified using multiple criteria, some of which was developed by Stanford University (Implementation Manual) and some by the Master Trainers. According to the Stanford University CDSMP the ideal Leader should:

- Have taken the CDSMP workshop as a participant, if possible
- Have a chronic condition, if possible
- Or have life experience of living with a family member with a chronic illness
- Not be fearful of public speaking
- Comfortable with presenting the program strictly as written in the *Leader's Manual*
- Committed to helping others with chronic conditions (Stanford University, 2008).

Vintage developed additional criteria to select individuals to train. One additional criterion was that Leaders had to not only taken the workshop but be graduates of the workshop (completed four out of six workshop classes). Vintage also selected graduates that did not heavy accents, poor hearing, and were healthy enough to conduct a workshop. Lastly, Vintage employed criteria to select evaluation staff. The evaluator needed to be competent, experienced, and external to the organization to reduce bias.

Initial training of Vintage's Master Trainers was completed off site in person at the Stanford University facility. Training was eight hours a day for five days and involved much interaction and role play. As was previously mentioned, Vintage's Master Trainers were trained

on the CDSMP and had to lead two workshops before beginning to train. This was a Stanford University CDSMP requirement intended to assure that Master Trainers were competent in the CDSMP before beginning to train. Since the initial implementation stage, the Vintage Master Trainers have trained eight Leaders in the CDSMP in line with the methods proposed by Stanford University. This means that the Vintage Master Trainers also have experience in training.

During the initial stages of implementation Vintage developed a fidelity tool, with the help of an evaluator, to help assure Leaders were delivering the CDSMP as it was intended. This tool was also used as an opportunity to provide constructive feedback to Leaders on the delivery of the CDSMP. To use the fidelity tool, Leaders observed each other leading a workshop and recorded notes on the presence or absence of behaviors taught in the original CDSMP training. After the observation, Leader observers provided feedback for improvement opportunities, both written and verbal, to other Leaders.

Before beginning to implement the fidelity tool, Leaders were taught by Master Trainers on how to use the tool and how not to use the tool. For example, Leaders were taught when to interject during a workshop and when it is inappropriate. Leaders were told to not interject during a workshop unless there was a significant deviation from CDSMP protocol. The fidelity tool was used to provide information to Vintage on how closely workshop behaviors of their Leaders matched the workshop behaviors recommended and taught in the CDSMP. Vintage also trained Leaders to use the tool to provide on-site and timely feedback to Leaders delivering the CDSMP.

Another method Vintage used to evaluate staff performance was a participant feedback form. The purpose of the feedback form was to assess the perceptions and opinions of CDSMP

participants. Feedback forms were given to workshop participants at the end of the final workshop of a CDSMP series. This feedback form was distributed to participants by Leaders and could be self-administered by participants without the aid of a Leader. This feedback form asked participants to rate, on a scale of one to five, how effective they felt the Leader of their workshop was overall. Scores of five meant the leader was excellent and scores of one meant the leader was poor. The average of all participant scores for the perceived overall effectiveness of a Leader was reported to funders.

Vintage's implementation of the Stanford University's CDSMP is funded by two external stakeholders within the region. These funders required Vintage to demonstrate that work was done that is directly related to the funding intentions (i.e. show that they have implemented the program). To assist with this task, Vintage contracted an external evaluator from the Institute for Evaluation Sciences in Community Health at University of Pittsburgh's Graduate School of Public Health. The evaluator was responsible for determining, in a quantitative manner, to what extent the CDSMP was being implemented (program fidelity) and what affect was this having on the recipients of the CDSMP intervention. To do this, Vintage and the evaluator administered the *HealthyView* questionnaire (developed at Stanford University), to all CDSMP participants before the first workshop. The *HealthyView* questionnaire asked a range of questions regarding the presence of chronic diseases and quality of life measures. This same questionnaire was administered over the telephone six months after completion of the CDSMP. The evaluator was also responsible for generating the evaluation reports, which were then edited by Vintage and sent to the funders.

Vintage has the CDSMP included in its Strategic Framework. The strategic framework is a summary of organizational goals that Vintage would like to achieve over a year period. In the

strategic framework it is written: “Vintage provides leadership in further integration of the chronic disease self- management model in senior services” and “the chronic disease model continues to be integrated into senior services and further expansion is explored” (p. 1). It was also reported in the strategic framework that Vintage is interested in fostering relationships with academic institutions to improve evaluative efforts of program implementation and patient outcomes (Vintage Inc., 2010). Vintage has plenty of space on which run the CDSMP workshops. Funding has also been allocated to Leaders of workshops as an incentive to contribute and Vintage has selected administrative personnel to be trained in the CDSMP.

3.0 METHODS

3.1 RESEARCH DESIGN

The research in this paper is a test of concept study. A test of concept is a formative examination of a concept to justify pursuing future research (IAVI Report, 2003). This concept (Fixsen et al.'s implementation model) was tested to understand its value toward implementation research and implementation practice. Fixsen et al.'s implementation model was tested using a case study design involving one model, one EBP, and one organization. The case that was used to test Fixsen et al.'s implementation model was an organization that has already achieved the state (successful implementation of an EBP) that the model proposed, if to be followed, would achieve. Background research was conducted on the organization and the EBP to determine general nature and purposes of each. A guided interview was conducted to understand what processes or activities were involved in the organization's implementation of the EBP (M. Campion, J. Campion & Hudson, 1994).

3.2 PARTICIPANTS

The participants in this test of concept study were: the organization that had successfully implemented the EBP, and the EBP program coordinator. The non-profit organization, Vintage Inc., has been providing services for the local population since 1973. In 2008 Vintage Inc. adopted and successfully implemented an EBP. The EBP program coordinator was interviewed to understand the activities and processes involved during the initial and recent implementation of the EBP. The program coordinator was recruited via email and agreed to participate in the interview.

3.3 DATA COLLECTION

3.3.1 Operationalizing the Drivers

In order to identify whether or not an implementation driver within Vintage's implementation of the CDSMP existed, the drivers had to first be operationalized. To operationalize a driver was to take an abstract concept like *facilitative administration* and identify elements corresponding to that driver which are observable or measurable. The methods used to operationalize Fixsen et al.'s implementation drivers consisted entirely of referencing the literature provided by Fixsen along with supplemental articles. Literature referencing was guided by the research on implementation drivers section in the Fixsen et al. (2005) monograph. This section is comprised of summaries of literature that Fixsen and colleagues believe to be relevant to demonstrating the significance of each implementation driver and the important

functional elements of each driver. For example, Joyce and Showers (2002) conducted a meta-analysis of research on training and coaching to identify effective strategies. The meta-analysis found that when training was coupled with on-site coaching, EBP behaviors were observed on-site 95% of the time. This is compared to 0% of the time when participants only received demonstrations during training and no on-site coaching (Joyce & Showers, 2002). Accordingly, determining whether or not Vintage conducted on-site coaching was a priority and was investigated.

3.3.2 Guided Interview

Once the implementation drivers had been operationalized and generated into a checklist, the next step was to observe or measure each driver as it currently existed. To help determine the existence of an implementation driver as described by Fixsen and his colleagues, a guided interview with the CDSMP Program Coordinator was conducted. The actual questions used in the guided interview are found in Appendix B. The objective of the guided interviews was to, as definitely as possible, determine if an implementation driver was present and if possible what were the explicit processes involved in that implementation driver.

The guided interview consisted of 12 total questions, and was created using the concepts from Fixsen et al.'s implementation drivers along with more general implementation questions. All seven implementation drivers had at least one question framed around it (two drivers had two questions framed around it). There were three questions in the guided interview that asked for more general information not directly related to Fixsen et al.'s model. These three questions concerned why the organization chose the particular EBP, perceived barriers to implement an

EBP, and perceived necessities for successful implementation. The questions in the guided interview were set up to serve two main purposes. The first purpose of the guided interview was to learn if the organization had conducted any activities or processes described by Fixsen to be contributory to the specific implementation drivers that comprise Fixsen et al.'s implementation model. The second purpose of the guided interview was to understand what those activities and processes involved, in the implementation of the EBP, were. The facilitative administration question was a closed response question that asked the respondent to rate how supportive the organization was towards the EBP. The guided interview took nearly two hours to complete and was conducted at the organization, Vintage Inc.

3.4 ANALYSIS

A checklist was used to record whether or not an implementation driver was identified within Vintage based on the operational element of the driver. On the checklist, each driver was broken down into specific concepts that were found in Fixsen et al.'s analysis to be operational and relevant to that driver. Operationalizing was done to create a way to measure the implementation driver definitively, while reducing chance of variation or ambiguity if repeated. If not one single concept, within the implementation driver, was identified (via guided interview or background research) that driver was considered to be absent and delivered a score of zero.

After the drivers were operationalized and guided interviews were conducted to determine the existence of Fixsen et al.'s implementation drivers within Vintage's implementation of the CDSMP, the next step was to transfer this information onto the checklist.

If an implementation driver was found to be present it received an X. If an implementation driver was not found to be present it did not receive any marking. There were seven implementation drivers proposed in Fixsen et al.'s model and seven implementation drivers were examined to determine whether or not they existed. Thus, the total score that could be received by Fixsen et al.'s model in this case study was a seven out of seven. The more implementation drivers that were marked as present the more useful and relevant Fixsen et al.'s model would be to the implementation of an EBP.

4.0 RESULTS

This section is a description of the results of the analysis conducted in this study. The results of all seven implementation drivers, in Fixsen et al.'s model, are described. The results of each implementation driver, begins by stating which operational components of the implementation driver were identified within Vintage. Then, the implementation driver is defined in the context of the organizational implementation of an EBP. Next, the operational components of the implementation driver that were used to identify the presence or absence of that implementation driver are stated. Lastly, the specific activities identified within Vintage's implementation of the CDSMP that correspond to each operational component described by Fixsen, are stated.

4.1 PRESENCE OF IMPLEMENTATION DRIVERS

4.1.1 Staff Selection

In the *staff selection* driver of Fixsen et al.'s model, three out of three components were identified within Vintage. The main purpose of this driver is to determine which staff are most appropriate for which implementation task. The three components of the *staff selection* driver

are: selection criteria for screening, conducting screenings, and screening for multiple levels of staff.

The first component of staff selection is criteria. Vintage used criteria to select staff. Some criteria were developed within the Stanford University CDSMP (Implementation Manual) and some criteria were created at Vintage. The second component of staff selection is screening. Vintage screened the two administrative personnel that were sent to receive training in order to become Master Trainers. Vintage had discussions with internal administrative staff to determine the level of commitment that could be devoted to the CDSMP as well as their interest in the program. Master Trainers also screened individuals participating in workshops to determine appropriate candidates to become Leaders. Master trainers observed participants to determine which participants had personality characteristics perceived to be important to being a Leader. The third component of staff selection is to apply the first two components across multiple levels of staff. Vintage applied criteria and screening methods to select staff on multiple levels of the implementation process, which included practice level (Leaders), administrative (Master Trainers) and evaluation personnel.

4.1.2 **Pre-service Training**

In the *pre-service training* driver of Fixsen et al.'s model, four out of four components were identified within Vintage. The main purpose of this driver is to increase the knowledge and skills related to the EBP within those individuals selected to deliver the program directly. The four components of the *pre-service training* driver are: competent trainers, experienced trainers, interactive format, and role-playing.

The first component of training is competent trainers. This means that those who are training have themselves been trained on the EBP. During the initial training to acquire Master Trainers the administrative staff from Vintage was trained by program assistants at Stanford University. These trainers had been trained in the CDSMP and were Master Trainers themselves. The Vintage Master Trainers also had been trained on CDSMP before training Leaders. The second component of training is experienced trainers. The Stanford University Master Trainers had conducted training sessions numerous times before training the Vintage staff. Vintage Master Trainers led four workshops before beginning to train and have now trained eight Leaders on the CDSMP. The third component of training is interactive. All trainings, whether it was the initial training of the Vintage Master Trainers or the Vintage Master Trainers training Leaders at Vintage, were done in person and involved discussion and interaction. The fourth component of training is role-playing. During the initial training at Stanford University and subsequent trainings at Vintage, trainees are required to assume the role of a workshop Leader and handle certain situations.

4.1.3 **Coaching & Consultation**

In the *coaching & consultation* driver of Fixsen et al.'s model six out of six components were identified within Vintage. The main purpose of this driver is to supplement knowledge and skills acquired during training, with emotional support and immediate feedback, in order to engrain EBP behaviors into on site routine delivery of services. The six components of the *coaching & consultation* driver are: criteria/instructions, competent coaches, experienced coaches, on-site, multiple times, and immediate feedback.

The first component of coaching and consultation is criteria/instructions. There were instructions Vintage used to provide coaching. Some instructions were developed at Stanford University (Implementation Manual) and some were developed at Vintage after multiple implementations of the CDSMP. The second component of this driver is competent coaches. Vintage Master Trainers were providing the coaching and they had received formal training in the CDSMP and had led four workshops before beginning to coach. The third component of coaching and consultation is experience. Vintage Master Trainers have coached multiple Leaders across multiple series. The fourth component of coaching and consultation is that coaching is done on-site. All coaching activities conducted by Vintage regarding CDSMP were conducted on-site and in real time. Master Trainers were present during live CDSMP workshops with the intention of observing Leaders and providing feedback. The fifth component of coaching and consultation is immediate feedback. Feedback was given from Master Trainers to Leaders immediately following a workshop. The sixth component of coaching and consultation is to coach multiple times. Leaders at Vintage received coaching on three out of six workshops they led.

4.1.4 **Staff Evaluation**

In the *staff evaluation* driver of Fixsen et al.'s model, four out of four components were identified within Vintage. The main purpose of this driver is to assure that staff delivering the EBP services are delivering them the way in which they were intended to be delivered. This is also known as fidelity. The four components of the *staff evaluation* driver are: criteria/tool, competent evaluators, experienced evaluators, and external.

The first component of staff evaluation is having a criteria or tool. Vintage had tools and criteria on which to evaluate. The fidelity tool, developed by Vintage, was used to determine how well Leader behaviors matched behaviors recommended and taught in CDSMP. Vintage Master Trainers used Stanford University CDSMP recommendations (Implementation Manual) to begin developing the fidelity tool. During the *innovation stage* of implementation, after Vintage had run the CDSMP workshop multiple times, Vintage Master Trainers refined and tailored the tool more toward Vintage implementation goals. The second component of staff evaluation is having competent evaluators. Vintage used resources from Stanford University CDSMP (Implementation Manual) to understand why staff evaluation was important and how it could be accomplished. The third component of staff evaluation is having experienced evaluators. The Master Trainers at Vintage have conducted staff evaluations of eight different Leaders using the fidelity tool and the participant feedback form. The fourth component of staff evaluation is having an external evaluator to increase objectivity of evaluation. Vintage contracted an external evaluator to oversee the evaluation of staff.

4.1.5 Program Evaluation

In the *program evaluation* driver of Fixsen et al.'s model, four out of four components were identified within Vintage. The main purpose of this driver is to help assure that all aspects of the program are being implemented as they were intended and is having an effect on the target population. The four components of the *program evaluation* driver are: criteria/tool, competent evaluators, experienced evaluators, and external.

The first component of program evaluation is having a criteria or tool on which to evaluate the program. Vintage used a tool, developed by Stanford University CDSMP personnel (Implementation Manual), to assess changes in specific outcomes within their target population. The *HealthyView* questionnaire was given to workshop participants before beginning the first workshop of the CDSMP. Participants that completed a pre questionnaire were contacted (via telephone) six months after the final workshop of a CDSMP was delivered. Changes in quality of life measures and the incidence of chronic diseases were reported. The second component of program evaluation is having competent evaluators. Vintage used the Implementation Manual to understand the importance of program evaluation and methods on which to evaluate the program. The third component of program evaluation is evaluators who have experience. Vintage has had the same administrative personnel conduct the program evaluation since the program was initially implemented. The fourth component of program evaluation is having an external evaluator oversee the program evaluation. Vintage contracted an external evaluator to oversee and assist with the program evaluation of the CDSMP.

4.1.6 **Facilitative Administration**

In the *facilitative administration* driver of Fixsen et al.'s model, four out of four components were identified within Vintage. The purpose of this driver was to provide an environment with resources that are necessary to implement an EBP. The components of the *facilitative administration* driver are: plan, resources, leadership/management, and competent division of labor.

The first component of facilitative administration was having a plan. Administrative personnel within Vintage conducted multiple meetings internally and with funding stakeholders to determine what resources would be necessary to implement CDSMP and how these resources could be acquired. The second component of facilitative administration was having resources devoted to the implementation of the CDSMP. Vintage has devoted space, personnel on multiple levels, and funding sources to the implementation of the CDSMP. The third component of facilitative administration is having leadership and management. Vintage delegated an administrative staff member to act as the program coordinator and oversee the implementation process. The fourth component of facilitative administration is having a competent division of labor. Vintage had personnel on multiple levels (e.g. Leaders, & administration) trained and evaluated on the CDSMP. The implementation manual, provided by Stanford University CDSMP, had a section on what was required administratively to implement the CDSMP. Vintage referenced this section prior to beginning implementation.

4.1.7 **Systems Interventions**

In the *systems interventions* driver of Fixsen et al.'s model, two out of three components were identified within Vintage. The purpose of this driver was to place the organization into a position of sustainability, where changes in the organization's socioecological environment do not significantly disrupt the implementation of the EBP. The three components of the *systems interventions* driver are: steady funding streams, community relationships, & dynamic.

The first component of systems interventions is steady funding streams. Vintage was initially funded to implement the CDSMP and they have been funded again since then to

continue implementing the CDSMP. However, their funding sources are through state grants and cannot be considered a consistent and reliable funding source for the sustainability of the CDSMP. Vintage Inc. would need to obtain a steadier and more reliable funding source to receive credit on this component of the *systems interventions* driver. The second component of systems interventions is established community relationships. Vintage has established relationships with the county health department, the local United Way, and the University of Pittsburgh. The third component of systems interventions is being dynamic. The multiple relationships Vintage has established, with diverse entities was used to satisfy this component.

5.0 DISCUSSION

This section provides the implications of the results regarding Fixsen et al.'s model and Vintage's implementation of the Stanford University Chronic Disease Self Management Program. First, the overall results of the analysis are summarized. Next, a description of the utility of Fixsen et al.'s model to approach implementation research is described. Then, the implications of these results toward implementation science are described. Lastly, the overall results and implications of this test of concept case study are reiterated and summarized.

After observation and guided interviews with the CDSMP program coordinator and evaluator it was determined that seven out of a possible seven implementation drivers were identified within Vintage's implementation of the CDSMP. Accordingly, concepts proposed by Fixsen to be useful to the implementation of an EBP were found to exist within Vintage.

According to this test of concept case study, Fixsen et al.'s model of implementation was relevant to the analysis of implementation and provided a framework on which to approach implementation projects and research. All seven implementation drivers, proposed by Fixsen to be instrumental in the successful implementation of an EBP, were identified within an organization that has successfully implemented an EBP.

Fixsen describes implementation drivers as being integrated and compensatory in nature (Fixsen et al., 2005). This integration of drivers was seen in Vintage's fidelity tool that was used

to coach Leaders, as well as examine the fidelity to which they delivered the CDSMP. According to this, it is possible for an organization to create something that is used for multiple drivers. Another example of integration is Vintage's contracting of an evaluator from the University of Pittsburgh. This contributed to the program evaluation driver as well as the systems interventions driver.

The Stanford University CDSMP is a highly credible EBP that has been implemented successfully on an international stage. Its sophistication with regard to staff selection, training, and evaluation are engrained in the program and perpetuated onto the implementers. It is hard to determine what success Vintage may have had implementing a less credible and less sophisticated program. However, it speaks on behalf of Vintage that they recognized the value of an EBP that has had some much notoriety.

6.0 LIMITATIONS

A comprehensive analysis of implementation requires that attention be given to multiple actions over an extended period of time (Greenhalgh, Robert, MacFarlane, Bate & Kyriakidou, 2004). Results and corresponding implications are easily limited in a case study. This study may have yielded more impactful results, in regard to implementation science in general, if it had been conducted over a longer period of time, incorporated more methods of scientific investigation (i.e. surveys, key informant interviews, structured observations), and measured across more sites. To more definitively evaluate the utility of Fixsen et al.'s model of implementation, it may have been useful to cross-sectionally compare identifiable implementation drivers in organizations that have not implemented an EBP against organizations that have successfully implemented an EBP. There are more sophisticated research designs on which to assess the utility of a model and the components it is made of. This test of concept study did not conduct any actual component analyses that involved comparing groups, with varying numbers of identified implementation drivers, on attempted, succeeded, and failed implementation initiatives.

7.0 FUTURE RESEARCH

This test of concept paper was useful in identifying a model that could be operational and used to explore the processes and activities involved in the implementation of an EBP. The next step to further validate and refine the operational components of the model, would be to apply the implementation driver checklist across organizations that have failed to implement an EBP to see if any drivers are lacking. Then compare these results to organizations that have successfully implemented an EBP and determine if there are differences in the presence of implementation drivers. It would also be interesting to examine the presence or absence of Fixsen et al.'s implementation drivers across multiple organization types (i.e. hospitals, non-profit, etc.) and across multiple organizational settings (i.e. rural, urban, etc.) to see if these implementation drivers are consistently found to exist in organizations that have successfully implemented an EBP.

Future research efforts should focus closer on interpersonal and intrapersonal characteristics that dictate good implementation outcomes. For example, how do perceptions of EBPs within administrative personnel currently implementing an EBP differ from the perceptions of administrative personnel who are not currently implementing an EBP? Also, future research should focus on the very specifics of these implementation drivers within organizations. For example, the number of screenings before a candidate was chosen could be

used to explain variation in implementation outcomes. The specific coach to Leader ratio found to be effective and the length of coaching sessions found to be effective would be useful information for those considering implementing an EBP.

Lastly, in order to confidently determine the association between Fixsen et al.'s implementation drivers and successful implementation of an EBP, a RCT should be conducted. This would be very difficult and very expensive, but would determine with a high degree of confidence the relationship between Fixsen et al.'s implementation drivers and particular implementation outcomes. It would essentially involve taking a large group of organizations that have not yet begun to implement an EBP. Next, the organizations are randomly divided into three groups. The first group will have observable activities occur within seven of seven implementation drivers. The second group will have observable activities occur within five of seven implementation drivers. The third group will only have observable activities within three of the seven implementation drivers. Then, these organizations will begin implementing the same EBP at the same time. These organizations will then be tracked over time to assess variations in implementation outcomes.

8.0 CONCLUSION

Strong evidence based programs that are not implemented well will yield poor results within the target population and result in direct and indirect losses of money (Goodman, 2000). Strategies to carry out effective implementation efforts are in short supply (Greenhalgh et al., 2004). Good science that demonstrates what strategies are effective for implementation of evidence based programs is lacking (Fixsen et al., 2005). Motivation and priorities, within entities (both private and government) that fund research initiatives, needs to shift focus towards research on implementation (Fixsen et al., 2005). Accordingly, there is still much work that needs to be done in implementation science in general, and in regard to the usefulness and relevance of Fixsen et al.'s implementation model. Clearly defining and operationalizing variables in a consistent manner on the practice, organizational, and system levels is important to successful implementation of EBP. Researching models and operationalizing implementation activities will help to develop strategies that provide explicit recommendations on how to successfully implement an EBP. This research should consist of scientific designs and be carried out in multiple settings to enhance the external validity of the results.

Appendix A

COMPLETED CHECKLIST FOR RECORDING IMPLEMENTATION DRIVERS

This is the checklist that was completed, following data collection, to record the presence or absence of Fixsen et al.'s implementation drivers within Vintage's implementation of the CDSMP.

Table 1. Completed Checklist for Implementation Drivers			
Implementation Driver	Description	Contributor	Presence
Staff Selection			
Criteria	Consistent, explicit, diffused	Manual, Vintage	X
Screening	Apply criteria objectively	Discussions	X
Multiple levels	Screen across levels of staff	Master Trainers	X
Pre-service Training			
Competent Trainers	Been trained on program	CDSMP training	X
Experience Trainers	Have trained others on program	CDSMP trainers	X
Interactive	Communication exchange	CDSMP focus	X
Role Playing	Practicing behavior	CDSMP focus	X
Coaching			
Criteria/Instructions	What to target	Manual, Vintage	X
Competent (coaches)	Been trained	Manual, Vintage	X
Experience (coaches)	Have coached	Vintage	X
On Site	given on site during real time	Vintage	X
Immediate	Short turn around on feedback	Vintage	X
Multiple Times	Coach more than once	Vintage	X
Staff Evaluation			
Criteria/Tool	Instruction, what to look for	Manual, Vintage	X
Competent	Been Trained	Manual	X

Table 1.continued

Experience	Have evaluated	Vintage	X
External	Objective perspective	Vintage	X
Program Evaluation			
Criteria/Tool	Instruction, what to look for	CDSMP, Vintage	X
Competent	Knowledge on subject	Manual	X
Experience	Have evaluated program before	Vintage	X
External	Objective perspective	Vintage	X
Facilitative Administration			
Plan	Visible, communicated, diffused	Manual, Vintage	X
Resources	Human, financial, space	Vintage	X
Leadership/Management	Support, resolution, visionary	Vintage	X
Competent division of labor	Know intervention components	CDSMP, Vintage	X
System Interventions			
Funding Streams	Consistent, multiple	Funded sources	
Relationships	Knowledge / resource exchange	Collab. w/orgs.	X
Dynamic	Relationships w/ diverse entities	U.Pitt., Un.Way	X

Appendix B

LIST OF GUIDED INTERVIEW QUESTIONS

Table 2. List of guided interview questions

1. Why did Vintage choose the Stanford University self management program (fit with community and organization needs)? What aspects of the program appealed to Vintage?
2. Were there particular criteria Vintage employed to select individuals to deliver the program? What were these criteria?
3. Did Vintage conduct any interviews to assess personality fits between staff and organization and program needs?
4. How did Vintage determine who within the organization would receive training in the core intervention components? Was there any training conducted related to the program other than the core intervention components (i.e. evaluation, consultation)?
5. Does Stanford University provide any type of consultation services to assist Vintage in the implementation of the self management program?
6. Other than the fidelity tool does Vintage provide any on-site coaching to assist staff in delivering components of the program?
7. Other than the fidelity tool does Vintage have any evaluative strategies in place to assure that program staff is implementing the program components as they were intended?
8. Is there anything in place to assure Vintage as an organization is implementing the program with fidelity (i.e. reporting to funders, organizational checks and balances)?
9. On a scale of 1 to 10, with 1 being very little and 10 being extremely supportive, how much does Vintage as a whole support the Chronic Disease Self Management Program? What are some ways that Vintage supports and facilitates the implementation of this program?

10. What relationships does Vintage have external to the organization that helps support the implementation of this program (i.e. funders, other organizations)?
11. What were the biggest challenges with regard to the implementation of the self management program? How were these overcome?
12. What do you feel are the most important items necessary to the successful implementation of the self management program? Do you have any recommendations for future implementation?

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