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OVERVIEW

Evidence-based interventions are often scaled-up for broad population level implementation. There is still often a need for adaptation of those interventions to meet the needs of specific populations, communities, and service systems to ensure fit and enhance long term sustainability. There are many strategies and frameworks available to guide the development and adaptation of interventions, the documentation and testing of adapted interventions, and strategies for supporting and monitoring sustainability. By designing for eventual implementation and maintenance of an intervention at the beginning and throughout development stages, barriers to sustainment could be avoided early. Also, monitoring changes in context over time can guide needed adaptations along the way, reducing the need for larger adaptations or outright failures of interventions down the road.

This annotated bibliography summarizes recent and seminal articles regarding intervention adaptation and sustainment and provides resources for best practices. Each entry includes a brief description of how a research team might find the resources helpful in the intervention development or adaptation process. Resources with a specific connection to home visiting are shown with an asterisk (*).

General Resources on Intervention Development Frameworks

Collins, L.M. (2018). Optimization of behavioral, biobehavioral, and biomedical interventions: The multiphase optimization strategy (MOST). Springer.

- This book provides a primer on the foundational concepts of the multiphase optimization strategy (MOST), a framework for intervention development. MOST includes 3 iterative and cyclical phases to develop an intervention that is designed and tested to be optimized under resource constraints. The use of the framework can include trial designs novel to the home visiting field such as complex factorials, Sequential Multiple Assignment Randomized Trials (SMART), micro-randomized trials, and more. Such trial designs are a departure from a standard 2-arm randomized controlled trial and instead allow for a broader set of questions to be answered. For example, a factorial trial could be used to determine which intervention components meaningfully contribute to one or more outcomes while a SMART can help answer questions about decision rules related to adaptive interventions.

O’Cathain, A., Croot, L., Duncan, E., Rousseau, N., Sworn, K., Turner, K.M., Yardley, L., Hoddinott, R., (2019). Guidance on how to develop complex interventions to improve health and healthcare. *BML Open*, 9(8): e029954. <https://doi.org/10.1136/bmjopen-2019-029954>

- This article provides considerations for developing interventions for specific contexts throughout the process of development. Of note, the article emphasizes the need for iterative development

with involvement from multi-sector partners in the process to develop an intervention that will be successful in a future implementation.

*Supplee, L.H., Duggan, A., (2019). Innovative research methods to advance precision in home visiting for more efficient and effective programs. *Child Development Perspectives*, 13(3):173-179.

<https://doi.org/10.1111/cdep.12334>

- With implementation and sustainability in mind, this article outlines approaches and considerations for improving precision in home visiting programs given the use of evidence-based models in the field. This resource focuses on questions and research methods that could advance knowledge about for whom programs work and how to adapt programs to be more efficient, thus improving their use, reach, and sustainability.

Adapting Interventions

Aarons, G. A., Green, A. E., Palinkas, L. A., Self-Brown, S., Whitaker, D. J., Lutzker, J. R., Silovsky, J. F., Hecht, D. B., & Chaffin, M. J. (2012). Dynamic adaptation process to implement an evidence-based child maltreatment intervention. *Implementation Science*, 7, 32. <https://doi.org/10.1186/1748-5908-7-32>

- This article describes the Dynamic Adaptation Process (DAP), which involves developing a process for creating planned adaptations and addressing ad-hoc adaptations that occur in real time. The DAP is designed to allow for EBP adaptation and system and organizational adaptations in a planned and intentional manner rather than on an *ad hoc* basis.

Chambers, D. A., & Norton, W. E. (2016). The adaptome: Advancing the science of intervention adaptation. *American Journal of Preventive Medicine*, 51(4), S124-131.

<https://doi.org/10.1016/j.amepre.2016.05.011>

- This article argues for developing strategies to advance the science of adaptation in the context of implementation that would comprehensively describe the needed fit between interventions and their setting. The authors recommend creating of a body of knowledge that documents types of adaptations (i.e., the “adaptome”) and how those adaptations affect implementation and outcomes.

Holtrop, J.S., Gurfinkel, D., Nederveld, A., Phimphasone-Brady, P., Robinson, C., Waxmonsky, J.A., Kwan, B.M., (2022). Methods for capturing and analyzing adaptations: implications for implementation research. *Implementation Science*, 17,51. <https://doi.org/10.1186/s13012-022-01218-3>

- This article introduces a framework to capture and analyze intervention adaptations that occur in practice. Adaptations to evidence-based programs can influence outcomes. Therefore, tracking and analyzing such changes to the intervention could uncover unintended consequences and a better understanding of which adaptations produce or preserve desirable outcomes.

Kidwell, K.M., Almirall, D., (2023). Sequential multiple assignment, randomized trial designs. *Journal of the American Medical Association*, 329(4):336-337. <https://doi.org/10.1001/jama.2022.24324>

- This article provides a brief overview of the use of a trial design that specifically tests decision rules that guide the changes that could be needed over time when delivering interventions. This

is a departure from testing full intervention packages with such decision-rules made based on common sense, clinical experience, or observational data. Instead, the article provides a trial design capable of directly testing such decisions. For example, trial designs described in this article can help guide decisions about when to discontinue treatment, when to augment treatment, or what intervention options are helpful at each stage. While often confused with an adaptive trial design, the SMART design uses multiple randomization points to directly test triggers of intervention changes, timing of changes, and intervention components to remove, add, or shift.

Miller, C., Barnett, M.L., Baumann, A.A., Gutner, C.A., Wiltsey-Stirman, S., (2021). The FRAME-IS: a framework for documenting modifications to implementation strategies in healthcare. *Implementation Science*, 16, 36. <https://doi.org/10.1186/s13012-021-01105-3>.

- This article describes a framework (FRAME-IS) for identifying and documenting modifications to strategies used to implement an evidence-based program or policy in a healthcare setting. The article focuses on strategies that support the use of an intervention, program, or policy that could be necessary for a successful implementation. This framework can guide a team in determining what changes were needed to inform further research investigations and adaptations.

Mui, H.Z., Brown-Johnson, C.G., Saliba-Gustafsson, E.A., Lessios, A.S., Verano, M., Siden, R., Holdsworth, L.M., (2024). Analysis of FRAME data (A-FRAME): An analytic approach to assess the impact of adaptations on health services interventions and evaluations. *Learning Health Systems*,8(1):e10364. <https://doi.org/10.1002/lrh2.10364>

- As a companion to the Miller et al. article on FRAME-IS, this manuscript describes an approach to analyzing modifications to implementation strategies. In doing so, this resource provides a template on how to evaluate such modifications and the effect such modifications have on program outcomes.

National Collaborating Centre for Methods and Tools. Evidence-Informed Decision Making in Public Health. <https://www.nccmt.ca/tools/eiph>

- This website provides brief tutorials on the process of making evidence-based decisions in public health, including the adaptation and implementation stages. The website provides a searchable database with resources, such as toolkits, videos, templates, checklists, and articles to guide the adaptation and implementation of evidence-based interventions, programs, and policies. The searchable database allows for filtering by topic and resource type.

*Studts, C.R., Merritt, A.S., Pilar, M.R., Bundy, H., Bardach, S.H., Jacobs, J.A., Feltner, F.J., (2020). Parent and provider preferences for parenting intervention delivery in rural Appalachia: A qualitative analysis guiding adaptation. *Journal of Health Care for the Poor and Underserved*, 31(3): 1399-1426. <https://doi.org/10.1353/hpu.2020.0102>

- This article outlines the use of ADAPT-ITT, an eight-phase framework for systematically adapting evidence-based interventions for new contexts. In this article the first the initial two ADAPT-ITT phases—assessment and decision—are detailed while outlining the following six steps (adaptation, production, topical experts, integration, training, and testing).

Considerations for Balancing Adaptation and Fidelity

Anyon, Y., Roscoe, J., Bender, K., Kennedy, H., Dechants, J., Begun, S., & Gallagher, C. (2019). Reconciling adaptation and fidelity: Implications for scaling up high-quality youth programs. *The Journal of Primary Prevention*, 40(1), 35–49. <https://doi.org/10.1007/s10935-019-00535-6>

- This paper reconsiders the idea that fidelity and adaption are opposing constructs and suggest that some adaptations are actually indicators of fidelity to the core principles of the program model. Illustrative examples from youth-serving programs are provided.

Castro, F. G., Barrera, M., & Martinez, C. R. (2004). The cultural adaptation of prevention interventions: Resolving tensions between fidelity and fit. *Prevention Science* 5, 41–45. <https://doi.org/10.1023/B:PREV.0000013980.12412.cd>

- This article discusses the tension between intervention fidelity and the need for program adaptation to individualize services for families. This paper takes a community-based participatory research perspective that emphasizes community engagement to improve outcomes. The authors recommend a hybrid prevention program design strategy with built in adaptations that allow for enhanced program fit while maximizing fidelity and effectiveness.

Movsisyan, A., Arnold, L., Evans, R., Hallingberg, B., Moore, G., O’Cathain, A., Pfadenhauer, L. M., Segrott, J., & Rehfuss, E. (2019). Adapting evidence-informed complex population health interventions for new contexts: A systematic review of guidance. *Implementation Science*, 14(1), 105. <https://doi.org/10.1186/s13012-019-0956-5>

- This review paper synthesizes guidance from prior papers on *what* to adapt when considering an adaptation of an intervention.

Adaptation Examples

*Self-Brown, S., Weeks, E. A., Perry, E., Lee, N., Rivers, D. E. S., Reuben, K. E., Rao, N., O’Connor, M. H., Feinberg, I., Willging, C. E., & Whitaker, D. J. (2022). Findings from a structured adaptation process for the SafeCare parenting program to address family needs in a diverse refugee community. *Research on Social Work Practice*, 32(3), 10497315221079237. <https://doi.org/10.1177/10497315221079237>

- This paper provides an example of a process, and an evaluation of that process, for an adaptation of the SafeCare home visiting model to better individualize services for families. An adaptation team worked with members of the community and service providers to develop three adaptations to SafeCare to meet specific family needs. Quantitative and qualitative data were collected to evaluate the adaptation process and ensure meaningful engagement.

Supporting Intervention Sustainment

* Goldfeld, S., Price, A., Kemp, L., (2018). Designing, testing, and implementing a sustainable nurse home visiting program: right@home. *Annals of the New York Academy of Sciences*, 1419:141-159. <https://doi.org/10.1111/nyas.13688>

- This paper discusses the importance of identifying and describing quality to support the long-term sustainability of a program. Additionally, describing the implementation and quality of a program can help others understand what was done to produce outcomes as intended and reported. The article provides a case example of conceptualizing the quality and implementation of a home visiting program.

Klaic, M., Kapp, S., Hudson, P., Chapman, W., Denehy, L., Story, D., Francis, J.J., (2022). Implementability of healthcare interventions: an overview of reviews and development of a conceptual framework. *Implementation Science*, 17, 10. <https://doi.org/10.1186/s13012-021-01171-7>

- This article provides a review of publications related to the acceptability, fidelity, feasibility, scalability, and sustainability of interventions within a healthcare context. The authors go further to recommend an iterative approach to plan for scalable uptake and sustainability of interventions. A discussion of key considerations to monitor during intervention development over time is also included.

Scaling out of Interventions

Aarons, G. A., Sklar, M., Mustanski, B., Benbow, N., & Brown, C. H. (2017). "Scaling-out" evidence-based interventions to new populations or new health care delivery systems. *Implementation Science*, 12(111), 1-13. <https://doi.org/10.1186/s13012-017-0640-6>

- This paper describes the process for “scaling out,” or applying an evidence-based intervention to a new population, in a new service system or both. The paper discusses types of scale outs, and how to consider the evidence base for an intervention when scaling out.

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