D&I favorites for the fall 2022 Introduction to D&I Science class:

4 votes:

Trinkley KE, Ho PM, Glasgow RE, Huebschmann AG. How Dissemination and Implementation Science Can Contribute to the Advancement of Learning Health Systems. Acad Med. 2022 Oct 1;97(10):1447-1458. doi: 10.1097/ACM.0000000000004801

Review 1: Many of the readings this semester helped me to understand how and where implementation science fits in the context of other fields -- learning health systems, quality improvement science, or behavioral health. The Trinkley paper presented how D&I science can contribute to a mature learning health system (LHS). They outlined components of a mature LHS model with guidance to the planning and development of them -- D&I science, informatics, inclusive approaches to precision health, health equity-focused and multilevel implementation partner engagement, quality improvement, and pragmatic research. Key characteristics of these components were detailed. It was illuminating to see different aspects of health equity-focused engagement outlined -- shared priorities, values, and needs of multiple types of partners across the socioecologic spectrum, representation of those from marginalized and outlier populations, capacity building, and transdisciplinary teams.

Review 2: I really enjoyed reading the week 5 articles (2) by Katy Trinkley et al: Integrating the Practical Robust Implementation and Sustainability Model With Best Practices in Clinical Decision Support Design: Implementation Science Approach (2020) & Applying Clinical Decision Support Design Best Practices With the Practical Robust Implementation and Sustainability Model Versus Reliance on Commercially Available Clinical Decision Support Tools: Randomized Controlled Trial (2021). One of the challenges that I have with DI science is that I sometimes feel caught up in the theoretical aspects and/or conceptual papers and have difficulty translating how to align this with what it actually looks like to conduct a study. Trinkley's two articles provided an exemplar of not only what to do, but how to do it. The Trinkley et al (2020) paper explored how clinical decision support fits within the context of the PRISM implementation framework and the 2021 paper expanded upon this via an effectiveness randomized controlled trial. This really resonated with what I am working on right now, which is a series of projects leading to the development and pilot of a hospital discharge intervention for children who are hospitalized with concern for child abuse or neglect. Being able to see how Trinkley's team approached their research questions helped me to take a deeper dive into mine. Trinkley's work, in combination with Rabin et al's 2022 *A citation analysis and scoping systematic review of the operationalization of the Practical, Robust Implementation and Sustainability Model (PRISM)*, helped me to think about what I needed to do to frame my research at Children's Hospital of Los Angeles to reach beyond the local context. As a result, I've been working on a scoping review of literature at the intersection of hospital discharge with child abuse or neglect, and how this aligns with the domains of PRISM. As a new PRISM user and a very visual person, I found the tables and figures in Trinkley's articles very helpful. I used a combination of content from Dr. Trinkley's guest lecture and figure 1 from her team's 2020 article to guide a figure for my own work. I am hoping that from the scoping review, I will be able

to construct a table that is similar to Trinkley et al.'s table 1 (2020) that will match up the PRISM domains to the hospital discharge process. Figure 1 from Trinkley et al (2021) provided a nice research design visualization, and I hope to construct something similar for the grant that I hope to submit in summer 2023. At the start of this class, I had already started a qualitative study of staff perceptions on the hospital discharge process for children who were admitted with concern for child abuse and neglect. I really liked the way that Table 4 (Trinkley et al., 2021) linked illustrative quotes to the design feature themes. In all, the combination of reading Dr. Trinkley's work and having the opportunity to interact with her during her guest lecture was just fantastic and I feel very grateful for how her work has inspired parts of mine!

Review 3: The question is, how can the University of Colorado Health System be more of learning health system? Trinkley et al provides multiple examples of institutions that are further along in achieving the goal of a true learning health system and I read it as a possible proscriptive guide and possible to do list. A major goal of mine is to help facilitate ways in which we can learn from the enormous amount of clinical information generated every day through routine health care and documentation and speed the rate of discovery and improvement by having clinical research baked in to every aspect of care without compromising quality. Health care would improve so much faster if every single patient was a de facto pragmatic clinical trial patient and if these results would be then applied to continuous care improvement and assessment. There is tremendous potential to leverage the existing infrastructure to make this a possibility and I will continue to look for opportunities to bring this goal closer to reality. This is aligned with what patients want and what hospital leadership wants, as well as providers, so I am hopeful that as new technology becomes available the barriers will become less obstructive to achieving this goal.

Review 4: I am thoroughly intrigued by the paper "How Dissemination and Implementation Science Can Contribute to the Advancement of Learning Health Systems" (Trinkley KE, Ho PM, Glasgow RE, Huebschmann AG, 2022). My own work is focused on building a rehabilitation-focused learning health system and completing projects using methods that align with learning health system cycles, so I naturally gravitate to a paper like this. In fact, my rationale for enrolling in this training program at CU was to gain skills to help me improve in "closing" the learning health system cycle loop. In the LHS cycle conceptualized by Friedman and colleagues, that final phase of the cycle is "Knowledge to Performance". This screams for implementation, and has been acknowledged as such by Friedman and others. Trinkley's paper highlights this. It also prompts other ideas that have been brewing in my own mind since learning more about D&I, but are better articulated in the paper:

1. Their ideas add confirmation for me that "learning health system research" or "systems science" or the same work under any other name is not just quality improvement (think PDSA). It really is science, and therefore requires the rigor that any science requires. I have felt increasingly convinced of this, so appreciate yet another perspective.
2. D&I science isn't meant for JUST the last phase of the LHS cycle, but is applicable throughout ALL phases of the cycle. Consider examples:

a. In Friedman's concept of an LHS cycle, phase 1 is "Performance to Data." As Trinkley and colleagues illustrate in their first phases of "identify gap/problem" and "plan/design", D&I methods are essential. They note, for example, the importance of partner engagement in those early phases, which Freidman and colleagues also acknowledge by highlighting the importance of a "learning community". While I value and use learning communities in my own projects, I just hadn't considered fully their importance to future implementation.
b. Friedman's second phase is "Data to Knowledge." To get the right kind of knowledge, we need the right kind of data. As the paper notes, using RE-AIM, Proctor's implementation outcomes taxonomy, or other D&I TMFs ensures that the right data is collected in order to illuminate new knowledge.

3. Finally, I'm reassured that I'm not the only one trying to link learning health systems research with D&I science! To me, they are natural partners, as this paper illustrates so well.

2 votes:

Pérez Jolles, M, Martinez, M, Garcia, SJ. Stein, GL, Mentor Parent Group Members, Thomas, KC. Involving Latina/o parents in patient-centered outcomes research: Contributions to research study design, implementation and outcomes. *Health Expect*. 2017; 20: 992– 1000. https://doi.org/10.1111/hex.12540

Review 1: The involvement of the parents as the voice of the community speaks directly to interests at my organization. It is a paper that described its study design and implementation in a way that was easy for me to follow, and to consider ways I could draw from it and apply it to programs I work on. The outcomes that it measured were also helpful to provoke thoughts of my own about outcomes that illustrate why involving patients in design is so important – in particular, the low dropout rate of participants is an outcome that I think would resonate with and catch the attention of leadership and funders, to speak to helping the sustainability of the program.

Review 2: I had no trouble choosing my favorite article this semester. It was Monica Perez-Jolles and colleagues 2017 study "Involving Latina/o parents in patient-centered outcomes research: Contributions to research study design, implementation and outcomes". There were many reasons this was a great article to read. First, the intervention itself was fantastic. It was a great way to involve and empower the participants who had the most to gain from the intervention. It also supported the researchers in boosting their recruitment, which was an excellent benefit. I also loved the study because of the concept of 'parent activation' and put the parents in a mentorship/advisor role versus being participants or subjects. This felt like a great way to approach participant involvement and was a 'win-win' for the researchers and the parents. I was grateful that the authors took the time to describe this aspect of the Padres Efectivos study as a separate article because it has so much relevance for how the researchers thoughtfully wove the parents in to boost child outcomes and it gave the

reader helpful insights into the process. I think you should ask Dr. Perez-Jolles to teach a class on participant engagement and it's benefits for achieving health equity outcomes for the D&I program. A big question this study generates is how to operationalize a model of parent involvement cross culturally. Who would be the 'experts' on your study team that could engage and plan for activation of families from a variety of cultural contexts. What types of skills would that take? Also, would the "Parent Activation Measure" that was used adequately measure this construct across cultures?

Shelton, R. C., Adsul, P., Oh, A., Moise, N., & Griffith, D. M. (2021). Application of an antiracism lens in the field of implementation science (IS): Recommendations for reframing implementation research with a focus on justice and racial equity. *Implementation Research and Practice*, *2*. https://doi.org/10.1177/26334895211049482

Review 1: This is my favorite read for the class. I've saved Table 1 and will use some of the examples in my implementation science project because we are trying to implement changes in the psychosocial evaluation for LVADs to improve numbers of underrepresented minorities and women who are eligible for LVADs. Much of the psychosocial evaluation is skewed by structural racism and socioeconomic disadvantages that lead to significant treatment disparities. Thank you for having us read this piece.

Review 2: I selected Shelton et al. 2021. "Application of an antiracism lens in the field of implementation science (IS): Recommendations for reframing implementation research with a focus on justice and racial equity" because I anticipate it will have a profound impact on my research going forward. I'm also have to include the entire amazing discussion/ lecture with you and the panel (thanks for sending the video since I unfortunately missed that class) As a translational genetics researcher with a deep investment in health equity for DNA-based testing and precision public health, this paper (and the others in the module and recommended by the panel) I found this paper groundbreaking. Though I struggled a little with choosing my framework and approach for the clinical PGx testing project (partly because I'm collaborating outside of my field), I thought I was prepared to appropriately center health equity in my implementation study of age-based genomic screening using CFIR-informed interview guides and adding on some quantitative measures. This paper was absolutely eye-opening about all the uses of conceptual frameworks and measures of structural racism to deliberately (and in multiple ways) and deeply understand, address, and reduce inequities in health that disproportionately harm historically excluded and marginalized groups.
The approach of building equity into TFM, as several widely used frameworks have recently been revised to do, by assessing metrics and measures in the development of equity-focused interventions and implementation strategies and the use of appropriate metrics and measures to evaluate implementation and other outcomes was extremely interesting. The Woodward et al. paper describing the creation of the Health Equity Implementation Framework which was specifically designed to identify and address determinants of health disparities helped answer a lot of questions from Shelton et al and made the idea of a health equity-focused determinant framework less daunting. Reading the Shelton paper about the extension of the RE-AIM framework to integrate

cross-cutting health equity considerations across its domains with emphasis on enhancing adaptation and long-term sustainability was quite interesting too, particularly in light of the last class that was focused on sustainment. That these articles and others including health equity-oriented revisions to CFIR have been cited dozens of times per year since they were published, indicates an emerging awareness of the need to center health equity in implementation science that was surprising but encouraging.
I was also so interested in the other school of thought around holistic consideration of structural racism as a deeply embedded contextual factor and determinant of widespread health disparities that must be routinely measured for all contextual domains and outcomes of interest! The Snell-Rood et al. paper that Meredith recommended about using transdisciplinary theories for insight into important dimensions of equity, such as intersectionality and structural violence, intersected so well with the Shelton et al. 2021 paper. I am excited about trying to capture these nuanced structural determinants as additional targets for reducing health disparities.
I realized even more strongly that as an implementation scientist-in-training, I will increasingly have an impact on the development, implementation, and sustainment of precision public health interventions. Therefore, I have a moral obligation to unfailingly advance health equity at every opportunity and this paper and the module empowered me to take on this challenge. My new favorite quote is from Snell-Rood et al, “However, we contend that we must embrace debate rather than prioritize consensus in implementation science.”

Powell BJ, McMillen JC, Proctor EK, Carpenter CR, Griffey RT, Bunger AC, Glass JE, York JL. A compilation of strategies for implementing clinical innovations in health and mental health. Med Care Res Rev. 2012 Apr;69(2):123-57. doi: 10.1177/1077558711430690.
Powell BJ, Waltz TJ, Chinman MJ, Damschroder LJ, Smith JL, Matthieu MM, Proctor EK, Kirchner JE. A refined compilation of implementation strategies: results from the Expert Recommendations for Implementing Change (ERIC) project. Implement Sci. 2015 Feb 12;10:21. doi: 10.1186/s13012-015-0209-1.

Review 1: I appreciated the article by Dr. Powell et al, “A compilation of strategies for implementing clinical innovations in health and mental health” which then led me to Dr. Powell et al, “A refined compilation of implementation strategies: results from the ERIC project”. I am a very concrete/practical person by nature. I think that this tendency has increased since writing scientific papers and working to conduct rigorous research + time spent as a physician. By way of example, I went to the Clyfford Still Museum a few weeks ago with my daughters. While I could appreciate the
beauty and innovation of the artwork, I couldn’t help but feel baffled by the artist himself, the chaotic artwork, and the impracticality and lack of security in pursuing a life of art. I bring this up because, until reading these two manuscripts, I was having hard time conceptually with understanding what “an implementation strategy” was and how it differed from an intervention. While I still feel that D&I is generally overwhelming and, at times, feels impossible to do well (there just doesn’t seem to be enough time and money), these two papers neatly categorized various implementation strategies into digestible and reproducible concepts. These two papers didn’t general more questions, instead, they answered questions that I hadn’t even fully formed in my brain up

to that point in class.

Review 2: The article below is my favorite because it provided a practical "go-to" resource for thinking about how to implement a clinical intervention, taking into account the 6 domains that are highlighted in the figure 2 below (from the paper). This review article provided a useful map to follow as well as a "toolkit" of IS approaches for specific aspects of intervention implementation. For an IS novice like me, this figure provided a great visual of the wide array of possible intervention approaches.

1 vote:

Woodward, E.N., Matthieu, M.M., Uchendu, U.S. *et al.* The health equity implementation framework: proposal and preliminary study of hepatitis C virus treatment. *Implementation Sci* 14, 26 (2019). https://doi.org/10.1186/s13012-019-0861-y

I vote for the whole health equity and D&I module. Each of these articles highlighted several structural and historical systemic issues with the current healthcare systems. For example, the Woodward article discuss the importance of addressing health disparities with implementation science. As I was reading this article, I couldn't help but think about how these disparities are the result of decades of structural and wealth inequities. As an example, Moore, Oklahoma reliably and consistently experience the destructive damage of Tornadoes. As a result, the housing market is cheap in that region. And because housing is so cheap in Moore, there is a disproportionate rate of BIPOC communities, which are now at a higher likelihood of experiencing a potentially traumatic event. Even though better implementation of evidence-based treatments for PTSD among these communities could be helpful, it does seem like the implementation strategy needs to target the system and structural issues contributing to the disparity from the beginning.

Shelton RC, Lee M. Sustaining Evidence-Based Interventions and Policies: Recent Innovations and Future Directions in Implementation Science. Am J Public Health. 2019 Feb;109(S2):S132-S134. doi:10.2105/AJPH.2018.304913

The most recent article we read, Shelton et al. (2019), was my favorite article because one of my primary goals in the D&I certificate program is to better understand program sustainability. I appreciated that the authors provide a clear definition of sustainability as "the continued use of program components at sufficient intensity for the sustained achievement of desirable program goals and population outcomes." In addition, they implicitly apply a health equity framework to acknowledging that sustainability may not always be in the best interest of the individuals served, especially when the population and needs of the community change or there is knowledge regarding more effective intervention. This article raised questions regarding my own project evaluating the Nurse Family Partnership (NSP) and rethinking what sustainability might look like. Because the NSP was originally part of a three-county system and had more resources but has now been downgraded to a single county, I wonder how this will impact sustainability and long-term expansion of the program back into other counties. Will other counties view the NSP as an evidence-based and feasible intervention that should be incorporated into their programming or rely on other

interventions? How will such a program be maintained when counties in Colorado are allotted different funding streams to support family-based programming? These are some questions that our team will have to think about as we apply the RE-AIM framework to our project and measure program outcomes.

Brown CH, Curran G, Palinkas LA, Aarons GA, Wells KB, Jones L, Collins LM, Duan N, Mittman BS, Wallace A, Tabak RG, Ducharme L, Chambers DA, Neta G, Wiley T, Landsverk J, Cheung K, Cruden G. An Overview of Research and Evaluation Designs for Dissemination and Implementation. Annu Rev Public Health. 2017 Mar 20;38:1-22. doi: 10.1146/annurev-publhealth-031816-044215.

I really enjoyed the article "Brown, H., Curran, G., Palinkas, L.A., Aarons, G.A. (2017). An Overview of Research and Evaluation Designs for Dissemination and Implementation. Annual Review of Public Health 38;1-22." Mainly because I will keep this article as a reference for future study design. I think this article is a very comprehensive overview of the different D&I strategies. In line with the idea of keeping it 'scientific' rather than 'practice', I think this article serves as a great reference for beginners who are thinking about study designs. The article was not meant as an in-depth exploration of each of the specific designs but learning about the different types of designs and categorizing them as 'within site' vs 'between sites' vs 'within and between sites' design really helped me think about which design strategy I should learn about further for my own study.

Hawe P, Shiell A, Riley T. Theorising interventions as events in systems. Am J Community Psychol. 2009 Jun;43(3-4):267-76. doi: 10.1007/s10464-009-9229-9. Hawe P. Lessons from complex interventions to improve health. Annu Rev Public Health. 2015 Mar 18;36:307-23. doi: 10.1146/annurev-publhealth-031912-114421.

I have spent this semester doing mental acrobatics trying to conceptualize integration of midwifery care as an "intervention." This has been problematic for several reasons. First, "low interventive birth" is a hallmark of midwifery, so just using the term intervention in conjunction with midwifery is oxymoronic. Second, midwifery care is the standard of maternity care in most of the world, so to call it an intervention when midwifery care is synonymous with maternity care is most settings seems counterintuitive. Next, using the term "innovation" for allowing birth to happen as physiologically intended, as is the aim of midwifery care, also seem inappropriate. Furthermore, midwifery care itself is not well defined (is it simply care delivered by a midwife or is it a model of care—there are decades of scholarly debate about this topic). Integrating midwifery care is incredibly complex because it is about providers, procedures, policies, etc. all bundled into one, therefore it is not a single intervention per se. It includes at least 5 Ps. But each small intervention itself does not warrant a full trial and would not be expected to have an appreciable effect, therefore they must be bundled. For these reasons, conceptualizing midwifery integration as a complex healthcare intervention—or better yet a "complex healthcare event"-- has provided me a path forward. There are multiple components, the effect of the components is synergistic, it targets multiple organizational levels, there are a number of outcomes, there are difficult and entrenched behaviors that require (re)training, and it will require a high degree of flexibility given the variation in perinatal care settings. I recognize that I

may need to slice off little pieces of this complex intervention but having the language with which to describe it in its entirety makes it easier to conceptualize for reviewers (and myself).