A Theory-Informed Approach to Locally Managed Learning School Systems: Integrating Treatment Integrity and Youth Mental Health Outcome Data to Promote Youth Mental Health

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Abstract

Numerous evidence-based programs (EBPs) exist for delivery in schools to promote youth mental health outcomes. However, school systems often lack the internal infrastructure to support the effective implementation and sustainment of EBPs when external supports are withdrawn, resulting in notable attenuation in the benefits in youth clinical outcomes that are associated with EBPs. This paper illustrates how to leverage concepts from improvement science and implementation science to develop learning school systems dedicated to enhancing the infrastructure capacity of a school to advance the implementation and sustainment of EBPs. In particular, we discuss how treatment integrity (extent to which an EBP is delivered as designed) and youth mental health outcome data are (a) collected, (b) analyzed and interpreted and (c) fed back into the school system to increase organizational supports and promote school practitioners' behavior change to produce improvements in youth mental health outcomes. We also discuss psychological safety among the people within a school system as a key characteristic of a learning school system. We then present a theory-informed approach to learning school systems to demonstrate how data generated by a learning school system can lead to precise and effective plans that continuously improve implementation and result in the eventual sustainment of EBPs. We conclude with a brief research agenda with concrete steps toward realizing the potential of learning school systems to support the implementation and sustainment of EBPs for mental health problems.

Keywords Learning school system · Treatment integrity · Clinical outcomes · Implementation

A significant percentage of youth experience mental health problems (Ghandour et al. 2019), which interfere with academic success, are linked to interpersonal problems at school, truancy and eventual dropout (Cook et al. 2010;

Desocio & Hootman 2015; Durlak & Weissberg 2011) and can become more resistant to intervention over time (Bradley et al. 2008). Such problems predict negative life course outcomes, including unemployment, adult mental health problems, and incarceration (Polanczyk et al. 2015). Given the prevalence and negative outcomes of mental health problems, there is a need for schools to implement evidence-based comprehensive intervention models (i.e., programs

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that include multiple discrete practices, hereafter called evidence-based programs [EBPs; Boyd et al., 2010]) for mental health promotion and treatment (Greenberg & Abenavoli 2017). A variety of EBPs have demonstrated positive effects for youth with mental health problems in school settings, but efforts to implement and sustain EBPs in school settings face a number of barriers.

Schools receive pressure from policy and educational agencies to adopt EBPs that prevent and address mental health problems (e.g., Every Student Succeeds Act 2015). However, consistent evidence indicates that when EBPs are implemented in schools, it is difficult to achieve adequate treatment integrity (i.e., deliver the program as designed; Locke et al. 2015) and the EBP may result in minimal to no impact on youth mental health outcomes (e.g., Stahmer et al. 2015; Suhrheinrich et al. 2013). Numerous factors, including the intervention, school practitioner and school, can influence implementation and sustainment (Lyon & Bruns 2019; Sanetti & Collier-Meek 2019). This paper focuses on addressing an important school-level factor associated with EBP implementation: the capacity needed within school systems to support the implementation and sustainment of EBPs on their own (Scaccia et al. 2015).

We argue that one way to help improve the uptake, use, and sustainment of a continuum of mental health EBPs in school settings is to build the infrastructure capacity of school systems to monitor and support EBP treatment integrity and mental health outcomes on an ongoing basis (Connors et al. 2020; Hogue et al. 2013). We illustrate how concepts from improvement science and implementation science can be integrated and used to develop a learning school system, defined as a school in which stakeholders openly collaborate to ensure efficient data collection and feedback are aligned for continuous organizational improvement to increase youth access to high-quality care in the service of improving mental health outcomes. We begin by describing two use case illustrations that outline real-world problems of practice that could be addressed via a learning school system. We then explain how a learning school system based on the concept of learning health systems (Hsu et al. 2017; Institute of Medicine 2015) merges ideas from improvement science and implementation science, including highlighting the central role of treatment integrity and youth mental health outcome data collection within a school culture and climate characterized by psychological safety. We then describe a theoretically informed learning school system, returning back to the two use case illustrations to demonstrate how a learning school system could address these real-world problems of practice.

Problem of Practice #1: Explore Current Implementation. A principal who is new to a building wants to get a sense of how well teachers are implementing an evidence-based social emotional learning (SEL) curriculum and whether implementation is having its intended effect on youth mental health outcomes. This information will be critical to inform the principal's school improvement plan throughout the next two academic years, as promoting youth social-emotional competencies is both a district and state priority. Unfortunately, the principal does not have any means to assess the degree to which teachers are delivering the SEL curriculum with integrity nor routine outcome measures for evaluating impact on youth mental health outcomes. The principal explores paying for an external audit to get a sense of implementation, but resources are unavailable to do so. The principal struggles to develop a plan to continuously improve implementation of the SEL curriculum.

Problem of Practice #2: Sustain Implementation. A large elementary school has implemented Responsive Classroom as a universal prevention EBP for the past three years. The school district has paid for training and follow-up support during this time. Given budget cuts, the district can no longer afford paying for consultative services from the EBP trainers, and now must maintain implementation on their own. However, despite a commitment by the school leadership to sustain Responsive Classroom, the team does not have an internal system in place to monitor delivery of the EBP over time and inform efforts to sustain.

Science-to-Practice Gap

Successfully translating EBPs for youth mental health problems into school settings is an important aspect of our nation's agenda to promote youth mental health. However, transporting EBPs into school settings is fraught with difficulties (Lyons & Bruns 2019; Wilson et al. 2011). Many school practitioners (e.g., teachers, counselors) receive inadequate training in and report lacking knowledge of EBPs that target youth mental health functioning (Sanetti & Collier-Meek 2019). When EBPs are adopted, practitioners often struggle to deliver them with sufficient treatment integrity or sustain them over time (i.e., continue to deliver EBPs with treatment integrity once training is completed; Locke et al. 2019, 2015; Stahmer et al. 2015; Suhrheinrich et al. 2013). Efforts to implement EBPs in school settings do not always produce positive mental health outcomes. Indeed, inconsistent implementation of EBPs can attenuate the impact of even the most effective school-based EBPs (Durlak & Weissberg, 2011; Suhrheinrich et al., 2013). Failure to implement EBPs with treatment integrity in everyday school settings limits the educational and public health benefits of EBPs and does not adequately address the mental health needs of youth (Cook & Odom 2013; McHugh & Barlow 2010).

Increasing the infrastructure capacity of schools can help attend to and address barriers to delivering and sustaining EBPs for mental health problems in school settings as well as provide valuable support to school practitioners. To build internal infrastructure capacity, we recommend turning to specific scientific disciplines that have examined how organizations can establish locally managed systems that aim to continuously improve care quality. In this context, care quality is defined as improvements in youth mental health outcomes that come about because of the degree to which EBPs are adopted and delivered with sufficient treatment integrity (i.e., delivering the practices found in an EBP protocol; Sutherland et al. 2013).

Using Learning School Systems to Bridge the Science-to-Practice Gap

To articulate how schools can build infrastructure capacity to continuously support EBP implementation and sustainment, we draw on lessons learned from two separate fields, improvement science and implementation science. Improvement science originally comes from business and has been used in healthcare to determine how efforts at the organization level can improve the quality, value and safety of healthcare services (see Check et al. 2020). A main aim of improvement science in healthcare is to systematically address areas of poor organizational performance related to healthcare delivery. Performance of an organization is viewed as a product of its design and operation. From this perspective, improvement science uses problem-solving cycles to improve the performance and increase the capacity of an organization. For example, teams can use the Plan-Do-Study-Act (PDSA; Chaney et al. 2011; Taylor et al. 2014) cycle to identify areas of poor organizational performance, develop a plan to test a change to address the performance problem (Plan), carry out the test (Do), observe and learn from the consequences (Study) and determine what modifications should be made to the test (Act). The resulting data can be used strategically by leadership teams to identify strengths and weaknesses in organizational performance that in turn inform action plans that incrementally improve and sustain performance (Todd et al. 2011).

Implementation science has emerged as a multi-disciplinary field dedicated to addressing longstanding science-practice gaps that exist across every service sector, including education (Lyon & Bruns, 2019). A key goal of implementation science is to produce generalizable knowledge about effective processes, methods and techniques for supporting EBP uptake and use (Damschroder et al. 2009; McLeod et al. 2020). Implementation science has accumulated a robust, generalizable knowledge base with high relevance to advancing the implementation of EBPs in schools (Lyon & Bruns 2019). For example, researchers have developed several implementation frameworks that can be used to guide implementation-oriented decision-making (Tabak et al. 2012), identified critical determinants that obstruct or enable implementation success (Krause et al. 2014), identified strategies that influence implementation outcomes (Cook et al. 2019), and synthesized theories of organizational and individual behavior change to better understand and explain the conditions for successful implementation (Nilsen 2015; Williams & Beidas 2019). Implementation science thus focuses on how multi-level factors influence the uptake and implementation of EBPs within school settings.

Merging key concepts from improvement and implementation science has the potential to advance efforts to successfully implement EBPs within organizations (Check et al. 2020). In 2012, the Institute of Medicine released a report urging healthcare organizations to improve care quality and to reduce costs through the creation of learning health systems (Hsu et al. 2017; Institute of Medicine 2015). Among other foundations, learning systems draw upon the focus on organizational functioning and capacity building from improvement science and the knowledge of how to promote the uptake, implementation, and sustainment of EBPs from implementation science (Check et al. 2020). To become a learning health system, data about care quality (i.e., information about treatment integrity and youth mental health outcomes) must be continuously (a) collected, (b) analyzed and

interpreted and (c) fed back into the system to improve mental health outcomes, practitioner behavior and organizational supports (Foley & Fairmichael 2015). Improvement science suggests that the first step to initiate a learning system process involves collaboration around the use of data to identify the main problem of practice to address through the selection and implementation of an EBP (Scott & Lewis 2015). To identify and define the problem of practice, it is critical to have data on youth mental health problems that suggest a need or problem exists warranting change. For example, data collected within a given school system may reveal that a significant number of youth exhibit levels of anxiety that interfere with their social and academic functioning indicating a need to select EBPs that prevent and address anxiety problems among youth. From an implementation science perspective, data in the form of youth mental health outcomes and treatment integrity are integral across active and sustainment phases of the implementation process, as feedback is the mechanism of action used to achieve both practitioner and organizational behavior change (Moullin et al. 2019). It is through the routine collection and monitoring of youth mental health outcome and treatment integrity data that stakeholders within a school have access to information to make decisions that increase organizational infrastructure capacity (e.g., provision of coaching to practitioners with low integrity and minimal change in youth mental health outcomes) to support the implementation and sustainment of EBPs. It thus is at this nexus of concepts from improvement and implementation science where there is potential for significant forward movement in improving organizational capacity to support the delivery of EBPs and improve mental health outcomes for youth (Chambers et al. 2016).

Applied to schools, a learning school system is a school in which efficient data collection and feedback are aligned for continuous organizational improvement and high-quality care (i.e., EBPs delivered with treatment integrity and positive academic or social-emotional outcomes; Beidas & Stirman 2020). Though our focus in this paper is on youth mental health outcomes, this definition is inclusive of academic and mental health outcomes as a learning school system is applicable to support both types of outcomes. Learning school systems can be realized through teams and consultants that use a structured PDSA cycle to (a) identify the problem (i.e., what is the treatment integrity or youth mental health outcome problem?), (b) analyze why the problem exists, (c) develop and implement plans and (d) evaluate and monitor whether the plan worked (e.g., Horner et al. 2018). A learning school system thus uses a data-driven process that employs cycles of treatment integrity and mental health outcome data to monitor and provide feedback to improve implementation at school, classroom and individual youth levels (Burnham et al. 2009; McLeod et al. 2013). A learning school system designed to support the implementation

and sustainment of EBPs uses mental health outcome and treatment integrity data to identify strengths (e.g., exemplar implementers, improvements in mental health outcomes) and weaknesses (e.g., integrity drift over time, no change or deterioration in mental health outcomes) that spur action planning that aims to incrementally improve implementation to achieve desired changes in mental health outcomes (Todd et al. 2011). Moreover, data can be used to allocate resources more efficiently to target specific mental health problems or identify particular school-based practitioners who need additional support (e.g., training, coaching, protected time for planning) to increase treatment integrity (Sanetti et al. 2015). From a theoretical standpoint, treatment integrity and mental health outcome data create feedback loops, which is essential for learning and improvement as it helps uncover discrepancies (e.g., difference between where implementation and outcomes ought to be and where implementation and outcomes are actually at) that motivate individuals to resolve—through learning—why the problem is happening (Brown et al. 2019).

Stakeholders Responsible for Creating a Learning School System

There are multiple stakeholders who could benefit from a learning school system across different levels of the school system, including educational administrators; educational consultants, purveyors, and intermediaries who support EBP implementation; internal teams operating within schools; and the practitioners who receive ongoing supports to promote youth access to quality mental health care. Ideally, distributed leadership teams that include members who possess complementary areas of expertise and social influence within the school system are best suited to create a locally managed learning school system. For an optimal learning school system, there is need for linked teams across district and school buildings that work in tandem to advance EBP implementation and youth mental health outcomes. A district distributed leadership team that consists of leaders who are responsible for overseeing the different areas of work within the district (e.g., teaching and learning; youth services; special education) functions to use data to support schools in building internal capacity to implement EBPs as a way of promoting youth mental health outcomes. School building distributed leadership teams include members with formal and informal leadership who work together to drive meaningful change in implementation and youth mental health outcomes through ongoing cycles of data collection and feedback that spur action planning. Teams are closely connected to the practitioners who are the designated implementers of EBPs that are charged with the task of increasing youth access to quality mental health services. Given the importance of teams and their connection to practitioners,

a healthy school culture and climate is a critical component of a well-functioning learning school system.

Role of a Positive School Culture and Climate

It is imperative to consider broader school culture and climate when determining whether key characteristics of the organizational context are in place to enable a learning school system. A simplified definition of culture is the patterns of how people behave professionally and toward one another (Hargreaves 1995). Relatedly, climate reflects staff perceptions based on their shared experiences in a given setting (e.g., school building), which affects how staff feel about certain activities, events, and situations that occur in school (e.g., treatment integrity data being gathered and receiving feedback; Wang & Degol 2015). Schools characterized as having a positive culture and climate are places where staff positively and effectively interact with one another and have favorable feelings about being a member of that school, which combine to create an enabling context that is conducive to successful implementation (Lyon et al. 2018). One specific aspect of school culture and climate that may function as a determinant of whether organizations become learning systems is psychological safety (Newman et al. 2017).

Psychological safety reflects the interpersonal context of an organization where people do not fear negative judgment, are open to receiving feedback, are willing to talk about what is not working, and collaboratively problem-solve barriers to improvement (Edmondson et al. 2001). Psychological safety is an organizational, interpersonal construct that is characterized by people in a given organization believing that the information that is gathered and shared will not be used to punish, humiliate, or negatively judge them when there are mistakes, mishaps, or issues voiced about implementation (Edmonson & Lei 2014). Organizational research has consistently shown that psychological safety is a critical factor to explaining why people collaborate toward achieving common goals and outcomes (e.g., Edmondson 2018). In addition, psychological safety enables teams and people within a given organizational context to learn (Bunderson & Boumgarden 2010) and improve performance over time (Carmeli et al. 2012). Psychological safety is the interpersonal element of learning school systems that is necessary to drive collaboration around data collection and feedback for purposes of continuous improvement. Without psychological safety, data collection around treatment integrity is likely to be reported inaccurately for fear of negative consequences, and feedback is likely to be taken as criticism as opposed to support learning (Edmonson 2018).

Over the past two decades, research has illuminated how a distributive leadership teams can intentionally cultivate a healthy school culture and climate characterized by psychological safety (Edmonson 2018). Psychological safety begins with those in charge modeling fallibility through admitting mistakes and mishaps, which sets the tone for being okay with talking about what is and is not working (Carmeli et al. 2009). Moreover, leadership that actively seeks input and feedback from staff about an implementation effort and the needs they have as providers help establish an environment where people feel safe to share their thoughts openly and honestly so plans take into account and are responsive to staff perspectives (Edmonson et al. 2016). Another way leadership teams can cultivate psychological safety is through designing opportunities for relationship building that enable staff to build a sense of trust and connection with one another (Higgins et al. 2012). Last, distributive leadership teams can be deliberate about avoiding punitive accountability structures and instead create systems of supportive accountability (e.g., goal setting and review, collaborative problem-solving if someone is stuck in making a change, peer accountability through professional learning community) wherein individuals are more open to informative feedback that enables them to improve toward achieving a shared outcome of interest (Edmonson 2018).

Overlap with Existing Frameworks and Models

Learning school systems have commonalities with the core features of a multi-tiered system of support (MTSS) and problem-solving models of service delivery. For example, data-based decision-making and teaming are both core features of MTSS and problem-solving models (Bruns et al. 2016). What is often missing from MTSS and problem-solving models of service delivery is the interpersonal element of a learning system that involves efforts to promote psychological safety that facilitates open collaboration around data collection and feedback to recognize what is and is not working to drive continuous organizational improvements that facilitate EBP implementation and youth mental health outcomes. When viewed in this way, MTSS and problem-solving models can function as a learning school system if (a) efficient data collection and feedback occur routinely to drive strategic action planning and (b) there is a collaborative, psychologically safe school culture and climate in which people collaborate together to achieve continuous improvement in both EBP implementation and youth outcomes.

Data Collection and Feedback are Critical to a Learning School System

A learning school system focused on EBP delivery depends on having actionable information that provides stakeholders within the organization about whether (a) youth are receiving EBPs in a way that they have been shown to be effective and (b) youth mental health outcomes are changing as a result of implementation. Treatment integrity and mental health measures, therefore, are necessary to drive a learning school system. In the education field, we have the measures to collect treatment integrity and mental health data and the ability to analyze and interpret these data. However, data collection and feedback systems that integrate and report treatment integrity across multiple EBPs and mental health outcome data to practitioners do not currently exist, which limits the ability to apply concepts from learning health systems to schools. Operationalizing the building blocks of learning health systems for schools holds enormous potential to improve care quality (Beidas & Stirman 2020; Powell et al. 2015). While numerous measures exist to gather and routinely monitor mental health outcomes (Bickman et al. 2016), education research has only recently begun to develop treatment integrity measures that are appropriate for use in a learning school system (Sanetti et al., 2020). Together, these two lines of research have advanced our ability to capture the data needed for a learning school system. Providing feedback about treatment integrity and mental health outcomes to practitioners can facilitate implementation of high-quality care and continuous improvement in line with the spirit of a learning school system (Foley & Fairmichael 2015).

Figure 1 illustrates how data generated by treatment integrity and mental health outcome measures can play a central role in a learning school system (Sutherland et al. 2013). The left side lists implementation inputs at the outer setting (e.g., policy, district leadership) and inner setting (e.g., site-based team, learning system, practitioner characteristics) levels of a school that influence implementation and youth mental health outcomes (Hogue et al. 2013; McLeod et al. 2013). The middle section depicts components of treatment integrity that are required for the effective delivery of an EBP (Hogue et al. 2008; Webb et al. 2010). Here, two treatment integrity dimensions are particularly relevant for a learning school system focused on the implementation and sustainment of EBPs for mental health problems (Southam-Gerow & McLeod 2013; Sutherland et al. 2013): adherence and competence. Adherence (quantity) refers to the extent to which the core practices of an EBP are delivered as specified in the treatment protocol, whereas competence (quality) refers to the responsiveness and skill demonstrated by a practitioner when delivering the core practices. From the perspective of supporting EBP implementation and sustainment, adherence is important to measure as it captures practitioner behavior regarding how extensively the steps or components of the practices are delivered as planned. Competence is also important to measure because it captures the quality of EBP delivery. Both adherence and competence can be addressed via implementation strategies (e.g., prompts/reminders, implementation planning, training). The right side of the model represents youth mental health outcomes that are influenced by the quantity (adherence) and quality (competence) of EBP delivery (Hogue et al. 2013; McLeod et al. 2013). In sum, measures that capture treatment integrity and youth mental health outcomes can be incorporated into a data collection system that produces metrics needed to monitor and facilitate data-driven decisions at the practitioner or school level to promote care quality and organizational change.
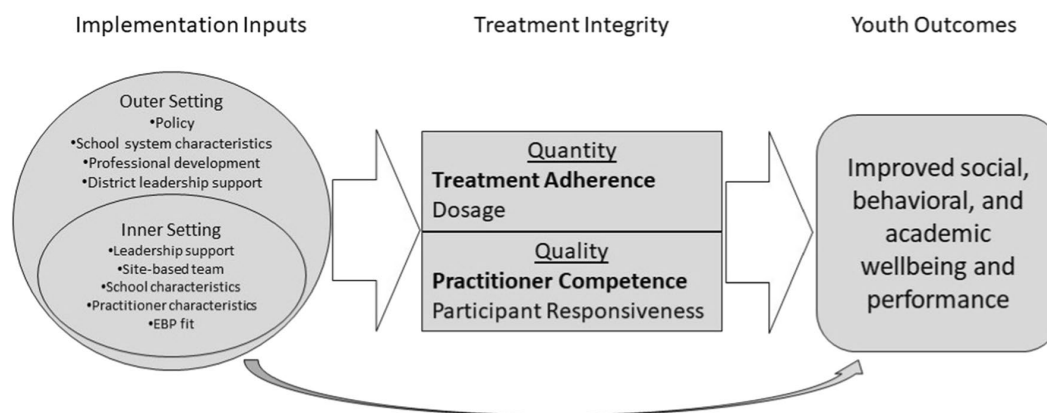

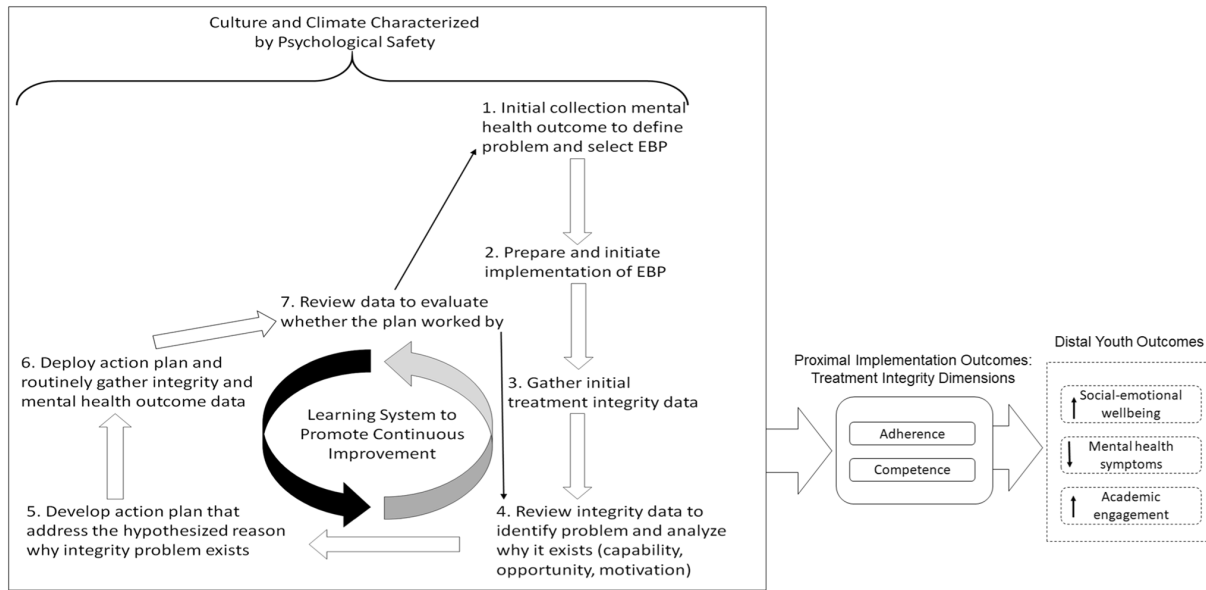**Fig. 1** Conceptual model of implementation

Fig. 2 Learning system theory of change

Theoretically Informed Learning School System

Findings from implementation science are quite clear: theoretically informed approaches are superior with regard to promoting implementation and service recipient outcomes as compared to approaches devoid of theory (e.g., French et al. 2012). Theoretically informed approaches to implementation specify the precise mechanisms that are likely to lead to proximal, intermediate, and distal outcomes of interest (Lewis et al. 2018). This section integrates several theories to illustrate how a learning school system that uses treatment integrity and mental health outcome data could operate within a school system to improve the effectiveness of EBP implementation and sustainment. As illustrated in the Theory of Change (ToC; see Fig. 2), treatment integrity and youth mental health outcome data play a central role in a learning school system as well as representing the specific targets of action plans that aim to improve the adherence and competence of the core practices of a given EBP (i.e., Proximal Implementation Outcomes). In turn, the adherence and competence components interact to increase the likelihood EBPs will be effective and lead to improvements in youth mental health outcomes (i.e., Distal Youth Outcomes).

The left side of the ToC depicts a learning school system that uses a structured problem-solving process to (a) identify the problem, (b) analyze why the problem exists, (c) develop and implement plans, and (d) evaluate and monitor whether the plan worked (e.g., Horner et al., 2018). Within

this problem-solving process, two theories describe how a learning school system works. First, the Clinical Performance Feedback Intervention Theory (CP-FIT; Brown et al. 2019) explains how feedback works to alter the behavior of end-users (e.g., school team, coach). CP-FIT posits that when end-users perceive a discrepancy between behavior (e.g., deterioration in youth mental health outcomes) and a goal (e.g., reductions in youth mental health outcomes), they will take steps to reduce the discrepancy. In Step 2 of the learning school system, if a school team, for example, perceives a discrepancy between the mental health outcomes of the youth and a goal (youth continue to struggle with particular mental health problems), then they will take steps to solve the problem. According to CP-FIT, how data are presented in feedback reports to end-users determines whether end-users recognize that a problem exists. Feedback reports with treatment integrity and mental health outcome data must effectively highlight discrepancies between the behavior and the goal to motivate efforts to address the discrepancy. To guide decision-making, decision rules are created to interpret different discrepancy scenarios that result from the intersection of treatment integrity and mental health outcome data. For example, if integrity data indicate insufficient EBP implementation and mental health outcome data remain unchanged, then the decision rule is to develop a plan to improve integrity as that represents a defensible hypothesis regarding why mental health outcome data have not improved. On the other hand, if integrity data indicate sufficient EBP implementation and mental health outcome do not change over time, then the decision rule is to consider
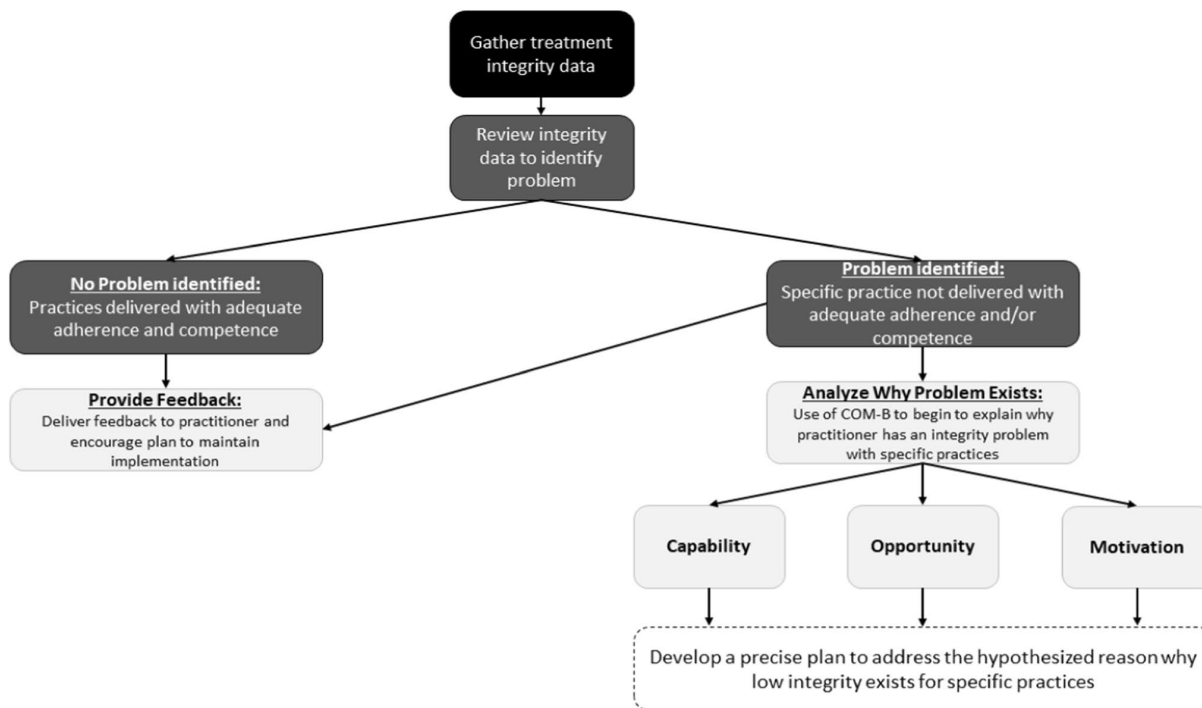
Fig. 3 Decision flowchart linking treatment integrity to use of COM-B to guide action planning

changing the practice as it is not producing the desired effect on youth mental health.

Whereas CP-FIT explains how feedback works to motivate end-users to problem-solve, it does not explain why the discrepancy exists. Once a discrepancy is identified (i.e., treatment integrity data indicate a problem with one or more specific practices related to poor youth mental health outcomes), the Capability, Opportunity and Motivation Model of Behavior (COM-B; Michie et al. 2014), an established theory of behavior change, is used to understand why the discrepancy exists among implementers (Step 3). COM-B predicts that behavior will occur when individuals have the capability and opportunity to engage in the behavior and are motivated to enact the behavior (Michie et al. 2014). Applied to a learning school system, the more capable practitioners are to enact specific behaviors related to adherence and competence and the more conducive the environment is to enable them to enact adherence and competence, the more they will deliver EBPs with integrity and the greater the likelihood that they will achieve positive youth mental health outcomes. Thus, the COM-B enables school teams to determine whether problems with treatment integrity are due to capability, opportunity and/or motivation and then develop more precise action plans that target why treatment integrity is low. Figure 3 provides a decision-making flowchart that

outlines the process from treatment integrity data collection through action planning using COM-B.

The middle part of the figure highlights the targets of measurement focused on adherence and competence of delivering the core practices found in an EBP protocol. With the use of treatment integrity data within a learning school system, the collection of treatment integrity data maintains a focus on components that support the implementation-outcome link depicted in Fig. 1 and represent malleable variables that can be targeted with behavior change strategies through a learning school system (i.e., use data to develop, monitor and evaluate a plan). As noted above, we make the case that treatment integrity data collection should include quantity (adherence) and quality (competence) dimensions. Practically, users of a learning school system would first examine data summary reports that include information about each treatment integrity dimension related to EBPs for youth mental health outcomes of concern and then, if scores are below an acceptable level, it will prompt users to examine the specific integrity dimension driving low overall treatment integrity (i.e., the prompt designed according to CP-FIT guidelines) and is hypothesized as the reason for no favorable changes in mental health outcomes. Feedback would prompt end-users to analyze why adherence or competence is low (i.e., using COM-B) and to select a behavior change strategy as solutions to produce improvements in the

delivery of the core practice elements of an EBPs in an effort to improve youth mental health outcomes.

Practical Importance of a Learning School System for Use in Educational Settings

A learning school system represents both an innovative and essential next step to bridging the implementation gap that hinders the prevention and amelioration of mental health problems in schools. Moreover, learning school systems offer significant promise to improve school-based implementation research that can inform everyday implementation practice targeting improvements in both implementation and youth mental health outcomes. Specifically, the practical importance of a learning school system stems from: (a) baseline assessment of mental health outcomes and the specific practices used by practitioners in a school/district, (b) ongoing monitoring of mental health outcome data and the delivery of specific practices to identify strengths and weaknesses to inform action plans to improve implementation, (c) monitoring mental health outcomes and treatment integrity with which EBPs are delivered to allocate resources to support specific practitioners who are in need of additional support to deliver EBPs with sufficient integrity, and (d) monitoring treatment integrity to maintain or improve sustainment of EBPs.

Importance of Locally Managed Learning School Systems

To realize the potential of learning school systems within school systems, it is important for the field to develop data collection and feedback processes that are capable of being locally managed. EBP implementation and sustainment is best established through building internal innovation-specific capacity within a given school system (Chambers & Norton 2016; Hogue et al. 2013). Often the process of transporting EBPs into school settings involves initiating contact with external experts in a given EBP whom the school pays to institute external learning school systems (e.g., training, consultation, integrity audits and feedback). Despite the importance of external support, this arrangement creates a dependency that serves as a barrier to EBP implementation and sustainment (Hogue et al., 2013). When schools are dependent on an external expert for EBP training and coaching and these external supports are withdrawn or can no longer be afforded, implementation drifts (McIntosh et al., 2010). This undermines the end goal of the implementation process—i.e., the continued use of an EBP with integrity when external involvement ends. Moreover, many low-resource schools are unable to afford external consultation to support their adoption and delivery of EBPs. There is a need for affordable approaches that enable schools to

manage their own efforts to adopt and deliver EBPs. In short, successful sustainment depends on the ability of a school to locally manage a learning school system that supports implementation and sustainment (Hogue et al. 2013; Schoenwald et al. 2011). However, to do so requires feasible and technically sound treatment integrity measures of EBP delivery along with measures of youth mental health outcomes.

Pragmatic Treatment Integrity Measures

Observer-rated measures are considered the "gold-standard" in treatment integrity measurement (McLeod et al. 2009; Sanetti et al.2009; Sutherland et al. 2013). However, there are several features of observer-rated measures that limit the feasibility and usability of deploying them in schools. First, observer-rated measures are costly and time intensive to gather treatment integrity data as part of a learning school system (Garland & Schoenwald 2013; Schoenwald et al. 2011). For example, an elementary school with 18 teachers that requires two 60 min integrity observations per year would result in 36 total hours of observation. With time and money scarce commodities within school systems, observer-rated measures often lack feasibility for routine use as part of an ongoing learning school system. Second, learning school systems require ongoing assessment and observer-rated integrity measures are not suited to this purpose (Hogue et al. 2017). The cost and time required to use observer-rated measures limit the frequency with which they can be used. As a result, they capture a smaller sample of implementer behavior (i.e., fewer occasions) and thus may miss important information (e.g., changes related to coaching; Hogue et al. 2013). For all these reasons, pragmatic treatment integrity measures are needed to support locally managed learning school systems—where pragmatic is defined as practical, brief, easy, acceptable and psychometrically strong (Hogue et al. 2013; Schoenwald et al. 2011; Stanick et al. 2018).

Self-report treatment integrity measures represent a viable option for a locally managed learning school system. Existing self-report integrity measures have some pragmatic features—i.e., they are low-cost and easy to fill out, which allows teachers to fill them out multiple times over the course of a school year. Since learning school systems function best when treatment integrity measures are repeatedly administered (Chambers et al. 2016), self-report treatment integrity measures have the potential to address the need for ongoing data collection to spur feedback and action planning as part of a learning school system (Hogue et al. 2013). However, several key advances are needed to produce pragmatic self-report treatment integrity measures that can be deployed as part of a locally managed learning school system.

Many have argued that it is imperative for researchers to make self-report treatment integrity measures work in

order to translate the science of implementation into everyday practice (Hogue et al. 2015; Sanetti et al. 2011). To develop a pragmatic self-report integrity measure to monitor the delivery of EBPs, the following need to be addressed. First, self-report measures lack feasibility and acceptability, which may be due, in part, to the fact that most self-report measures have not been designed specifically for (or by) end-users. For example, most self-report measures are in paper-and-pencil format, which makes them more difficult to fill out, score, and integrate into a teacher's typical workday (Hogue et al. 2015). As another example, most items are written by researchers, so there may be a mismatch between how items are written and how the items are interpreted by end users (Haynes et al. 1995; Ware et al. 2003). Second, self-report measures lack utility as most treatment integrity measures are tied to a specific EBP model. Schools often implement more than one EBP in which case they would need to deploy multiple treatment integrity measures for adequate coverage, which would place additional burden on staff. Third, self-report integrity measures have evidenced weak correspondence with observer-rated measures, raising concerns about data accuracy (Caron et al. 2019; Chapman et al. 2013).

Pragmatic Youth Mental Health Measures

As is the case with treatment integrity, the unique conditions and constraints of a learning school system dictate that the mental health measures need to be pragmatic (Glasgow & Riley 2013). This means that mental health measures for a learning school system must be (Glasgow & Riley 2013; Stanick et al. 2018): (a) practical and cost effective and (b) validated for use in school settings. Practicality and cost are key considerations when selecting a measure to assess mental health problems. From the perspective of practicality, if mental health measures are too long or too difficult to deploy as part of a learning school system, then the data will not be collected. A number of factors can influence practicality and cost (Jensen Doss 2005): (a) the amount of time required to administer the measure, (b) the financial cost of administering and scoring the measure, (c) time spent scoring and interpreting the measure, and (d) required equipment (e.g., computers to score the measure). Personnel factors can also influence cost if training is required to use a measure or if a certain level of training is required to administer and score the measure (e.g., whether a trained clinician must administer the measure). Though pragmatic measures of mental health problems are needed, few exist for school systems. One example of a measure that has pragmatic qualities is the Patient Health Questionnaire (PHQ) as it is brief (2 and 9 item versions), it is free, the score reliability and validity are established, and it includes items that can be used by stakeholders to guide decision making (Kroenke et al. 2011; Stanick et al. 2018). Other common measures of mental health outcomes that are free and relatively brief include the Strengths and Difficulties Questionnaire (Goodman 2001),
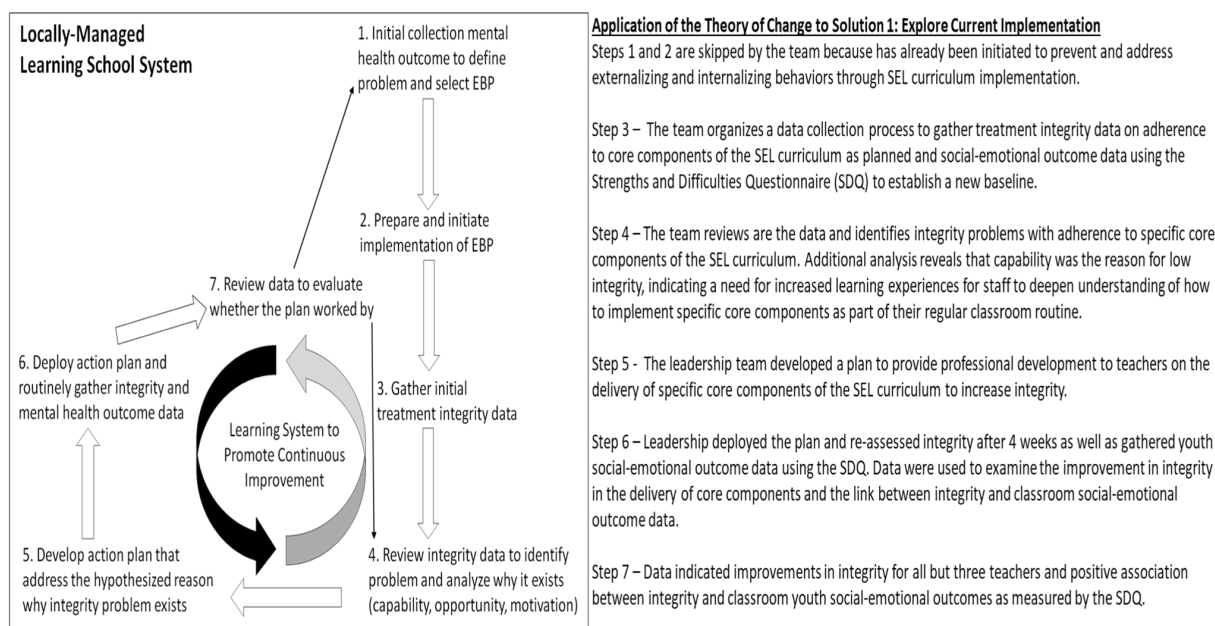
Fig. 4 Application of learning school system theory of change as a solution to everyday problems of practice

Within the figure:

Locally-Managed Learning School System

1. Initial collection mental health outcome to define problem and select EBP
2. Prepare and initiate implementation of EBP
3. Gather initial treatment integrity data
4. Review integrity data to identify problem and analyze why it exists (capability, opportunity, motivation)
5. Develop action plan that address the hypothesized reason why integrity problem exists
6. Deploy action plan and routinely gather integrity and mental health outcome data
7. Review data to evaluate whether the plan worked by

Learning System to Promote Continuous Improvement

Application of the Theory of Change to Solution 1: Explore Current Implementation

Steps 1 and 2 are skipped by the team because has already been initiated to prevent and address externalizing and internalizing behaviors through SEL curriculum implementation.

Step 3 – The team organizes a data collection process to gather treatment integrity data on adherence to core components of the SEL curriculum as planned and social-emotional outcome data using the Strengths and Difficulties Questionnaire (SDQ) to establish a new baseline.

Step 4 – The team reviews are the data and identifies integrity problems with adherence to specific core components of the SEL curriculum. Additional analysis reveals that capability was the reason for low integrity, indicating a need for increased learning experiences for staff to deepen understanding of how to implement specific core components as part of their regular classroom routine.

Step 5 - The leadership team developed a plan to provide professional development to teachers on the delivery of specific core components of the SEL curriculum to increase integrity.

Step 6 – Leadership deployed the plan and re-assessed integrity after 4 weeks as well as gathered youth social-emotional outcome data using the SDQ. Data were used to examine the improvement in integrity in the delivery of core components and the link between integrity and classroom social-emotional outcome data.

Step 7 – Data indicated improvements in integrity for all but three teachers and positive association between integrity and classroom youth social-emotional outcomes as measured by the SDQ.

Student Risk Screening Scale-Internalizing and Externalizing (Lane & Menzies 2009), and Youth Internalizing and Externalizing Problem Screeners (Renshaw & Cook 2018, 2016). There are also behaviorally focused measures such as direct behavior ratings that provide quick, easy, and free ways of tracking changes in specific behaviors such as disruptive behavior, compliance, and behavioral engagement (Chafouleas et al. 2009).

Revisiting Real-World Problems of Practice

We now want to revisit the real-world problems of practice presented at the beginning of this article to illustrate the promise of locally managed learning school system approach that incorporates pragmatic measures of treatment integrity and mental health outcomes to facilitate continuous improvement in the implementation and sustainment of EBPs. In addition, to further illustrate how learning school system provides a solution to problem of everyday implementation practice, Fig. 4 presents a supplemental image applying the learning system theory of change depicted in Fig. 2 to the Solution 1: Explore Current Implementation.

Concluding with an Agenda for Future Research

Across school systems tasked with the delivery of services to promote youth mental health, a key challenge is successful implementation and sustainment of EBPs. Youth who receive ineffective mental health services or do not receive effective mental health services as designed are more likely to have ongoing needs for support. Building the capacity within school systems to locally manage a learning school system provides significant promise to promote improvements in the quality of mental health services youth receive and, ultimately, the positive mental health outcomes they are likely to experience. We provided a description of why and how locally managed learning school system can work, with pragmatic measures of treatment integrity data and youth mental health outcomes as a centerpiece of continuous improvement efforts that drive successful EBP

Solution #1: Explore Current Implementation. A principal who is new to a building wants to get a sense of the degree to which teachers are implementing SEL curriculum. The principal was fortunate to enter a school with a distributed leadership team in place that has an internal system to gather treatment integrity and social-emotional outcome data to drive action planning to support teachers' delivery of the SEL curriculum. The new principal is able to immediately join the building leadership team to interpret data and use the findings from the data to identify discrepancies in the school-wide delivery of the SEL curriculum. In turn, the principal collaborates with other members on the team to analyze why low treatment integrity is happening (e.g., due to capability, opportunity, or motivation) in order to develop tailored plans to support teachers in their delivery of the SEL curriculum and monitor effects on relevant mental health outcomes.

Solution #2: Sustain Implementation. A large elementary school has implemented Responsive Classroom as a universal EBP for the past three years. Given budget cuts, the district can no longer afford paying for consultative services provided by the EBP trainers. Thankfully, the school spent time building internal capacity to monitor the treatment integrity of core practices of Responsive Classroom and use the data within a learning systems approach. The school team within the building develops a plan for gathering and monitoring treatment integrity data and was able to show that in classrooms where integrity is high there are more positive social, emotional, and behavioral outcomes for youth. The team used the data to identify staff with low adherence and competence indices who are in need of additional support, the plan was to connect with each of the teachers with low treatment integrity to explore the supports they need to improve their delivery of Responsive Classroom to achieve shared goals for improving youth mental health outcomes.

implementation and sustainment. We finish with an agenda for future research on learning school systems that can help improve the quality of and outcomes associated with school-based mental health services.

1. We need pragmatic, technically sound measures of treatment integrity and mental health outcomes to provide educational stakeholders with the ability to routinely monitor EBP implementation and produce actionable information to spur continuous improvement efforts. For these measures to be pragmatic, they need to be brief, inexpensive, and sensitive to change to inform simultaneous, ongoing monitoring of implementation and mental health outcomes by educational stakeholders themselves without dependency on external consultants or EBP purveyor groups.

2. We need to integrate the use of behavior change theory to develop more precise and potentially effective action plans that optimize school-based mental health practitioners' delivery of EBP. Identifying theoretical determinants at the organizational and individual implementer levels provides promising avenues to inform plans that improve EBP treatment integrity and youth mental health outcomes. The COM-B described above can explain why treatment integrity is low and could also be combined with organizational theories to better understand why implementers are struggling to make changes in their behavior to achieve high-integrity delivery of an EBP.

3. We need to develop and test specific protocols and processes that school-based stakeholders can follow to create a locally managed learning school system that results in successful EBP implementation and sustainment. For example, specific meeting protocols that provide teams with a structured agenda that begins with members reviewing data to identify the main problem to be addressed, followed by a process of analyzing why the problems exists, and ending with the development of an action plan that aims to increase treatment integrity as a means of improving mental health outcomes.

4. We need additional research that explores methods and strategies to promote a healthy school culture in which people perceive the climate as psychologically safe to enable a learning school system approach to happen. Research in this area needs to move away from articulating the problem (e.g., demonstrating that unhealthy environments for the adults leads to inadequate implementation) to developing and testing solutions that promote healthier organizational contexts for staff to promote collaboration and higher quality delivery of EBPs with integrity. For example, research that develops and tests different leadership-focused interventions is needed to examine how leaders can cultivate a school culture

and climate characterized by psychological safety and trust among staff.

To close, we are hopeful about the future of school mental health research and practice given innovations in improvement science and implementation science. We also hope our paper provides optimism for the type of learning school system approaches that can build local capacity to improve youth access to quality mental health services.

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