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ORIGINAL PAPER

Workforce Development and the Organization of Work: The Science We Need

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Abstract The industrialization of health care, underway for several decades, offers instructive guidance and models for speeding access of children and families to clinically and cost effective preventive, treatment, and palliative interventions. This industrialization—i.e., the systematized production of goods or services in large-scale enterprises—has the potential to increase the value and effects of care for consumers, providers, and payers (Hayes and Gregg in Integrated behavioral healthcare: Positioning mental health practice with medical/surgical practice. Academic Press, San Diego, 2001), and to generate efficiencies in care delivery, in part because workforce responsibilities become more functional and differentiated such that individuals with diverse educational and professional backgrounds can effectively execute substantive clinical roles (Rees in Clin Exp Dermatol, 33, 39–393, 2008). To date, however, the models suggested by this industrialization have not been applied to children's mental health services. A combination of policy, regulatory, fiscal, systemic, and organizational changes will be needed to fully penetrate the mental health and substance abuse service sectors. In addition, problems with the availability, preparation, functioning, and status of the mental health workforce decried for over a decade will need to be addressed if consumers and payers are to gain access to effective interventions irrespective of geographic location, ethnic background, or financial status. This paper suggests that critical knowledge gaps exist regarding (a) the knowledge, skills, and competencies of a workforce prepared to deliver effective interventions; (b) the efficient and effective organization of work; and (c) the development and replication of effective workforce training and support strategies to sustain effective services. Three sets of questions are identified for which evidence-based answers are needed. Suggestions are provided to inform the development of a scientific agenda to answer these questions.

Keywords Behavioral health workforce · Workforce training and performance · Functional reorganization of behavioral health

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Introduction

Within the last decade, several government reports and independent reviews have concluded that the development of a workforce adequately prepared to implement effective

mental health treatments and services is among key challenges to the larger scale dissemination and implementation of evidence-based treatments (EBTs) (Hoge and Morris 2002; Hoge et al. 2005; Institute of Medicine 2001; US Public Health Services 2000). These reports cite a combination of worker shortages, inadequate workforce training, and limited post-professional education and quality assurance mechanisms as limiting the reach and benefit of effective treatments and services to consumers. The reports suggest that to improve the quality and effectiveness of care, "the burden clearly lies with researchers, educators, and the administrators of healthcare organizations to identify the competencies required for effective practice, to effectively teach these competencies, and to support their application in the daily process of caring for those in need" (Hoge et al. 2005 p. 529).

Relatively little is known, however, about the knowledge, skills, competencies, and attitudes needed to adequately implement one or more evidence-based treatments; and nothing is known about the extent to which there is commonality or uniqueness among the knowledge, skills, competencies and attitudes for implementing effective treatments targeted at either a particular class of problems or across problem areas.

We propose that evidence-based answers to three sets of questions are needed to speed progress toward the development and continuous renewal of an effective workforce in children's mental health. The first set pertains to what is known about individual *learning* and *performance on the job* of effective interventions.

1. To what extent are the knowledge, skills, competencies, and attitudes needed to effectively implement one or more treatments for a particular class of problems similar and distinct?
2. To what extent (and for which treatments of which conditions) does learning to implement different treatment protocols have synergistic effects on the implementation and outcomes of each protocol?
3. To what extent (and for which treatments of which conditions) does learning different protocols interfere with the adequate performance of one or more of them?

That these questions are pertinent now points to the progress that has been made in children's mental health treatment and services research over the past three decades. It suggests that the knowledge base on children's mental health has reached a point where basic knowledge about diagnostic accuracy, treatment efficacy, and effectiveness for some disorders exists and where there is at least some consensus in the field to issue guidelines for practice. The scientific and practical questions about workforce development that can now be posed are more refined, nuanced, and precise. These issues are relevant to the delivery and the instantiation of treatments within the service "system." such as it is. Thirty years ago these kinds of questions would not have been asked or, if asked, would have seemed irrelevant or premature.

The answers to these questions have implications for research on the development, testing, and dissemination of effective and efficient strategies to train and support a workforce that can deliver effective treatments and services as the evidence base on effectiveness changes over time. They also have immediate relevance to the organization of the components of the service system, and vice versa.

Service System Organization and Structure

The mission, structure, and organization of health care affect the definition, nature, and organization of children's mental health care; and, accordingly, the work and workforce providing that care. We propose that a public health model of mental health and emerging models of health care reform are particularly important to redefining and reorganizing children's mental health care, and accordingly, the development and support of the workforce providing that care.

A Public Health Model for Children's Mental Health

A public health model for children's mental health services would expand the mental health workforce from a limited number of trained professionals to incorporate the range of persons and settings important to children's development. Acknowledging the importance of key ecological settings to children's development would encourage an alignment of mental health research, programs, and resources to the key predictors that promote successful adaptation, thus enhancing the benefits for all children. The functions of settings (e.g., childrearing in families, learning and social development in schools) and their structure (i.e., family homes, school classrooms, playgrounds) would guide the target, content, and form of services. Thus, the goals of mental health care would be to support the adaptive functioning and positive outcomes across settings in which children and their families live. A second implication of a public health framework for children's mental health is the identification and support of indigenous resources within these settings as targets for activating change processes. This follows logically from prioritizing the goals of the setting (e.g., home, school, community organization, clinic, healthcare center) rather than a predetermined goal. It is also important to insure the sustainability of program goals and processes, as well as to reconcile the workforce imbalance relative to regional disparities and the high need

for services. The identification of indigenous resources involves both the selection of primary change agents (i.e., who in the natural and service ecology does the work of intervention) and those factors involved in the successful performance of their roles. Thus, the functions and roles of the more traditional mental health workforce would be expected to shift (e.g., office-based individual counseling of a youth might be replaced with consultation with the teacher) and the diversity of individuals working to support mental health in children and families would be expected to expand (e.g., a teacher coaching a colleague in use of a classroom based behavior management strategy; parents coaching one another in academic support strategies to use at home).

Structural and Financing Changes in Health Care

Structural changes in health care will likely influence the workforce, organization of work units, and training models needed to deliver effective treatments efficiently. Emerging models of health care delivery and financing, such as the patient-focused medical home model, focus on a combination of efficiency, effectiveness, continuity, and accountability. The current medical home model (in the future, an integrated health—not just medical—home) may be particularly instructive for the deployment of effective mental health treatments and services for children and their families. Chronic illness management in pediatric care has embodied elements of this model for decades, and its application and adaptation to children's mental health is consistent with the public mental health model described above. For example, the course of chronic illnesses such as cystic fibrosis and Type II diabetes is somewhat predictable, as is the impact of specific habits, events, and the biological and psychosocial changes that unfold during particular times in the life of the child (for example, onset of puberty). A primary care physician aware of the research on the life course of the illness and general health of the child may be well equipped to monitor the health and illness, provide medications, while a nurse practitioner or patient educator provides health behavior instructions to the child and parent. Essentially, a health care team is accountable for having the information, competencies, and tools needed to help a child and family promote a child's health and effectively manage illness over time, and consequently throughout a child's development. A specialist may be needed when developmental or unexpected events exacerbate the illness; and, when this is the case, the specialist can and should (in collaboration and with permission of the youth and caregiver, of course), obtain the information on the life course of the illness and child's general health needed to effectively tailor the specialty and/or crisis care to the patient and family. The primary care provider or group, in turn, obtains information about the specialty care provided, and implications for managing the illness on a routine basis following that care. Increasingly, the hope is that electronic health records will aid this communication process. An advantage of this organizational structure is that both generalist and specialist care can be coordinated, individualized, and delivered across geographic regions, thus increasing the potential reach of effective care for larger populations.

Implications for Organization of the Children's Mental Health Workforce

A parallel scenario for children's mental health might involve the cultivation of a cadre of practitioners who are generalists and provide the equivalent of a "mental health home" for a child and family, able to diagnose, activate preventive strategies in the natural ecology (e.g., at home, in school, at pediatric care visits), and provide episodes of treatment for a range of commonly-occurring problems that can be effectively treated using outpatient based (i.e., clinic, school, home) models of service delivery. Specialists or specialty teams may be needed to effectively treat particularly chronic or severe conditions. For children with chronic problems, the specialty team may be the "mental health home," as happens often in the early years of the diagnosis of a chronic pediatric medical condition. Accountability for the child's well being throughout childhood and adolescence could reside with the "mental health home" whether that is a generalist team or a specialist team (depending on the youth's conditions). In the future, an integrated health home would house needed medical and mental health expertise.

Consideration of specialist and generalist functions. Of the evidence-based treatments for youth thus far transported and sustained in a number of communities and states, several were developed, tested, and delivered in usual care by specialty teams. For example, Multisystemic Therapy (MST) therapists are organized into teams with a clinical supervisor, work flexible hours to conduct assessment and intervention activities when and where needed, have caseloads of 4–6 families, and so forth. Similarly, a team of staff with differentiated roles and functions implements Multidimensional Treatment Foster Care (MTFC; Chamberlain 2003). And, both models were designed, tested, and transported as alternatives not to standard outpatient care, but to restrictive, out-of-home placements (incarceration, residential treatment, group home) for adolescents whose serious antisocial behavior was chronic and often violent.

This specialty model stands in contrast to the majority of efficacious treatments for childhood anxiety, depression,

and disruptive behavior disorders increasingly being evaluated in effectiveness and usual care implementation studies (including state-wide initiatives) in which a single clinician is expected to learn multiple distinct treatments. Not yet known is how well therapists are able to implement an evidence-based treatment with some children while continuing to treat others with the mix of techniques that characterize common practice. Nor is it clear how well therapists are able to implement more than one evidence-based treatment with more than one set of problems at a time**.** Anticipating the problems in clinician learning and performance of multiple models of this approach to the generalist model nearly a decade ago, John Weisz suggested, "One could imagine new strategies for case assignment, with a generalist model replaced by specialty teams, such that therapists are not required to treat all types of youth seen in the clinic, and thus not expected to learn all treatments for all child conditions" (Weisz 2000, p. 4.). Another alternative to this scenario should the deployment of treatment elements common across classes of evidence-based treatments be found effective for at least some conditions and target population (see, e.g., Chorpita and Daleiden 2009), that the generalist clinician could be one trained to effectively implement the common elements for the pertinent conditions and target populations.

Localized, population-based organization. The decision as to whether the constellation of individuals serving generalist and specialist functions is formally organized as a team (i.e., a group of individuals—generalists and specialists—operating as a unit within a single service organization) or as coalitions (i.e., groups of generalists and specialists, operating either within or across service organizations or even regions, who access one another and client information as needed) will most likely be determined on the basis of several factors. These may include the size and needs of the populations to be served; the contours of the treatments known to be effective for identified problems; and the costs and effects on clients of organizing and deploying the services in different ways. For example, a medium sized city that locks up (or sends to residential treatment) a certain proportion of youth with chronic serious antisocial behavior would likely need a single specialty team (MTFC, MST), and the organization hosting that team could well also host (as many do) a variety of outpatient programs for youth, which in the near future would include evidence-based approaches to the treatment of child and adolescent depression, anxiety, disruptive behavior disorders, substance use, and co-occurrence among these conditions.

The implications of a regionalized restructuring of healthcare for workforce development are that greater diversification and coordination of the workforce will be needed. Service components may be disaggregated into job functions assigned to different providers depending on the individual needs of the children and their caregivers. For example, a trained paraprofessional or parent support specialist in a primary care or community health center might conduct intake screening using standardized measures. The intake may be followed by facilitated referral to a multi-family group therapy or a specific, 12–16 session treatment with or without medication management provided by trained clinical staff; with discharge planning and ongoing monitoring by a parent support specialist, and coordination to a school support specialist at the child's local school. This is but one of numerous potential examples. The point is that the opportunities afforded by the current impetus of healthcare restructuring for mental health workforce development and for the organization of clinical care suggest strategic expansion coupled with greater functional specificity and diversification of roles. These roles are likely to target both trained clinical providers as well as a range of facilitative service support staff, with job functions dictated by functional competencies centered on the components of effective clinical treatments. Functional criteria, rather than degree or licensure based criteria (unless they are functionally driven), would be used to determine who serves in these capacities.

The set of research questions most pertinent to supporting the *functional organization* (rather than profession, setting, or service category based organization) of a diversified workforce to support a public health model of children's mental health is as follows.

1. Will specialty teams be needed to effectively treat some kinds or classes of problems because evidence indicates therapists are more effective with those problems when they are relatively more specialized rather than operating as generalists?
2. For what types of problems, and functions, could generalists be effective for some functions (screening, prevention, education, referral, skill training, some types of evidence-based treatments)?
3. What are the most efficient and effective ways to organize individuals with general and specialized expertise?
4. To what extent can efficiencies in delivery of effective treatment be achieved through diversification of the workforce?

In addition, workforce competency models developed in business and government may be instructive to the functional organization of the mental health workforce. Such models typically organize the details of required competencies into groups needed for effective performance of particular jobs that are executed in the context of particular teams or organizations, and thus take into

account the information, tools, organizational support, and motivational enhancements (recognition, advancement, compensation) in that context (Marelli 2001). One competency model for the behavioral healthcare workforce (Hoge et al. 2005), suggests three clusters of competencies: (1) Core competencies are applicable to everyone in the organization providing service, such as ensuring client rights; (2) job family competencies are applicable to everyone providing a particular type of service, such as outpatient treatment or case management; and (3) "level competencies" reflect job levels within a job family (e.g., unlicensed versus licensed staff providing case management).

Pursuit of the research agenda proposed in this paper could provide some of the evidence needed to redefine clusters of competencies on functional grounds. "Core" competencies might be those shown across diverse roles and functions (family advocate, skill builder, therapist, psychiatrist) to contribute to client attendance and receipt of adequate doses of desired interventions, and such competencies might be those facilitating "common factors" explored in psychotherapy process research (e.g., alliance, expectations, satisfaction). "Job family competencies" may be the cluster associated with the effective performance of elements of a particular class of treatments subsumed within effective treatments for certain conditions (e.g., Chorpita and Daleiden 2009), assuming deployment of these elements is demonstrated empirically to improve outcomes for the targeted client populations. "Levels" might be reframed to reflect the combination of competencies needed to execute one or more specific treatment models for particular conditions, if evidence continues to indicate that such models constitute the most effective treatment approach for these conditions. The extent to which these clusters of competencies are demonstrated to be discrete and related would inform the design and testing of training and support strategies used to develop and sustain them in practice. The National Action Plan for Workforce Development proposed by the Annapolis Coalition on the Behavioral Healthcare Workforce, explicitly calls for research and evaluation of the organizational, training, and workplace based support strategies it proposes to expand the availability, diversity, and effectiveness of the behavioral healthcare workforce. (www.annapoliscoalition.org).

If we can begin to answer the questions about individual learning and performance in the workplace context of effective interventions, and functional organization of the workforce, then we will be better equipped to develop and evaluate efficient and effective training and workplace based support strategies. Basic research on learning, cognition, and performance; and, research in other fields and industries on the organizational context of performance (Marelli 2001) and innovation implementation (Klein and Sorra 1996; Real and Poole 2005) are pertinent to this effort.

Feasibility, effects, and efficiency questions. Clearly, research is needed to determine the feasibility, effects, and efficiency of the kind of organization and flow of mental health care proposed here, the aim of which is to support continuity of effective care throughout the life cycle of a particular condition or set of problems, and of the child and family, in the relevant contexts (e.g., home, school, health care clinic). Among the potential limitations of this proposed reorganization of work is that it does not represent a "health home" that integrates the prevention and intervention of all medical, substance abuse, and behavioral and mental health needs under one umbrella. The implications of such a comprehensive integration for the organization and financing of the continuum of preventive to palliative services, and for the workforce currently employed in medical, mental health and substance abuse services, is beyond the scope of the current discussion. The modest proposal offered here is as follows: *To replace the current guild and cottage industry based approach to children's mental health services—which is largely reactive and discontinuous—with an approach in which the workforce is (a) organized functionally and paid to anticipate and respond to both predictable and sentinel events in the life and natural ecology of the child and family over time with (b) effective screening, assessment, preventive, treatment, and palliative strategies that (c) take into account the strengths, needs, and preferences of the child and family and (d) are communicated, along with intervention outcomes and maintenance activities needed to sustain them, to the family and to those in the natural and service ecology involved in future episodes of care.*

Taking Workforce Development and Renewal to Scale

As evidence accrues regarding the boundary conditions of: (a) treatment effectiveness (for which problems in which populations are specific treatments needed; for which problems is deployment of select treatment components effective); (b) individual learning and performance in the practice context of the putative interventions; and (c) reorganization of the workforce along functional lines, then strategies can be developed and tested to facilitate, sustain, and refresh (as the evidence base is refreshed) the knowledge, skills, and competencies of the workforce. The extent to which master's or doctoral level training will contribute to the effectiveness of a mental health workforce engaged in the deployment of evidence-based interventions is an open question (Hayes 1998). And, as noted previously, some aspects of client care may be effectively deployed by individuals whose pertinent qualifications come in the form

of experience with a particular mental illness, service system, or advocacy effort, rather than in the form of a particular degree. Post-bachelor's university training may still turn out to be a necessary step toward the effective deployment of effective treatments and services—particularly if training in evidence-based thinking and treatments are part of the curriculum and practicum or internship experience. This is, however, an empirical question. We propose that somewhere between two workforce extremes—the combination of "professionalism added to immunity from market and price effects" that hobbles policy efforts to mandate change in practice (Rossi 1978, p. 81), and relegation to technician status of practitioners—lies a range and combination of training, support, organizational, and policy (including standard setting, now accomplished via educational and professional credentials and licensing) strategies that can be shown empirically to sustain and renew the capacity of the workforce to provide effective care.

Taking workforce development and support strategies to scale suggests another set of research questions.

1. For which treatments is ongoing support (i.e., regular supervision, peer supervision, work sample review, implementation and outcomes data review, other mechanisms of support) necessary to sustain adequate implementation and outcomes?
2. For which treatments is providing such support feasible in community settings?
3. What kinds of training strategies can be used to help individuals deliver more than one distinct treatment for more than one condition?
4. What strategies can be used to effectively and efficiently update knowledge, skills, and competencies as the science on evidence-based treatments change? Do these strategies have to differ for clinicians implementing multiple evidence-based treatments at a time?

The scant evidence base on training clinicians to implement evidence-based treatments provides some guidance with respect to the first two questions, and suggests methods used to train and supervise clinicians in randomized trials can be used effectively in usual care settings, to the desired effect (i.e., usual care clinicians are able to implement the treatment as specified and achieve the intended outcomes) (see, e.g., Sholomskas et al. 2005). In addition, several studies have manipulated workplace-based support (inclusion or exclusion of ongoing supervision, or continued coaching following initial training) in community care settings and found such is likely to be needed to sustain effective implementation of effective treatments (see, e.g., Bradshaw et al. 2007). But, there is much to be learned about which assessment, preventive, and treatment approaches require what kinds of training and/or workplace support to ensure effective implementation and desired client outcomes, and how to most efficiently and effectively provide that training and support.

Conceptual and theoretical development. Guidance regarding the development and larger-scale deployment of training and support strategies that effectively and efficiently facilitate workforce implementation of effective treatments (as those treatments and the workforce change) may require making forays into basic psychological research as well as into the training and performance literature from other fields. With respect to more basic research, we might look to studies applying theory on behavior learning and performance to understand normative beliefs, expectancies, attitudes and intentions that influence the adoption of innovation. For example, several hundred studies of health-related behaviors, including substance use, risk-taking, and sexual behavior, have relied on a small group of theories, including the Theory of Planned Behavior, other decision-making and cognitive theories, and basic learning theory (Ajzen and Fishbein 1981; Jaccard et al. 1999, 2002) to identify core elements that influence individual behavior and behavior change (Fishbein et al. 1991, 2001). A general framework distilling and synthesizing all of these elements, known as the Unified Theory of Behavior (UTB), has been applied to participation in community partnerships (McKay et al. 2004), adolescent-parent communication (Jaccard et al. 2002) and physician adoption of guidelines (Perkins et al. 2007). The UTB conceptualizes a person's behaviors along two dimensions: those pertaining to the *immediate determinants* of behavior and those pertaining to the *determinants of the willingness to engage* in a given behavior. The UTB suggests that the expected values beliefs and self-efficacy are likely to influence intention to act.

The UTB framework could be used to identify the determinants at the individual level of the adoption of effective intervention approaches and extent to which these determinants vary across the stakeholders in children's mental health, thereby informing the extent to which the targets of strategies to promote adoption of new practices, and the strategies themselves, should vary across these stakeholder groups. For example, research guided by the framework could identify the *expectancies and attitudes* (beliefs about the advantages and disadvantages of adoption of an innovation by agency directors vs. middle management vs. clinical staff); *normative beliefs* (perceived frequency of EBP participation by families vs. administrative staff); *subjective norms* (perceptions of what important others think about decisions regarding adoption of innovation); and *self-efficacy* (degree to which various respondents believe they possess the skills needed for implementing innovations). These different determinants would point to different intervention targets to facilitate

ease of adoption or implementation of new practices. Indeed, a number of approaches to the dissemination and implementation of effective medical and substance abuse treatment practices evaluated over the last decade, such as social marketing, employ several, but not all, of these elements (Grol and Grimshaw 1999; Martin et al. 1998). This framework, as well as research on adult learning, and on the role of computer assisted learning and decision support in the acquisition and performance of clinical skills and competencies may help inform strategies to enhance the uptake and execution of new strategies among seasoned professionals, as described subsequently.

Infrastructure support for workforce development. The current infrastructure for workforce development consists largely of colleges and universities that supply educational and pre-professional training, and guild and licensure-based post-professional education and training requirements. Most community-based clinics serving children and families facilitate staff attendance (and, in some cases, financial support for) the required training, and provide training on a variety of topics themselves (Schoenwald et al. 2008). Thus, norms supporting some ongoing professional training and a modicum of institutional support for such training, characterize mental health practice today. Alignment is needed, however, of norms and institutional support with the demand characteristics of effective interventions and effective methods of training individuals at the front line to provide and support these interventions.

The current process of designing, and deploying and evaluating training and support strategies in usual care settings is, however, essentially undertaken anew by each group of treatment model developers and the early adopters of the treatment—the service provider organizations (and clinicians they employ) and service systems keen to introduce the new treatment into the mix of services they provide (Becker et al. 2009; Chorpita et al. in press). Taking any particular training and support process to scale also requires enabling others to replicate it (that is, others have to be able to provide the training and support needed for front line staff to achieve adequate implementation and outcomes). Furthermore, such replication must be sufficiently robust to succeed in communities and service systems with widely varying levels of individual expertise, training requirements for practitioners, salary structures, working conditions (hours, unionization, liability issues), and professional and service system norms for the workforce.

Chorpita and colleagues have suggested that the large-scale replication and installation of training and on-the-job support to develop and sustain workforce capacity for implementing effective interventions may require the development of additional infrastructure, if not an entirely new industry. They note such an industry could be analogous to the Information Technology (IT) enterprise now commonly found in most government and privately held organizations with more than a few employees. Although the developers and manufacturers of software programs provide the instructions for installation and problem-solving directly to consumers (organizations and individuals purchasing the products), individuals in local IT departments provide the installation and trouble shooting services to their colleagues. The Network Partner model developed to cultivate and sustain local expertise in MST training and quality assurance could be construed as an iteration of this concept. Details of this model are presented elsewhere (Schoenwald 2008).

Technological support of the workforce. Examples of the effective use of technology in the training and supervision of individuals providing evidence-based interventions can be found in strategies used by colleges and universities to facilitate distance learning. Online synchronous systems enable learners and teachers to engage in online discussion, and are supported by several commercially available software systems, including, for example, those developed by Elluminate, Inc. Web cams are used to enable participants to see who is talking, and instructors can present all types of media in such forums, including streaming video and Power Point Voice Over (ProVoice USA.com). In instructional settings, some of the content is typically presented by instructors asynchronously via a website or learning management system using commercially available systems such as BlackBoard (Blackboard, Inc. 1997), with online meetings occurring after students or trainees have reviewed and interacted with the content. Content can also be delivered over time, such as two hours per day, until all material is covered. With software such as BlackBoard, trainees can upload examples of their interactions with clients, engage in chat rooms and submit assignments. Trainees can use headsets with microphones or use computers with built in microphones. Learners can be separated into groups, take exams, be polled for their opinions and many other activities. With this kind of technology, learners can be in their offices or at their home computer and interact individually, in contrast with systems that require participants in a conference call to gather in a common room.

The use of data to inform clinical decision-making (including but not limited to monitoring treatment progress and outcomes) and a reliance upon computers or other technologies to facilitate care is among competencies likely to require further development in the future workforce. The conventional mechanism by which a typical clinician judges his or her own performance or client progress remains prior experience and clinical supervision; meanwhile, there is no consensus as to whether or not either positively affects clinical outcomes (Beutler et al. 2004). Studies have

demonstrated the positive impact of feedback about client mental health status on outcomes, particularly for clients who may require a change in their current treatment (Lambert 2001). Other studies suggest the helpfulness of both client outcomes and therapeutic process indicators (e.g., alliance) to clinical decision-making (Anker et al. 2009). This research is complimented by a growing evidence base on effective interventions for promoting the adoption of information and communication technologies by healthcare professionals (see review by Gagnon et al. 2009). Many practitioners may feel that the dynamic nature of a therapeutic relationship or client change cannot be captured by standardized measures or via computer technology. But with a growing federal and state government emphasis on outcomes accountability, clinicians are increasingly being asked to administer standardized clinical assessments to their clients and to interact with computerized data systems for more than billing purposes. Therefore, the onus is upon the research community to demonstrate the value of data to practitioners and discover data presentations that will be considered helpful to everyday clinical practice (Kelley and Bickman 2009). Such efforts are likely to increase the appeal to consumers of technology-based clinical decision making tools and enhance clinician data literacy.

Policy support. Numerous authors have proposed changes in policy needed to facilitate the broader deployment of effective services (see, e.g., Raghavan et al. 2008; Isett et al. 2007; Rossi 1978). The ostensible and actual functions of professional licensure and certification policies are among those to be reconsidered when taking effective workforce development to scale. The purpose of licensure was originally legal: to protect the public from individuals who lack the knowledge and skills to perform certain activities. For instance, a license is defined as permission by the government or a regulating body to perform certain activities and is required if some activity is prohibited (Gostin 2000, p. 254). Examples of prohibited activities might include the administration of prescribed medications, the prescription of controlled substances, or the diagnosis and treatment of disease. Licensing authorities include professional boards, boards of regents or state educational boards, health departments or other governmental agencies. In addition to licensing, some professional organizations also have credentialing systems that designate special qualifications of their occupation's members, for example Advanced Practice Registered Nurses or the American Board of Professional Psychology (ABPP). Certain states also have specialty certifications, such as South Carolina's certification in substance abuse treatment. These professional associations and organizations have the authority not only to limit entry into practice, but also to monitor practice and revoke the license of those considered unsafe to practice under that license. These organizations also control licensure and certification through continuing education requirements, which often rely on passive approaches to training that are generally ineffective at changing provider behavior (Grimshaw et al. 2001).

The extent to which changes in licensure, certification or continuing education requirements may impact client outcomes is an empirical question. Currently, there is little evidence to suggest that the licensure or certification process has an impact on either client outcomes or the effectiveness of care, possibly because they are established with little reference to evidence about the safety or effectiveness for the target population. For children's services, for example, a very limited number of measures identified by the National Committee for Quality Assurance specifically target youth. Furthermore, they represent only a fraction of those likely to receive services (i.e., follow up after hospitalization and follow-up for children prescribed medication for Attention-deficit/Hyperactivity Disorder; http://www.ncqa.org/).

The limitations of licensure and continuing education in promoting effective mental health services have been described before (see Bickman 1999); however, these practices have gone largely unchanged in the last decade and the noted limitations largely unchallenged. Licensure and certification may not only have a limited impact on effective service delivery but they may also limit workforce flexibility by reinforcing the use of specialists, rather than generalists, whether or not they are needed. They do, however, represent one potential platform for change. A research and professional challenge will be to determine what skills and knowledge are needed to provide safe and effective services, how the practice of therapy and other services can be monitored, if and how the workforce should be required to update skills and knowledge, and how unsafe or ineffective members of the workforce should be managed. This will be particularly challenging because of guild issues, which may have little to do with safe and effective practice.

Conclusion

The advances made over the last two decades with respect to the validation of effective treatments for a variety (but certainly not all) problems in youth mental health; the fledgling success of efforts to transport and sustain such treatments in usual care settings; and the nascent science on factors affecting the dissemination, implementation, and outcomes of effective treatments in usual care have combined to render children's mental health better able to take advantage of the industrialization of health care delivery.

The implications for strategic expansion of the workforce centered on increased specificity of the components of quality care are significant. The industrialization of health care delivery—the systematized production of goods or services in large-scale enterprises—has the potential to create efficiencies in technologies and in productivity, in part because tasks become more functional and systematic, as does the workforce training to support effective implementation of such tasks (Cummings and Hayes 1996). In health care, this industrialization process has been underway for over two decades, and is now being revisited with an eye toward greater access, comparative effectiveness and efficiency. Because children's mental health now has at least some effective interventions to offer in usual care contexts, pressures to systematize the implementation of effective treatments and training of the workforce to deliver them are building, and research is needed to respond to that pressure with evidence-based strategies.

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