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**Evaluating the Implementation and Sustainability of an Evidence-based Intervention:
Delivering Triple P within Indigenous Child Welfare Agencies**

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Abstract

In both Indigenous and non-Indigenous populations, research clearly links evidence-based parenting programs to decreases in child behavior problems, dysfunctional parenting, and child abuse and maltreatment. However, Indigenous families often do not have adequate opportunities to access these programs. This is due to a number of compounding program, service organization, process and interaction factors that are reviewed and evaluated in this thesis.

Chapter 1 provides a rationale and overview for evaluating factors that impact initial and long-term use of evidence-based programs (EBPs). It presents the case for developing and evaluating a framework of supports for sustainment of EBPs developed specifically for providers working in disadvantage communities. The research plan presented involves: a systematic review and conceptual framework of barriers and enablers to implementation and sustainment in real-world practice settings; development and validation of a scale measuring inhibitors and enablers to program sustainment; and evaluation of outcomes for implementation and sustainment for providers who are trained in the Triple P – Positive Parenting Program, as an example EBP, both internationally in varied service settings and specifically for Indigenous Australians working in the child protection sector.

Chapter 2 presents a review of the literature (*submitted for publication*) pertaining to provider implementation and sustainment of EBPs with families and communities experiencing disadvantage. Important factors that facilitate success and create barriers to program sustainment are synthesized into key themes. These themes are drawn on to develop the Sustained Implementation Support Framework for EBPs. The need to develop a conceptual framework and a measure to guide and evaluate EBP implementation in community settings is established.

Chapter 3 outlines the preliminary validation of a measure, the Sustained Implementation Support Scale, of enablers and inhibitors (program benefits, program burden, workplace support, workplace cohesion and leadership style) to EBP sustainment (*submitted for publication*). Exploratory and confirmatory factor analysis with a sample of 593 Triple P trained practitioners showed that the model had good fit to the data [$\chi^2(340) = 736.27, p < .001$; CFI = .914; SRMR = .053; RMSEA = .062 90% (CI .056 - .068)] and led to a 28-item scale with good reliability, and good convergent, discriminant and predictive validity. The combined set of predictors explained between 8.3% – 8.9%^e (Cox and Snell R²) of the variance in sustained program implementation. This study demonstrated that practitioners sustaining implementation at least three years post training were more likely to have supervision/peer support, reported higher levels of program benefit, workplace support and positive leadership style, and lower program burden compared to practitioners who were non-sustainers. Workplace cohesion was not significantly related to

sustained implementation. This highlights the potential benefit of using an evaluation measure to assess service provider perceptions of sustainment inhibitors and enablers to enhance capacity to sustain EBPs.

Chapter 4 consists of a paper (*submitted for publication*) reporting on the use of the Sustained Implementation Support Scale (validated in Chapter 3), to evaluate key workplace, program and process and interaction factors identified in the Sustained Implementation Support Framework (developed in Chapter 2), with ($N=35$) Aboriginal and Torres Strait Islander family support workers using Triple P in real-world settings. Correlation analyses and binary logistic regression were used to assess the associations between key factors and program implementation (at 18 months) and sustainment (at 36 months) when Triple P is used with Indigenous parents involved with child protection services in Queensland, Australia. This study demonstrated that for implementation at 18 months, as predicted, there was a trend for implementing practitioners to report higher levels of partnership support, program benefit, workplace support and workplace cohesion (weak positive relationship). However, the only significant (moderate positive) relationship was with partnership support ($r=.31$ $p<.05$), and the regression analysis indicated that none of the independent variables made a significant contribution to the program implementation model. For sustained implementation at 36 months, as predicted, practitioners that received supportive coaching [OR = 15.63, 95% CI (1.98 – 123.68), $p = 0.009$] were more likely to sustain the intervention, however the hypothesized relationship between the remaining four factors (program characteristics, workplace support, supervision and peer support and sustainability planning) was not significant. Overall, this suggests further exploration of program burden and perceived program benefit, workplace support and cohesion, and provides evidence for ensuring partnership support and supportive coaching are available to improve the likelihood of EBP program implementation and sustainment in Indigenous child protection services.

Chapter 5 concludes by drawing together the findings. The major conclusions are presented, limitations and directions for future research are outlined along with implications for researchers, practice and policy. It is argued that program, workplace and process and interaction factors, including perceptions of program burden, program benefit, workplace support, cohesion and leadership style, partnership support, supportive coaching, and supervision and peer support are important factors to increase the likelihood of EBP implementation and sustainment for communities with disadvantage.

Declaration by author

This thesis is composed of my original work, and contains no material previously published or written by another person except where due reference has been made in the text. I have clearly stated the contribution by others to jointly-authored works that I have included in my thesis.

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List of Abbreviations

- ABS: Australian Bureau of Statistics
- AIC: Akaike's information criterion
- AIF: Active Implementation Framework
- AIHW: Australian Institute of Health and Welfare
- Australian Early Development Index (AEDI)
- AVE: Average Variance Extracted
- B: Unstandardized Regression Weight
- BIC: Bayesian information criterion
- CFA: Confirmatory Factor Analysis
- CFI: comparative fit index
- CI: Confidence interval
- Cont'd: Continued
- CR: composite reliability
- DIS: Dissemination and Implementation Science
- EBP: Evidence-based program
- EBPAS: Evidence Based Practice Attitude Scale
- EFA: Exploratory Factor Analysis
- FIML: Full-information maximum likelihood
- PCSCL: Parent Consultation Skills Checklist
- LMICs: low and middle income countries
- MAR: missing at random
- MCAR: missing completely at random
- MLR: maximum likelihood estimator
- NIRN: National Implementation Research Network
- OR: Odds Ratio
- PAF: Principal Axis Factor Analysis
- PCA: Principal Components Analysis
- PROSPER: PROMoting School-community-university Partnerships to Enhance Resilience model
- PSS: Partnership Support Scale
- QATSICPP: Queensland Aboriginal and Torres Strait Islander Child Protection Peak
- RE-AIM: Reach, Efficacy, Adoption, Implementation and Maintenance framework

- RMSEA: root mean square error of approximation
- SIC: Squared Inter-construct Correlation
- SISS: Sustained Implementation Support Scale
- SRMR: standardized root mean square residual
- SPS: Sustainability Planning Scale
- Triple P: Positive Parenting Program
- TPI: Triple P International
- UQ: The University of Queensland
- WES: Workshop Evaluation Survey

Chapter 1

Overview

Although advances in health have contributed to improvements in quality of life world-wide, large rates of health inequities still exist for disadvantaged communities and Indigenous people across the world; this is especially true for the Aboriginal and Torres Strait Islander people of Australia. According to the Australian Early Development Index (AEDI), Indigenous children are more likely to be developmentally vulnerable compared to non-Indigenous children with higher rates of vulnerability reported across all domains of development (e.g., physical health and wellbeing, social competence, emotional maturity, language and cognitive development, communication and general knowledge; Department of Education, 2013). Early developmental vulnerabilities have cognitive (IQ) and non-cognitive (e.g., motivation; self-control; perseverance) consequences across the lifespan that continue to have an impact in adulthood (e.g., suicide, disease burden, medical care costs, drug use, poor job performance, and social functioning) and subsequent consequences for the next generation (Anda et al., 2006; Dube et al., 2006; Corso, Edwards & Fang, 2008). Without early intervention, these heightened developmental vulnerabilities for children can have serious consequences across the lifespan in all areas of cognitive and non-cognitive capability and health (Heckman, 2008).

In Australia, Aboriginal and Torres Strait Islander children and youth have higher rates of early school dropout, suicide, and involvement with the child protection system and juvenile justice system (ABS and AIHW, 2011) compared to their non-Indigenous counterpart. The reasons for this overrepresentation in child protection, as well as health and social disadvantage are complex, and need to be approached with consideration of multiple historical and social factors in regards to the intergenerational effects of past policies including forced removal and cultural assimilation (HREOC, 1997).

Research shows that evidence-based family and parenting support programs that focus on the early years of a child's life are the most effective way to improve long-term outcomes for children because the skills and abilities of an adult are fostered through the early environment (Bowes & Grace, 2014; Heckman, 2008; Prinz, Sanders & Shapiro, 2009). However, even when community providers are trained to deliver programs, the programs often fail to survive after initial training or grant funding ceases (Adleman & Taylor, 2003). Low rates of program implementation and continuation are due to a range of factors that interact over time within the context of the system in which service providers function (Aarons, Hurlburt & Horwitz, 2011). In order to sustain highly effective programs it is important to understand what factors lead to their sustainment in diverse service provider settings (Scheirer & Dearing, 2011). Breaking the intergenerational cycle of disadvantage will require evaluation of the implementation process to determine variables that

influence effective evidence-based intervention implementation and sustainment separate from treatment effectiveness outcomes.

As Indigenous communities have a range of traditions, languages and views about raising children, the challenge for program developers is to design an intervention system that is culturally acceptable, effective in changing dysfunctional parenting practices, adopted with ease after training, and sustainable after implementation (Sanders & Kirby, 2010). The Triple P – Positive Parenting Program is an early parenting intervention that is based on 30 years of evidence involving numerous rigorous evaluations that show long-term improvements for child emotional and behavioral problems and a reduction of reliance on dysfunctional parenting practices including a reduction in rates of child maltreatment (Sanders, Kirby, Tellegen & Day, 2014). More importantly, a randomized controlled trial of Indigenous Triple P (a version of Triple P designed specifically for Aboriginal and Torres Strait Islander families) in Australia produced significant results on a wide range of parent and child outcomes including decreases in child behavioral and emotional problems and improvements in parenting skills and a reduction in dysfunctional parenting (Turner & Sanders, 2007).

Historically, health scientists have focused on the need to develop evidence-based interventions and therapy that demonstrate treatment effectiveness for child psychopathology, including emotional and behavioral problems (Southam-Gerow & Prinstein, 2014). Now, with a wide range of evidence-based interventions that are proven effective to improve population health and behavior for children and adolescents (Chorpita et al., 2011, United Nations Office on Drugs and Crime, 2011), research is required to enhance effective implementation of programs in real world practice settings. Program effectiveness should be measured not only by treatment effectiveness, but also implementation effectiveness. Evaluating the implementation process and translating research-based interventions into practice settings effectively will ensure high impact interventions reach vulnerable families and communities.

Recent implementation research has focused on identifying the factors that impact the adoption and implementation stages of the process, especially factors that involve systematically adapting programs to suite the cultural context and forming partnerships with the community to enhance post-implementation support. Providing adapted versions of evidence-based interventions that take a consumer perspective and address the barriers identified by diverse families can increase recruitment and parental engagement (Owens et al., 2007). Also, studies have found that successful implementation is possible when substantial planning and support are involved (Berry et al. 2005; Johnson, et al., 2004; Mancini & Marek, 2004; Scheirer, 2005). Partnerships can build upon previously developed infrastructures for the provision of training, technical assistance, and other

resources to enhance capacity for sustained implementation of evidence-based interventions (Spoth et al., 2004).

However, even adapted and effective interventions frequently are not sustained once funding is withdrawn. This is particularly relevant in Indigenous communities as there are often additional issues such as: availability of trained professionals; practitioners not embracing an intervention; parental access, trust and engagement issues; and parental dropout (Tuner et al. 2007). Little research has explored the sustainability of evidence-based interventions in Indigenous communities using support from key partners to enhance implementation success.

As interventions implemented in the community often fail to survive, this thesis evaluates the development of a conceptual model and measure to support program implementation and sustainment in disadvantaged communities, and investigate the factors that predict success.

Research Aims

This thesis will extend on previous research in four ways:

Aim 1: Conduct a systematic review of the factors that influence sustained program implementation in disadvantaged communities and develop a conceptual framework that captures the predominant themes in the analysis.

Aim 2: Develop and validate a measure of evidence-based program implementation and sustainment supports that will be used to evaluate predictors of program utilization and sustainability after professionals undergo Triple P training. This study will also explore factors predicting program implementation and sustainability.

Aim 3: Allow for a consumer perspective to be taken into account when introducing program training to a new service provider setting, thereby directly contributing to the evolving evidence base for tailoring training for Indigenous professionals and diverse settings.

Aim 4: Explore the impact on implementation (18 months following training) of a partnership between an Indigenous peak body (Queensland Aboriginal and Torres Strait Islander Child Protection Peak: QATSICPP), a university program development and research team (The University of Queensland: UQ), a university-licensed training and publishing organization (Triple P International: TPI) and Indigenous practitioners using Triple P with Indigenous parents. Other factors explored include perceived program benefits and burden, workplace support, workplace cohesion, workplace leadership style and partnership support.

Aim 5: Assess factors influencing program sustainment factors (36 months following training) including program characteristics, workplace characteristics, availability of supervision and peer support, supportive coaching and sustainability planning.

Hypotheses

Specifically, it is hypothesized that **(H1: conceptual framework)** factors that facilitate success or create barriers for program implementation sustainment in disadvantaged communities will be identified; **(H2: scale development and validation)** program and workplace factors from the conceptual model will load as a valid and reliable scale and the factors will be valid predictors of program sustainment; **(H3: training acceptability)** training in the example evidence-based program, Triple P, will be acceptable by Indigenous family support providers and improve their confidence in delivering parent consultation; **(H4: program implementation)** factors identified in the conceptual model will predict program implementation in Indigenous child protection agencies; **(H5: program sustainment)** factors identified in the conceptual model predict program sustainment in Indigenous child protection agencies.

The project will provide insights into the predictors of program implementation and sustainment, and will explore consumer perspectives on the introduction of a training program for Indigenous child protection and family support services. It will also inform the scientific knowledge base about implementing sustainable interventions within Indigenous communities by posing and evaluating a conceptual model for program implementation and sustainability.

References

- Aarons, G. A., Hurlburt, M., & Horwitz, S. M. (2011). Advancing a conceptual model of evidence-based practice implementation in public service sectors. *Administration and Policy in Mental Health, 38*(1), 4-23. doi: 10.1007/s10488-010-0327-7
- Adelman, H. S., & Taylor, L. (2003). On sustainability of project innovations as systematic change. *Journal of Education and Psychological Consultation, 14*(6), 1-25. doi: 10.1207/S1532768XJEPC1401_01
- Anda, R. F., Felitti, V. J., Walker J., Whitfield, C.L., Bremner, J. D., Perry B. D., . . . Giles, W. H. (2006). The enduring effects of abuse and related adverse experiences in childhood: a convergence of evidence from neurobiology and epidemiology. *European Archives of Psychiatry and Clinical Neurosciences, 56* (3): 174- 86.
- Beery, W. L., Senter, S., Cheadle, A., Greenwald, H. P., Pearson, D., Brousseau, R., & Nelson, G. D. (2005). Evaluating the legacy of community health initiatives: A conceptual framework and example from the California Wellness Foundation's health improvement initiative. *American Journal of Evaluation, 26*(2), 150-165. doi: 10.1177/1098214005275627
- Bowes, J., & Grace, R. (2014). Review of early childhood parenting, education and health intervention programs for Indigenous children and families in Australia. Canberra, ACT: Australian Institute of Health and Welfare.
- Chorpita, B. F., Daleiden, E. L., Ebesutani, C., Young, J., Becker, K. D., Nakamura, B. J., . . . Starace. (2011). Evidence-based treatments for children and adolescents: An updated review of indicators of efficacy and effectiveness. *Clinical Psychology Science and Practice, 18*(2), 154-172. doi: 10.1111/j.1468-2850.2011.01247.x
- Corso, P. S., Edwards, V. J., & Fang, X. (2008). Health-related quality of life among adults who experienced maltreatment during childhood. *American Journal of Public Health [H.W. Wilson - GS]*, 98(6), 1094.
- Department of Education. (2013). Australian Early Development Index 2012 Summary Report, Updated November 2013 (ISBN: 978-1-74361-238-5). Canberra, ACT: Australian Government.
- Dube, S. R., Miller, J. W., Brown, D. W., Giles, W. H., Felitti, V. J., Dong, M., & Anda, R. F. (2006). Adverse childhood experiences and the association with ever using alcohol and initiating alcohol use during adolescence. *Journal of Adolescent Health, 38*(4), 444.e1-444.e10. doi:10.1016/j.jadohealth.2005.06.006
- Heckman, J. J. (2008). Schools, skills, and synapses. *Economic Inquiry, 45*(3), 289-324. doi: 10.1111/j.1465-7295.2008.00163.x

- Johnson, K., Hays, C., Center, H., & Daley, C. (2004). Building capacity and sustainable prevention innovations: a sustainability planning model. *Evaluation and Program Planning*, 27(2), 135-149. doi: 10.1016/j.evalprogplan.2004.01.002
- Lavarch, M. (1997). Bringing them home *Report of the national inquiry into the separation of Aboriginal and Torres Strait Islander children from their families*. Sydney: Human Rights and Equal Opportunity Commission.
- Mancini, J. A., & Marek, L. I. (2004). Sustaining community-based programs for families: Conceptualization and measurement. *Family Relations*, 53(4), 339-347. doi: 10.1111/j.0197-6664.2004.00040
- Owens, J. S., Richerson, L., Murphy, C. E., Jagelewski, A., & Rossi, L. (2007). The parent perspective: Informing the cultural sensitivity of parenting programs in rural communities. *Child Youth Care Forum*, 36(5), 179-194. doi: 10.1007/s10566-007-9041-3
- Prinz, R. J., Sanders, M. R., Shapiro, C. J., Whitaker, D. J., & Lutzker, J. R. (2009). Population-based prevention of child maltreatment: The U.S. Triple P System Population Trial. *Prevention Science*, 10(1), 1-12. doi: 10.1007/s11121-009-0123-3
- Sanders, M. R., & Kirby, J. N. (2010). Consumer involvement and population based parenting interventions. *Administration*, 58(2), 33-50.
- Sanders, M. R., Kirby, J. N., Tellegen, C. L., & Day, J. J. (2014). The Triple P-Positive Parenting Program: A systematic review and meta-analysis of a multi-level system of parenting support. *Clinical Psychology Review*, 34(4), 337-357. doi: 10.1016/j.cpr.2014.04.003
- Scheirer, M. A. (2005). Is sustainability possible? A review and commentary on empirical studies of program sustainability. *American Journal of Evaluation*, 26(3), 320-346. doi: 10.1177/1098214005278752
- Scheirer, M. A., & Dearing, J. W. (2011). An agenda for research on the sustainability of public health programs. *American Journal of Public Health*, 101(11), 2059–2067. doi: 10.2105/AJPH.2011.300193
- Southam-Gerow, M. A., Arnold, C. C., Rodriguez, A., & Cox, J. R. (2014). Acting locally and globally: Dissemination implementation around the world and next door. *Cognitive and Behavioral Practice*, 21(2), 127-133. doi: 10.1016/j.cbpra.2013.12.007
- Spoth, R., Greenberg, M. T., Bierman, K., & Redmond, C. (2004). PROSPER community-University partnership model for public education systems: Capacity building for evidence-based, competence-building prevention. *Prevention Science*, 5(1), 31-39. doi: 10.1023/B:PREV.0000013979.52796.8b
- Turner, K. M., & Sanders, M. R. (2007). Family intervention in Indigenous communities: Emergent issues in conducting outcome research. *Australasian Psychiatry*, 15(Supp.), S39-S49.

United Nations Office on Drugs and Crime. (2010). Compilation of evidence-based family skills training programmes. http://www.unodc.org/docs/youthnet/Compilation/10-50018_Ebook.pdf.

Chapter 2

Sustained Implementation of Evidence-based Programs in Disadvantaged Communities: A Conceptual Framework of Supporting Factors

This chapter consists entirely of a manuscript submitted for publication.

Abstract

This manuscript presents a review of the empirical literature for studies that evaluate factors that facilitate and create barriers to sustained program implementation in disadvantaged communities. The paper outlines study methodology and sustainment outcomes and proposes a conceptual model that involves implementation sustainment support for providers trained in evidence-based health and family support programs who work with disadvantaged communities. Sustained program implementation in the community setting is a significant issue as only 43% of studies reported successfully sustained programs. The review identified 18 factors that facilitate success and create barriers to program sustainment. The factors are synthesized into three themes; program characteristics, workplace capacity, and process and interaction factors. The majority of factors map onto commonly cited sustainability influences from other sustainment literature reviews. However, there was an additional focus for studies included in this review on the importance of support factors such as program burden, program familiarity and perceived competence in program skills, workplace support for the program, staff mobility and turnover, supervision and peer support, and ongoing technical assistance. The need to use a conceptual framework and develop a measure to guide and evaluate capacity building in EBP implementation and sustainment in low resource community settings is highlighted.

Keywords: sustainability, implementation, evidence-based programs

Sustained Implementation of Evidence-based Programs in Disadvantaged Communities: A Conceptual Framework of Supporting Factors

Before a child is born, their chance at a healthy life can be determined based on their social status (NICHD ECCRN, 2005). Research in disadvantaged communities in high, low and middle income countries, including Indigenous and non-Indigenous populations, clearly link the impact of evidence-based parenting interventions to improved child development and healthy life outcomes (Bowes & Grace, 2014; Engle et al., 2011; Gross et al., 2009; Turner, Richards, & Sanders, 2007). However, disadvantaged families are less likely to access parenting support compared to the wider population (Coe, Gibson, Spencer, & Stuttaford, 2008; Cortis, Katz, & Patulny, 2009) and parenting support services do not always maximize their opportunities to include disadvantaged families in services (Carbone, Fraser, Ramburuth, & Nelms, 2004). In order to eradicate health and social inequalities and break the intergenerational cycle of disadvantage, it is important that effective public health prevention and intervention programs are available to all families, from the most disadvantaged to the wealthiest (Lexmond & Reeves, 2009).

Providing adapted versions of evidence-based parenting interventions that address the barriers identified by families can improve parent engagement, because parents are more likely to relate to the relevant examples and language used in tailored resources (Owens, Richerson, Murphy, Jagelewski, & Rossi, 2007). However, even adapted interventions are frequently not sustained long term by service provision organizations following training and initial adoption (Spoth, Greenberg, Bierman, & Redmond, 2004). This is particularly relevant in low resourced areas as there are often additional issues such as: lack of availability of trained professionals, lack of practitioner supervision, practitioner resistance to innovation, lack of parental access, lack of trust and engagement in services, and high attrition rates (Turner & Sanders, 2007).

Developing and evaluating an implementation and sustainment support framework for evidence-based programs (EBPs) in disadvantaged communities will help fill the gap in the literature around factors that facilitate success or create barriers for sustained program implementation. Such a framework can directly inform evidence-based parenting support service delivery by highlighting requirements for program sustainment. There is the potential for community change and significant impact on health inequalities and intergenerational disadvantage if program developers and researchers work together with family support services within the community to plan program implementation and sustainment in the best and most cost-effective way.

The transfer from program evaluation to real world practice involves program implementation not as a single step, but as a process that is influenced by specific factors over time, from initial adoption and implementation to long-term sustainment (Aarons, Hurlburt, & McCue

Horwitz, 2011). A number of conceptual models, frameworks and theories have been developed in the implementation science literature to guide successful EBP implementation (Damschroder et al., 2009; Meyers, Joseph, & Wandersman, 2012). For example: Diffusion of Innovation theory focuses on the influences of opinions of potential adopters about a new innovation (Rogers, 2003); the PROMoting School-community-university Partnerships to Enhance Resilience (PROSPER) model (Spoth et al., 2004) takes a partnership support approach to implementation; Aarons and colleagues' Exploration, Adoption/Preparation, Implementation and Sustainment model emphasize "inner" and "outer" organization context factors (Aarons et al., 2011); and the Interactive Systems Framework (Wandersman et al., 2008) focuses on building local capacity for implementation and the multiple ecological factors that interact to impact this. In general, these frameworks propose that providers are more likely to adopt, implement and sustain a new program if a number of essential provider, program and setting elements (internal organization functioning and external variables) exist. However, there are limitations as each emphasizes different areas relevant to implementation, some were not developed specifically for health program implementation, or they highlight sustainment as a critical part of the implementation process, but lack empirical support in the area of sustainability. Proctor and colleagues illustrate the need for concerted efforts to advance implementation science and merge learnings to form a comprehensive model with clearly defined constructs, a measurement model for the key constructs and an analytic model hypothesizing links between measured constructs (Proctor et al., 2009).

Although there is a growing number of frameworks relating to program sustainment, few have been used and evaluated in low and middle income countries (LMICs) or disadvantaged communities in high income countries (Gruen et al., 2008), which have unique community and workplace capacity issues. The professionals who work with families living with the most disadvantage have a difficult task when implementing an EBP due to the demands of integrating often complex programs with their full workload and sometimes inadequate health systems (Haines, Kuruvilla, & Borchert, 2004). When implementing a program with disadvantaged communities, the practical aspects of program delivery must be taken into consideration, including the needs and capacity of the community and provider, intergenerational trauma in the community, level of complexity for the provider when moving from training to delivery in their workplace, the barriers to provider and community engagement, the availability and nature of the workforce, and the importance of community partnerships (Duong et al., 2015; Zhou et al., 2015).

Different research disciplines have historically had different perspectives of implementation and sustainment, leading to different approaches for investigating program sustainability (Greenhalgh, Robert, Macfarlane, Bate, & Kyriakidou, 2004). Similar to the current study, organization change, community coalition and innovation research define sustained implementation

as the continued use of programs in usual practice (Chambers, Glasgow, & Stange, 2013; Gomez, Greenberg, & Feinberg, 2005). This is measured by how long an individual project continues or how well a program becomes institutionalized within the organization system (Chaudoir, Dugan, & Barr, 2013). With a specific focus on disadvantaged communities, we aimed to: 1) review existing theoretical and empirical literature to synthesize themes around factors that facilitate success or create barriers to program sustainment; 2) draw on the themes to develop a Sustained Implementation Support Framework for EBPs; and 3) use this framework to propose an approach to planning and monitoring EBP implementation and sustainment. We conducted a systematic review of studies that examined the influences or predictors of EBP sustainment in disadvantaged communities.

The studies reviewed used a variety of terms to describe program sustainment (e.g., sustainability, maintenance, institutionalization, long-term implementation). For the purpose of this review we will use the term sustainment for our outcome measure, which is sustained program implementation (whether a program operated over multiple years). The specific questions that guided our review were:

- *Does the article specifically address factors related to the sustainment of the community-based/health program over time (i.e. over multiple years)?*
- *Does the study take place in a LMIC or disadvantaged community in a high income country?*

Method

Search method

We searched MEDLINE via EBSCOHost, PsychINFO, SCOPUS and Cochrane Library databases using the terms “sustainment”, “sustainability”, “maintenance”, “institutionalization”, “long-term implementation”, “evidence based program” and “health worker.” Shortened forms of these terms (e.g., “sustain*” and “program*”) and alternative spellings were included in the search. To check for articles missed by the database search, we used hand searching and snowballing strategies, which involved searching the reference lists of reviews and relevant articles from our initial search (Marquez, Silvia, Edward, & Simon, 2014; Pallas, Minhas, Pérez-Escamilla, Lauren, & Curry, 2013; Stirman et al., 2012). The database search encompassed literature published in the previous five years (from January 2009 to December 2014). This was extended a further five years to January 2005 for the hand searching and snowballing strategy.

Inclusion and exclusion criteria

For inclusion in this review, articles had to meet the following criteria: at least one of the key words listed above; peer review; and availability in English. In screening the search results we excluded articles that did not focus on community/health professionals and program sustainment in

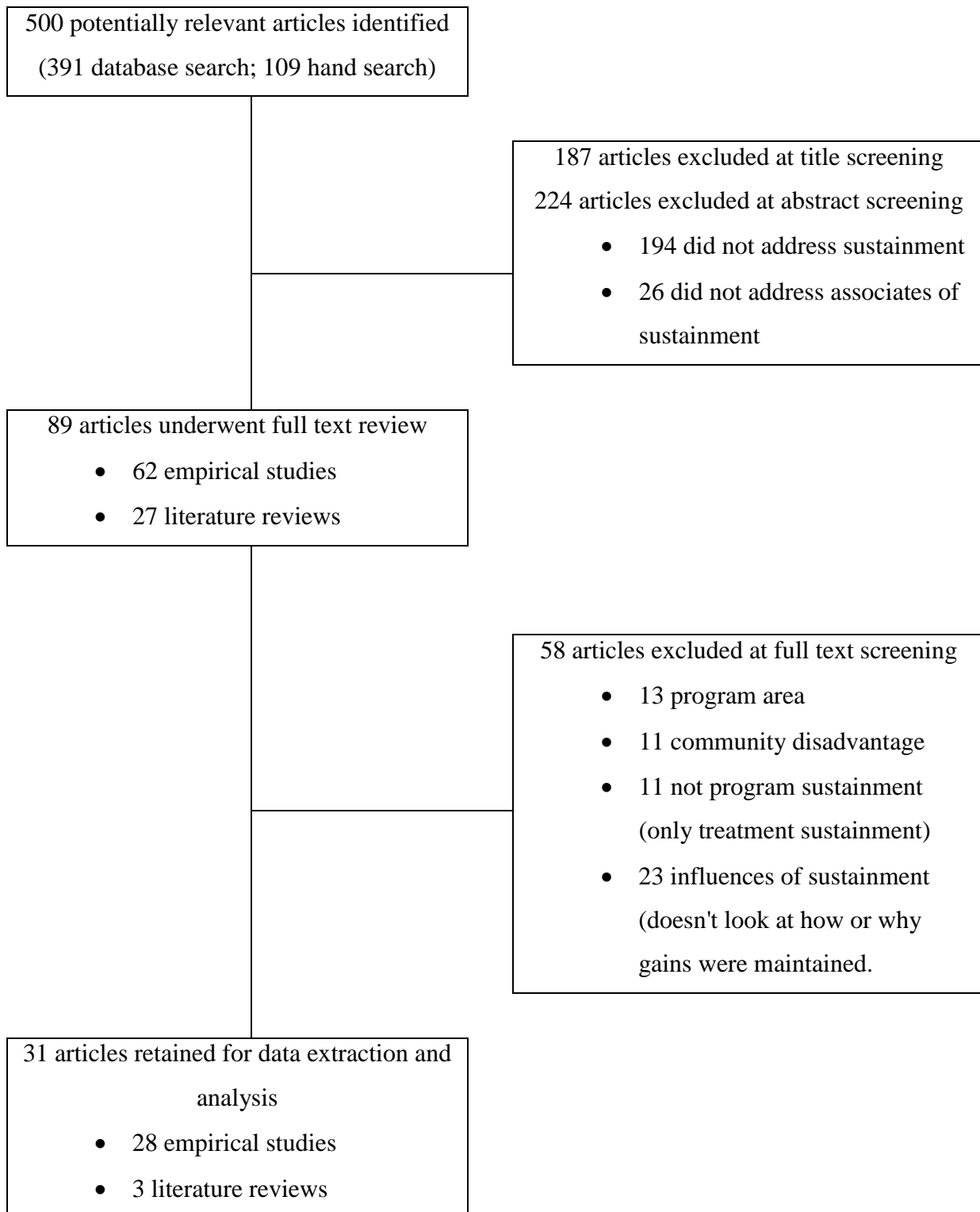
the areas of health and wellbeing (including family support, behavioral and emotional adjustment, mental health); if their target community did not meet at least one of Tony Vinson's (2007) five domains of disadvantage (social, health, community safety, economic and education); or the period of follow up did not meet the definition of sustainment described earlier (i.e. program maintained at least 2 years after initial training/implementation).

Review method

One reviewer screened all titles and abstracts of articles identified through the database search ($n = 500$). See Figure 2.1 for a diagram of the screening and exclusion process. Articles were excluded if it was clear they did not address sustainment or predictors of sustainment at title screening ($n = 187$) or abstract screening ($n = 224$). The remaining 89 articles (62 empirical studies, 27 literature reviews) underwent full text screening. Studies were excluded at this stage on the variables of program area, community disadvantage and length of follow-up evaluation (four significant articles were retained because of their rigorous study design that had less stringent follow up than originally specified, with reported outcomes beyond 12 months rather than 24 months after initial training/implementation).

Following the full text screening, 31 articles were retained for data extraction and analysis (see Appendix for article details and references). Three research assistants conducted data extraction, with significant overlap to ensure consistency in information extracted. Information extracted included general characteristics (location, program focus, design including framework (if referenced), key definitions, measures used, target outcome, unit of analysis and respondents per site), sustainment outcomes and factors influencing sustainment. This was checked for comprehensiveness by the first researcher and additional detail on sustainment constructs extracted as appropriate.

Figure 2.1:

Article Review and Selection Method

General Research Characteristics

The final sample of articles included 28 empirical studies representing a range of locations, program foci and designs. Three literature reviews were also included to confirm and expand on the identified sustainment constructs.

Location

Twenty-four countries were represented including high income countries: USA, Australia, Israel; and LMICs: Africa (12), Latin America (4), Asia (4) and Papua New Guinea.

Program focus

Ten articles (32%) examined family and child behavioral health programs such as prevention programs for family violence, child conduct problems and emotional problems. Eight (26%) covered medical or healthcare programs for disease prevention or intervention, such as river blindness, diabetes and iodine-deficiency, and six (19%) addressed general primary health care. Three studies (10%) reported on health promotion programs, such as maternal and newborn health, and four (13%) on mental health programs, including varied psychological intervention approaches.

Methodology

Design. To measure *sustainment outcomes*, the 28 empirical studies employed qualitative (12; 43%), quantitative (10; 21% longitudinal, 14% cross-sectional), and mixed methods (6; 21%). Most were naturalistic (20; 71%); however, some involved experimental manipulation (2; 7%) or quasi-experimental evaluation (6; 21%) of implementation approaches to analyze sustainment. With regard to *sustainment factors*, the spread of designs was similar: qualitative (15; 54%), quantitative (7; 25%) and mixed-methods (6; 21%). None of the factor evaluations were experimental, but a few studies used an observational or triangulated approach to strengthen the validity of the analysis. Twenty-four (86%) were descriptive, with a number of correlational, cross-sectional, case study and thematic analytic procedures.

Framework. Only 14 (45%) of the articles indicated that they were guided by a conceptual framework.

Sustainment definition. Only half of the articles (16; 52%) included a definition of sustainment. Of these, the most common definition was ‘continued or discontinued practice/project/activity’ (15; 94%), with some of these also including continued benefits for participants, continued capacity or program anchored in the organization system. The most common terms used to describe continued practice, project or activity were ‘sustainability’ (8; 50%) or ‘sustainment’ (2; 13%). Other terms were ‘institutionalization’ or ‘institutionalized sustainability’, ‘de-adoption’, ‘ex-novation’ and ‘maintenance’.

Measures. Assessment processes in the 28 empirical studies included interviews (14; 50%), self-report measures (13; 46%), observation or program adherence assessment (8; 29%), and record

review (6; 21%). However, the instruments used to measure sustainment outcomes and influences were not always clear. Ten studies (36%) used measures that were pilot tested and only four of these measures were validated before use in the study. For the remainder, the validity and reliability of assessment measures was unclear, with the large majority failing to mention psychometric properties at all.

Targeted outcome. Many different sustainment outcomes were reported and most studies reported more than one outcome. Twenty studies (65%) reported the proportion of *providers* or sites who sustained or institutionalized activities, or not (i.e. provider attrition; ex-novation; de-adoption), nine (29%) reported the proportion of eligible *people* that received or benefited from the intervention long term, and 12 (39%) reported *prevalence rates* and health outcome sustainment. A few reports (4, 13%) did not provide a clear indication if the intervention or practice was continued, but did report factors that impact sustainment.

Unit of analysis. The majority of the empirical studies (20; 71%) reported on sustainment at multiple implementation sites or settings (e.g., health unit, school, community, village, organization, project, cluster), rather than at the individual provider level (7, 25%) or team level (1, 4%). The three literature reviews reported all levels of analysis.

Respondents per site. In the 20 multi-site studies, there were commonly 1-3 respondents per site (7, 35%). Three studies (15%) gathered data from two different sources (e.g., providers and community members) using a large number of respondents per site (e.g., 8-10 per village in 29 villages). Three studies (15%) divided the sample between two groups to compare sustainment for a larger number of respondents at two sites (e.g., providers in year 1 and year 2; north commune and central commune). Seven studies (35%) did not specify the number of respondents per site, and instead either aggregated scores across sites or extracted sustainment data from records and reports. Reporting on outcomes at the individual level, five studies (16%) used one large group of respondents within the community, two (7%) reported on small numbers of providers, and one (4%) aggregated scores at the team level. In terms of analyzing sustainment factors, of all 31 articles, 12 (39%) drew on the same sustainment data, 16 (52%) had alternative measures or respondents (e.g., health workers were questioned instead of villagers, or health leaders instead of patients) and five (16%) described factors that influence sustainment using commentary on the study data or reviewed studies.

Summary of Sustainment Outcomes

Program sustainment

In the empirical studies, varying rates of program sustainment were reported: 12 (43%) successfully sustained the innovation (the minimum definition of successful sustainment was around half of the original sites/respondents still using the program); eight studies (29%) indicated that they were not successfully sustained (e.g., less than a third of targeted sites implemented the program, implementation problems, partial implementation, de-adoption over time), three (11%) were unclear about level of success in sustaining program activity and five (18%) reported health outcome and prevalence rates without reporting innovation sustainment outcomes.

Fidelity sustainment

A small number of the empirical studies (8; 29%) assessed program fidelity or implementation quality. The level of program adherence / quality improved consistently for six (75%) of the studies, but high levels of sustainment for quality adherence were only reported in three (37.5%) of those studies.

Changes in implementation rates

Of the 20 articles that reported on changes in implementation levels after initial implementation efforts or funding ceased, 18 (90%) reported lower levels of implementation and two (10%) reported program spread to other locations without providing details on extent of spread. Overall, very few studies reported on non-respondents and most studies had small sample sizes and collected data retrospectively raising questions about the accuracy of the informants' memories and how this may have affected the findings.

Summary of Sustainment Factors

The data extraction process identified 18 enablers and barriers to the sustainment of community programs, grouped into three broad thematic categories of potential influences: 1) program characteristics, 2) capacity factors within the workplace, and 3) process and interaction factors. In the following discussion of the conceptual distinctions between constructs, superscripts have been inserted to identify specific articles (see Appendix for detail) where the construct is discussed. Table 2.1 summarizes the articles referring to each construct.

Program characteristics (*n* = 17)

The first category, program characteristics, not only refers to provider attitudes toward the program's effectiveness, benefits, burden and fit, but also aspects of program adaptability for local requirements. Findings on key program characteristics are discussed below.

1. Program benefits and burden (n = 9)

The most frequently cited factor in this category was provider perception of program characteristics (e.g., attitudes toward the program, perception of personal program benefit or burden). A provider's decision to implement is often made through a cost-benefit analysis, with programs that are appealing²⁷, easy to implement^{1, 3, 21} and visibly effective^{3, 15, 26} being sustained more often^{1, 23}. Time burden experienced by providers when balancing the commitment to deliver a new program and day-to-day work is another factor that can lead to program discontinuation^{12, 21}. Practitioners' openness to innovation is also important⁵. If a growing group of health professionals believe in a program's principles they will endorse it and fight for its success²³; however, it is possible that the program will first need to prove effective outcomes on a small scale under routine conditions and work with families^{15, 26}.

2. Program fit (n = 6)

Program compatibility indicates a good fit between the program and the values, beliefs and needs of the provider. Studies in this review indicate that programs are more likely to be sustained if they fill a critical gap in the health system^{9, 20}, fit well with existing work commitments¹² and become a part of mandated service delivery and everyday practice^{20, 21, 26}. This emphasizes the importance of selecting evidence-based programs that fit the context (taking into account the system, organization, staff, and families served)²².

3. Ability of program to be adapted (n = 3)

Program adaptation refers to the adjustment of program activities in unity with local circumstances (Pluye, Potvin, Denis, Pelletier, & Mannoni, 2005) that should be properly guided by theory and community needs (strengths) and assessed for effectiveness (Barrera & Castro, 2006). Developing adaptations of evidence-based practices requires an understanding of the local political, religious social and economic context as well as the cultural norms and family practices (Barrera & Castro, 2006). A review of numerous mental health EBPs in the U.S. found 88% of sustaining sites had adapted the EBP to meet local needs²⁸. Common adaptations for agencies with limited resources related to lack of financial and staff support (e.g., discontinuation of fidelity assessment, reduced training, limiting provider time commitment, decreased supervision hours)^{28, 31}. All of these have the potential to reduce program efficacy. Other adaptations were driven by client or staff preferences (e.g., adding in other program material when relevant for the client, relaxing eligibility rules for participation)²⁸. Flexible program delivery can improve sustainment by allowing providers to employ innovative solutions to adapt to new cultural contexts² and meet local needs²⁸. However, the struggle is striking the balance between providing a program that can be adapted by trained providers that have no research training, rarely receive supervision involving EBP skill rehearsal

Table 2.1 *Summary of Identified Sustainment Factors*

Sustainment factor	Article number															
	Total	1	2	3	4	5	6	7	8	9	10	11	12	13*	14	15*
Innovation characteristics																
1 Program benefits and burden	9	X		X		X							X			X
2 Program fit	6									X			X			
3 Ability of program to be adapted	3		X													
4 Program familiarity and competency	2						X		X							
Capacity factors within the workplace																
5 Workplace climate and cohesion	7					X	X	X			X			X		
6 Workplace support	13	X	X	X				X		X	X		X			
7 Integration of the program	9	X			X		X	X						X		
8 Leadership style	6							X		X				X		X
9 Staff mobility and turnover	7				X		X				X					
10 Supervision and peer support	9	X			X		X					X	X		X	
Process and interaction factors (external and internal)																
11 Engagement	19			X	X		X		X	X	X	X	X	X	X	X
12 Training strategies	12	X						X		X	X		X	X		X
13 Key program champion	8	X	X							X				X		
14 Technical assistance and ongoing support	19		X	X	X		X	X	X	X	X	X	X	X		
15 Evaluation and feedback	9						X		X				X			X
16 Collaborative partnerships	13						X		X	X	X		X			
17 Sustainment planning	8			X			X		X	X				X		X
18 Funding and policy	16				X		X	X		X	X	X	X	X		X

Table 2.1 Cont'd

Sustainment factor	Article number																
	16	17	18	19	20	21	22*	23	24	25	26	27	28	29	30	31	
Innovation characteristics																	
1 Program benefits and burden						X		X			X	X					
2 Program fit					X	X	X				X						
3 Ability of program to be adapted													X			X	
4 Program familiarity and competency																	
Capacity factors within the workplace																	
5 Workplace climate and cohesion				X			X										
6 Workplace support	X		X				X		X				X	X			
7 Integration of the program						X			X					X		X	
8 Leadership style	X								X								
9 Staff mobility and turnover						X	X						X	X			
10 Supervision and peer support							X				X		X				
Process and interaction factors (external and internal)																	
11 Engagement			X	X	X			X	X	X					X	X	
12 Training strategies			X		X		X	X			X						
13 Key program champion					X				X				X			X	
14 Technical assistance and ongoing support		X	X	X			X		X		X	X				X	
15 Evaluation and feedback							X	X		X	X		X				
16 Collaborative partnerships	X		X		X	X		X		X		X	X				
17 Sustainment planning							X							X			
18 Funding and policy						X	X	X	X	X			X			X	

* Denotes literature review

nor are incentivized to deliver programs with fidelity (Onken, Carroll, Shoham, Cuthbert, & Riddle, 2014), while maintaining fidelity to core EBP content to ensure program effectiveness (Mazzucchelli & Sanders, 2010).

4. Program familiarity and competency (n = 2)

Familiarity and knowledge are related to the degree of (complexity) difficulty to understand and implement an evidence-based program (Hubbard & Sandmann, 2007). Having already participated in program activities at a smaller scale demonstration site ⁶ and greater knowledge of the program's logical model ⁸ have been associated with increased sustainment. Professional training systems that incorporate active skills training methods are well accepted and are related to increased practitioner self-efficacy and observed and self-reported skills in conducting parent support programs (Turner, Nicholson, & Sanders, 2011). Maintenance of the knowledge and skills gained by providers at training has not been evaluated extensively, but recent work shows that perceived competency in program skills can impact provider retention (Boucar et al., 2011) and sustained implementation ^{6,8}.

In summary, in relation to program characteristics, the studies reviewed show that providers are more likely to sustain a new program if they have open attitudes toward the program, it offers them a better way of working, has observable benefits, is compatible with their values and needs, is adaptable for the local context, is not too complex, and offers adequate training and practice to maintain knowledge and skills.

Capacity factors within the workplace (n = 24)

Factors included in this category relate to workplace, manager and co-worker characteristics that reinforce or create barriers to program sustainment. Key factors identified in the review are detailed below.

5. Workplace climate and cohesion (n = 7)

A large literature review of EBPs for child and adolescent mental health found that implementation strategies focused on improving organizational climate, such as addressing sustainability from the outset and developing systems to ensure access to ongoing support and supervision, were associated with better intervention sustainment as well as child and adolescent outcomes ²². This suggests that implementation strategies should be focused at both the workplace level and provider level ⁵. For example, a weak information communication process in a workplace can negatively impact program sustainment ⁷ even when providers intend program sustainment. High quality and productive interpersonal relationships promote trust and commitment in the workplace (Aarons, Ehrhart, & Farahnak, 2014; Edmondson, 2003). A common theme found in the review was the influence of workplace trust, unity and ability to resolve conflict on program sustainment. A positive workplace climate includes teamwork as a core value (emphasizing respect,

quality and continued improvement)⁷. Conversely, lack of cohesion at the site level can inhibit institutionalization⁶. The workplace is important because it provides the base for program functioning. If the base is not solid, then the program will start out with an inadequate foundation (Steckler & Goodman, 1989).

6. Workplace support (n = 13)

Practitioners' perception of their workplace's commitment to staff impacts their work-related attitudes and behaviors, and organizations can directly influence employee work attitudes and behaviors related to new programs or innovations by providing (or withholding) support (Eisenberger, Huntington, Hutchison, & Sowa, 1986). Sustainment research has supported this theory with studies showing programs in Indigenous communities², LMICs^{1, 7} and disadvantaged populations in high income countries^{12, 22} operating in a supportive workplace are more likely to be sustained², and programs with weak support functions (e.g., information and communication, capacity building, rewarding quality program delivery) at any level (from management to front line staff²⁸) are less likely to maintain program activity^{7, 12}. Pragmatic support (e.g., guidance in collaboration, provision of space for the practice, time for training, financial support, and a vocal mandate for practice continuation) is related to successful sustainment^{16, 18}, and these supports are often missing in sites where sustainment fails²⁸. Workplace and community Leadership factors that can distinguish between continued and non-continued projects and enhance community participation include: the leader's or management's ownership and support of the project^{1, 3, 10}, and definition of the project as a flagship of the organization^{1, 24}; It is also important to develop adequate workplace support⁹ for programs across various workplace settings where appropriate, including schools and community based practices²⁹.

7. Integration of the program (n = 9)

The extent of a leader's commitment to the workplace mission can improve sustainment³¹, so it follows that the level of staff awareness of workplace values, mission and goals and program congruence and integration with those values are important factors for sustainment^{1, 13, 29, 21}. If a new program is implemented with practitioner feedback^{4, 6} and easily integrated with existing programs in the organization or community¹, a smooth implementation process is created that can lead to program sustainment^{6, 13} and improve a site's ability to sustain program outcomes⁴. Involving all staff and community members or community systems (i.e. community assembly meetings; reports) in new programs can be important for integration and are also appropriate indicators for sustainment^{1, 7, 24}.

8. Leadership style (n = 6)

Effective leadership is respected, respectful, empowering, creative and able to negotiate and resolve conflict (Livet, Courser, & Wandersman, 2008). Transformational leadership, especially

senior leadership, which articulates values and vision that motivate and inspire others in a way that achieves cohesion, sets priorities, promotes learning and models quality is also associated with sustainment⁷. This is important at the level of local management^{24, 16}, the community⁹ and local leaders^{13, 15}.

9. Staff mobility and turnover (n = 7)

Sustained implementation and program outcomes can be adversely affected by high staff turnover⁴ which constitutes a common challenge^{6, 28} for both implementation²¹ and project administration¹⁰. For EBPs, staff retention improves, burn out reduces and adherence to program protocol is sustained when program supervision and support is provided²². Other issues in disadvantaged communities, besides retaining staff, are availability of qualified staff and ability to attract them due to funding restrictions, often requiring the use of less-qualified staff²¹. Staff readiness and preparedness for the implementation process can have a positive impact on sustainment²⁹.

10. Supervision and peer support (n = 9)

Many articles highlighted the importance of support in program delivery through supervision to maintain program benefits, activity and fidelity, with a need for refresher training and proper supervision¹ to maintain program activity^{1, 6, 11, 14}, benefits¹⁴, quality care⁶ and staff¹¹. Lack of supervision can lead to significant increases in staff attrition and retention is significantly enhanced when professionals are supervised¹¹. After external technical support ends, lack of feedback from superiors is linked to sustainment failure, whereas, improving fidelity to EBP guidelines and on-site clinical mentoring can contribute significantly to maintenance of gains in quality of care⁶. Supervision and support for program staff are usually measured for their impact on maintaining fidelity²² and practice^{26, 28}. When outcomes are not maintained from initial trials within an organization, even when fidelity is good, potential barriers to positive outcomes include the lack of engagement and loss of program specific supervision from trial to routine practice⁴. Supervision is regarded as integral to sustaining a practice; however, supervision time often decreases after the initial implementation period due to time constraints. Maintaining connection between the EBP developers and the site-level providers could be particularly helpful in supporting sustainment through supervision²². A different form of supervision is facilitated through peer support (McPherson, Sanders, Schroeter, Troy, & Wiseman, in prep), as post-training support from both supervisors and peers has been shown to influence program sustainment^{12, 26}. Peer assisted supervision is helpful for managing workload, sharing costs, engaging attendees, administering and scoring outcome assessment instruments and sharing learnings and increasing confidence¹². Ongoing supervision that allows time to practice program delivery skills, review clinical cases and

receive feedback can prevent burnout and improve program delivery confidence and fidelity (Beidas & Kendall, 2010; Pallas et al., 2013; Sanders & Turner, 2005).

In summary, in relation to workplace characteristics, a positive workplace climate is necessary throughout the implementation process to make effective decisions and take action to enhance program and practice sustainment. The climate is gauged by staff awareness of agency mission and goals, workplace trust, unity and stability, effective leadership, integration and support for adopted programs, and the provision of supervision and peer support (Brown, Feinberg, & Greenberg, 2011; Simpson & Flynn, 2007)

Process and interaction factors (external and internal) (*N* = 31)

While program and workplace functioning factors are important, simply providing information and training in prevention innovations (Michel & Sneed, 1995; Ringwalt et al., 2002) and managing workplace functioning is not enough to guarantee implementation and sustained practice. Additional internal and external processes and interactions were associated with sustainment in all of the reviewed studies. The most commonly cited were engagement, technical assistance and ongoing support and program support from parties outside the organization¹². The key factors identified are outlined below.

11. Engagement (*n* = 19)

Engagement is about attracting and involving appropriate individuals in the implementation of a program through a combined strategy of community education and engagement (Stirman et al., 2012), which involves shared decision making among stakeholders'⁴ program alignment (e.g., tailoring intervention delivery to an issue, the context and the providers)^{6,23} to ensure the program is consistent with local culture and appeals to the intended user^{13,15}. Engaging the professionals who are to implement a program is a process factor that can be overlooked. Good team member engagement can support continuous implementation; lack of engagement can create major hurdles. Missing opportunities to engage individuals^{4,6,8,12}, having too rapid a pace of geographic spread of program activity¹⁵ and lack of community education²⁵ can have a large negative effect on sustained implementation. However, engaging appropriate individuals^{18,24} through stakeholder outreach^{8,13}, community consultation²⁴, public education^{11,19,23} and building trusted personal relationships^{14,30,31} can improve the likelihood of program sustainment. It is not a surprise then that community ownership is among the primary determining factors of the sustainability of many of the community-based programs in the review^{3,9,10,15,20}. Several evaluations showed the influence of village leader support on ongoing community participation and sustained implementation of village health care programs^{9,3,10}. It is also important to plan realistically for program hand over and transition control to the community^{9,20}. Having local leaders take on increasing responsibility until they eventually have full control is one way to phase out outside

project support⁹. Program implementation should engage the end user and involve stakeholders throughout the entire process using a participatory approach²³.

12. Training strategies (n = 12)

Training is an important process factor that can inhibit or support program sustainment in communities¹³. Research suggests that unsuccessful implementation of an innovation is related to the inability of staff to understand the innovation (Aaltonen & Ikävalko, 2002) which speaks to the importance of providing appropriate training and ongoing education for health workers^{1, 10, 18, 20, 22, 26}. A training approach that provides training at every level of the health system (i.e. the central, district and local level) and includes training for any staff who may come in contact with the family can successfully influencing continued program use^{7, 23}. Programs can fail when they envision large-scale implementation simply as a training cascade (i.e. do not offer ongoing training and support when they move from the training room to program delivery^{9, 12, 15}, and do not allow for appropriate learning and pilot phases¹⁵).

13. Key program champion (n = 8)

A key champion for a program is an individual who advocates for the program or approach¹ by providing support through the duration of the project (from initial implementation to sustainment)^{20, 28}, leading integration efforts within the community and workplace⁹ and encouraging ongoing implementation of activities²⁰. There may be several champions or leaders in one setting¹³. The presence of at least one individual within the community or workplace who is highly committed to a program and who provides leadership, continuity²⁸, and stability to the program⁹ can distinguish significantly between continued and non-continued projects^{2, 24, 31}

14. Technical assistance and ongoing support (n = 19)

Technical assistance relates to the level of supportive resources dedicated to implementation and on-going operations including human resources (training and supportive coaching by experienced program facilitators) and physical resources (materials, space, transportation). Providing technical assistance is intended to build provider confidence in program delivery, enhance capacity^{7, 18, 24, 31}, promote local problem solving efforts¹⁹ and motivate providers in regards to program delivery²². Depending on the context, this may include some combination of re-training initial providers¹⁷, training new staff, access to continued program education¹⁷ providing technical support^{2, 12, 26, 31}, continuous program and implementation coaching^{6, 10, 18} and program resources^{11, 13, 26}. Lack of resources such as transportation and essential materials³, uneven support for the program training, or medical treatment supplies can create issues for sustainment^{3, 4, 9, 11}. The level of support dedicated to implementation is positively associated with program sustainment²⁴, and is acknowledged as a way to facilitate sustainment in many of the reviewed studies (n = 18).

For EBPs, this can include communication with the trainer or program developer to promote the sustainability of EBPs in non-research contexts ⁸.

15. Evaluation and feedback (n = 9)

The degree to which program effectiveness and implementation outcomes are clearly monitored, acted upon, and fed back to staff, and the alignment of that feedback with program delivery expectations, are important process factors. Different methods of evaluation and feedback including measuring clinical and performance outcomes can influence sustainment ^{25, 26, 22}.

Continued monitoring and evaluation can allow for continuous performance improvements when lack of adherence to basic delivery standards is an issue ^{15, 28}. Also, monitoring implementation can help determine if there are aspects of the program that providers do not use (e.g., requiring parent monitoring forms) which, if they do not impact the effectiveness of program delivery ²⁶, may be eliminated to enhance opportunities for successful program sustainment. However, any change in program guidelines must be evaluated as sustainment failure has also been linked to lack of regular monitoring and commitment to assessment and reassessment of outcomes ²⁵. Other supports to sustainment were reporting program outcomes to a large audience ⁸, integrating data collection and scoring applications into the service delivery system ¹², ongoing measurement of indicators of sustainment ⁶ and the evaluation of quality assurance approaches, including steps to define, measure and improve the quality of services ²³.

16. Collaborative partnerships (n = 13)

Partnership models are beneficial for implementation and sustainment because they build upon a community or organization's pre-existing capacity¹⁶ and provide a support system to help them perform at their optimal level (Spoth et al., 2004). This type of partnership support can potentially improve program sustainment in communities with higher levels of disadvantage because they usually have lower support for high quality implementation (Brown, Feinberg, & Greenberg, 2010). However, it is important that partnerships are high functioning ⁸, involve stakeholders who contribute to and gain from the partnership to reduce the deterioration of the capacity built ⁶. Partnerships can help move away from the normal unidirectional model of dissemination of research from the university setting to practice, to more mutual, collaborative blending of science and practice (Glasgow, Toobert, & Gillette, 2001; Hohmann & Shear, 2002). In our review of the literature, abandonment of team meetings ⁶ and indicators that external partner agents did not support the agency's effort to implement the program were barriers to sustainment ²¹.

Developing strong, transparent partnerships across the board (i.e. at the organization¹², community¹², district ¹⁸, state ²⁸, national level ^{10,25}), involvement of universities, commitment of the Ministry of Health ²³ and greater coalition functioning ⁸ are all supports for sustainment ^{8,9}. In Indigenous communities, gaining support from elders and community groups was critical to

sustainment²⁰. It is clear that partnerships and study of those partnerships between intervention and services researchers, policy makers, administrators, providers, consumers and their communities hold great promise for effective program sustainment²⁷. It has been demonstrated that when this type of capacity building framework is used it can enhance the chance of program sustainment success, especially if the partnership members are all trained in the program (Brown, Feinberg, Shapiro, & Greenberg, 2015).

17. Sustainment planning (n = 8)

Both program and community partnership sustainment involve financial and operational plans that will establish independently sustainable programs (Feinberg, Bontempo, & Greenberg, 2008). The fundamental objective of sustainment planning is to design a course of action early to promote effective implementation by collectively building local expertise for using the program¹³. The degree to which professionals and individual workplaces have developed effective plans to secure funding and sustain program activity are significant correlates of sustainment^{3, 8, 15, 29}. It is suggested that large-scale community health programs should be planned with at least a 10-year timeframe¹⁵. Consequently, the decision to implement a program should be treated as a long-term investment, requiring long-term commitment (Bustamante, Hurtado, & Zeribi, 2012; Quality Assurance Project and UNICEF/Nicaragua, 2006) rather than fleeting one-off training activity. Reports from both disadvantaged²² and non-disadvantaged areas (Beery et al., 2005; Johnson, Hays, Center, & Daley, 2004; Scheirer, 2005) indicate that sustainment of health promotion programming is possible when substantial planning takes place in the early stages of implementation. This planning from the outset is similarly important for community ownership; creating a handover plan from the beginning can emphasize a real plan for community ownership⁹. Program sustainment is much more likely if key partners firmly commit not only to support adoption, but to the ongoing, long-term effort of continuously meeting to address sustainment planning⁶ and ensuring programs continue to perform solidly^{8, 15}.

18. Funding and policy (n = 16)

Broad constructs that represent the degree to which the program was supported by parties outside the community, such as government policy and regulations, mandates and funding are reported to influence program sustainability. For programs that were not sustained, studies indicate the importance of fiscal oversight of program expenditures in improving the chance of replicating program outcomes⁴, monetary incentives to improve retention of staff¹¹, financial resources^{6,7} and support for program sustainment^{21, 28}. In fact, financial resources and support was reported as a barrier⁷ or influence on sustainment for most studies^{10, 12, 15, 24, 31}. Ensuring long-term financial support and political commitment is essential to sustain programs, but many factors impact this in

regards to financial arrangements and stability of the socioeconomic and political environment^{13, 15, 22}.

Introducing a new program amongst a shifting political setting can be a threat to sustainment⁹; however, national laws that support a program can reinforce sustainment²³ as long as there is a political commitment to carry out the new legislation or regulations²⁵. Diversity of funding sources, use of political fundraising strategies (and number of strategies employed), and funding body involvement all distinguish between continued and non-continued projects²⁴. Social programs have an average of four years of initial funding, echoing the message that programs need some time to establish themselves in the community or workplace before being left to support and take care of themselves²⁴.

In summary, in relation to process and interaction factors, insufficient funding may lead to low sustainment, but it should also be taken into consideration that an agency may fail to sustain program funding because they are dissatisfied with the program or have inadequate workplace functioning. Therefore, it's equally important to take program, workplace and all process and interaction factors into consideration to secure and maintain support for the program from the start²⁹.

Discussion

We examined 31 published papers to identify themes for influences, predictors and correlates of sustainment to construct a conceptual framework for evidence-based program sustainment in disadvantaged communities and provide recommendations for further evaluation. The challenges relating to service sustainability are a topic of increasing discussion worldwide. There is even greater complexity in low and middle income countries and disadvantaged communities in high income countries, given the highly constrained human resource context for low resource settings (Bloom, 2007). While the identified factors primarily overlap with those drawn from the 2012 review by Stirman and colleagues of 125 implementation studies, there were several differences identified in relation to supports and barriers to program sustainment in disadvantaged communities (2012). Our review found a greater focus on program burden, program familiarity and perceived competence in program skills, workplace support for the program, staff mobility and turnover, supervision and peer support, and ongoing technical assistance. These factors primarily relate to support for program implementation, ease of implementation and assistance to build capacity, and speak to the importance of providing strong, tailored support when implementing programs in settings with complex systems and limited resources.

If long-term implementation is desired, a model of sustainment, similar to the sustained implementation support framework for EBPs identified in this study, is needed that spans the ecological context (systems, policies and practice setting) and considers individual service provider

and program differences (Chambers et al., 2013; Estabrooks et al., 2011; Pluye, Potvin, & Denis, 2004; Spoth, Guyll, Redmond, Greenberg, & Feinberg, 2011) with a focus on monitoring the key factors that support or hinder implementation over time (Saldana & Chamberlain, 2012).

Future Recommendations for Research, Practice and Policy

Directions for research

Half of the studies in this review did not identify a formal definition for sustainment and less than half were guided by a conceptual framework or theory. There is a need for consistency in terminology and definition in all areas of implementation science, and for sustainability evaluation to be guided by a theory-driven conceptual framework. Such a framework has not been established to guide work in disadvantaged communities. In addition, there is a clear need for a valid and reliable instrument that taps into key factors that influence sustainment given that only a few studies included measures that were pilot tested and validated, with most failing to mention psychometric properties completely.

In an attempt to thoroughly capture the complex system that programs operate within in the real world, a few studies looked at multiple levels of implementation, but did not have a large enough sample size within each level or enough respondents per site to evaluate the data appropriately. Overall, very few studies reported on non-respondents, most of the studies in the sample collected data retrospectively and none used experimental manipulation to address the complex relationship of factors that influence sustainment, making it difficult to draw many steadfast conclusions. However, the reality of working and researching with disadvantaged communities is that rigorous controlled trials will not always be appropriate, as small sample size is very common, and carrying out rigorous data analytic procedures is not always possible.

To strengthen sustainability studies, research and data collection should start before program implementation to measure pre-implementation capacity and continue through the implementation and sustainment process, with a plan to follow-up with non-implementers. This will help capture implementation capacity building and skill attainment which is as important as program effectiveness. To strengthen the analysis, a few studies used a multi-method approach to triangulate qualitative data with quantitative data^{20, 21, 28}. Future research should consider triangulating interview data with analysis of reports, documents and survey data to identify elements of projects that continued after pilot funding ceased and factors that influenced sustainment (Bekhet & Zauszniewski, 2012). Also, only seven studies looked at both program effectiveness (health outcomes) and implementation success. Effectiveness-implementation hybrid trials to assess both program effectiveness and the implementation strategy used to deliver the program should be considered to ensure that sustained programs are in fact continuing to produce effective outcomes for communities (Bernet, Willens, & Bauer, 2013; Curran, Bauer, Mittman, Pyne, & Stetler, 2012).

Directions for practice

Evidence-based programs anticipating real world implementation and sustainment should focus support on the three categories of factors proposed as influences on program sustainability: program characteristics, provider and workplace capacity, and interaction factors (external and internal). These factor categories align with recommendations from Shediac-Rizkallah and Bone (1998) and Stirman and colleagues (2012) for program sustainability and evaluation; however, more empirical support is required relating to program sustainment in disadvantaged communities. A program implementation and sustainment support framework specific to disadvantaged communities will directly inform successful delivery of evidence-based parenting.

The empirical studies examined in this review suggest that, of the program factors that influence sustainability, provider perceptions of the program (benefits, burden) ($n = 9$) and program fit ($n = 6$) were most frequently cited and have the strongest empirical evidence. Program adaptation and program knowledge or familiarity are also reported influences. These findings highlight the fundamental importance of engaging with the providers so they understand the program and can make informed decisions on personal benefit from program training and delivery, and if and how the program fits with their practice setting. EBPs can often take a linear approach to program implementation by providing one-off training for providers to develop the skills to put a program into practice. However, first engaging with providers before training and then providing continued support after training to assist providers to maintain knowledge and familiarity should be considered for successful program implementation especially for more complex interventions.

Of the workplace factors examined, the most frequently cited and empirically supported factors were organizational and leadership support ($n = 13$), integration of the program into the workplace ($n = 9$), and supervision and peer support ($n = 9$). To increase the likelihood of sustained implementation, the aims of the program should be congruent with the mission and activities of the host organization. Support for the introduced program should be fostered across all staff levels (front line staff to higher management) and settings (health care practice, schools, village) as all levels of workplace support for a program may directly influence employee implementation behavior. Similarly, integrating a program with all parts of the organization (e.g., administrative staff to providers) and/or community systems (e.g., community assembly meetings) can improve sustainability. Orientation of service providers, other staff in the organization and community stakeholders to the program can clarify expectations and establish alignment with the program. Also, the availability of supervision (by a mentor or peers) and practice feedback is shown to impact numerous sustainment elements including program continuation, outcomes, fidelity, quality of care and staff retention.

All of the reviewed studies explored process and interaction factors. The most frequently cited and empirically supported factors were engagement ($n = 19$) and technical assistance and ongoing support from program disseminators ($n = 19$). Other commonly identified factors include external support, such as funding and policy imperatives ($n = 16$) and collaborative partnerships ($n = 13$). Program implementation should engage the end user and involve stakeholders from the beginning of program planning throughout the entire implementation and sustainment process. This can be achieved through stakeholder outreach (such as briefings and updates), community engagement and public education, and building trust and personal relationships. Providing technical assistance and ongoing support can enhance resources (human and physical resources), promote local problem solving efforts and motivate providers in regards to program delivery and thus improve sustainment. For EBPs, this can include communication with the trainer or program developer to promote program sustainability in non-research contexts⁸. Developing strong, high functioning, transparent partnerships (e.g., community-university partnerships) supports sustained and high quality implementation. This type of partnership can facilitate capacity building for providers, workplaces and communities by providing information about an innovation before the organization decides if it wants to adopt, training in how to carry out an innovation before it implements and technical assistance once the innovation is in use. The goal is to enhance the resources, skills and motivation of an organization or community. This partnership capacity building approach can enable implementation researchers to move away from the normal unidirectional model of dissemination of research from the university setting to practice, to more mutual, collaborative blending of science and practice.

Planning intervention implementation using an EBP sustained implementation support framework, that involves a partnership approach with appropriate workplace climate and program elements, can allow organizations to carry out complex planning for implementation and build the capacity for professionals to implement interventions and sustain program delivery long term.

Directions for policy

In order to equip government bodies and family support services to work with providers and communities in managing program planning and sustained implementation in the best and most cost-effective way, it is important to look at policy and larger system factors that influence sustainability. Ensuring long term financial support and political commitment is essential to sustain programs, but many factors impact this in regards to financial arrangements and stability of the socioeconomic and political environment. Programs need time to establish themselves before being left to financially support themselves, one review suggests at least four years establishment support, because insufficient funding may lead to failure to sustain and; therefore, wasted initial investment.

Ongoing evaluation of implementation rates and outcomes along with feedback loops to funders are; therefore, crucial to justify investment in program sustainment.

Conclusion

The conceptual model proposed in this paper synthesizes findings from health program literature around the factors that impact program sustainability specific to low and middle income countries and disadvantaged communities in high income countries. It highlights three different areas impacting EBP sustainability that can guide ongoing implementation and sustainability research and to address key program, workplace and process factors that impact program sustainment in real world settings. Recent interest in successful program dissemination beyond efficacy trials has led to a rapid increase in the number of models, frameworks, variables and definitions for sustained program implementation and consolidation of the literature is warranted. The sustained implementation support framework for EBPs proposed here adds to implementation research by providing a model for sustained program implementation in disadvantaged community health settings, with an emphasis on a supportive partnership approach and ongoing evaluation of appropriate program, workplace and process elements. In reality, disadvantaged communities are likely to have unique characteristics that need to be taken into account, such as the needs and capacity of the community and available service providers; intergenerational trauma in the community; learning styles, language barriers and the level of complexity for the provider when moving from the training room to the practical setting; barriers to provider and community engagement due to issues with trust based on past experience; system structure and integrity; and the importance of community partnerships. However, it would be helpful to compare disadvantaged communities with non-disadvantaged communities to ascertain whether different factors are most important to program sustainability for different populations.

Once a program is developed and proven effective it is often difficult to move beyond the university trialling of the program to full program implementation and sustainment. Delivering a culturally acceptable, adapted, evidence-based parenting intervention that continues to be implemented past grant funding has the potential to have a large impact on the intergenerational issues faced by families living with disadvantage. New strategies and approaches to implementation and sustainment have the potential to move EBPs from the research setting to fully sustained programs in real world practice settings.

References

- Aaltonen, P., & Ikävalko, H. (2002). Implementing strategies successfully. *Integrated Manufacturing Systems*, 13(6), 415-418. doi: 10.1108/09576060210436669
- Aarons, G. A., Ehrhart, M. G., & Farahnak, L. R. (2014). The implementation leadership scale (ILS): development of a brief measure of unit level implementation leadership. *Implementation Science*, 9(45), 1-10. doi: 10.1186/1748-5908-9-45
- Aarons, G. A., Hurlburt, M., & McCue Horwitz, S. (2011). Advancing a conceptual model of evidence-based practice implementation in public service sectors. *Administration and Policy in Mental Health*, 38(1), 4-23. doi: 10.1007/s10488-010-0327-7
- Barrera, J. M., & Castro, F. G. (2006). A heuristic framework for the cultural adaptation of interventions. *Clinical Psychology: Science and Practice*, 13(4), 311-316. doi: 10.1111/j.1468-2850.2006.00043.x
- Beery, W. L., Senter, S., Cheadle, A., Greenwald, H. P., Pearson, D., Brousseau, R., & Nelson, G. D. (2005). Evaluating the legacy of community health initiatives: A conceptual framework and example from the California Wellness Foundation's health improvement initiative. *American Journal of Evaluation*, 26(2), 150-165. doi: 10.1177/1098214005275627
- Beidas, R. S., & Kendall, P. C. (2010). Training therapists in evidence-based practice: A critical review of studies from a systems-contextual perspective. *Journal of Clinical Psychology: Science and Practice*, 17(1), 1-30. doi: 10.1111/j.1468-2850.2009.01187.x
- Bekhet, A. K., & Zauszniewski, J. A. (2012). Methodological triangulation: An approach to understanding data. *Nurse Researcher*, 20(2), 40-43. doi: 10.7748/nr2012.11.20.2.40.c9442
- Bernet, A. C., Willens, D. E., & Bauer, M. S. (2013). Effectiveness-implementation hybrid designs: Implications for quality improvement science. *Implementation Science*, 8((Suppl 1): S2). doi: 10.1186/1748-5908-8-S1-S2
- Bloom, B. B. (2007). *Sustainable health: A new dimension of sustainability science*. Paper presented at the Proceedings of the National Academy of Sciences of the United States of America.
- Boucar, M., Franco, L. M., Sabou, D., Saley, Z., Jennings, L., & Mohan, D. (2011). Sustaining better maternal and newborn care and quality Improvement in Niger: Challenges and successes. Bethesda, MD: University Research Co., LLC (URC).
- Bowes, J., & Grace, R. (2014). Review of early childhood parenting, education and health intervention programs for Indigenous children and families in Australia *Closing the Gap Clearinghouse* (pp. 1-61). Canberra, ACT: Australian Institute of Health and Welfare.

- Brown, L. D., Feinberg, M. E., & Greenberg, M. T. (2010). Determinants of community coalition ability to support evidence-based programs. *Prevention Science, 11*(3), 287-297. doi: 10.1007/s11121-010-0173-6
- Brown, L. D., Feinberg, M. E., & Greenberg, M. T. (2011). Measuring coalition functioning: Refining constructs through factor analysis. *Health Education & Behavior, 39*(4), 486-497. doi: 10.1177/1090198111419655
- Brown, L. D., Feinberg, M. E., Shapiro, V. B., & Greenberg, M. T. (2015). Reciprocal relations between coalition functioning and the provision of implementation support. *Prevention Science, 16*(1), 101-109. doi: 10.1007/s11121-013-0447-x
- Bustamante, R., Hurtado, E., & Zeribi, K. A. (2012). Improving the quality of Guatemala's public health system: A view to institutionalization (pp. 30). Bethesda, MD: University Research Co., LLC.
- Carbone, S., Fraser, A., Ramburuth, R., & Nelms, L. (2004). Promoting inclusion of vulnerable families in antenatal and universal early childhood services: A report on the first three stages of the project *Breaking Cycles, Building Futures*. Melbourne, Victoria: Department of Human Services.
- Chambers, D. A., Glasgow, R. E., & Stange, K. C. (2013). The dynamic sustainability framework: addressing the paradox of sustainment amid ongoing change. *Implementation Science, 8*(1), 117-128. doi: 10.1186/1748-5908-8-117
- Chaudoir, S. R., Dugan, A. G., & Barr, C. H. (2013). Measuring factors affecting implementation of health innovations: A systematic review of structural, organizational, provider, patient, and innovation level measures. *Implementation Science, 8*(22). doi: 10.1186/1748-5908-8-22
- Coe, C., Gibson, A., Spencer, N., & Stuttaford, M. (2008). Sure start: Voices of the 'hard-to-reach'. *Child: Care, Health and Development, 34*(4), 447-453. doi: 10.1111/j.1365-2214.2008.00816.x
- Cortis, N., Katz, I., & Patulny, R. (2009). Engaging hard-to-reach families and children *Occasional Paper No 26*. Canberra, ACT: Department of Families, Housing, Community Services and Indigenous Affairs.
- Curran, G. M., Bauer, M., Mittman, B., Pyne, J. M., & Stetler, C. B. (2012). Effectiveness-implementation hybrid designs: Combining elements of clinical effectiveness and implementation research to enhance public health impact. *Medical Care, 50*(3), 217-226. doi: 10.1097/MLR.0b013e3182408812.
- Damschroder, L. J., Aron, D. C., Keith, R. E., Kirsh, S. R., Alexander, J. A., & Lowery, J. C. (2009). Fostering implementation of health services research findings into practice: A

- consolidated framework for advancing implementation science. *Implementation Science*, 4(1), 50-65. doi: 10.1186/1748-5908-4-50
- Duong, D. M., Bergström, A., Wallin, L., Bui, H. T., Eriksson, L., & Eidh, A. C. (2015). Exploring the influence of context in a community-based facilitation intervention focusing on neonatal health and survival in Vietnam: a qualitative study. *BMC Public Health*, 15(814), 1-9. doi: 10.1186/s12889-015-2142-2
- Edmondson, A. C. (2003). Speaking up in the operating room: How team leaders promote learning in interdisciplinary action teams. *Journal of Management Studies*, 40(6), 1419-1452. doi: 10.1111/1467-6486.00386
- Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. (1986). Perceived organizational support. *Journal of Applied Psychology*, 71(3), 500-507. doi: 10.1037/0021-9010.71.3.500
- Engle, P. L., Fernald, L. C. H., Alderman, H., Behrman, J., O'Gara, C., Yousafzai, A., . . . The Global Child Development Steering Group. (2011). Child Development 2: Strategies for reducing inequalities and improving developmental outcomes for young children in low-income and middle-income countries. *Lancet*, 378(9799), 1339-1353. doi: 10.1016/S0140-6736(11)60889-1
- Estabrooks, P. A., Smith-Ray, R. L., Dzewaltowski, D. A. D., Diane, Lattimore, D., Rheaume, C., Bazzarre, T., . . . Wilcox, S. (2011). Sustainability of evidence-based community-based physical activity programs for older adults: Lessons from active for life. *Translational Behavioural Medicine*, 1(2), 208-215. doi: 10.1007/s13142-011-0039-x
- Feinberg, M. E., Bontempo, D. E., & Greenberg, M. T. (2008). Predictors and level of sustainability of community prevention coalitions. *American Journal of Preventive Medicine*, 34(6), 495-501. doi: 10.1016/j.amepre.2008.01.030
- Glasgow, R. E., Toobert, D. J., & Gillette, C. D. (2001). Psychosocial barriers to diabetes self-management and quality of life. *Diabetes Spectrum*, 14(1), 33-41. doi: 10.2337/diaspect.14.1.33
- Gomez, B. J., Greenberg, M. T., & Feinberg, M. E. (2005). Sustainability of community coalitions: An evaluation of Communities That Care. *Prevention Science*, 6(3), 199-203. doi: 10.1007/s11121-005-0003-4
- Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., & Kyriakidou, O. (2004). Diffusion of innovations in service organizations: Systematic review and recommendations. *The Milbank Quarterly*, 82(4), 581-629. doi: 10.1111/j.0887-378X.2004.00325.x
- Gross, D., Garvey, C., Julion, W., Fogg, L., Tucker, S., & Mokros, H. (2009). Efficacy of the Chicago Parent Programs with low-income African American and Latino parents of young children. *Prevention Science*, 10(1), 54-65. doi: 10.1007/s11121-008-0116-7

- Gruen, R. L., Elliott, J. H., Nolan, M. L., Lawton, P. D., Parkhill, A., & McLaren, C. J. (2008). Sustainability science: An integrated approach for health-programme planning. *The Lancet*, 372(9649), 1579-1589. doi: 10.1016/S0140-6736(08)61659-1
- Haines, A., Kuruvilla, S., & Borchert, M. (2004). Bridging the implementation gap between knowledge and action for health. *Bulletin of the World Health Organization*, 82(10), 724-732. doi: 10.1590/S0042-96862004001000005
- Hohmann, A. A., & Shear, M. K. (2002). Community-based intervention research: Coping with the "noise" of real life in study design. *American Journal of Psychiatry*, 159(2), 201-207. doi: 10.1176/appi.ajp.159.2.201
- Hubbard, W. G., & Sandmann, L. R. (2007). Using diffusion of innovation concepts for improved program evaluation. *Journal of Evaluation*, 45(5).
- Johnson, K., Hays, C., Center, H., & Daley, C. (2004). Building capacity and sustainable prevention innovations: a sustainability planning model. *Evaluation and Program Planning*, 27(2), 135-149. doi: 10.1016/j.evalprogplan.2004.01.002
- Kolko, D. J., Iselin, A.-M. R., & Gully, K. J. (2011). Evaluation of the sustainability and clinical outcome of Alternatives for Families: A cognitive-behavioral therapy (AF-CBT) in a child protection center. *Child Abuse & Neglect*, 35(2), 105-116. doi: 10.1016/j.chiabu.2010.09.004
- Lexmond, J., & Reeves, R. (2009). Building character: Parents are the principal architects of a fairer society. London, UK: DEMOS.
- Livet, M., Courser, M., & Wandersman, A. (2008). The prevention delivery system: Organizational context and use of comprehensive programming frameworks. *American Journal of Community Psychology*, 41(3-4), 361-378. doi: 10.1007/s10464-008-9164-1
- Mann, S., & Byrnes, T. (1999). Capacity building and community enrichment: Evaluation for sustainability. *Australian Journal of Primary Health*, 5(3), 43-50. doi: 10.1071/PY99032
- Marquez, L., Silvia, H., Edward, B., & Simon, H. (2014). Improving health care: the results and legacy of the USAID health care improvement project. *Final Report*. Bethesda, MD: University Research Co., LLC (URC).
- Mazzucchelli, T. G., & Sanders, M. R. (2010). Facilitating practitioner flexibility within an empirically supported intervention: Lessons from a system of parenting support. *Clinical Psychology Science and Practice*, 17(3), 238-252. doi: 10.1111/j.1468-2850.2010.01215.x
- McPherson, K., Sanders, M. R., Schroeter, B., Troy, V., & Wiseman, K. (in prep). Acceptability and feasibility of Peer Assisted Supervision and Support (PASS) for early intervention practitioners: A Q-methodology evaluation.

- Meyers, D. C., Joseph, D. A., & Wandersman, A. (2012). The quality implementation framework: A synthesis of critical steps in the implementation process. *American Journal of Community Psychology, 50*(3-4), 462-480. doi: 10.1007/s10464-012-9522-x
- Michel, Y., & Sneed, N. V. (1995). Dissemination and use of research findings in nursing practice. *Journal of Professional Nursing, 11*(5), 306-311. doi: 10.1016/S8755-7223(05)80012-2
- NICHD ECCRN. (2005). Duration and developmental timing of poverty and children's cognitive and social development from birth through third grade *Child Development* (Vol. 76, pp. 795-810): National Institute of Child Health and Human Development Early Child Care Research Network.
- Onken, L. S., Carroll, K. M., Shoham, V., Cuthbert, B. N., & Riddle, M. (2014). Reenvisioning clinical science: Unifying the discipline to improve the public health. *Clinical Psychological Science, 2*(1), 22-34. doi: 10.1177/2167702613497932
- Owens, J. S., Richerson, L., Murphy, C. E., Jagelewski, A., & Rossi, L. (2007). The parent perspective: Informing the cultural sensitivity of parenting programs in rural communities. *Child Youth Care Forum, 36*(5), 179-194. doi: 10.1007/s10566-007-9041-3
- Pallas, S. W., Minhas, D., Pérez-Escamilla, R., Lauren, T., & Curry, L. (2013). Community health workers in low- and middle-income countries: What do we know about scaling up and sustainability? . *American Public Health Association, 103*(7), e74-e82. doi: 10.2105/AJPH.2012.301102
- Pluye, P., Potvin, L., & Denis, J.-L. (2004). Making programs last: Conceptualizing sustainability. *Evaluation and Program Planning, 27*(2), 121-133. doi: 10.1016/j.evalprogplan.2004.01.001
- Pluye, P., Potvin, L., Denis, J., Pelletier, J., & Mannoni, C. (2005). Program sustainability begins with the first events. *Evaluation and Program Planning, 28*(2), 123-137. doi: doi:10.1016/j.evalprogplan.2004.10.003
- Proctor, E. K., Landsverk, J., Aarons, G. A., Chambers, D. A., Glisson, C., & Mittman, B. (2009). Implementation research in mental health services: An emerging science with conceptual, methodological, and training challenges. *Administration and Policy in Mental Health, 36*(1), 24-34. doi: 10.1007/s10488-008-0197-4
- Quality Assurance Project and UNICEF/Nicaragua. (2006). The Nicaragua mother and baby friendly health units initiative: Factors influencing its success and sustainability. In B. R. Burkhalter, I. González, N. Herrera, O. Nunez, S. L. S., & F. I. Sandino (Eds.), (Vol. U.S. Agency for International Development (USAID)). Bethesda, MD: U.

- Ringwalt, C. L., Ennett, S., Vincus, A., Thorne, J., Rohrbach, L. A., & Simons-Rudolph, A. (2002). The prevalence of effective substance use prevention curricula in U.S. middle schools. *Prevention Science, 3*(4), 257-265. doi: 10.1023/A:1020872424136
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York: Free Press.
- Saldana, L., & Chamberlain, P. (2012). Supporting implementation: The role of community development teams to build infrastructure. *American Journal of Community Psychology, 50*(3-4), 334-346. doi: 10.1007/s10464-012-9503-0
- Sanders, M. R., & Turner, K. M. (2005). Reflections on the challenges of effective dissemination of behavioural family intervention: Our experience with the Triple P – Positive Parenting Program. *Child and Adolescent Mental Health, 10*(4), 158-169. doi: 10.1111/j.1475-3588.2005.00367.x
- Scheirer, M. A. (2005). Is sustainability possible? A review and commentary on empirical studies of program sustainability. *American Journal of Evaluation, 26*(3), 320-346. doi: 10.1177/1098214005278752
- Shediac-Rizkallah, M. C., & Bone, L. R. (1998). Planning for the sustainability of community-based health programs: conceptual frameworks and future directions for research, practice and policy. *Health education Research, 13*(1), 87-108.
- Simpson, D. D., & Flynn, P. M. (2007). Moving innovations into treatment: A stage-based approach to program change. *Journal of Substance Abuse Treatment, 33*(2), 111-120. doi: 10.1016/j.jsat.2006.12.023
- Spoth, R., Greenberg, M. T., Bierman, K., & Redmond, C. (2004). PROSPER community-University partnership model for public education systems: Capacity building for evidence-based, competence-building prevention. *Prevention Science, 5*(1), 31-39. doi: 10.1023/B:PREV.0000013979.52796.8b
- Spoth, R., Gyll, M., Redmond, C., Greenberg, M. T., & Feinberg, M. E. (2011). Six-year sustainability of evidence-based intervention implementation quality by community-university partnerships: The PROSPER study. *American Journal of Community Psychology, 48*(3-4), 412-425. doi: 10.1007/s10464-011-9430-5
- Steckler, A., & Goodman, R. M. (1989). How to institutionalize health promotion programs. *American Journal of Health Promotion, 3*(43), 34-43. doi: 10.4278/0890-1171-3.4.34
- Stirman, S. W., Kimberly, J., Cook, N., Calloway, A., Castro, F., & Charns, M. (2012). The sustainability of new programs and innovations: a review of the empirical literature and recommendations for future research. *Implementation Science, 7*(1), 17-36. doi: 10.1186/1748-5908-7-17

- Turner, K. M., Nicholson, J. M., & Sanders, M. R. (2011). The role of practitioner self-efficacy, training, program and workplace factors on the implementation of an evidence-based parenting intervention in primary care. *Journal of Primary Prevention, 32*(2), 95-112. doi: 10.1007/s10935-011-0240-1.
- Turner, K. M., Richards, M., & Sanders, M. R. (2007). Randomised clinical trial of a group parent education programme for Australian Indigenous families. *Journal of Paediatrics and Child Health, 43*(6), 429-437. doi: 10.1111/j.1440-1754.2007.01053.x
- Turner, K. M., & Sanders, M. R. (2007). Family intervention in Indigenous communities: Emergent issues in conducting outcome research. *Australasian Psychiatry, 15*(Supp.), S39-S49.
- Vinson, T. (2007). The web of social disadvantage. *Developing Practice: The Child, Youth and Family Work Journal*(19), 56-55.
- Wandersman, A., Duffy, J., Flaspohler, P., Noonan, R., Lubell, K., Stillman, L., . . . Saul, J. (2008). Bridging the gap between prevention research and practice: The interactive systems framework for dissemination and implementation. *American Journal of Community Psychology, 41*(3), 171-181. doi: 10.1007/s10464-008-9174-z
- Zhou, H., Zhang, W., Zhang, S., Wang, F., Zhong, Y., Gu, L., . . . Tian, D. (2015). Health providers' perspectives on delivering public health services under the contract service policy in rural China: Evidence from Xinjian County. *BMC Health Services Research, 15*(75), 1-15.

Appendix 2.A
Summary of Reviewed Studies

Reference	Intervention Type	Research Design: Methodology (tools)	Unit of Analysis	Respondents
1. Ahluwalia et al. (2010)	Community-Based Reproductive Health Project (CBRHP)	<ul style="list-style-type: none"> • Descriptive, mixed methods: Qualitative (interview), quantitative (community survey, provider survey) • Descriptive: Qualitative (group interview) 	<ul style="list-style-type: none"> • Village health worker • Community member • Village leader (aggregated to village level) 	<ul style="list-style-type: none"> • 124 (29 villages) • 8-10 per village (29 villages) • 2 (6 villages)
2. Aitaoto et al. (2009)	Pacific Diabetes Today Resource Center (PDTRC) community-empowerment approach to diabetes programming	<ul style="list-style-type: none"> • Descriptive, cross-sectional: Qualitative (in person interview) • Case study: Qualitative (group conference call interview) 	<ul style="list-style-type: none"> • Program training sponsor • Coalition members (community coalition unit of analysis) 	<ul style="list-style-type: none"> • 1 per community (11 communities) • 4 per community (4 communities)
3. Amazigo et al. (2007)	African Programme for Onchocerciasis Control (APOC) projects	<ul style="list-style-type: none"> • Descriptive, mixed methods: Quantitative (survey), qualitative logistic regression (interview and direct observation) 	<ul style="list-style-type: none"> • Central, local government, front-line health facility, community • Leader and community directed distributor (aggregated to community level) 	<ul style="list-style-type: none"> • 4 operational levels per project (41 projects) • 1-3 respondents per community (492 communities = 12 per project)

4. August et al. (2006)	Early Risers “Skills for Success” conduct problems prevention program.	<ul style="list-style-type: none"> • Experimental: Intent-to-treat RCT (survey) • Descriptive: Qualitative (fidelity data) 	<ul style="list-style-type: none"> • High/moderate risk students • High/moderate risk families • Commentary 	<ul style="list-style-type: none"> • 15 / 10 per school (16 schools) • 169 / 126 total
5. Beidas et al. (2015)	Family therapy; behavioral therapy; psychodynamic therapy techniques	<ul style="list-style-type: none"> • Observational / cross-sectional: Quantitative (survey) 	<ul style="list-style-type: none"> • Therapists • Supervisors • Executive administrators (aggregated to site level)	<ul style="list-style-type: none"> • 130 / 36 / 22 at 19 agencies with 23 sites
6. Boucar et al. (2011)	Essential Obstetric and Newborn Care Improvement Collaborative plus institutionalization change intervention	<ul style="list-style-type: none"> • Quasi-experimental (pre-post): Qualitative (survey interview, observation, self-assessment, clinical records) • Descriptive: Qualitative (survey interview) 	<ul style="list-style-type: none"> • Provider • Team leader or team member (aggregated to team or site level)	<ul style="list-style-type: none"> • 90 yr 1, 83 yr 2 • 1 per site (20 sites)

7. Bustamante et al. (2012)	Guatemalan Ministry of Public Health and Social Assistance including intensive support intervention	<ul style="list-style-type: none"> • Descriptive, cross-sectional, mixed methods: Quantitative (self-administered survey), qualitative (focus groups at central and district level) • Descriptive (purposeful non-random sample): Qualitative (interview) 	<ul style="list-style-type: none"> • 4 levels of workers (central / health area / district health facility / district improvement collaborative) • 3 levels of workers (central / health area / district health facility) (measured at the group level) 	<ul style="list-style-type: none"> • 42 / 31 / 70 / 45 workers • 8 / 3 / 6 individuals
8. Cooper et al. (2015)	Classroom programs (e.g., Life Skills Training); community (e.g., Big Brothers and Big Sisters), family prevention (e.g., Strengthening Families); family treatment (e.g., Funct'l Family Therapy)	<ul style="list-style-type: none"> • Descriptive, cross-sectional: Quantitative (survey) • Descriptive, correlational: Quantitative (survey) 	<ul style="list-style-type: none"> • Program director (analysis by program type: classroom, community, family prevention and family treatment) 	<ul style="list-style-type: none"> • 1 respondent per program (77 programs)
9. Edwards et al. (2006)	Canada-China Yunnan Maternal and Child Health Project to improve the quality of life, productivity and social prosperity.	<ul style="list-style-type: none"> • Descriptive, longitudinal: Qualitative (records) 	<ul style="list-style-type: none"> • Commentary 	<ul style="list-style-type: none"> • (Respondents not clear) 10 projects

10. Eliason (1999)	Life Abundant Programme, a church sponsored primary health care project	<ul style="list-style-type: none"> • Descriptive, longitudinal: Qualitative (observation) 	<ul style="list-style-type: none"> • 3 levels (village health center / integrated health center / project administration) 	<ul style="list-style-type: none"> • (Respondents not clear) 16 health centers
11. Emukah et al. (2008)	Community-Directed Distribution of Onchocerciasis Project	<ul style="list-style-type: none"> • Descriptive, cross-sectional (community random selection): Qualitative (semi-structured interviews and focus groups) 	<ul style="list-style-type: none"> • Community member • Implementers / non-implementers 	<ul style="list-style-type: none"> • 6-10 per community (12 communities) • 60 / 41 workers
12. Gaven et al. (2013)	Triple P – Positive Parenting Program	<ul style="list-style-type: none"> • Quasi-experimental (pre-post): Qualitative (participant survey) • Descriptive, mixed methods: Qualitative (focus group, consultation), Quantitative (provider survey) 	<ul style="list-style-type: none"> • Families • Practitioners 	<ul style="list-style-type: none"> • 182 families • 360 practitioners
13. Gruen et al. (2008)	24 different health programs	<ul style="list-style-type: none"> • Literature review 	<ul style="list-style-type: none"> • Health program sustainability 	<ul style="list-style-type: none"> • 24 out of 145 articles
14. Gürtler et al. (2007)	Sustainable vector control and management of chagas disease – community campaigns re insecticide spraying.	<ul style="list-style-type: none"> • Quasi-experimental (pre-post): Descriptive 	<ul style="list-style-type: none"> • Core area houses • Peripheral area houses with sporadic spray (aggregated to the area level) 	<ul style="list-style-type: none"> • 137 houses (5 villages)/ • 186 houses (35 rural villages)

15. Hodgins et al. (2013)	Successfully scaled up health programs	<ul style="list-style-type: none"> Literature review 	<ul style="list-style-type: none"> Health worker programs 	<ul style="list-style-type: none"> 3 programs (3 countries)
16. Kay et al. (2010)	Community-based mosquito control strategy against <i>Aedes aegypti</i> in Vietnam	<ul style="list-style-type: none"> Descriptive, cross-sectional: Qualitative and quantitative (survey, records, focus groups) Thematic analysis: Qualitative (interview) 	<ul style="list-style-type: none"> North/Central commune community members North/Central key informants (commune level of analysis) 	<ul style="list-style-type: none"> 18-30 / 40 community members 16/10 informants
17. Kitau et al. (2011)	Indigenous Australian Family Wellbeing empowerment program	<ul style="list-style-type: none"> Descriptive, cross sectional: Qualitative and qualitative (interview) 	<ul style="list-style-type: none"> Provider 	<ul style="list-style-type: none"> 60 providers
18. Loman et al. (2010)	First Steps to Success targeted intervention for students at risk for behavior disorders	<ul style="list-style-type: none"> Descriptive, cross sectional: Quantitative (phone or in person survey interview) 	<ul style="list-style-type: none"> Provider 	<ul style="list-style-type: none"> 1 per school (29 schools)
19. McDermott et al. (2004)	Diabetes Care Improvement program	<ul style="list-style-type: none"> Quasi-experimental (follow-up data from previous cluster trial): Quantitative (hospital records) 	<ul style="list-style-type: none"> Primary healthcare centers Commentary 	<ul style="list-style-type: none"> 3 forms of audit per center (21 centers)

20. MacLean et al. (2012)	Eight projects to address Alcohol and other Drug associated harm	<ul style="list-style-type: none"> • Case study: Quantitative and qualitative (project records, documents, semi-structured interviews) 	<ul style="list-style-type: none"> • Stakeholder (data triangulated to identify elements that continued after funding ceased and factors that influenced sustainability) 	<ul style="list-style-type: none"> • 3 per project (8 projects), 22 total
21. Massatti et al. (2008)	Innovative Mental Health Practices	<ul style="list-style-type: none"> • Descriptive, longitudinal, mixed method: Qualitative and quantitative (open-ended and structured interview) 	<ul style="list-style-type: none"> • Internal and external decision makers • Administrative staff • Staff involved in implementation (qualitative data triangulated with quantitative data at the innovation level of analysis) 	<ul style="list-style-type: none"> • 1-3 per project (12 de-adopted projects), 21 total • 1-6 per project (12 implementer projects), 30 total • 1-3 per de-adopter project (12 projects), 18 total
22. Novins et al. (2013)	Evidence-based practices to improve child and adolescent mental health	<ul style="list-style-type: none"> • Literature review 	<ul style="list-style-type: none"> • Intervention program sustainability 	<ul style="list-style-type: none"> • 8 out of 73 articles drawn from 44 studies

23. Quality Assurance Project and UNICEF / Nicaragua (2006)	Mother and Baby Friendly Health Units Initiative	<ul style="list-style-type: none"> • Descriptive, cross-sectional (simple random sample design): Qualitative (semi-structured key informant interviews, group interviews and focus groups) 	<ul style="list-style-type: none"> • Coordinators and implementers (randomization by health unit clusters) 	<ul style="list-style-type: none"> • 3-9 interviews per health unit cluster (4 clusters), 30 interviews total
24. Savaya et al. (2012)	Programs for children and adolescents, the elderly and persons with special needs	<ul style="list-style-type: none"> • Descriptive, cross-sectional, mixed method: Qualitative and quantitative (survey) 	<ul style="list-style-type: none"> • Project director, organization director, senior professional positions (data collected retrospectively and analyzed at the service delivery project level) 	<ul style="list-style-type: none"> • 1 informant per project (197 projects)
25. Sebotsa et al. (2007)	Iodine-Deficiency Disorders Control Program	<ul style="list-style-type: none"> • Quasi-experimental (cluster design): Quantitative (urine samples) • Descriptive, mixed method: Quantitative and qualitative (interview) 	<ul style="list-style-type: none"> • Women/children • Chairperson (cluster design: the proportion to population size method of sampling was used to select clusters) 	<ul style="list-style-type: none"> • 30/30 for each cluster (31 clusters) • 1 respondent per cluster (31 clusters)

26. Shapiro et al. (2014)	Triple P – Positive Parenting Program without external implementation support for providers	<ul style="list-style-type: none"> • Descriptive (purposeful sampling): Qualitative (interviews) thematic analysis 	<ul style="list-style-type: none"> • Providers (sustainability analysis only included sustainers) 	<ul style="list-style-type: none"> • 69 total (across 9 counties in one state)
27. Spoth et al. (2011)	Family-focused and school-based evidence-based interventions	<ul style="list-style-type: none"> • Experimental: RCT qualitative data (observation) • Descriptive: correlational (observation) 	<ul style="list-style-type: none"> • Community team members and prevention coordinators; • Community observation (examines community team level sustainability of implementation quality) 	<ul style="list-style-type: none"> • 120 total (14 communities) • 1 observation per community (14)
28. Swain et al. (2010)	Practices within the National Implementing Evidence Based Practices Project for people with serious mental illness	<ul style="list-style-type: none"> • Descriptive, mixed method: Qualitative (telephone survey interview, themes) and quantitative (survey) 	<ul style="list-style-type: none"> • Site representatives (program leaders, administrators) and external source (consultant, trainer) <p>(triangulation of data; analysis at site level)</p>	<ul style="list-style-type: none"> • At least 1 for each site (49 sites)

29. Tibbits et al. (2010)	Pennsylvania Commission on Crime and Delinquency's Research-Based Delinquency and Violence Prevention Initiative	<ul style="list-style-type: none"> • Descriptive, cross-sectional: Quantitative (survey) • Descriptive, longitudinal (correlational): Quantitative (survey) 	<ul style="list-style-type: none"> • Intervention representative post-funding sustainability • Agency/school intervention representative (triangulation of data, analysis at intervention level) 	<ul style="list-style-type: none"> • 1 per intervention (67 interventions) • 1 per intervention (15 interventions)
30. Wong et al. (2002)	Community intervention to reduce scabies secondary skin infection with Group A streptococcus	<ul style="list-style-type: none"> • Quasi-experimental (follow-up data from previous study): Quantitative (screening) • Descriptive 	<ul style="list-style-type: none"> • Children screened • Commentary 	<ul style="list-style-type: none"> • 177 children
31. Wright (2009)	Rural primary health care programs	<ul style="list-style-type: none"> • Multiple case study (purposeful sampling): Qualitative (records) 	<ul style="list-style-type: none"> • Sustained programs 	<ul style="list-style-type: none"> • 4 programs

Appendix 2.A References

- Ahluwalia, I. B., Robinson, D., Vallely, L., Giesecker, K. E., & Kabakama, A. (2010). Sustainability of community-capacity to promote safer motherhood in northwestern Tanzania: what remains? *Global Health Promotion, 17*(1), 39-108. doi: 10.1177/1757975909356627
- Aitaoto, N., Tsark, J., & Braun, K. L. (2009). Sustainability of the Pacific Diabetes Today coalitions. *Preventing Chronic Disease, 6*(4), 1-8.
- Amazigo, U., Okeibunor, J., Matovu, V., Zoure, H., Bump, J., & Seketeli, A. (2007). Performance of predictors: Evaluating sustainability in community-directed treatment projects of the African programme for onchocerciasis control. *Social Science & Medicine, 64*(10), 2070-2082. doi: 10.1016/j.socscimed.2007.01.018
- August, G. J., Bloquist, M. L., IEE, S. S., Realmuto, G. M., & Hektner, J. M. (2006). Can evidence-based prevention programs be sustained in community practice settings? The Early Risers' advanced-stage effectiveness trial. *Prevention Science, 7*(2), 151-165. doi: 10.1007/s11121-005-0024-z
- Beidas, R. S., Marcus, S., Aarons, G. A., Hoagwood, K. E., Schoenwald, S. K., Evans, A. C., . . . Mandell, D. S. (2015). Predictors of community therapists' use of therapy techniques in a large public mental health system. *JAMA Pediatrics, 169*(4), 374.
- Boucar, M., Franco, L. M., Sabou, D., Saley, Z., Jennings, L., & Mohan, D. (2011). Sustaining better maternal and newborn care and quality Improvement in Niger: Challenges and successes. Bethesda, MD: University Research Co., LLC (URC).
- Bustamante, R., Hurtado, E., & Zeribi, K. A. (2012). Improving the quality of Guatemala's public health system: A view to institutionalization (pp. 30). Bethesda, MD: University Research Co., LLC.
- Cooper, B. R., Bumbarger, B. K., & Moore, J. E. (2015). Sustaining evidence-based prevention programs: Correlates in a large-scale dissemination initiative. *Prevention Science, 16*(1), 145-157. doi: 10.1007/s11121-013-0427-1
- Edwards, N. C., & Roelofs, S. M. (2006). Sustainability: The elusive dimension of international health projects. *Canadian Journal of Public Health, 97*(1), 45-49.
- Eliason, R. N. (1999). Towards sustainability in village health care in rural Cameroon. *Health Promotion International, 14*(4), 301-306. doi: 10.1093/heapro/14.4.301
- Emukah, E. C., Enyinnaya, U., Olaniran, N. S., Akpan, E. A., Hopkins, D. R., Miri, E. S., . . . Katarbarwa, M. N. (2008). Factors affecting the attrition of community-directed distributors of ivermectin, in an onchocerciasis-control programme in the Imo and Abia states of south-eastern Nigeria. *Annals of Tropical Medicine and Parasitology, 102*(1), 45-51. doi: 10.1179/136485908X252241

- Gaven, S., & Schorer, J. (2013). From training to practice transformation: Implementing a public health parenting program. *Australian Institute of Family Studies*(93), 50-57.
- Gruen, R. L., Elliott, J. H., Nolan, M. L., Lawton, P. D., Parkhill, A., & McLaren, C. J. (2008). Sustainability science: An integrated approach for health-programme planning. *The Lancet*, 372(9649), 1579-1589. doi: 10.1016/S0140-6736(08)61659-1
- Gürtler, R. E., Kitron, U., Cecere, M. C., Segura, E. L., & Cohen, J. E. (2007). Sustainable vector control and management of Chagas disease in the Gran Chaco, Argentina. *Proceedings of the National Academy of Sciences of the United States of America*, 104(41), 16194–16199. doi: 10.1073/pnas.0700863104
- Hodgins, S., Crigler, L., Lewin, S., Tsui, S., & Perry, H. (2013). Scaling up and maintaining effective community health worker programs at scale. 1-18.
- Kay, B. H., Hanh, T. T. T., Le, N. H., Quy, T. M., Nam, V. S., Hang, P. V. D., . . . Ryan, P. A. (2010). Sustainability and cost of a community-based strategy against *Aedes aegypti* in Northern and Central Vietnam. *The American Journal of Tropical Medicine and Hygiene*, 82(5), 822-830. doi: 10.4269/ajtmh.2010.09-0503
- Kitau, R., Tsey, K., McCalman, J., & Whiteside, M. (2011). Adaptability and sustainability of an Indigenous Australian family wellbeing initiative in the context of Papua New Guinea: A follow up. *Australasian Psychiatry*, 19(1), S80-S83. doi: 10.3109/10398562.2011.583050
- Loman, S. L., Rodriguez, B. J., & Horner, R. H. (2010). Sustainability of a targeted intervention package: First Step to Success in Oregon. *Journal of Emotional and Behavioral Disorders*, 18(3), 178-191. doi: 0.1177/1063426610362899
- MacLean, S., Berends, L., & Mugavin, J. (2012). Factors contributing to the sustainability of alcohol and other drug interventions in Australian community health settings. *Australian Journal of Primary Health*, 19(1), 53-58. doi: 10.1071/PY11136
- Massatti, R. R., Sweeney, H. A., Panzano, P. C., & Roth, D. (2008). The de-adoption of Innovative Mental Health Practices (IMHP): Why organizations choose not to sustain an IMHP. *Administration and Policy in Mental Health*, 35(1-2), 50-65. doi: 10.1007/s10488-007-0141-z
- McDermott, R., Tulip, F., & Sinha, A. (2004). Sustaining better diabetes care in remote indigenous Australian communities. *BMJ*, 327(7412), 428-430. doi: 10.1136/bmj.327.7412.428
- Novins, D. K., Green, A. E., Legha, R. K., & Aarons, G. A. (2013). Dissemination and implementation of evidence-based practices for child and adolescent mental health: A systematic review. *Journal of the American Academy of Child and Adolescent Psychiatry*, 52(10), 1009-1025. doi: 10.1016/j.jaac.2014.02.003

- Quality Assurance Project and UNICEF / Nicaragua. (2006). The Nicaragua mother and baby friendly health units initiative: Factors influencing its success and sustainability. In B. R. Burkhalter, I. González, N. Herrera, O. Nunez, S. L. S., & F. I. Sandino (Eds.), (Vol. U.S. Agency for International Development (USAID)). Bethesda, MD: U.
- Savaya, R., & Spiro, S. E. (2012). Predictors of sustainability of social programs. *American Journal of Evaluation*, 33(1), 26-43. doi: 10.1177/1098214011408066
- Sebotsa, M. L. D., Dannhauser, A., Jooste, P. L., & Joubert, G. (2007). Assessment of the sustainability of the iodine-deficiency disorders control program in Lesotho. *Food and Nutrition Bulletin*, 28(3), 337-347.
- Shapiro, C. J., Prinz, R. J., & Sanders, M. R. (2014). Sustaining use of an evidence-based parenting intervention: Practitioner perspectives. *Journal of Child and Family Studies*, 24(6), 1615-1624. doi: 10.1007/s10826-014-9965-9
- Spoth, R., Gyll, M., Redmond, C., Greenberg, M. T., & Feinberg, M. E. (2011). Six-year sustainability of evidence-based intervention implementation quality by community-university partnerships: The PROSPER study. *American Journal of Community Psychology*, 48(3-4), 412-425. doi: 10.1007/s10464-011-9430-5
- Swain, K., Whitley, R., McHugo, G. J., & Drake, R. E. (2010). The sustainability of evidence-based practices in routine mental health agencies. *Community Mental Health Journal*, 46(2), 119-129. doi: 10.1007/s10597-009-9202-y
- Tibbits, M. K., Bumbarger, B. K., Kyler, S. J., & Perkins, D. F. (2010). Sustaining evidence-based interventions under real-world conditions: Results from a large-scale diffusion project. *Prevention Science*, 11(3), 252-262. doi: 10.1007/s11121-010-0170-9
- Wong, L.-C., Amega, B., Barker, R., Connors, C., Dulla, M. E., Ninnal, A., . . . Currie, B. J. (2002). Factors supporting sustainability of a community-based scabies control program. *Australasian Journal of Dermatology*, 43(4), 274-277.
- Wright, B. D. (2009). Care in the country: A historical case study of long-term sustainability in 4 rural health centers. *American Journal of Public Health*, 99(9), 1612-1618. doi: 10.2105/AJPH.2008.146050

Chapter 3

Sustained Implementation Support Scale: Validation of a Measure of Program Characteristics and Workplace Functioning for Sustained Program Implementation

This chapter consists entirely of a manuscript submitted for publication.

Abstract

An evaluation measure of enablers and inhibitors to sustained evidence-based program (EBP) implementation may provide a useful tool to enhance organizations' capacity. This paper outlines preliminary validation of such a measure. An expert informant and consumer feedback approach was used to tailor constructs from two existing measures assessing key domains associated with sustained implementation. Validity and reliability were evaluated for an inventory comprised of five subscales: Program benefits, Program burden, Workplace support, Workplace cohesion and Leadership style. Exploratory and confirmatory factor analysis with a sample of 593 Triple P – Positive Parenting Program practitioners led to a 28-item scale with good reliability, and good convergent, discriminant and predictive validity. Practitioners sustaining implementation at least three years post training were more likely to have supervision/peer support, reported higher levels of program benefit, workplace support and positive leadership style, and lower program burden compared to practitioners who were non-sustainers.

KEY WORDS: Sustained Implementation Support Scale, evidence-based programs, adoption, implementation, sustainability

Sustained Implementation Support Scale: Validation of a Measure of Program Characteristics and Workplace Functioning for Sustained Program Implementation

There is widespread support among leading behavioral health associations and organizations for service providers to deliver parenting and family support interventions that are considered evidence-based programs ([EBPs] e.g., American Psychology Association, United Nations Office on Drugs and Crime, 2010; World Health Organization, 2010). However, treatment effectiveness demonstrated in a controlled scientific trial does not guarantee implementation effectiveness in the real world (Odgen & Fixsen, 2014). It is important to ensure that effective interventions are implemented and sustained in the community long enough to achieve meaningful impact. Failure to sustain implementation of EBPs prevents program objectives from being attained (Goodman & Steckler, 1989; LaPelle, Zapka, & Ockene, 2006), is costly to funders and organizations (Gaven & Schorer, 2013) and detrimental to clients seeking effective services (World Health Organization, 2012). In a review of 19 health-related programs, 60% were found to still exist in the community, in some form, one to six years after adoption; however, authors often did not provide a clear explanation of the factors that led to sustained implementation (Scheirer, 2005).

Most research in this area is theoretical and exploratory in nature. Few high quality empirical studies have examined specific factors that facilitate and limit the sustainability of EBPs (Wiltsey Stirman et al., 2012). To enhance the likelihood of an EBP being sustained, it is important for organizations to use reflective practice and monitor factors that impact sustainability, to identify areas where support can be enhanced and strengthen factors that help reach sustained implementation (Fixsen, Blase, Naoom, & Duda, 2015).

For the purpose of this paper, *sustainability* is defined as the capacity to maintain implementation of EBP components long term; *sustainment* and *sustained implementation* are defined as the maintained implementation of an EBP at least three years past initial training in an EBP. However, the amount of time required to establish effective implementation is likely to vary with the complexity of the intervention or location (Durlak & Dupre, 2008). Historically, diverse research disciplines have had different perspectives and definitions of sustained implementation, resulting in different approaches to conceptualize and investigate program sustainment (Greenhalgh, Robert, Macfarlane, Bate, & Kyriakidou, 2004). Due to a lack of consensus across disciplines, research groups have continued to reinvent the wheel and create new definitions, constructs, frameworks and evaluation methodology (Durlak & Dupre, 2008; Scheirer & Dearing, 2011; Wiltsey Stirman et al., 2012). Recent studies take a multidimensional framework approach and combine successful concepts to improve real world implementation (Aarons, Hurlburt, & McCue Horwitz, 2011; Damschroder et al., 2009; Hodge & Tuner, 2015; Marquez, Silvia, Edward, & Simon, 2014; Meyers, Joseph, & Wandersman, 2012; Sanders, Turner, & McWilliam, 2015).

Research on sustainability involves numerous layers of information gathering to capture the various processes and variables required for a program's successful continuation (Scheirer & Dearing, 2011). The field of implementation science has developed various tools to help guide EBP implementation including: theories (e.g., Diffusion of Innovation Theory [Rogers, 2003]; Organizational Readiness for Change Theory [Weiner, 2009]); various conceptual frameworks (e.g., Reach, Efficacy, Adoption, Implementation and Maintenance [RE-AIM; Glasgow, Vigt & Boles, 1999] framework; NIRN Active Implementation Framework [AIF; Fixsen, Naoom, Blasé, Friedman & Wallace, 2005]); and implementation models (e.g., PROMoting School-community-university Partnerships to Enhance Resilience [PROSPER; Spoth, Greenberg, Bierman & Redmond, 2004] partnership model; TCU Program Change Model [Simpson & Flynn, 2007]). These models, conceptual frameworks, multidimensional frameworks and theories (further referred to as models) are used to predict, describe and explain successful EBP implementation, and subsequently to inform thinking and action about the uptake of EBPs (Ilott, Gerrish, Laker, & Bray, 2013). Empirically, however, rigorous evaluation of implementation models is needed to understand how implementation factors interact in real world settings.

Implementation models share several core themes (Meyers et al., 2012): they describe specific stages for adoption, implementation and sustained implementation (Aarons et al., 2011) influenced by variables at multiple levels (i.e. program, practitioner, organization, community, funder; Proctor et al., 2009) with an emphasis on stakeholder (or program adopter) involvement through partnerships or other participatory approaches (Spoth, Gyll, Redmond, Greenberg, & Feinberg, 2011). However, each model has key components that are emphasized over others and much of this is descriptive and anecdotal, lacking evaluation of the key sustainment constructs (Scheirer & Dearing, 2011).

Implementation evaluations are complex and it is often viewed as methodologically difficult to conceptualize implementation constructs and uncontrollable confounding factors in real world implementation (Fixsen et al., 2015; Greenhalgh et al., 2004). Yet, advancing implementation research is the key for transporting programs from the laboratory to the community for families who will actually benefit from program development and efficacy research (Proctor et al., 2009). To move forward in this relatively new and challenging field, empirical studies are required that articulate and advance the measurement of constructs that impact successful implementation (Feldstein & Glasgow, 2008; Schell et al., 2013). Part of the conceptualization issue is acknowledging implementation effectiveness and outcomes as conceptually and empirically distinct from treatment effectiveness and outcomes (Odgen & Fixsen, 2014; Proctor et al., 2011). That is, intervention failure (the intervention is ineffective in the new setting) versus implementation failure (an effective intervention is deployed incorrectly). Although lacking robust methodological and

empirical evaluation to date (Greenhalgh et al., 2004; Wiltsey Stirman et al., 2012), navigation of the stages of EBP implementation requires a better understanding of the challenges and facilitators specific to sustained program implementation in the field (Armstrong et al., 2008; Hodge & Turner et al., 2015).

The development of a measure that assesses factors for sustained program implementation is needed for organizations and implementation researchers to monitor practitioner and organization sustainment capacity in a new setting, and adapt implementation supports accordingly (Feldstein & Glasgow, 2008; Southam-Gerow, Arnold, Rodriguez, & Cox, 2014). These factors are commonly referred to as ‘inner’ context factors, which are variables within an organization or agency that impact implementation (Aarons et al., 2011). Routine stage-based performance assessments of inner context factors that commence before implementing a program and continue throughout the adoption, implementation and sustained implementation stages, enables the assessment and feedback processes and improves implementation success (Feldstein & Glasgow, 2008; Fixsen, Blase, Naoom, & Van Dyke, 2010). Several common inner context factors have been proposed to contribute to sustained implementation (Aarons et al., 2011). These fall into two main categories: *program* characteristics as perceived by implementers within the organization, and characteristics of the *organization* itself (Aarons et al., 2011; Brown, Feinberg, & Greenberg, 2012; Savaya & Spiro, 2012).

In relation to *program* characteristics, professionals are more likely to have positive attitudes toward adopting an EBP if it is intuitively appealing and if the professional is required to adopt (Aarons, 2004). Implementation is more likely if professionals believe it enhances the service they provide (Rogers, 2003), yields some relative advantage compared to other methods of working with clients (Bartholomew, Parcel, Kok, Gottlieb, & Fernandez, 2011; Goodman & Steckler, 1989), is endorsed by respected colleagues (Cohen, Sargent, & Sechrest, 1986; Cook, Schnurr, Biyanova, & Coyne, 2009), and the program presents little burden (Feldstein & Glasgow, 2008). EBPs that are appealing to the implementer (Reding, Chorpita, Lau, & Debbie, 2014) *and* align with organization productivity requirements are more likely to be implemented long term (Shapiro, Prinz, & Sanders, 2014).

While both individual and organizational factors can impact the extent of compliance with requirements and sustained program implementation (Glisson, 2002), sustainment is potentially more strongly influenced by organizational factors (Beidas et al., 2015). Key *organization* characteristics linked to successful implementation can create a positive sustainment climate, including practices and processes that demonstrate what is expected, supported and rewarded in an organization (Aarons et al., 2014; Ehrhart, Aarons, & Farahnak, 2014; Jacobs, Weiner, & Bunger, 2014) by both management and co-workers (Aarons, Sommerfeld, & Walrath-Greene, 2009).

Workplace cohesion can support a positive sustainment climate by establishing congruence between the EBP and organization goals and mission (Gruen et al., 2008), ensuring staff awareness of the goals and mission (Simpson, 2002), and focusing on workgroup trust and methods of resolving disagreements (Lehman, Greener, & Simpson, 2002). Also important is leadership style (Edmondson, 2003), such as the ability to empower staff, establish consensus, have a clear vision for the team and have respect from the community (Brown et al., 2012). Programs are more likely to be sustained in organizations that have leaders who communicate clear goals to frontline staff (Mancini & Marek, 2004) and establish a workplace climate that is motivating and promotes effective staff interaction (Schneider, Ehrhart, Mayer, Saltz, & Niles-Jolly, 2005).

Supervisor support for a program has long been assumed the primary influence on an organization's climate for implementation (Van de Ven, Douglas, Garud, & Venkataraman, 1999), but the level of support from supervisors for implementing a practice is a new factor in implementation research (Aarons et al., 2009). The characteristics of adequate supervision are often not understood or sustained and many supervisors lack the knowledge, skills and tools for effective supervision (Marquez & Kean, 2002; Spence, Jill, Kavanagh, Strong, & Worrall, 2001). Involving the broader workforce in supervision (i.e., both supervisors and peer colleagues) can reduce workload for supervisors, promote practitioner self-regulation and skill development, and build organization capacity (Turner & Sanders, 2006). Therefore, some EBPs promote supervision models with peer-led supervision and support groups (Marquez & Kean, 2002; Matthew R. Sanders & Turner, 2005). Ongoing supervision that allows time to practice program delivery skills, review clinical cases and receive feedback can prevent burnout and improve program delivery confidence and fidelity (Beidas & Kendall, 2010; Pallas, Minhas, Pérez-Escamilla, Taylor, Curry & Bradley, 2013; Sanders & Turner, 2005).

Developing organization capacity is crucial for long-term program implementation, and success requires a number of program and organizational interactions to be considered and monitored. To our knowledge, there is no single discrete, valid and reliable measure available to monitor program sustainability constructs. A systematic review of 62 implementation measures developed to assess predictors of EBP implementation, revealed limited demonstration of criterion validity or reliable association with an implementation outcome (e.g., adoption, fidelity, penetration or sustainability; Chaudoir, Dugan, & Barr, 2013). In fact, there is limited evidence of reliability and validity for most measures of organizational factors that impact adoption, implementation or sustainment of programs (Emmons, Weiner, Fernandez Eulalia, & Tu, 2012; Weiner, Amick, & Lee, 2008). A recent review of organizational-level constructs that impact dissemination and implementation found that no measure was used in more than one study, many studies did not report the psychometric properties of measures, some assessments were based on a single response

per unit, and the instrument and theory did not always match up (Emmons et al., 2012). The most comprehensive review of all dissemination and implementation science (DIS) instruments ($n = 420$) and constructs ($n = 48$) found a vast contribution of measures ($n = 391$) emerging from the field of psychology (Lewis et al., 2015). A measurement evaluation system was developed within this study and, using this system, a preliminary analysis of DIS measures concluded that the instrument development and psychometric properties of DIS instruments are weak at best.

Of the implementation measures available, most assess aspects of implementation other than program sustainment, such as program acceptability (e.g., Ottawa Acceptability of Decision Rules Instrument; Brehaut et al., 2010); adoption (e.g., Smoking Cessation Protocol Adoption Survey; Bolman, de Vries, & Mesters, 2002); program appropriateness (e.g., Parenting Strategies Questionnaire; Whittingham, Sofronoff, & Sheffield, 2006); penetration (Level of Institutionalization Scale; Steckler, Goodman, McLeroy, Davis, & Koch, 1992); and feasibility (e.g., Measure of Disseminability; Trent, 2010). In order to address the call for development and evaluation of robust measures of sustained EBP implementation capacity (Chaudoir et al., 2013; Schell et al., 2013), there is a need to assess the multiple factors that impact implementation processes and the transition from implementation to sustained implementation (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005). Two measures of program sustainability were identified: the Program Sustainability Index (Mancini & Marek, 2004) and the Sustainability Model and Guide originally developed by the NHS Institute for Innovation and Improvement (Maher, Gustafson, & Evans, 2007). Both are promising measures; however, to our knowledge, neither has been tested to determine criterion validity and reliable association with program sustainment, nor do they include all inner context factors purported to be key to sustained implementation (i.e. program appeal and burden, requirements of program delivery, workplace cohesion and unity, and co-worker support for program delivery).

The large number of implementation models that highlight program sustainment as the outcome, and the lack of valid assessment tools to evaluate factors that influence sustainment, suggests a need to bring together the literature to create a measure of factors that impact long-term implementation. The present study sought to fill this gap by validating a practitioner self-report measure, the Sustained Implementation Support Scale (SISS). The SISS builds on others' work in evidence-based delivery systems (Spoth, Greenberg, Bierman, & Redmond, 2004), "inner" organization context factors (Aarons et al., 2011), measures of implementation to assess best practice (Fixsen et al., 2015) and diffusion of innovation (Rogers, 2003). The SISS is a measure of internal organizational context for program implementation at the level of the practitioner and the organization employing the practitioner. It can be used by organizations to monitor the portion of ecological context that involves key program and workplace variables during the initial program

implementation phase with a view to supporting sustained implementation. The measure categorizes variables into five domains: Program benefits; Program burden; Workplace support; Workplace cohesion and Leadership style.

The present study aimed to: 1) apply principles of measure development as outlined by Cohen and colleagues (Cohen, Swerdlik, & Sturman, 2013) to create a brief, user-friendly implementation sustainability measure; 2) identify the factor structure of this measure via exploratory factor analysis (EFA); 3) determine the construct validity (including the convergent and discriminant validity) of the measure via confirmatory factor analysis (CFA); 4) determine internal consistency of the scale; 5) explore the predictive validity of the measure by 5a) evaluating the predictors of sustained program implementation three years or more after program training and 5b) evaluating supervision and peer support as a moderator between the constructs measured by the SISS and sustained program implementation. Based on a literature review of the factors that impact program sustainability, it was predicted that having access to supervision and peer support (Beidas & Kendall, 2010), higher levels of perceived Program benefits (Rogers, 2003), Workplace support (Aarons et al., 2009; Klein, Conn, & Sorra, 2001), Workplace cohesion (Gruen et al., 2008) and Leadership style (Edmondson, 2003) and lower levels of Program burden (Feldstein & Glasgow, 2008) would be associated with increased likelihood of sustained program implementation three years or more after program training. In addition, it was predicted that supervision and peer support would moderate the relationship between the constructs measured by SISS (program characteristics and organizational characteristics) and sustained program implementation, by enhancing the impact of these constructs on the likelihood of program implementation.

To evaluate the measure, this study involved practitioners already trained in an EBP, the Triple P – Positive Parenting Program (Sanders, 2012), which is a parenting and family support intervention system backed by over 30 years of empirical evidence (Sanders, Kirby, Tellegen, & Day, 2014). The Triple P system of support is designed to prevent, as well as treat behavioral and emotional problems in children and teenagers by enhancing the knowledge, skills and confidence of parents to manage family issues. A recent meta-analysis of 101 randomised controlled trials (involving 16,099 families) evaluating different variants and delivery formats showed Triple P to be effective when delivered in group, individual, telephone-assisted and self-directed formats, and in culturally and linguistically diverse contexts (Sanders et al., 2014). Over the years, a dissemination approach has evolved for Triple P that now includes implementation support processes. The approach includes engagement, commitment and contracting, implementation planning, training and accreditation, and implementation and maintenance phases (Sanders et al., 2015). Earlier work has identified the importance of practitioner self-efficacy, and program supports and barriers on program implementation six months following training (Turner, Nicholson, & Sanders, 2011). The

current evaluation is the first to gather quantitative information from practitioners in the maintenance phase, three years or more after training.

Method

Sample Characteristics

Data were collected from an international convenience sample recruited through an online network of accredited Triple P practitioners to complete two surveys: The Training Preferences Survey, reported elsewhere (Turner, Sanders, & Hodge, 2014), and the SISS (*Note*. The surveys were available in English). Participants were 592 practitioners trained between 1996 and 2012 who responded to the online survey. The majority were female ($n = 550$, 92.9%), and from English-speaking countries ($n = 517$; 90%): Australia ($n = 204$, 34.5%), Canada ($n = 149$, 25.2%), United Kingdom ($n = 104$, 17.6%), United States ($n = 75$, 12.7%), New Zealand ($n = 12$, 2.0%), Barbados ($n = 1$, <1%) and Ireland ($n = 1$, <1%), with the remaining from, Belgium ($n = 2$, <1%), Germany ($n = 12$, 2.0%), Netherlands ($n = 30$, 5.1%), Romania ($n = 1$, <1%) and the United Arab Emirates ($n = 1$, <1%).

The professional sectors represented were psychology, education, health, allied health, child protection and child welfare. There was a spread of educational attainment: 412 (69.9%) had a university degree or higher, 155 (26.2%) had completed a trade or technical college qualification, and 21 (3.9%) had completed high school or less. Seventy-seven (13%) were supervisors of staff that were using Triple P. The practitioners were trained in 20 different program variants of Triple P with the highest numbers trained in Level 4 Group Triple P (52.4%; Turner, Markie-Dadds, & Sanders, 2010) and Level 3 Primary Care Triple P (33.8%; Turner, Sanders, & Markie-Dadds, 2010). The majority of the sample had implemented Triple P after program training ($n = 529$; 89.4%) or were getting ready to start ($n = 37$; 6.3%). Of those practitioners who completed the survey, about half had *used* Triple P in the last four weeks ($n = 345$; 58.7%) and 32.9% ($n = 195$) had *completed* Triple P with families in the last four weeks. On average, practitioners estimated that they had used Triple P with six families in the last month and had completed Triple P with an average of four families.

Measures

Demographics. Brief demographic information collected included gender, age, profession, education, country of residence, cultural identification, Triple P training level/s and date of training. Also, a series of questions were asked regarding previous and current program use.

The Sustained Implementation Support Scale. The SISS was compiled as a 40-item measure assessing five categories of common barriers and enablers of sustained program implementation: Program benefits (11 items), Program burden (4 items reverse scored), Workplace support (9 items), Workplace cohesion (8 items), and Leadership style (8 items). Items were drawn

and adapted where necessary (with permission) from scales used in the PROSPER Community–University Partnership evaluation (33 items: Program benefits, Program costs, Agency characteristics, Team cohesion and Leadership style, and Leadership competence scales; Brown et al., 2012); and the Evidence-Based Practice Attitude Scale: (7 items: Appeal and Requirements subscales; Aarons, 2004). These scales were selected because they measure important influences on continued program use identified in the literature as described in the introduction (Hodge & Tuners, 2015), include key inner context factors measured at the practitioner (program) and team (organization) level (to match the theory), and have adequate to good internal consistency (Aarons, 2004; Aarons et al., 2011; Brown et al., 2012; Feinberg, Chilenski, Greenberg, Spoth, & Redmond, 2007). They were originally developed to measure coalition functioning, and program appeal and requirement, respectively, as supports that influence EBP implementation and this study checks how they hang together when measuring continued implementation. Expert knowledge was sought from evidence-based implementation researchers at The University of Queensland’s Parenting and Family Support Centre, family support managers and Triple P practitioners to tailor the measure. Their input included selection of appropriate items from identified relevant pre-existing measures, and evaluation and revision of items to include language specific for family support professionals working in child welfare, to reference program and organization functioning during implementation rather than readiness to implement, and to match the EBP that participants were trained in (Triple P), although the measure could be used for any program. Items are rated on 4-point Likert scales. For each subscale of the SISS, the items are summed to provide total subscale scores, with higher scores indicating higher levels of perceived program benefits and positive workplace functioning. The original pool of 40 items is included in an Appendix.

Sustained program implementation. Sustained program implementation (a measure of program use), was assessed with the question “*With how many families have you completed Triple P in the last 4 weeks that you worked?*” (an estimate was provided; Shapiro, Prinz, & Sanders, 2012) The main outcome variable is whether or not the practitioner had sustained program implementation three years after training, coded as 0 (has not completed Triple P with parents in the last 4 weeks) or 1 (has completed Triple P with parents in the last 4 weeks). Program completion was used as the criterion instead of program use, as a measure of successfully bringing clients through the core content of the program.

Supervision and peer support. Supervision and peer support within the workplace were assessed with one item: “*Since Triple P accreditation, please tell us the average number of hours per month you have spent carrying out supervision and peer support (including face-to-face and telephone contact).*” Time dedicated to peer support and supervision was rated using a 7-point Likert scale (1= 0 hours, 7= more than 20 hours). Given little variability of the scores, they were

recoded as a dichotomous variable: 0 (has not received supervision or peer support since program training) or 1 (has received supervision or peer support since program training).

Procedure

The following steps were taken in designing the measure: definition of constructs; review of existing measures; generation of initial item pool; and input and feedback from organization managers and practitioners. An invitation to complete the SISS was emailed to the Triple P Provider Network in December 2012. The survey was open for 3 months and participants were offered the chance to go into a draw to win an iPad for completing the survey.

Statistical Analyses

Construct validity. First, an EFA was conducted in Mplus ([Muthén & Muthén, 1998-2012](#)) version 7.1 to identify the factor structure for the scale. Although a five-factor structure was hypothesized, EFA was conducted first due to the lack of previous exploration of the measure. We used the robust full-information maximum likelihood method or FIML (correlation fitting factoring method) for the estimation of common factor method. Maximum likelihood approach to factor analysis offers the advantage over Principal Components Analysis (PCA) or Principal Axis Factor Analysis (PAF) as it acknowledges the data as they are (i.e. distribution assumptions), provides accurate estimation of standard errors and allows to statistically evaluate the hypotheses that there are a certain number of factors that explain the relationships among items (Schmidt, 2011). In addition, the application of robust FIML approach accounted for deviation from normal distribution assumptions and missing data points (See Analysis section). The GEOMIN (oblique) factor rotation was chosen to increase interpretability of the factors while also allowing the factors to correlate. The number of factors was determined using the scree plot, the comparison of fit indices, as well as the conceptual meanings behind the factors. Items with a factor loading $> .45$ were considered as part of the factor (Stevens, 2002). In the next step the factor structure revealed through EFA was analysed via CFA to confirm its validity.

For both EFA and CFA, robust maximum likelihood estimator (MLR) was employed as it produces standard errors and fit indices that are robust in relation to non-normality of observations (Satorra & Bentler, 1994). The scaled chi-square (χ^2) statistic, the comparative fit index (CFI), the root mean square error of approximation (RMSEA) with 90% confidence interval, and the standardized root mean square residual (SRMR)^a were used to test model fit. For fit to be acceptable, RMSEA and SRMR should be $< .08$ with CFI $> .90$ ([Browne & Cudeck, 1989](#); [Hu & Bentler, 2009](#)).

The assessment of construct validity included investigation of the convergent and discriminant validity (Churchill, 1979) of the factor structure. Three standard approaches were applied to assess the convergent validity: 1) evaluate the statistical significance and magnitude of

factor loadings for each latent construct (Gerbing & Anderson, 1988); 2) check that the estimate is above .50 for the Average Variance Extracted (AVE)^b that is shared between the construct and its measure (Fornell & Larcker, 1981) ‘within’ construct measure of convergent validity; and 3) test that estimates were $>.70$ for composite reliability (CR, ‘between’ constructs measure of convergent validity; Fornell & Larcker, 1981).

Three standard techniques to assess the discriminant validity were also employed: 1) examine that the correlation between the latent constructs is not close or equal to the value of 1.00; 2) apply the χ^2 difference test (Bollen, 1989)^c using the scaled chi-square and formulas developed by Satorra and Bentler (Satorra & Bentler, 1994); and 3) assess if AVE for each construct are higher than to the shared variance between the constructs (the squared inter-construct correlation estimate (SIC; Fornell & Larcker, 1981).

Predictive validity. The predictive validity of the SISS was assessed by examining the associations between the constructs measured by the scale and supervision and peer support with sustained program implementation (i.e. including only practitioners who were trained at least three years prior to the survey: between 1996 and 2009). Because the dependent variable in the model was binary (sustained program implementation), multiple logistic regression models were conducted in SPSS v.21 to evaluate the hypothesized associations. In the first step, the predictive effects of SISS constructs were evaluated as well as supervision and peer support on sustained program implementation. To avoid multicollinearity issues, predictors measured by SISS were centered on the mean (Afshartous & Perston, 2011).^d The second set of analyses assessed the moderating effects of supervision/peer support on the associations between SISS constructs and sustained program implementation. The interaction terms were created by multiplying supervision and peer support by each construct of SISS.

Reliability. Internal consistency of the SISS was examined using Cronbach’s α coefficient computed in SPSS v.21. Values $>.70$ are considered good and $>.80$ as very good indicators of internal consistency (De Vaus, 2002).

Results

Data screening

Seven hundred and seventy-seven practitioners responded to the survey. Of these, 44 only provided demographic information and did not complete any items of the SISS, and a further 140 practitioners completed less than 40% of items on the SISS and therefore did not provide enough information to be included in the analyses (Bentler, 2006). This resulted in a total sample of 592 respondents with 0.62% data missing. Little's MCAR test indicated that the data were missing completely at random, $\chi^2(3623) = 3683.13, p = .24$. To conduct EFA and CFA, the Mplus full information maximum likelihood (FIML) procedure was applied to account for missing data. When evaluating associations between the constructs, Multiple Imputations procedure with five imputations was applied.^e Both FIML and multiple imputations are considered the most efficient methods for handling missing data, when the data is at least MAR. (Enders, 2010)

When conducting both a CFA and EFA it is not appropriate to use the same sample of participants for the two different factor analyses (Van Prooijen & Van der Kloot, 2001). Therefore, the data file was randomly split into two samples to conduct EFA ($n = 292$) and CFA ($n = 300$).

Exploratory Factor Analysis. The Kaiser-Meyer-Olkin Index (.89) and Bartlett's Test of Sphericity $\chi^2(1035) = 7537.42, p < .001^f$ indicated very good factorability of the correlation matrix. The examination of the scree plot suggested a five-factor solution, which matched the literature discussed earlier. To determine whether a five-factor solution was the optimal one, we tested six models in Mplus, each with a higher number of hypothesized latent factors (from 1 to 6) and examined which model offered the most parsimonious solution with acceptable fit as well as conceptually and theoretically coherent and meaningful factor structure (See Table 3.1). None of the tested models showed excellent fit according to CFI and chi-square statistics. The six-factor model revealed better fit to the data than the other models, however the last factor had only two items with loadings meeting the threshold of $> .45$ and it is recommended that a factor should have at least three indicators (Child, 1990; Stevens, 2002). In addition, our evaluation of the item content suggested that the last factor could not be meaningfully interpreted. The five-factor solution showed worse fit to the data compared to the six-factor model, however it offered more parsimonious and meaningful solution, with each factor having at least three indicators with factor loadings meeting the threshold of $> .45$. Furthermore, the five factor solution was strongly supported by existing literature. Therefore, a five-factor solution was chosen as the best representation of the data.

The examination of factor loadings indicated that several items did not have standardized loadings above the recommended threshold of $> .45$ on any factor. These items were removed from the scale. One item (item 8; "What balance of costs and benefits have you experienced personally from your involvement with the program?") was removed from the Program burden subscale.

Table 3.1

Exploratory Factor Analysis of the Factor Structure of Sustained Implementation Support Scale

Model	χ^2	df	CFI	SRMR	RMSEA	RMSEA 90% CI	AIC	BIC
One-factor solution	4171.80***	740	.436	.127	.126	.122-.130	25120.12	25561.34
Two-factor solution	3239.64***	701	.583	.094	.111	.108-.115	24073.29	24657.89
Three-factor solution	2795.55***	663	.649	.080	.105	.101-.109	23613.83	24338.51
Four-factor solution	2398.12***	626	.709	.068	.098	.094-.103	23255.42	24115.77
Five-factor solution	1799.44***	590	.801	.054	.084	.079-.088	22689.76	23682.48
Six-factor solution	1330.57***	555	.872	.038	.069	.064-.074	22261.17	23382.56
Five-factor structure (with 12 items removed)	523.16***	248	.935	.029	.062	.054-.069	14238.04	14291.92

Note. χ^2 = Satorra-Bentler scaled chi-square, *df* = degrees of freedom, CFI = comparative fit index, SRMR = standardized root mean square residual, RMSEA = root mean square error of approximation, CI = confidence interval, AIC = Akaike's information criterion, BIC = Bayesian information criterion. All models based on $N = 292$.

*** $p < .001$

It describes the balance between both Program burden and Program benefits, which may explain why the item did not load significantly on any of the factors. Seven items (items 16–22) intended to measure perceived program appeal and required implementation (from EBPAS; Aarons, 2004) did not load significantly on any of the factors (See Appendix A for individual items). These items may be more pertinent at the adoption phase than the implementation or sustainment phase. Four items were removed from the Workplace cohesion subscale (items 23, 24, 26, 29). They describe team goals and governance, and general efficiency, which may be less directly related to program implementation from the perspective of an individual practitioner.

The revised five-factor structure (presented in Table 3.2) showed good fit to the data [$\chi^2(248) = 523.16, p < .001$; CFI = .935; SRMR = .029; RMSEA = .062 90% CI (.054 - .069)]. As Table 3.2 shows, each factor had an eigenvalue greater than 1 (9.72, 3.38, 2.26, 1.97 and 1.78 for factors 1 to 5, respectively) and all the items had significant and meaningful loadings on the designated factors (ranging from .50 to .93). Correlations between the factors are presented in Table 3.3, indicating both oblique (moderate correlations ranging from .32-.56) and orthogonal relationships (non-significant correlations) between the factors.

Table 3.2

Final Factor Structure of Sustained Implementation Support Scale. Results of the Exploratory Factor Analysis with MLR Estimator and Geomin (Oblique) Rotation

	Factor				
	1	2	3	4	5
<i>Program benefits</i>					
1. Benefits from learning new professional skills	.50	.16	.01	.06	-.11
2. Benefits from feeling personally fulfilled in working to improve your community	.61	.19	-.05	.02	-.02
3. Benefits from networking with professionals	.79	.00	.04	-.04	.13
4. Benefits from gaining support from others in your community for your work	.89	-.02	.00	.02	.01
<i>Program burden</i>					
5r. Interference with work schedule and responsibilities	-.01	-.02	.50	-.12	.11
6r. Interference with family life	-.01	.00	.93	.03	-.03
7r. Interference with personal free time	.03	.00	.86	.00	-.02
<i>Workplace support</i>					
9. Staff in my organization are supportive of offering the program for parents in the community	-.07	.76	-.01	.05	.01
10. My supervisor is supportive of offering the program for parents in the community	-.02	.89	.00	-.05	.03

11. My supervisor and organization support collaboration with other community services around the program	.16	.66	.07	-.03	.12
12. My organization commits resources to planning and providing the program	-.03	.68	.00	.01	.14
13. My work with the program is viewed positively by my supervisor	.01	.86	.00	.00	.06
14. My work with the program is viewed positively by my co-workers	.04	.60	-.06	.29	-.07
15. While working on the program, I am able to rely on my co-workers for ideas and support	.08	.53	.00	.31	-.13
<i>Workplace cohesion</i>					
25. There is a sense of unity and cohesion in this team	-.03	.01	-.02	.86	.03
27r. There is not much group spirit among team members	-.17	.05	.15	.57	.01
28. There is a strong feeling of belonging in the team	.02	-.01	-.03	.83	.09
30. Members of this team feel close to each other	.07	-.06	-.04	.83	.01
31. This is a decision making team	.01	-.01	.02	.62	.16
32r. This team has a hard time resolving conflicts	-.16	.12	.09	.56	.03
<i>Leadership style</i>					
33. Leadership makes you feel welcome at meetings	-.03	.15	.01	.15	.63
34. Leadership gives praise and recognition	.06	.03	-.01	-.07	.87
35. Leadership intentionally seeks out your views	-.02	-.02	-.01	-.01	.81
36. Leadership asks you to assist with specific tasks	-.03	-.01	-.05	-.02	.79
37. Leadership makes an effort to get to know workers	-.02	-.04	-.01	.11	.84
38. Leadership has a clear vision for the team	.07	.02	.01	.02	.79
39. Leadership is respected in my community	-.01	.08	-.02	.07	.70
40. Leadership is skilful in resolving conflict	.03	.01	.03	.14	.73
Eigenvalue	9.72	3.38	2.26	1.97	1.78

Note. Coefficients $\geq .45$ are in bold

Table 3.3

Geomin Factor Correlations (Pearson Correlations Among Latent Factors)

Factor	1	2	3	4
1				
2	.32*			
3	-.02	.03		
4	.09	.35*	-.02	
5	.06	.43*	.04	.56*

* $p < .05$

Confirmatory Factor Analysis. The factor validity of the five-factor 28-item model obtained via EFA was analyzed via CFA using the second subsample of the data. Results of EFA indicated that only four out of ten inter-factor correlations were significant. Nevertheless, while conducting CFA we specified correlations between all the latent constructs to be estimated in order to obtain accurate estimates of these relationships and use them consequently to evaluate discriminant validity of the obtained factor structure (calculation of SIC values). The model showed good fit to the data [$\chi^2(340) = 736.27, p < .001$; CFI = .914; SRMR = .053; RMSEA = .062 90% (CI .056 - .068)]. The graphic representation of this final model is presented in Figure 3.1.

Convergent and Discriminant Validity of the Factor Structure. For the convergent validity of the SISS, all the indicators had significant loadings on the factors they were specified to measure (See Figure 3.1). The AVE estimates for Program benefits, Program burden, Workplace support, Workplace cohesion and Leadership style were above the cut-off value of .50 (.55, .63, .65, .54, and .68 respectively). Also, the Composite Reliability (CR) estimates for the five subscales were satisfactory (.82, .83, .93, .86 and .95). For the discriminant validity, the inter-correlations between the factors were low (See Figure 3.1) and the chi-square difference tests provided strong evidence for discriminant validity of the constructs (See Table 3.4). The comparison of AVE estimates with SIC estimates are presented in Table 3.5. The comparisons further indicated good discriminant validity of the five subscales.

Table 3.4

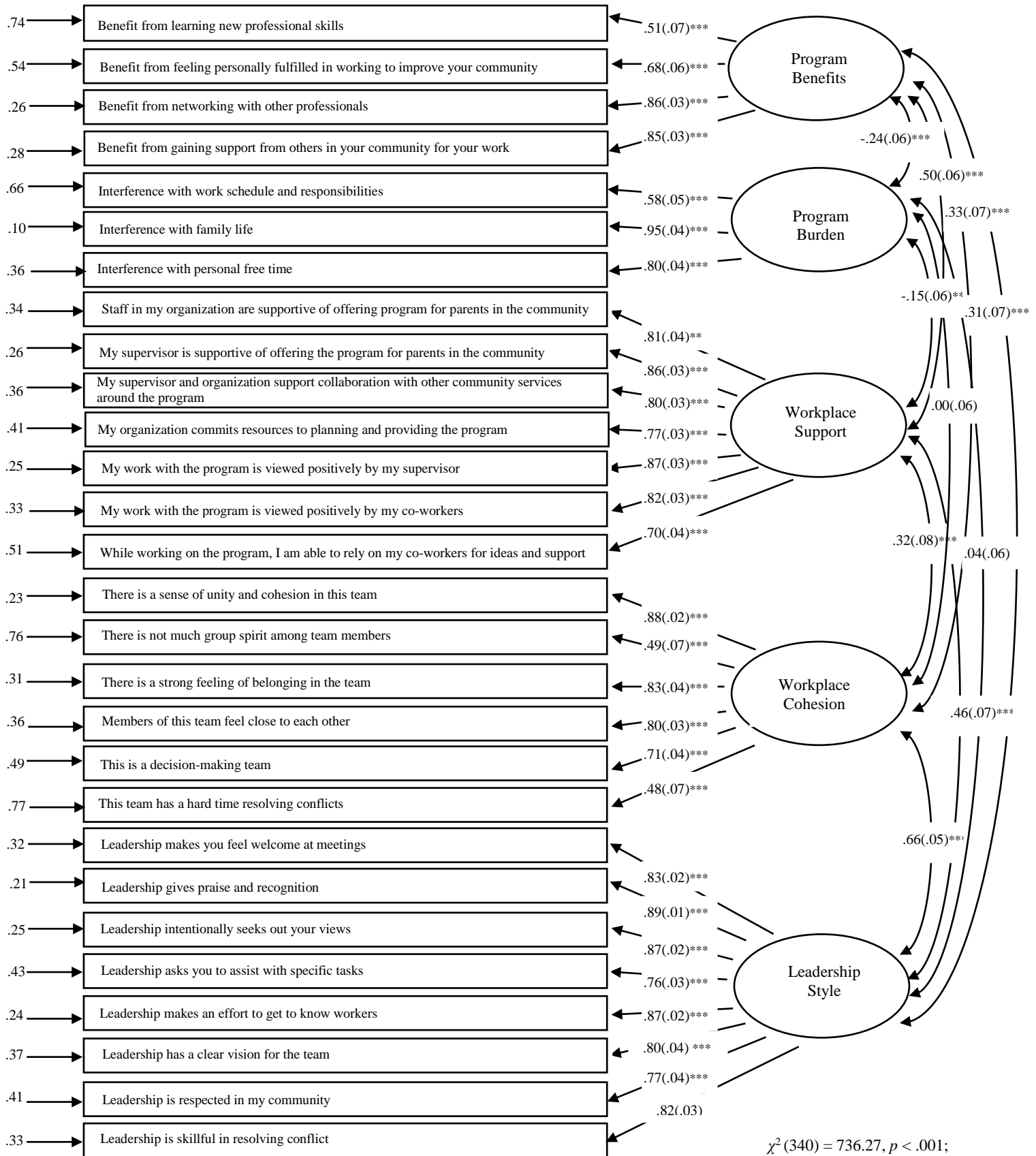
Wald Test of Parameter Constraints – the Comparison of Free Estimated Model with the Constrained Ones

Constrained covariance	df	Wald test
Program benefits with Program burden	1	3296.39***
Program benefits with Workplace support	1	1149.08***
Program benefits with Leadership style	1	1719.82***
Program benefits with Workplace cohesion	1	1432.99***
Program burden with Workplace support	1	2299.20***
Program burden with Leadership style	1	1955.54***
Program burden with Workplace cohesion	1	1425.82***
Workplace support with Leadership style	1	459.66***
Workplace support with Workplace cohesion	1	519.86***
Workplace cohesion with Leadership style	1	263.08***

Note. *df* = degrees of freedom; ****p* < .001

Figure 3.1

Five-factor 28-item model of SISS obtained via Confirmatory Factor Analysis. Standardized estimates.



***p < .001; **p < .01; standard errors presented in brackets

$\chi^2(340) = 736.27, p < .001$;
CFI = .914; SRMR = .053;
RMSEA = .062 (90% CI .056 - .068)

Table 3.5

Average Variance Extracted Estimates as Compared with Squared Intercorrelation Estimates for the Sustained Implementation Support Scale

SISS	AVE	SIC
Program benefits	.55	.06, .25, .12, .10
Program burden	.63	.06, .02, .00, .00
Workplace support	.65	.25, .02, .10, .21
Workplace cohesion	.51	.10, .00, .21, .43
Leadership style	.68	.11, .00, .10, .43

Note. AVE = Average Variance Extracted, SIC = Squared Inter-construct Correlation.

Reliability. The five subscales showed very good internal consistencies, with Cronbach's α of: .91 (Total Score), .82 (Program benefits), .81 (Program burden), .92 (Workplace support), .85 (Workplace cohesion) and .94 (Leadership style).

Predictive validity. In the first step, Spearman rho correlations were evaluated between the SISS variables (Program benefit, Program burden, Workplace support, Workplace cohesion and Leadership style), supervision and peer support, and sustained program implementation (See Table 3.6). The correlations were computed in SPSS v. 21 using composite scores (observable variables). The results indicated that Program benefit, Program burden, Workplace support and Leadership style as well as supervision/peer support were significantly related to sustained program implementation. As predicted, practitioners, who reported sustained implementation, reported higher levels of Program benefit, Workplace support, supervision and peer support, better Leadership style and lower Program burden as compared with practitioners who did not sustain implementation. The relationship between Workplace cohesion and sustained implementation was not significant.

In the second step, multiple logistic regression models were tested to evaluate the predictive validity of SISS constructs. Two models were evaluated. The first model tested the hypothesis that supervision/peer support and the Program benefits, Workplace support, Workplace cohesion and Leadership style would be positively associated, and the Program burden would be negatively associated with sustained implementation. The analyses indicated that the Program burden scale (i.e. program interferes with work schedule and responsibilities, personal free time or life) significantly predicted sustained implementation (See Table 3.7). For each additional difficulty to using the program, respondents were .87 times less likely to report sustained use of the program [OR = .88, 95% CI (.784 – .978), $p < .05$]. The combined set of predictors explained between 8.3% – 8.9%^e (Cox and Snell R^2) of the variance in sustained program implementation.

Table 3.6

Spearman Rho Correlations between Constructs Measured by Sustained Implementation Support Scale, Supervision and Peer Support and Sustained Implementation. Correlations Obtained Using Composite Scores.

	1	2	3	4	5	6	7
1. SISS Program benefit	---						
2. SISS Program burden	-.13*	---					
3. SISS Workplace support	.39**	-.10	----				
4. SISS Workplace cohesion	.14*	.12*	.40**	---			
5. SISS Leadership style	.23**	.06	.48**	.55**	---		
6. Supervision and peer support	.24**	-.12*	.32**	.07	.14*	---	
7. Sustained implementation	.26**	-.22**	.23**	.01	.12*	.21**	---

Note. Correlation coefficients were pooled across five imputed samples using Rubin's rules for Multiple Imputations (1987). It has to be noted that the associations between the five scales of SISS are different as compared to the correlations obtained via EFA and CFA. The reason for it is that correlations between SISS factors presented in Table 3.3 and Figure 3.1 were obtained using latent factors, whereas correlations presented in Table 3.6 were obtained using composite scores (observable variables). Estimation of associations using composite scores does not allow to decompose true score variance from error variance therefore the effect sizes can be attenuated by measurement error. * $p < .05$, ** $p < .01$.

The second model tested the moderating effects of supervision and peer support on the relationships between the Program benefits, Program burden, Workplace support, Workplace cohesion and Leadership style and sustained implementation (See Table 3.7). The analysis indicated that supervision and peer support moderate the effects of Program burden and Leadership style on sustained implementation. Practitioners who indicate program burden but receive supervision and peer support are 1.4 times more likely to report sustained implementation as compared with practitioners who report program burden but do not receive supervision and peer support [OR= 1.44, 95% CI(1.11 – 1.89), $p < .05$]. The results also showed that practitioners working under a positive Leadership style and receiving supervision and peer support are 1.19 times more likely to sustain implementation as compared with practitioners who work under a positive Leadership style but receive no supervision or peer support [OR = 1.19, 95% CI(1.02 – 1.40), $p < .05$]. The

combined set of predictors and moderators explained between 13.3% - 14.2%^g (Cox and Snell R²) of the variance in sustained program use.

Table 3.7

Results of Logistic Regression Analyses: Factors Predicting the Likelihood of sustained Program Implementation.

Model 1	B	S.E.	p-value	OR	95% CI
Constant	.45	.23	.048	0.05	1.00 - 2.46
<i>SISS Program benefit</i>	.09	.05	0.074	1.10	0.99 - 1.22
<i>SISS Program burden</i>	-.13	.06	0.018	0.88	0.78 - 0.98
<i>SISS Workplace support</i>	.05	.044	0.144	1.05	0.98 - 1.13
<i>SISS Workplace cohesion</i>	-.03	.05	0.541	0.97	0.89 - 1.06
<i>SISS Leadership style</i>	.02	.04	0.574	1.02	0.95 - 1.09
<i>Supervision and Peer support</i>	.40	.28	0.156	1.49	0.86 - 2.60
Model 2	B	S.E.	p-value	OR	95% CI
<i>SISS Program benefit</i>	-.03	.10	0.790	0.98	0.81 - 1.18
<i>SISS Program burden</i>	-.40	.12	0.001	0.67	0.54 - 0.85
<i>SISS Workplace support</i>	.08	.06	0.218	1.80	0.96 - 1.22
<i>SISS Workplace cohesion</i>	.03	.08	0.671	1.03	0.89 - 1.20
<i>SISS Leadership style</i>	-.10	.07	0.130	0.90	0.79 - 1.03
<i>Supervision and Peer support</i>	.37	.32	0.243	1.44	0.78 - 2.67
Constant	.47	.27	0.468	1.60	0.95 - 2.69
Supervision x benefit	.15	.12	0.191	1.17	0.93 - 1.46
Supervision x burden	.37	.14	0.007	1.14	1.11 - 1.89
Supervision x support	.00	.08	0.997	1.00	0.86 - 1.16
Supervision x cohesion	-.09	.10	0.378	0.92	0.76 - 1.11
Supervision x leadership	.18	.08	0.027	1.19	1.02 - 1.40

Note. B = Unstandardized Regression Weight; OR = Odds ratio; 95% CI = 95% Confidence Interval. OR (odds ratio) represents the odds that an outcome will occur given a particular factor, comparing to the odds of the outcome occurring in the absence of these factors. OR=1 indicates that a given factor does not affect the odds of an outcome; OR > 1 indicates that a given factor is associated with higher odds of the outcome; OR < 1 indicates that a given factor is associated with lower odds of the outcome. The coefficients were pooled across 5 imputed samples using Rubin's rules for Multiple Imputations (1987).

Discussion

This study adds to the work on inner organization context variables (Aarons et al., 2011) and provides strong support for considering program and organization context variables; perceived benefits or burden of a program, availability of support in the form of supervision and peer support, level of support for the program in the workplace and positive leadership; when measuring sustained implementation. Roger's diffusion of innovation theory established that program benefits will support diffusion and program burden will be a barrier to program diffusion (Rogers, 2003). The current study builds on this theory by demonstrating that sustained implementation is significantly less likely for practitioners that find the program to be a burden, however, supervision and peer support can remediate this and enhance the likelihood of sustained implementation for those practitioners who do find the program a burden.

Another interesting finding is that effective leadership alone did not significantly predict sustained implementation, but when a practitioner has effective leadership and supervision and peer support they are more likely to report sustained implementation. The literature across the decades acknowledges the importance of leadership (Van de Ven et al., 1999), however, leadership may be a stronger predictor for workplace functioning in the earlier stages of implementation (Jasuja et al., 2005).

This study establishes the importance of supervision and peer support for overcoming barriers related to leadership or program burden for sustained implementation. This is consistent with the model of supervision suggested for successful Triple P implementation (Sanders & Turner, 2005) and supports the PROSPER Partnership Model approach to technical assistance (Spoth et al., 2004) and the large literature on sustained behavior change of clinicians that highlight a focused ongoing implementation support system and monitoring implementation goals and benchmarks as central for sustainment (Grol & Grimshaw, 2003; Spoth et al., 2011).

As predicted, practitioners who reported sustained implementation were more likely to have supervision and peer support, report higher levels of Program benefit and Workplace support, positive Leadership style, and lower levels of Program burden, compared to practitioners who did not sustain the program. These results indicate that SISS can be used by an organization, during EBP implementation, to assess program characteristics and organizational functioning factors important for sustained implementation. The role of workplace cohesion is less clear and warrants further exploration.

The findings of this study should be considered in light of several limitations. Firstly, the scale validation was measured only at the level of the individual practitioner. The scope of the current study allowed for individual participation but did not include corroborative informants. Therefore, it was not possible to measure inter-rater reliability to show if other organisation and

partnership members would rate the variables the same way. However, even at the level of individual perception of organizational functioning, the measure has merit. Secondly, including other implementation researchers or organizations outside of our partnership in the consultation process when adapting the measure would have enhanced and broadened the scope of feedback. Thirdly, sustained program implementation, as measured here, is only one outcome of interest. Focused enquiry into the fidelity of sustained program implementation and factors that impact the routinization of daily program activity and procedures (i.e. resource stabilization, risk taking, incentives, adaption of activities, objective fit, transparent communication) will add richer insight into the required conditions for quality service delivery long term (Pluye, Potvin, Denis, Pelletier, & Mannoni, 2005). Fourthly, it must be clarified that the SISS focuses on the internal organizational context of implementation at the level of the practitioner and the organization employing the practitioner. However, organizations are not closed systems. They operate within a system influenced by the external environment (Langley & Denis, 2011). Further large scale work is warranted to explore systems of care (e.g. many organizations within a discrete geographic region) to elucidate confounding external environmental factors such as market share and competing priorities which may impact on program sustainment. Finally, this study was limited to contacting a large sample of practitioners at one time point through the Triple P Provider Network to validate the measure. Longitudinal evaluation using a stage-based approach to measure influences on implementation throughout the implementation process would be the ideal for future enquiry (Fixsen et al., 2015). Finally,

Workplace climate can vary drastically between organizations depending on their governance and availability of funding for EBP training and practice. More research is needed to investigate the external validity of the measure and assess whether the results of this study will generalize beyond sustainment of the example EBP, Triple P. Although it is early to reach conclusions about which factors are most important for sustained implementation, research that continues to assess the impact of the five factors tested here, particularly across the implementation stages, and for practitioners in diverse settings, will significantly add to the literature. This initial validation study indicates that the SISS is psychometrically sound and therefore a promising measure that can be used to assess program characteristics and workplace functioning for professionals trained to deliver EBPs with the aim of providing adequate support for program sustainment.

Implications for Behavioral Health

An evaluation measure to assess service provider perception of enablers and inhibitors to sustained program implementation in their workplace can be a useful tool to enhance organizations' self-regulation relating to program implementation planning and capacity to sustain an EBP. Using

and evaluating this measure with other EBPs and other organizational settings could lead to a more in-depth understanding of the impact of program characteristics and workplace functioning on sustained program implementation.

Notes

^a The CFI, RMSEA and SRMR fit indices were all affected by the Satorra-Bentler scaling correction for the chi-square statistic.

^b The AVE estimate represents the average amount of variation that a latent construct is able to explain in the observed variables that theoretically relate to the construct. It is calculated by averaging the sum of squared factor loadings for each latent construct. The squared factor loading represents the amount of variation in each observed variable that the latent construct accounts for. When this variance is averaged across all observed variables that relate theoretically to the latent construct, we generate the AVE.

^c For the chi-square difference test a constrained model, in which the correlation between the factors is fixed at 1.00 is compared to the original model's χ^2 where the correlation between the constructs is estimated freely. Significantly lower chi-square value of the unconstrained model implies good discriminant validity.

^d The supervision and peer support variable was a binary predictor coded 0 if there was no supervision and peer support and 1 if the practitioner received some supervision and peer support. Since it was desirable to estimate the intercept and the slope for the group coded 0, no mean centring was applied for this predictor (Aiken, West, & Reno, 1991).

^e FIML procedure is not available for logistic regression (FIML can only be used with maximum likelihood estimation).

^f The Bartlett's test of sphericity is sensitive to deviations from normality and since the first sample was non-normally distributed, the results of this test should be interpreted with caution.

^g Results based on Multiple Imputations present a range of Cox and Snell R^2 across five imputed samples.

References

- Aarons, G. A. (2004). Mental health provider attitudes toward adoption of evidence-based practice: The evidence-based practice attitude scale (EBPAS). *Mental Health Services Research*, 6, 61-67. doi: 10.1023/B:MHSR.0000024351.12294.65
- Aarons, G. A., Green, A. E., Willging, C. E., Ehrhart, M. G., Roesch, S. C., Hecht, D. B., & Chaffin, M. J. (2014). Mixed-method study of a conceptual model of evidence-based intervention sustainment across multiple public-sector service settings. *Implementation Science*, 9(1), 183. doi: 10.1186/s13012-014-0183-z
- Aarons, G. A., Hurlburt, M., & McCue Horwitz, S. (2011). Advancing a conceptual model of evidence-based practice implementation in public service sectors. *Administration and Policy in Mental Health*, 38(1), 4-23. doi: 10.1007/s10488-010-0327-7
- Aarons, G. A., Sommerfeld, D. H., & Walrath-Greene, C. M. (2009). Evidence-based practice implementation: The impact of public versus private sector organization type on organizational support, provider attitudes, and adoption of evidence-based practice. *Implementation Science*, 4(1), 83-83. doi: 10.1186/1748-5908-4-83
- Afshartous, D., & Perston, R. A. (2011). Key results of interaction models with centering. *Journal of Statistics Education*, 19, 1-23.
- Aiken, L. S., West, S. G., & Reno, R. R. (1991). Multiple regression: Testing and interpreting interactions. Newbury Park, CA: Sage Publications.
- American Psychological Association. (2009). Effective Strategies to Support Positive Parenting in Community Health Centers. Washington, DC Report of the Working Group on Child Maltreatment Prevention in Community Health Centers.
- Armstrong, R., Waters, E., Moore, L., Riggs, E., Cuervo, L. G., Lumbiganon, P., & Hawe, P. (2008). Improving the reporting of public health intervention research: Advancing TREND and CONSORT. *Journal of Public Health*, 30(1), 103-109. doi: doi:10.1093/pubmed/fdm082
- Bartholomew, L. K., Parcel, G. S., Kok, G., Gottlieb, N. H., & Fernandez, M. E. (Eds.). (2011). Planning health promotion programs: an intervention mapping approach (3rd ed.). San Francisco, CA: Jossey-Bass.
- Beidas, R. S., & Kendall, P. C. (2010). Training therapists in evidence-based practice: A critical review of studies from a systems-contextual perspective. *Journal of Clinical Psychology: Science and Practice*, 17(1), 1-30. doi: 10.1111/j.1468-2850.2009.01187.x
- Beidas, R. S., Marcus, S., Aarons, G. A., Hoagwood, K. E., Schoenwald, S. K., Evans, A. C., . . . Mandell, D. S. (2015). Predictors of community therapists' use of therapy techniques in a large public mental health system. *JAMA Pediatrics*, 169(4), 374.

- Bentler, P. M. (2006). EQS 6 structural equations program manual. Encino, CA: Multivariate Software, Inc.
- Bollen, K. A. (1989). Structural equations with latent variables. New York, NY: Wiley.
- Bolman, C., de Vries, H., & Mesters, I. (2002). Factors determining cardiac nurses' intentions to continue using a smoking cessation protocol. *Heart & Lung: The Journal of Acute and Critical Care*, 31(1), 15-24. doi: 10.1067/mhl.2002.119834
- Brehaut, J. C., Graham, I. D., Wood, T. J., Taljaard, M., Eagles, D., Lott, A., . . . Stiell, I. G. (2010). Measuring acceptability of clinical decision rules: validation of the Ottawa acceptability of decision rules instrument (OADRI) in four countries. *Medical Decision Making*, 30(3), 398-408. doi: 10.1177/0272989X09344747
- Brown, L. D., Feinberg, M. E., & Greenberg, M. T. (2012). Measuring coalition functioning: Refining constructs through factor analysis. *Health Education & Behavior*, 39(4), 486-497. doi: 10.1177/1090198111419655
- Browne, M. W., & Cudeck, R. (1989). Single sample cross-validation indexes for covariance-structures. *Multivariate Behavioral Research*, 24(4), 445-455. doi: 10.1207/s15327906mbr2404_4
- Chaudoir, S. R., Dugan, A. G., & Barr, C. H. (2013). Measuring factors affecting implementation of health innovations: A systematic review of structural, organizational, provider, patient, and innovation level measures. *Implementation Science*, 8(22). doi: 10.1186/1748-5908-8-22
- Child, D. (1990). The essentials of factor analysis, second edition. London: Cassel Educational Limited.
- Churchill, G. A. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research (JMR)*, 16(1), 64-73. doi: 10.2307/3150876
- Cohen, L. H., Sargent, M. M., & Sechrest, L. B. (1986). Use of psychotherapy research by professional psychologists. *American Psychologist*, 41(2), 198-206. doi: 10.1037/0003-066X.41.2.198
- Cohen, R. J., Swerdlik, M., & Sturman, E. (2013). Psychological testing and assessment: An introduction to tests and measurement (8th ed.). Boston, MA: McGraw-Hill Higher Education.
- Cook, J. M., Schnurr, P. P., Biyanova, T., & Coyne, J. C. (2009). Apples don't fall far from the tree: Influences on psychotherapists' adoption and sustained use of new therapies. *Psychiatric Services*, 60(5), 671-676. doi: 10.1176/appi.ps.60.5.671
- Damschroder, L. J., Aron, D. C., Keith, R. E., Kirsh, S. R., Alexander, J. A., & Lowery, J. C. (2009). Fostering implementation of health services research findings into practice: A

- consolidated framework for advancing implementation science. *Implementation Science*, 4(1), 50-65. doi: 10.1186/1748-5908-4-50
- De Vaus, D. A. (2002). *Analyzing social science data*. London, England: SAGE.
- Durlak, J. A., & Dupre, E. P. (2008). *Implementation matters: A review of research on the influence of implementation on program outcomes and the factors affecting implementation*. *American Journal of Community Psychology*, 41(3-4), 327-350. doi: 10.1007/s10464-008-9165-0
- Edmondson, A. C. (2003). Speaking up in the operating room: How team leaders promote learning in interdisciplinary action teams. *Journal of Management Studies*, 40(6), 1419-1452. doi: 10.1111/1467-6486.00386
- Ehrhart, M. G., Aarons, G. A., & Farahnak, L. R. (2014). Assessing the organizational context for EBP implementation: The development and validity testing of the Implementation Climate Scale (ICS). *Implementation Science*, 9(1), 157-168.
- Emmons, K. M., Weiner, B., Fernandez Eulalia, M., & Tu, S. P. (2012). Systems antecedents for dissemination and implementation: A review and analysis of measures. *Health Education and Behavior*, 39, 87-105. doi: 10.1177/1090198111409748
- Enders, C. K. (2010). *Applied missing data analysis: Methodology in social sciences*. New York, NY: Guilford Press.
- Feinberg, M. E., Chilenski, S. M., Greenberg, M. T., Spoth, R., & Redmond, C. (2007). Community and team member factors that influence the operations phase of local prevention teams: The PROSPER project. *Prevention Science*, 8(3), 214-226. doi: 10.1007/s11121-007-0069-2
- Feldstein, A. C., & Glasgow, R. E. (2008). A practical, robust implementation and sustainability model (PRISM) for integrating research findings into practice. *Joint Commission Journal on Quality and Patient Safety*, 34(4), 228-243.
- Fixsen, D., Blase, K., Naoom, S., & Van Dyke, M. (2010). Stage-based measures of implementation components. National Implementation Research Network, 1-43.
- Fixsen, D., Blase, K. A., Naoom, S. F., & Duda, M. A. (2015). *Implementation drivers: Assessing best practices*. Chapel Hill, NC: Creative Commons License.
- Fixsen, D., Naoom, S. F., Blase, K. A., Friedman, R. M., & Wallace, F. (2005). *Implementation research: A synthesis of the literature* Tampa, FL: Louis de la Parte Florida Mental Health Institute.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research (JMR)*, 18(1), 39-50. doi: 10.2307/3151312
- Gaven, S., & Schorer, J. (2013). From training to practice transformation: Implementing a public health parenting program. *Australian Institute of Family Studies(93)*, 50-57.

- Gerbing, D. W., & Anderson, J. C. (1988). An updated paradigm for scale development incorporating unidimensionality and its assessment. *Journal of Marketing Research (JMR)*, 25(2), 186-192. doi: 10.2307/3172650
- Glasgow RE, Vogt TM, Boles SM. (1999). Evaluating the public health impact of health promotion interventions: The RE-AIM framework. *American Journal of Public Health*, 89(9): 1322-1327
- Glisson, C. (2002). The organizational context of children's mental health services. *Clinical Child and Family Psychology Review*, 5(4), 233-253. doi: 10.1023/A:1020972906177
- Goodman, R. M., & Steckler, A. (1989). A model for the institutionalization of health promotion programs. *Journal of Family and Community Health.*, 11(4), 63-78.
- Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., & Kyriakidou, O. (2004). Diffusion of innovations in service organizations: Systematic review and recommendations. *The Milbank Quarterly*, 82(4), 581-629. doi: 10.1111/j.0887-378X.2004.00325.x
- Grol, R., & Grimshaw, J. (2003). From best evidence to best practice: Effective implementation of change in patients' care. *Lancet*, 362, 1225-1230.
- Gruen, R. L., Elliott, J. H., Nolan, M. L., Lawton, P. D., Parkhill, A., & McLaren, C. J. (2008). Sustainability science: An integrated approach for health-programme planning. *The Lancet*, 372(9649), 1579-1589. doi: 10.1016/S0140-6736(08)61659-1
- Hodge L. M. & Turner K. M. T. (2015). Sustained Implementation of Evidence-based Programs in Disadvantaged Communities: A Conceptual Framework of Supporting Factors. Manuscript submitted for publication.
- Hu, L. T., & Bentler, P. M. (2009). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling - a Multidisciplinary Journal*, 6(1), 1-55. doi: 10.1080/10705519909540118
- Ilott, I., Gerrish, K., Laker, S., & Bray, K. (2013). Bridging the gap between knowledge and practice: using theories, models and conceptual frameworks. *Getting Started: Naming and Framing the Problem, Your starter for* 10(2), 1-4. Retrieved from
- Jacobs, S., Weiner, B., & Bunger, A. (2014). Context matters: Measuring implementation climate among individuals and groups. *Implementation Science*, 9(1), 46-60. doi: 10.1186/1748-5908-9-46
- Jasuja, G. K., Chou, C.-P., Bernstein, K., Wang, E., McClure, M., & Pentz, M. A. (2005). Using structural characteristics of community coalitions to predict progress in adopting evidence-based prevention programs. *Evaluation and Program Planning*, 28, 173-184. doi: 10.1016/j.evalprogplan.2005.01.002

- Klein, K. J., Conn, A. B., & Sorra, J. S. (2001). Implementing computerized technology: An organizational analysis. *Journal of Applied Psychology*, 86(5), 811-824. doi: 10.1037/0021-9010.86.5.811
- Langley, A. & Denis J. L. (2011). Beyond evidence: the micropolitics of improvement. *British Medical Journal*, 20(Supp 1), i43-i46.
- LaPelle, N. R., Zapka, J., & Ockene, J. K. (2006). Sustainability of Public Health Programs: The Example of Tobacco Treatment Services in Massachusetts. *American Journal of Public Health*, 96(8), 1363-1369. doi: 10.2105/AJPH.2005.067124
- Lehman, W. E. K., Greener, J. M., & Simpson, D. (2002). Assessing organizational readiness for change. *Journal of Substance Abuse Treatment*, 22(4), 197-209. doi: 10.1016/S0740-5472(02)00233-7
- Lewis, C. C., Stanick, C. F., Martinez, R. G., Weiner, B. J., Kim, M., Barwick, M., & Comtois, K. (2015). The society for implementation research collaboration instrument review project: A methodology to promote rigorous evaluation. *Implementation Science* 10(2). doi: DOI 10.1186/s13012-014-0193-x
- Maher, L., Gustafson, D., & Evans, A. (2007). Sustainability model and guide. NHS Institute for innovation and improvement. Retrieved from http://www.institute.nhs.uk/sustainability_model/general/welcome_to_sustainability.html
- Mancini, J. A., & Marek, L. I. (2004). Sustaining community-based programs for families: Conceptualization and measurement. *Family Relations*, 53(4), 339-347. doi: 10.1111/j.0197-6664.2004.00040
- Marquez, L., & Kean, L. (2002). Making supervision supportive and sustainable: New approaches to old problems. Washington, DC: Lani Marquez University Research Co.
- Marquez, L., Silvia, H., Edward, B., & Simon, H. (2014). Improving health care: the results and legacy of the USAID health care improvement project. Final Report. Bethesda, MD: University Research Co., LLC (URC).
- Meyers, D. C., Joseph, D. A., & Wandersman, A. (2012). The quality implementation framework: A synthesis of critical steps in the implementation process. *American Journal of Community Psychology*, 50(3-4), 462-480. doi: 10.1007/s10464-012-9522-x
- Muthén, L. K., & O., M. B. (1998-2012). Mplus user's guide (7th ed.). Los Angeles, CA: Muthén & Muthén
- Odgen, T., & Fixsen, D. L. (2014). Implementation science: A brief overview and a look ahead. *Zeitschrift Für Psychologie*, 222(1), 4-11. doi: 10.1027/2151-2604/a000160
- Pallas, S. W., Minhas, D., Pérez-Escamilla, R., Taylor, L., Curry, L. & Bradley E. H. (2013). Community health workers in low- and middle-income countries: What do we know about

scaling up and sustainability? *American Public Health Association*, 103(7), e74-e82. doi: 10.2105/AJPH.2012.301102

Pluye, P., Potvin, L., Denis, J., Pelletier, J., & Mannoni, C. (2005). Program sustainability begins with the first events. *Evaluation and Program Planning*, 28(2), 123-137. doi: doi:10.1016/j.evalprogplan.2004.10.003

Proctor, E. K., Landsverk, J., Aarons, G. A., Chambers, D. A., Glisson, C., & Mittman, B. (2009). Implementation research in mental health services: An emerging science with conceptual, methodological, and training challenges. *Administration and Policy in Mental Health*, 36(1), 24-34. doi: 10.1007/s10488-008-0197-4

Proctor, E. K., Silmere, H., Raghavan, R., Hovmand, P., Aarons, G., Bunger, A., . . . Hensley, M. (2011). Outcomes for implementation research: Conceptual distinctions, measurement challenges, and research agenda. *Administration and Policy in Mental Health*, 38(2). doi: 10.1007/s10488-010-0319-7

Reding, M. E. J., Chorpita, B. F., Lau, A. S., & Debbie, I.-G. (2014). Provider' attitudes toward evidence-based practices: Is it just about providers, or do practices matter, too? *Administration and Policy in Mental Health*, 41(6). doi: 10.1007/s10488-013-0525-1

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York: Free Press.

Sanders, M. R. (2012). Development, evaluation, and multinational dissemination of the Triple P-Positive Parenting Program. *Annual Review of Clinical Psychology*, 8, 345-379. doi: doi: 10.1146/annurev-clinpsy-032511-143104

Sanders, M. R., Kirby, J. N., Tellegen, C. L., & Day, J. J. (2014). The Triple P-Positive Parenting Program: A systematic review and meta-analysis of a multi-level system of parenting support. *Clinical Psychology Review*, 34(4), 337-357. doi: 10.1016/j.cpr.2014.04.003

Sanders, M. R., & Turner, K. M. (2005). Reflections on the challenges of effective dissemination of behavioural family intervention: Our experience with the Triple P – Positive Parenting Program. *Child and Adolescent Mental Health*, 10(4), 158-169. doi: 10.1111/j.1475-3588.2005.00367.x

Sanders, M. R., Turner, K. M. T., & McWilliam, J. (2015). The Triple P- Positive Parenting Program: a community wide approach to parenting and family support In: MJ Van Ryzin, KL Kumpfer, GM Fosco, MT Greenberg (Eds). *Family-Based Prevention Programs for Children and Adolescents: Theory, Research, and Large-scale Dissemination* (pp. 130- 155). New York: Psychology Press.

Satorra, A., & Bentler, P. M. (Eds.). (1994). *Corrections to test statistics and standard errors in covariance structure analysis*. Thousand Oaks, CA: Sage.

- Savaya, R., & Spiro, S. E. (2012). Predictors of sustainability of social programs. *American Journal of Evaluation*, 33(1), 26-43. doi: 10.1177/1098214011408066
- Scheirer, M. A. (2005). Is sustainability possible? A review and commentary on empirical studies of program sustainability. *American Journal of Evaluation*, 26(3), 320-346. doi: 10.1177/1098214005278752
- Scheirer, M. A., & Dearing, J. W. (2011). An agenda for research on the sustainability of public health programs. *American Journal of Public Health*, 101(11), 2059–2067. doi: 10.2105/AJPH.2011.300193
- Schell, S. F., Luke, D. A., Schooley, M. W., Elliot, M. B., Hebers, S. H., Mueller, N. B., & Bunger, A. (2013). Public health program capacity for sustainability: a new framework. *Implementation Science*, 8(1), 15-24. doi: 10.1186/1748-5908-8-15
- Schmidt, T. A. (2011). Current Methodological Considerations in Exploratory and Confirmatory Analysis. *Journal for Psychoeducational Assessment*, 29, 304-321. .
- Schneider, B., Ehrhart, M. G., Mayer, D. M., Saltz, J. L., & Niles-Jolly, K. (2005). Understanding organization-customer links in service settings. *Academy of Management Journal*, 48(6), 1017-1032. doi: 10.5465/AMJ.2005.19573107
- Shapiro, C. J., Prinz, R. J., & Sanders, M. R. (2012). Facilitators and barriers to implementation of an evidence-based parenting intervention to prevent child maltreatment: The Triple P - Positive Parenting Program. *Journal of Child Maltreatment*, 17(1), 86-95. doi: 10.1177/1077559511424774
- Shapiro, C. J., Prinz, R. J., & Sanders, M. R. (2014). Sustaining use of an evidence-based parenting intervention: Practitioner perspectives. *Journal of Child and Family Studies*, 24(6), 1615-1624. doi: 10.1007/s10826-014-9965-9
- Simpson, D. D. (2002). A conceptual framework for transferring research to practice. *Journal of Substance Abuse Treatment*, 22(4), 171-182. doi: 10.1016/S0740-5472(02)00231-3
- Simpson, D. D., & Flynn P. M. (2007) Moving innovations into treatment: A stage-based approach to program change. *Journal of Substance Abuse Treatment* ;33(2):111-120.
- Southam-Gerow, M., Arnold, C., Rodriguez, A., & Cox, J. (2014). Acting locally and globally: Dissemination implementation around the world and next door. *Journal of Cognitive and Behavioral Practice* 21, 127-133.
- Spence, S. H., Jill, W., Kavanagh, D., Strong, J., & Worrall, L. (2001). Clinical supervision in four mental health professions: *A review of the evidence*. *Behaviour Change*, 18(3), 135-155.
- Spoth, R., Greenberg, M. T., Bierman, K., & Redmond, C. (2004). PROSPER community-University partnership model for public education systems: Capacity building for evidence-

based, competence-building prevention. *Prevention Science*, 5(1), 31-39. doi: 10.1023/B:PREV.0000013979.52796.8b

- Spoth, R., Gyll, M., Redmond, C., Greenberg, M. T., & Feinberg, M. E. (2011). Six-year sustainability of evidence-based intervention implementation quality by community-university partnerships: The PROSPER study. *American Journal of Community Psychology*, 48(3-4), 412-425. doi: 10.1007/s10464-011-9430-5
- Steckler, A., Goodman, R. M., McLeroy, K. R., Davis, S., & Koch, G. (1992). Measuring the diffusion of innovative health promotion programs. *American Journal of Health Promotion*, 6(3), 214-224.
- Stevens, J. P. (2002). *Applied multivariate statistics for the social sciences* (4th ed.). New York, NY: Taylor & Francis Group.
- The United Nations Office on Drugs and Crime. (2010). *Compilation of evidence-based family skills training programmes*. Retrieved from http://www.unodc.org/docs/youthnet/Compilation/10-50018_Ebook.pdf.
- Trent, L. R. (2010). *Development of a Measure of Disseminability (MOD)*. University of Mississippi.
- Turner, K. M., Nicholson, J. M., & Sanders, M. R. (2011). The role of practitioner self-efficacy, training, program and workplace factors on the implementation of an evidence-based parenting intervention in primary care. *Journal of Primary Prevention*, 32(2), 95-112.
- Turner, K. M., & Sanders, M. R. (2006). Dissemination of evidence-based parenting and family support strategies: Learning from the Triple P – Positive Parenting Program system approach. *Aggression and Violent Behavior*, 11(2), 176-193. doi: 10.1016/j.avb.2005.07.005
- Turner, K. M., Sanders, M. R., & Hodge, L. (2014). Issues in professional training to implement evidence-based parenting programs: The preferences of Indigenous practitioners. *Australian Psychologist*, 49(6), 384-394. doi: 10.1111/ap.12090
- Turner, K. M. T., Markie-Dadds, C., & Sanders, M. R. (2010). *Facilitator's manual for Group Triple P* (3rd ed.). Brisbane, QLD, Australia: Triple P International.
- Turner, K. M. T., Sanders, M. R., & Markie-Dadds, C. (2010). *Practitioner's manual for Primary Care Triple P* (2nd ed.). Brisbane, QLD, Australia: Triple P International.
- Van de Ven, A., Douglas, P., Garud, R., & Venkataraman, S. (1999). *The innovation journey*. New York, NY: Oxford University Press.
- Van Prooijen, J.-W., & Van der Kloot, W. A. (2001). Confirmatory analysis of exploratively obtained factor structures. *Educational and Psychological Measurement*, 61(5), 777-792. doi: 10.1177/00131640121971518

- Weiner, B. J. (2009) A theory of organizational readiness for change. *Implementation Science* ;4(1):67-76.
- Weiner, B. J., Amick, H., & Lee, S.-Y. D. (2008). Conceptualization and measurement of organizational readiness for change: A review of the literature in health services research and other fields. *Medical Care Research and Review*, 65(4), 379-436. doi: 10.1177/1077558708317802
- Whittingham, K., Sofronoff, K., & Sheffield, J. K. (2006). Stepping Stones Triple P: A pilot study to evaluate acceptability of the program by parents of a child diagnosed with an Autism Spectrum Disorder. *Research in Developmental Disabilities*, 27, 364-380. doi: 10.1016/j.ridd.2005.05.003
- Wiltsey Stirman, S., Kimberly, J., Cook, N., Calloway, A., Castro, F., & Charns, M. (2012). The sustainability of new programs and innovations: a review of the empirical literature and recommendations for future research. *Implementation Science*, 7(1), 17-36. doi: 10.1186/1748-5908-7-17
- World Health Organization. 2010. *Violence Prevention: The evidence*. Geneva, Switzerland: Departement of Violence and Injury Prevention and Disability.
- World Health Organization. 2012. *From Evidence to Policy: Expanding Access to Family Planning*. Geneva: Department of Reproductive Health and Research.

Appendix 3.A

3.A. Original 40-Item Implementation and Sustainment Support Scale (SISS)

Item

How much benefit have you gained from your involvement with [program name] in these areas?

1. Learning new professional skills
2. Feeling personally fulfilled in working to improve your community
3. Networking with other professionals
4. Gaining support from others in your community for your work

How much has your involvement with [program name] interfered with the following?

5. Your work schedule
6. Your family life
7. Your personal free time
8. What balance of costs and benefits have you experienced personally from your involvement with [program name]?

These questions relate to your work team or group of professionals involved with Triple P at your workplace (including supervisors that provide supervision around Triple P). If you don't have a team of workers that are delivering Triple P in your workplace, answer the team questions based on you and your supervisor or manager.

Please indicate how much you agree or disagree with each statement about your organization.

9. The staff in my organization are supportive of offering [program name] for parents in the community
10. My supervisor is supportive of offering [program name] for parents in the community
11. My supervisor and organization support collaboration with other community services around [program name]
12. My organization commits resources to planning and providing [program name]
13. My work with [program name] is viewed positively by my supervisor
14. My work with [program name] is viewed positively by my co-workers
15. While working on [program name], I am able to rely on my co-workers for ideas and support

How much did each of the following influence your use of [program name]?

16. It was intuitively appealing
17. It 'made sense' to you
18. It was required by your supervisor
19. It was required by your workplace
20. It was required by your state
21. It was being used by colleagues who were happy with it
22. Feeling you had enough training to use it correctly

Please indicate how much you agree or disagree with each statement.

23. The team has the common goal of making [program name] sustainable within my organization
24. The team has developed clear goals and objectives for delivering [program name] (e.g. how many groups will be delivered or families seen, how regularly supervision is offered)

Please indicate how much you agree or disagree with the following statements about your work team.

25. There is a sense of unity and cohesion in this team
26. There is a strong emphasis on practical tasks in this team
27. There is not much group spirit among members of this team
28. There is a strong feeling of belonging in this team
29. This team rarely has anything concrete to show for its efforts
30. Members of this team feel close to each other
31. This is a decision-making team
32. This team has a hard time resolving conflicts

Please indicate how much you agree or disagree with the following statements about the leadership at your work team.

33. Makes you feel welcome at meetings
34. Gives praise and recognition
35. Intentionally seeks out your views
36. Asks you to assist with specific tasks

37. Makes an effort to get to know workers
 38. Has a clear vision for the team
 39. Is respected in my community
 40. Is skillful in resolving conflict
-

Chapter 4

Factors that Influence Evidence-based Program Implementation and Sustainment for Indigenous Family Support Providers in Child Protection Services

This chapter consists entirely of a manuscript submitted for publication.

Abstract

This paper evaluates key program, workplace and process factors important for implementation and sustainment of evidence-based programs (EBPs) in disadvantaged communities. Correlation analyses and binary logistic regressions were used to assess the associations between factors and program implementation (at 18 months) and sustainment (at 36 months) with ($N=35$) Aboriginal and Torres Strait Islander family support providers using the Triple P – Positive Parenting Program in Indigenous child protection agencies. This study demonstrated that for implementation at 18 months, as predicted, there was a trend for implementing providers to report higher levels of perceived partnership support, program benefit, workplace support and workplace cohesion. However, the only significant relationship was with partnership support ($r=.31$ $p<.05$), and the regression analysis indicated that none of the variables were significant predictors of program implementation. For sustained implementation at 36 months, contrary to predictions, no relationship was found between sustainment and Program characteristics, Workplace characteristics, Supervision and peer support or Sustainability planning. Supportive coaching was the only significant correlate ($r=.46$, $p <.01$) and predictor [OR = 15.63, 95% CI (1.98 – 123.68), $p = 0.009$] in the program sustainment model. Overall, these findings suggest the need for further exploration of program and workplace variables and provide evidence to consider incorporating partnership support and supportive coaching in real world implementation models to improve the likelihood of EBP program implementation and sustainment in Indigenous child protection services.

KEY WORDS: evidence-based programs, implementation, sustainment

Factors that Influence Evidence-based Program Implementation and Sustainment for Indigenous Family Support Providers in Child Protection Services

A recent empirical review of studies involving health program sustainability in disadvantaged communities (low and middle income countries and disadvantaged communities in high income countries) found that only 43% of studies reported successful program sustainment two years after program funding or training finished (Hodge & Turner, 2015). Therefore, treatment and prevention programs that could eradicate diseases like river blindness, for which 75 million Sub-Saharan Africans are at risk, are not reaching the families who need them the most (Emukah et al., 2008). Similarly, prevention and intervention programs for issues like diabetes, child maltreatment and family violence, that could significantly reduce the rates of health and social inequality between Indigenous and non-Indigenous populations, are not well accessed by the families who would benefit most (Aitaoto, Tsark, & Braun, 2009; Gaven & Schorer, 2013; Kitau, Tsey, McCalman, & Whiteside, 2011).

In Australia, Aboriginal and Torres Strait Islander communities are significantly disadvantaged in comparison to the mainstream population on most indices of health and well-being: they have poorer education and employment outcomes, higher rates of health risk behaviours, lower life expectancy, and higher rates of suicide, involvement with the justice system, family fragmentation and forced removal of children, and are over-represented in abuse and neglect cases (see Australian Institute of Health and Welfare [AIHW], 2015; Turner, Richards & Sanders, 2007). During 2013-2014, 39 716 Aboriginal and Torres Strait Islander children received child protection services (AIHW, 2015). In June 2014, close to 15,000 Indigenous children were living in government sponsored out-of-home care, which is 9 times the rate of their non-Indigenous peers (AIHW, 2015). Indigenous children are significantly over-represented in all areas of the child protection system in Australia. The reasons for this are complex and should be approached with consideration of multiple historical, social, community and family factors (Human Rights and Equal Opportunities Commission, 1997). However, programs proven effective to improve family outcomes and reduce rates of child abuse and maltreatment (e.g., Prinz, Sanders, Shapiro, Whitaker & Lutzker, 2009) are rarely implemented with families living in disadvantaged environments (i.e., low resource settings, Indigenous communities) or they are often not sustained by service providers (Carbone, Fraser, Ramburuth, & Nelms, 2004).

Attempts at reducing disadvantage are notable as program implementers have community interests in mind. Nevertheless, early termination of a program can have damaging effects on the trust community members place in the new program or, worse, it can negatively impact community members who require the service (Ahluwalia, Robinson, Vallely, Gieseke, & Kabakama, 2010; World Health Organization, 2012). The problem is that effectively moving from a university

clinical trial of an evidence-based program (EBP) to community settings and making the program sustainable in the real world poses large challenges. Examples of well-run and sustained programs suggest community implementation and sustainment is achievable with the right combination of supports including, but not limited to, local community engagement, intensive implementation support for local service providers trained to deliver the program, leadership, planning, fitting the program to the local context and ensuring long-term financial support (e.g., (Aitaoto et al., 2009; Amazigo et al., 2007; Bustamante, Hurtado, & Zeribi, 2012; Cooper, Bumbarger, & Moore, 2015). All factors depend on the program adoption setting (i.e. the community, the service providing agency) and none independently guarantee program implementation and sustained use.

The goal of this study was to evaluate the implementation of an EBP to further assess the factors that associate with and predict program implementation and sustainment using a supportive framework for EBPs. This research builds upon previous work by the first and second author (Hodge & Turner, 2015) that explored existing empirical literature for factors that facilitate success or create barriers to program sustainment in disadvantaged communities. Reviewed articles often did not provide clear definitions of concepts or examples of factors, research evaluations were often based on weak measures and simplified designs, and most were not based on an overarching conceptual framework (Hodge & Turner, 2015). Based on themes that emerged in the analysis of the literature, a framework and corresponding measure to support program implementation and sustainment in disadvantaged communities was developed and subsequently evaluated with a large international sample of service providers trained in the same EBP (Hodge, Turner, Sanders, & Filus, 2015). We aimed to go beyond exploratory studies found in the review to evaluate the implementation and sustainment of the Triple P – Positive Parenting Program (Triple P) in Indigenous child protection services.

Program implementation and sustainment support framework

The implementation and sustainment support framework for EBPs in disadvantaged communities developed in preliminary research in this series emphasizes three areas important to the implementation process (program, workplace, and process and interaction factors) across various health service delivery settings. Existing implementation literature concurs that the entire context of the service provider system is important to consider when evaluating implementation. However, it would be very difficult, if not impossible, to study all of the factors that impact on the system in one, short-term funded research project. Therefore, program, workplace and process factors from the framework that are quantifiable and relate to the child welfare agency setting were selected for this study. Following is a summary of the factors explored in this study and their impact on implementation and sustainment in disadvantaged communities.

Program characteristics

Program benefit. Providers trained in a program must believe that the program enhances the service they provide (Rogers, 2003) and yields some relative advantage when compared to other programs if they are to implement and sustain its implementation (Bartholomew, Parcel, Kok, Gottlieb, & Fernandez, 2011; Goodman & Steckler, 1989). Programs that are easy to implement and visibly effective for the participating client are more likely to be sustained (Ahluwalia et al., 2010; Quality Assurance Project and UNICEF/Nicaragua, 2006).

Program burden. It is important that an EBP is not seen as a burden to daily work life for trained providers (Feldstein & Glasgow, 2008). Time burden creates a challenge when balancing the commitment to deliver a new program and day-to-day work tasks, and can lead to program discontinuation (Gaven & Schorer, 2013; Massatti, Sweeney, Panzano, & Roth, 2008). As such, a provider's decision to sustain implementation is often made through a cost-benefit analysis.

Workplace characteristics

Workplace support. On the workplace level, there should be an emphasis on organizational functioning and its influence on the implementation process when adopting a new program (Simpson & Flynn, 2007). A positive, supportive workplace can enhance implementation climate and program sustainment (Aitaoto et al., 2009). The extent of support for program delivery across all levels of the workplace, from management to front line staff (Swain, et al., 2010), are crucial for effective implementation and sustainment (Edwards & Roelofs, 2006; Klein, Conn, & Sorra, 2001).

Workplace cohesion. Staff unity, trust and ability to resolve disagreements impact all levels of program functioning (Lehman, Greener, & Simpson, 2002) and program continuation (Boucar et al., 2011). Workplace cohesion can establish congruence between the EBP and workplace goals to ensure staff awareness of workplace and program mission and vision (Gruen et al., 2008; Simpson, 2002).

Workplace leadership. A manager or leader's ability to empower staff, have a clear vision for the team, communicate clear goals and have respect in the community influences program sustainment and overall workplace functioning (Bustamante et al., 2012; Livet, Courser, & Wandersman, 2008; Mancini & Marek, 2004). Studies show that this type of transformational leadership can also impact attitudes toward EBP adoption (Gregory A Aarons, 2006) and is associated with successful implementation efforts (Michealis, Stegmaier, & Sonntag, 2009, 2010). Establishing a workplace with high quality and productive interpersonal relationships between leaders and front line staff promotes trust and commitment in the workplace and can positively impact not only the entire implementation process, but also consumer outcomes (Glisson, 2002; Schneider, Ehrhart, Mayer, Saltz, & Niles-Jolly, 2005).

Supervision and peer support. Availability of supervision is integral to sustained quality practice and is associated with reduced staff turnover (Aarons, Sommerfeld, Hecht, Silovsky, &

Chaffin, 2009) and burnout (Aarons, Fettes, Flores & Sommerfeld, 2009). For service providers working with disadvantaged families, appropriate supervision can support providers to maintain program activity (Ahluwalia et al., 2010), quality of care (Boucar et al., 2011), program benefit for participants (Gurtler, Kitron, Cecere, Segura, & Cohen, 2007), and help retain staff (Emukah et al., 2008). In addition, other methods of support such as peer-assisted supervision, can reduce line manager workload, increasing practitioner self-regulation, engagement, and shared learnings (McPherson, Sanders, Schroeter, Troy, & Wiseman, 2015) Peer support also provides opportunities to practice delivering the program and receive feedback from peers to continually improve intervention delivery and enhance provider confidence and sustained program use (Gaven & Schorer, 2013; Sanders & Turner, 2005; Shapiro, Prinz, & Sanders, 2014).

Process and interaction characteristics

Partnership support. This portion of the conceptual model is guided by the PROMoting School–community–university Partnerships to Enhance Resilience (PROSPER) Partnership Model (Spoth, Greenberg, Bierman, & Redmond, 2004), a delivery system that facilitates sustained, quality delivery of EBPs (Spoth, Guyll, Trudeau, & Goldberg-Lillehoj, 2002). Strong, transparent partnerships build upon an organization’s pre-existing capacity and help the organization perform at its optimal level by providing a system of support (Cooper et al., 2015; Edwards & Roelofs, 2006). The underlying purpose of the partnership model is to bring multiple sectors of the community together to share resources, plan activities and provide a comprehensive approach to solve complex issues that agencies working with disadvantaged communities address when delivering EBP (Brown, Feinberg, & Greenberg, 2010; Spoth, 2007).

Technical assistance and ongoing support. Technical assistance refers to the supportive resources dedicated to implementation and ongoing operations including human resources (training and supportive coaching by experienced program facilitators) and physical resources (materials, space, transportation). The level of technical support dedicated to program implementation is acknowledged as a facilitator or influence for program sustainment in most studies included in the previous review of the literature (Hodge & Turner, 2015). Providing technical assistance is intended to promote local problem solving efforts (McDermott, Tulip, & Sinha, 2004), motivate providers in regards to program delivery (Novins, Green, Legha, & Aarons, 2013) and enhanced program implementation and sustainment. This assistance can include a combination of re-training initial providers (Kitau et al., 2011), training new staff, providing emotional support (Gaven & Schorer, 2013; Shapiro et al., 2014), supportive program and implementation coaching (Boucar et al., 2011; Loman, Rodriguez, & Horner, 2010) or program resources (Emukah et al., 2008).

Sustainability planning. Despite community disadvantage, sustainment of health promotion programming is possible when given substantial planning in the early stages of implementation

(Amazigo, et al., 2007; Bustamante et al., 2012; Savaya & Spiro, 2012; Beery et al., 2005). The degree to which professionals and individual workplaces have developed effective plans to sustain program activity and secure ongoing funding are important for sustainment (Cooper et al., 2015; Tibbits, Bumbarger, Kyler, & Perkins, 2010). It has been suggested that large-scale community health programs should be planned with a 10-year timeframe in mind at least, to make it worth the effort and cost to commence adoption of an EBP (Hodgins, Crigler, Lewin, Tsui, & Perry, 2013).

The Partnership

Our goal in this partnership project was to evaluate the state wide implementation of Triple P with Queensland Aboriginal and Torres Strait Islander Child Protection Peak (QATSICPP) family support service providers. QATSICPP is a non-government Aboriginal and Torres Strait Islander peak body representing and working together with its 21 member organizations, to improve the safety and wellbeing of Aboriginal and Torres Strait Islander children, young people and their families. Triple P was chosen by the peak body because of previous supporting the program's cultural acceptability by Indigenous parents (Turner, Richards, & Sanders, 2007) and providers (Turner, 2008) and program effectiveness in reducing dysfunctional parenting and improving child behavior (Turner, et al., 2007). The partnership approach builds on evidence that peer support and program implementation mentoring are key themes to designing a supportive post-training environment for Indigenous providers (Turner, Sanders, & Hodge, 2014)

An earlier study with an international sample of providers indicated that program and workplace factors (program benefit, program burden, workplace support, workplace cohesion and leadership style) were associated with Triple P sustainment 36 months or more after training (Hodge et al., 2015). The current evaluation not only measured program implementation and sustainment, it also presented a unique opportunity to explore the planning and support of a partnership between an Indigenous peak body (QATSICPP), a university program development and research team (The University of Queensland: UQ), a university-licensed training and publishing organization (Triple P International: TPI) and Indigenous service providers using Triple P with Indigenous parents.

Aims and objectives

This longitudinal study evaluated factors that are associated with and predict program implementation and sustainment through an innovative, supported application of a culturally-adapted EBP, Indigenous Triple P (Turner, Markie-Dadds, & Sanders 2010; Turner, Sanders, & Markie-Dadds, 2006), by Aboriginal and Torres Strait Islander child welfare agencies. The aim was to determine the program, workplace and process factors associated with EBP implementation and sustainment based on the perceptions of the individual family support providers. These factors have not previously been evaluated with Triple P in the context of Indigenous child protection agencies.

An additional aim of this project was to examine program adherence to ensure maintenance of implementation fidelity (reach, dosage and quality of delivery).

Method

Setting

Participating professionals were selected for training using purposeful sampling by the QATSICPP Member Support Officer that liaised with eleven participating Aboriginal and Torres Strait Islander child welfare agencies across the state of Queensland (in regional, remote and very remote settings) that were member organizations of QATSICPP. This led to a participant pool of 59 Indigenous family support providers and managers trained in Indigenous Group (Turner et al., 2006; 2010) and Standard Triple P (Sanders, Markie-Dadds, & Turner, 2013). All eleven QATSICPP member organizations (Kalwun Development Corporation, R.E.F.O.C.U.S Aboriginal and Torres Strait Islander Corporation, Townsville Aboriginal and Torres Strait Islander Corporation for Health Service, Central Queensland Indigenous Development, Goolburri Aboriginal Health Advancement Company, Remote Area Aboriginal and Torres Strait Islander Child Care, Kurbingui, Wuchopperen Health Service Limited, Port Kennedy Association Inc. Children of the Dreaming-Centre for Self-Healing, Indigenous Wellbeing Centre) had an office based in a regional area and most agency services covered disadvantaged communities in remote locations or had satellite offices based in very remote locations with providers trained in Triple P based locally.

To be eligible to deliver Triple P and participate in the implementation and sustainment evaluation, the family support provider had to become accredited as a Triple P provider. The Department of Communities and Child Safety, Department of Education and Indigenous medical centers referred parents to participating agencies. Once a parent referral was received by the accredited family support provider, they made contact with the family. The family's participation was not mandated. 'Parents' were Aboriginal and Torres Strait Islander care givers (e.g., biological mother, father, aunt, uncle, grandparent, close relative taking on the caregiving role) considered at risk of child abuse or neglect or who were currently involved with the child protection system (i.e. children removed due to child protection orders). Triple P was primarily used as a prevention strategy to reduce the likelihood of families entering the child protection system, but was also used to facilitate parent behavior change and improve the likelihood of reunifying families where children had been removed from home.

Participants

Training participants were 40 female and 19 male family support providers, aged 23 to 67 years ($M = 41.3$, $SD = 9.68$). The sample had approximately 3.5 years ($M = 3.56$; $SD = 3.50$) of experience working in family support, and spent an average of 12 hours per week in parent

consultation ($M = 12.4$; $SD = 12.7$). There was a spread of educational attainment: 8 (13.6%) bachelor degree; 16 (27.1%) diploma or certificate as a paraprofessional; 15 (25.4%) trade or technical college; 10 (16.9%) high school, and 10 (16.9%) did not respond to the question. Five (8.5%) participants were supervisors of family support providers at their organization. All providers reported that their most common clients identified as Aboriginal Australian and/or Torres Strait Islander, with children aged between 4-7 (74.6%) and 7-12 (72.9%) years. Most providers (62.7%) reported that they heard of Triple P before their training, 6.8% had previously been trained in Triple P and 13.6% had previous training in a different parenting program.

Triple P – Positive Parenting Program

Evidence base

The interventions were culturally sensitive adaptations of the mainstream Group Triple P (Turner et al., 2006) and Standard Triple P (Sanders et al., 2013), with tailored resources such as a demonstration DVD (Turner & Sanders, 2007) and parent workbook (Turner et al., 2010) used flexibly according to families' preferences. The culturally adapted program process and resources take into consideration cultural values, traditions and needs in order to convey evidence-based parenting support in an engaging and culturally sensitive way. Sessions are delivered flexibly to allow time to discuss the social and political context for parenting, develop trust, adapt the pace of presentation and share personal stories. Delivered in a parent group, extended family groups or individual format, the program uses an active skills training process to help parents acquire new knowledge and skills. Indigenous Triple P has demonstrated effectiveness in reducing dysfunctional parenting and improving child behavior and emotional problems (Turner et al., 2007).

Training approach

The training course provides a comprehensive overview of common developmental and behavioral problems in children, and gives detailed information on a range of strategies designed to promote children's development. In addition, the course provides practical skills-based training in a range of consultation skills necessary to deliver effective interventions with families. A variety of instructional methods, including didactic presentation, DVD and live demonstrations, clinical problem-solving, simulated practice of consultation skills, feedback and peer tutoring strategies are used throughout the course. Practitioners develop skills to use Triple P to enhance parents' self-sufficiency in interacting with their children in instrumental, social and emotional care-giving contexts. After training, practitioners are required to complete a competency-based accreditation to ensure proficiency in program delivery.

Measures

Demographics. Brief demographic information collected included gender, age, profession, education, and previous Triple P training.

Training evaluation. Two items from the *Parent Consultation Skills Checklist* (PCSCCL; Turner and Sanders, 1996) assessed providers' feelings of being adequately trained and self-efficacy or confidence in conducting consultations with parents about children's behavior. Items were rated on a 7-point scale, with higher values indicating a higher level of self-efficacy.

The *Workshop Evaluation Survey* (WES; (Turner, Nicholson, & Sanders, 2011). The WES rated providers' satisfaction with training on four five items using a 7-point rating scale and higher scores indicated higher satisfaction. Items assessed satisfaction with the quality of the training presentation, the amount of active participation provided, the quality of the course content, and overall satisfaction with training, with established reliability ($\alpha = .85$) (Turner et al., 2011).

Implementation and sustainment. *Implementation* (a measure of program use; (Shapiro, Prinz, & Sanders, 2012) was assessed with the question "Are you currently using Triple P in your work with families?" The outcome variable was program implementation 9-18 months after training, coded as 0 (no) or 1 (yes). *Program sustainment* (a measure of continued program use; Hodge et al., 2015), was assessed with the question "With how many families have you used Triple P in the last 12 months that you worked?" (an estimate was provided). The outcome variable was sustained program implementation three years after training, coded as 0 (has not used Triple P with parents in the last 12 months) or 1 (has used Triple P with parents in the last 12 months). Parent outcome data to determine intervention effectiveness for improving dysfunctional parenting and child behavior and emotional problems when delivered by Indigenous family support providers was also collected and will presented elsewhere.

Sustained Implementation Support Scale. The SISS (Hodge et al., 2015) is a validated 28-item measure adapted from scales used in the PROSPER Community–University Partnership evaluation (Brown, Feinberg, & Greenberg, 2012). The scale assessed five categories of common barriers and enablers of sustained program implementation: Program benefits (4 items), Program burden (3 items, reverse scored), Workplace support (7 items), Workplace cohesion (6 items), and Leadership style (8 items). Items were rated on a 4-point Likert scale. For each subscale, the items were summed to provide total subscale scores, higher scores indicated higher levels of perceived program benefits and positive workplace functioning. The scale has good convergent, discriminant and predictive validity. It has good internal consistency: $\alpha = .91$ (Total score), .82 (Program benefits), .81 (Program burden), .92 (Workplace support), .85 (Workplace cohesion) and .94 (Leadership style). It also has good reliability: Composite Reliability (CR) estimates for the five subscales were .82, .83, .93, .86 and .95 respectively (Hodge et al., 2015). Participants rate their perceptions of their own workplace. Workplace category questions refer to the Triple P providers' individual place of work, not the peak body (QATSICPP).

Supervision and peer support. Supervision and peer support (Hodge et al., 2015) within the workplace were assessed with one item: “*Since Triple P accreditation, please tell us the average number of hours per month you have spent carrying out supervision and peer support (including face-to-face and telephone contact).*” Time dedicated to peer support and supervision was rated using a 7-point Likert scale (1= 0 hours, 7= more than 20 hours). Given little variability in responses, scores were recoded as a dichotomous variable: 0 (has not received supervision or peer support since program training) or 1 (has received supervision or peer support since program training).

Partnership support. A *Partnership Support Scale* (PSS) was adapted from the team enablers scale used to measure coalition functioning, which has good internal consistency [$\alpha = .80$; (Perkins et al., 2011)]. The scale explored the partnership between the researchers, training organization, child protection peak body and child protection agency managers from the service providers’ perspective. Partnership support was defined as the degree to which the work of Triple P providers benefited from the support of key partners (e.g., *How much has your work with Triple P benefited from support of management in your workplace?*), rated on a 4-point Likert scale from ‘*Not at all*’ to ‘*A great deal*’. Items were revised to refer more specifically to the partners involved in this partnership.

Supportive coaching. The partnership approach included technical assistance in the form of supportive coaching offered by an experienced Indigenous Triple P provider on the UQ research team. This was assessed with one question, ‘*Have you received peer support from the Indigenous Triple P Liaison Coordinator (this can involve the discussion of Triple P strategies, practicing Triple P and/or co-facilitating)?*’ The response was coded as 0 (no) or 1 (yes).

Sustainability planning. The *Sustainability Planning Scale* (SPS; Perkins et al., 2011) measured organization exploration of funding strategies and the development of a realistic, concrete plan to continue offering the program (e.g., *Has your organization explored potential funding sources for continuing Triple P?*). The four-item scale has good internal consistency ($\alpha = .85$; Brown et al., 2012) and acceptable test–retest reliability (Feinberg, Gomez, Puddy, & Greenberg, 2008). Items were scored on a 4-point Likert scale with items ranging from ‘*Not at all*’ to ‘*A great deal*.’

Program fidelity. Fidelity data were collected to determine the percentage of programs completed, participants reached, dosage and quality of adherence to program delivery protocol. Clinicians completed detailed protocol adherence checklists (Sanders et al., 2013; Turner et al., 2010) in-session including client details, attendance, session duration and session content covered. *Reach* was determined by recording the number of parents who came in contact with the program divided by the number of parents expected to be in contact with the program. *Dosage* was

determined by the number of sessions covered in the intervention divided by the number of sessions prescribed in the validated intervention model. A guided participation approach recommends key processes for providers to employ that promote positive client outcomes (Sanders & Burke, 2014). These key therapeutic alliance building processes and core program content covering positive parenting strategies are covered in the first five sessions of the Group and Standard Triple P interventions, followed by individual follow-up sessions for review and practice. *Adherence* data were extracted from the *Triple P Session Checklists* and calculated based on the core content achieved (session 1-5). The items within each session checklist outline the core program content along with extra program elements that are important, but not vital to program effectiveness or behavior change (i.e. overview of previous session, agenda for the session, conclusion statement). If all core content items were ticked the provider was considered to have covered core content in that session. Adherence was calculated by counting the number of sessions that core content was covered divided by the number of total sessions.

Procedure

Professionals attended 5-day training in Indigenous Group and Standard Triple P. The PCSCL was completed before Triple P training, directly after training and after program accreditation. Providers also completed the WES at the end of training. During the first year after training, the providers went through a series of routine follow-up workshops with a Triple P trained facilitator. This included pre-accreditation (1 month after training), accreditation (2-3 months after training), manager briefing (6 months after training) and a clinical consultation day (6 months after training). Also, a site visit from the university research team was offered annually in order to provide supportive coaching, facilitate peer support connections, review research project findings, review data collection strategies, and trouble shoot through service delivery issues that were causing barriers to program delivery. All questionnaires were completed during face-to-face interviews or over the telephone. The SISS and PSS were completed 9 months (as a progress check to inform technical assistance supportive coaching) and 18 months after training. The sustainability planning scale and supportive coaching measures were completed 24 months and 36 months, respectively, following Triple P training. Professionals were able to access a Triple P chat room, specifically developed for project participants, to submit session checklists and parent outcome data and receive peer support from other providers that took part in their training.

Statistical analyses

One-way repeated measures ANOVAs were conducted in SPSS v.21 to identify whether participants reported feeling more adequately trained and confident to conduct parent consultations about child behavior following completion of both modules of the course (i.e. training and accreditation).

A series of correlations and binary logistic regression analyses at the provider level identified correlates and predictors of program implementation (use versus non-use) at 18 months and program sustainment (continued use versus non-use) at 36 months. The predictive effects of SISS constructs and perceived partnership support were evaluated on implementation at 18 months. Where the provider was not available at 18 months ($n = 5$), 9 month data was used. Also, the predictive effect of the same SISS constructs and supervision and peer support, supportive coaching and sustainability planning, were evaluated on sustained program implementation at 36 months. To avoid multicollinearity issues, all non-binary predictors were centered on the mean (Afshartous & Perston, 2011). As the Supervision and peer support and Supportive coaching variables were binary predictors, to estimate the intercept and the slope for the group coded 0, no mean centring was applied for these predictors (Aiken, West, & Reno, 1991).

There are many different recommendations on the subject to item ratio for regression analysis. One recommendation that is based on statistical evidence suggests an item to participant ratio of 1:10 (Agresti, 2007). The current study would need the full sample of participants with no drop outs to meet the recommended ratio. With a smaller sample, the confidence held in the results will be reduced.

Results

Attrition and missing data

Nine training participants did not complete accreditation and were therefore not eligible to implement Triple P. Of the 50 eligible providers, the rate of attrition during the first 18 months was 30% ($n = 15$). Providers who dropped out: left their workplace ($n = 4$), or declined due to their work time constraints ($n = 9$; of whom 4 [44.4%] reported they were using the program) or moved to a position that did not involve direct family support (1 receptionist, 1 manager). The participating sample of thirty five providers completed in the follow-up surveys, with 3.3% missing data. Little's MCAR test indicated that data were missing completely at random, $\chi^2(371) = 116.34, p = 1.0$. When evaluating associations between the constructs, the multiple imputations procedure with five imputations was applied. Multiple imputations are considered one of the most efficient methods for handling missing data, when the data is considered at least missing at random (Enders, 2010). The data were normally distributed with all subscale items having average skew and kurtosis (the average skewness and kurtosis were .409 and .799, respectively).

Training evaluation

Confidence in consultation skills. Two one-way repeated measures ANOVAs were conducted on PCSCL scores for providers' feelings of adequacy of their training and confidence in conducting parent consultation prior to training, following training and following accreditation 2-3 months after training. Results indicated a significant, large effect for increased perceived adequacy

of training (Wilks' Lambda = .46, $F(2, 35) = 20.69$, $p < .0005$, $\eta^2 = .54$) and confidence in conducting parent consultation (Wilks' Lambda = .52, $F(2, 33) = 14.50$, $p < .0005$, $\eta^2 = .49$) over time. Pairwise comparison tests showed significant improvement from pre- to post-training, maintained at accreditation, and further improved from post-training to accreditation assessment for feelings of being adequately trained to conduct parent consultations (see Table 4.1 for mean scores for and associated F-statistics).

Table 4.1

Mean Ratings of Confidence in Conducting Parent Consultations

	Pre <i>M (SD)</i>	Post <i>(M (SD))</i>	Accreditation <i>M (SD)</i>	<i>F (df)</i>
PCSCCL adequately trained	4.16 (1.46) ^{ab}	5.38 (0.92) ^{ac}	5.89 (1.05) ^{bc}	20.69 (2, 35) ^{***}
PCSCCL confidence	4.14 (1.19) ^{ab}	5.14 (1.06) ^a	5.59 (0.98) ^b	17.50 (2, 33) ^{***}

Note. PCSCCL = Parent Consultation Skills Checklist; means with the same superscript show a significant change over time ($p < .05$).

*** $p < .001$

Consumer satisfaction with training. Participants reported high ratings of satisfaction with the quality and content of the provider training courses on the WES. The overall mean for the training was 5.85 and accreditation 6.48 out of 7. In an overall sense, 67.9% reported that they were more than 'satisfied' with training, with an increase in proportion (93%) for the accreditation day. The mean ratings for training and accreditation are reported in Table 4.2.

Table 4.2

Mean Ratings of Satisfaction with Training

Course	Quality of Training <i>M (SD)</i>	Active Participation <i>M (SD)</i>	Training Content <i>M (SD)</i>	Skills to Implement <i>M (SD)</i>	Overall Satisfaction <i>M (SD)</i>
WES Training	6.09 (0.84)	5.79 (1.03)	5.92 (0.90)	5.19 (0.90)	5.85 (0.93)
WES Accreditation	6.43 (0.73)	6.40 (0.82)	6.33 (0.75)	5.92 (1.07)	6.48 (0.63)

Note. WES = Workshop Evaluation Survey

Program implementation and sustainment

Of the 35 providers (70%) who participated in the 18 month survey, 15 (42.9%) were implementing the program at 18 months, increasing to 17 (48.6%) sustaining program implementation at three years post training.

Predictors of program implementation and sustainment

In the first step, Spearman rho correlations were evaluated between the SISS variables (Program benefit, Program burden, Workplace support, Workplace cohesion and Leadership style), Partnership support and program implementation (see Table 4.3). The correlations were computed in SPSS v. 21 using composite scores (observable variables). The bivariate relationships indicate that one independent variable, Partnership support, was significantly related to implementation ($r = .31$ $p < .05$) using a one-tailed p-value. Although not significant, there were small, positive associations between implementation and Program benefit, Workplace support and Workplace cohesion variables. As predicted there was a trend for providers who reported program implementation at 18 months to report higher levels of Partnership Support, Program benefit, Workplace support and Workplace cohesion as compared with providers who did not implement. There was no association between two factors (Program burden and Leadership style) and implementation.

Table 4.3

Spearman Rho Correlations Between Constructs Measured by SISS, Partnership Support and Implementation

	1	2	3	4	5	6	7
1. SISS Program benefit	---						
2. SISS Program burden	-.07	---					
3. SISS Workplace support	.40*	.05	---				
4. SISS Workplace cohesion	.32*	-.39*	-.16	---			
5. SISS Leadership style	.46**	-.30*	.33*	.38*	---		
6. Partnership support	.31*	-.19	.47**	.08	.41**	---	
7. Implementation	.12	-.07	.13	.24	-.02	.31*	---

Note. SISS = Sustained Implementation Support Scale; correlation coefficients were pooled across five imputed samples using Rubin's rules for Multiple Imputations (1987).

* $p < .05$, ** $p < .01$.

Table 4.4 presents the Spearman rho correlations among the SISS constructs program characteristics (Program benefit and Program burden) and workplace characteristics (Workplace support, Workplace cohesion and Leadership style), Supervision and peer support, Supportive coaching, Sustainability planning, and sustained implementation. The bivariate relationships indicate that Supportive coaching was the only independent variable significantly related to sustained implementation ($r = .46$, $p < .01$) using a one-tailed p-value. There were no significant associations between the remaining four factors (Program characteristics, Workplace characteristics, Supervision and Peer Support and Sustainability planning) and sustained implementation.

Table 4.4

Spearman Rho Correlations between Constructs Measured by SISS, Supervision and Peer Support, Supportive Coaching, Sustainability Planning and Sustained Implementation.

	1	2	3	4	5	6
1. SISS Program characteristics	---					
2. SISS Workplace characteristics	.16	---				
3. Supervision and peer support	.10	-.03	---			
4. Supportive coaching	.19	-.07	.10	---		
5. Sustainability planning	-.13	.03	.15	-.23	---	
6. Sustained implementation	-.09	.08	.03	.46**	.00	---

Note. SISS = Sustained Implementation Support Scale; correlation coefficients were pooled across five imputed samples using Rubin's rules for Multiple Imputations (1987). ** $p < .01$.

In the second step, binary logistic regression models were tested to evaluate the impact of a number of factors on the likelihood that respondents would report that they implemented and sustained program implementation. Two models were evaluated and both models, containing all predictors, demonstrated good fit of data determined by the Hosmer-Lemeshow Goodness of Fit Test, indicating that the models were able to distinguish between implementers and non-implementers. The first model tested the hypothesis that Program benefit, Workplace support, Workplace cohesion, Leadership style and Partnership support would be positively associated, and the Program burden scale would be negatively associated with program implementation. The combined set of predictors explained between 21.1% – 21.8%^e (Cox and Snell R²) of the variance in program implementation and correctly classified 71.4% – 72.3% of cases. The results are presented in Table 4.5. The analyses indicated that none of the independent variables made a statistically significant contribution to the model.

Table 4.5

Results of Binary Logistic Regression Analyses: Factors Predicting the Likelihood of Program Implementation.

	B	S.E.	p-value	OR	95% CI
Constant	-.39	.40	.048	0.05	1.00 - 2.46
SISS Program benefit	-.04	.19	0.843	0.96	0.66 - 1.41
SISS Program burden	.12	.18	0.492	1.13	0.80 – 1.61
SISS Workplace support	-.05	.12	0.678	0.95	0.76 - 1.19
SISS Workplace cohesion	.34	.17	0.050	1.41	1.00 - 1.98
SISS Leadership style	-.14	.12	0.268	.87	0.69 – 1.11
Partnership support	.38	.20	0.065	1.45	0.98 - 2.17

Note B = Unstandardized Regression Weight; OR = Odds ratio; 95% CI = 95% Confidence Interval. The coefficients were pooled across 5 imputed samples using Rubin's rules for Multiple Imputations (1987).

The second model tested the hypothesis that Program characteristics (Program benefits and burden), Workplace characteristics (Workplace support, Workplace cohesion and Leadership style), Supervision and peer support, Supportive coaching, and Sustainability planning would be positively associated with sustained program implementation. The analyses indicated that Supportive coaching significantly predicted sustained implementation (see Table 4.6). Respondents who received supportive coaching during the implementation phase of the project were 15 times more likely to sustain use of the program at 36 months [OR = 15.63, 95% CI (1.98 – 123.68), p = 0.009]. No other variables contributed significantly to the model. The combined set of predictors explained between

23.6% – 25.8%^e (Cox and Snell R²) of the variance in program sustainment and correctly classified 74.3% of cases.

Table 4.6

Results of Logistic Regression Analyses: Factors Predicting the Likelihood of Sustained Program Implementation

	B	S.E.	p-value	OR	95% CI
Constant	-1.90	.94	.044	0.15	0.02 - 0.95
<i>SISS Program characteristics</i>	-0.19	0.18	.306	0.83	0.58 - 1.19
<i>SISS Workplace characteristics</i>	0.02	0.06	.777	1.02	0.90 - 1.15
<i>Sustainability planning</i>	0.12	0.14	.397	1.13	0.86 - 1.48
<i>Supervision and peer support</i>	-0.09	0.84	.917	0.92	0.18 - 4.76
<i>Supportive coaching</i>	2.75	1.06	.009	15.6	1.98 - 123.7

Note B = Unstandardized Regression Weight; OR = Odds ratio; 95% CI = 95% Confidence

Interval. The coefficients were pooled across 5 imputed samples using Rubin's rules for Multiple Imputations (1987).

Program fidelity

Reach. Fifty-nine Indigenous family support providers received Triple P training through QATSICPP. The expected number of parents to participate in Triple P, based on the number of providers trained was close to 2,000 (approximately 30 parents per trained provider). The reach according to the submitted session checklists from the 17 sustaining providers was 368 parents ($M = 22$ parents per trained provider; 18.4% of original projection for 59 trainees). However, formal assessment and recording was a considerable issue for providers. The 36 month follow-up data on reach of the program showed that the 17 sustaining Triple P providers in reality used the program flexibly with over 1460 parents ($M = 86$ families per trained provider: 238 families outside of work, 262 friends outside of work and over 960 parents at work) in some form (i.e. tip sheets, strategies, group or standard program) and providers recommended Triple P to more than 1662 parents in the community.

Dosage. Compliance on the amount of the intervention delivered according to the intervention protocol was accomplished for Standard and Group Triple P programs. A total of 338 parents participated in 52 Group Triple P programs. Providers delivered 76% of the program according to the session protocol checklist (316 sessions delivered out of 416 possible sessions; many providers were not able to provide individual follow-up sessions and therefore conducted the five group sessions only). A total of 30 parents participated in Standard Triple P. Providers delivered 95% (228 sessions delivered out of 240 possible sessions) of the program according to the

session protocol checklists. Providing a total achieved dosage percentage of 82.9% (544 total sessions out of 656 possible sessions) of the Triple P program delivered to parents.

Adherence. It is important when implementing and sustaining EBPs that core content that is proven to facilitate change in clients is covered. Sessions checklists for the core session content (sessions 1-5) showed that Triple P was delivered with adequate adherence to session protocol: 97.3% (399 out of 410) of sessions covered core session content as per protocol.

Discussion

This study evaluated the factors that impact implementation and sustainment of an evidence-based parenting program delivered by community-based Indigenous child protection services, following support from project partners (program developers, researchers, training organization and peak body). The results provided reasonable support for the program's successful implementation (as measured by program delivery at 18 months post training) and sustainment (as measured by program delivery at 36 months) with Indigenous family support providers.

The study examined whether program, workplace or process factors were associated with implementation and sustainment. Taking into consideration the small sample size ($n = 35$), using a Spearman rho one-tailed significance test we found a trend in the implementation analysis for higher Program benefit, Workplace support, Workplace cohesion and Partnership support for providers who reported program implementation at 18 months. Unexpectedly, Partnership support was the only significant correlation with implementation. Program burden and Workplace leadership were not associated with implementation as hypothesized and none of the factors were significant predictors of implementation as demonstrated in the regression analysis. The sustainment Spearman rho correlation results found no relationship between sustainment and Program characteristics, Workplace characteristics, Supervision and peer support or Sustainability planning. The only significant correlation and predictor (from the regression analysis) of program sustainment was the availability of Supportive coaching. Therefore, providers who receive post-training supportive coaching were more likely to sustain program implementation at 36 months. Indices of program implementation fidelity indicated acceptable program reach, good dosage (amount of the intervention delivered to parents in relation to the amount prescribed in the validated intervention model) with high levels of adherence and quality of delivery.

Why were some factors not significant predictors of implementation and sustainment? The most probable explanation is the low participant to item ratio. As mentioned earlier, there are different recommendations on the item to subject ratio for regression analysis, a common ratio is 1:10 (Agresti, 2007). The current study would have reached ratio with no participant attrition, but the reality of implementation research is that participants move to other workplaces or roles. This resulted in the study having half the number of participants required to meet the recommended ratio,

which could explain why many results did not reach significance. With a small sample it is also possible that the results over-estimated the degree to which the factors predicted the outcome (Reed & Wu, 2013). This does not mean that the results of the study should be ignored. Given the lack of implementation research involving Aboriginal and Torres Strait Islander child protection agencies and communities, these results form the basis of vital future work in the area. A larger sample could consolidate these results. In a previous study, with a sample of 592 Triple P providers, the SISS factors and Supervision and peer support were found to be significantly associated with program sustainment. However, in this study only supportive coaching reached significance.

The support provided by the partnership could also be a reason for reduced significance in the association between the program and workplace factors and implementation and sustainment. Without a comparison group it is not possible to determine the impact of the support provided through the partnership, but previous studies have demonstrated the benefit of community-university partnerships in achieving high levels of implementation for preventative interventions using the PROSPER model (Spoth et al., 2002). With 48.6% of providers sustaining program delivery in this study compared to a previous study that demonstrated 32.9% of providers sustained program delivery without a community-university partnership (Hodge et al., 2015) it could be speculated that the partnership implementation support improved implementation so much that other factors have reduced relevance. Also, the service delivery setting may have impacted on our ability to determine the effects of workplace factors as all participants were from the same sector and peak body, meaning potentially reduced variability.

Another limitation is the lack of data collected from the member organizations on their interactions with Elders in their community about the program and its implementation. As all practitioners worked within Aboriginal and Torres Strait Islander community controlled agencies, it was expected that each agency had an existing protocol for including Elders in their direction and decision making. However, tapping into this process of how member organizations include Elders in decision making around program adoption and sustainment is an important aspect to consider for future implementation science research.

Similarly, not having data from upper management is a limitation to this study. However, on completion of the project, the QATSICPP CEO was asked for feedback on the project from her perspective. This is in synchrony with the findings about the need for tailored support for Indigenous Family Support Workers to continue to deliver effective services long term:

‘The project demonstrated the potential for positive change for Aboriginal and Torres Strait Islander families and communities through dedicated capacity and capability development. It reaffirms our position that "importing" technical skills and evidence based programs to an Aboriginal and Torres Strait Islander community controlled sector is far more effective in

generating positive outcomes for our families than attempting to "export" cultural competency to the non-Indigenous service industry... the program outcomes have encompassed positive benefits for participating families and for QATSICPP member organizations. For families, benefits have included improved parenting skills and confidence, and reductions in ineffective, lax and overly punitive parenting styles. This prevention or early intervention family support approach has the demonstrated potential to prevent participating families from entering the statutory child protection system or to support reunification of families where children had been in out-of-home placement. For QATSICPP, with both qualitative and quantitative feedback about the benefit for families, member organizations have been better able to plan their staff roles, training and resource needs related to the provision of the Triple P program. They have been able to encourage staff effort and sustained use of evidence-based programs, and have been able to use project reporting to support core funding applications. Triple P will continue to be available through participating QATSICPP member organizations and we will continue to advocate that the requisite supports to sustain and extend implementation are made available to build upon the outcomes achieved through this project.' (N. Lewis, personal communication, December 22, 2015).

Recommendations for Future Research

This research examined a novel and unique application of Triple P by using a supportive framework for intervention implementation and evaluation of both implementation and sustainment. Partnership models can build upon previously developed infrastructures for the provision of training, technical assistance, and other resources used to enhance capacity for sustained implementation of EBPs (Bracht et al., 1994). In future research, the inclusion of randomized controlled comparison groups would allow for evaluation of the key elements of the implementation and sustainment support framework in different settings.

As expected, many program, workplace and process variables showed some association with implementation and sustainment, however, few relationships were significant. This is a normal issue for small samples, a limitation of this research, which accordingly reduces confidence in the findings. These factors should be analysed with a larger sample of family support providers working with disadvantaged populations. Also, future work could compare results between organizations to explore impact at the organization level.

A notable finding in this series of research was the significant difficulty in program implementation for agencies with providers working in rural and remote communities. This is likely to be a result of the overall lack of supervision, technical support in program delivery, and resource mobilization as found in both this study and existing literature. This further highlights the

importance of supporting human resources and community capacity to sustain future social projects for disadvantaged communities (Savaya & Spiro, 2012).

In order to provide the necessary proactive support for human resources and promote human action for health care program sustainability in low resource settings, new modes of support and collaboration are needed. The integration of a supportive framework and partnerships that involve the community, program developers, researchers, disseminators and community-based providers and gatekeepers will be essential to increasing access to quality services and to improve health care globally. Other process and interaction factors not evaluated in this study that should be evaluated in future work include community engagement strategies, program champion involvement and the influence of parties outside of the community (i.e., funding and policy level influences) of providers and the community directly.

References

- Aarons, G. A. (2006). Transformational and transactional leadership: Association with attitudes toward evidence-based practice. *Psychiatric Services*, 57(8), 1162-1169. doi: 10.1176/appi.ps.57.8.1162
- Aarons, G., Fettes, D., Flores, L., Sommerfeld, D. (2009). Evidence based practice implementation and staff emotional exhaustion in children's services. *Behav Res Ther*;47:954-960
- Aarons, G. A., Sommerfield, D. H., Hecht, D. B., Silovsky, J. F., & Chaffin, M. J. (2009). The impact of evidence-based practice implementation and fidelity monitoring on staff turnover: Evidence for a protective effect. *Journal of Consulting and Clinical Psychology*, 77(2), 270-280. doi: 10.1037/a0013223
- Afshartous, D., & Perston, R. A. (2011). Key results of interaction models with centering. *Journal of Statistics Education*, 19, 1-23.
- Agresti, A. (2007). An introduction to categorical data analysis (2nd ed., pp. 161-162). New York: John Wiley & Sons.
- Ahluwalia, I. B., Robinson, D., Vallely, L., Giesecker, K. E., & Kabakama, A. (2010). Sustainability of community-capacity to promote safer motherhood in northwestern Tanzania: what remains? *Global Health Promotion*, 17(1), 39-108. doi: 10.1177/1757975909356627
- Aiken, L. S., West, S. G., & Reno, R. R. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage Publications.
- Aitaoto, N., Tsark, J., & Braun, K. L. (2009). Sustainability of the Pacific Diabetes Today coalitions. *Preventing Chronic Disease*, 6(4), 1-8.
- Amazigo, U., Okeibunor, J., Matovu, V., Zoure', H., Bump, J., & Seketeli, A. (2007). Performance of predictors: Evaluating sustainability in community-directed treatment projects of the African programme for onchocerciasis control. *Social Science & Medicine*, 64(10), 2070-2082. doi: 10.1016/j.socscimed.2007.01.018
- Australian Institute of Health and Welfare. (2015). Child protection Australia *Child Welfare Series*. Canberra.
- Bartholomew, L. K., Parcel, G. S., Kok, G., Gottlieb, N. H., & Fernandez, M. E. (2011). Diffusion of innovation theory *Planning health promotion programs: an intervention mapping approach* (3rd ed., pp. 108-111). San Francisco, CA: Jossey-Bass.
- Beery, W. L., Senter, S., Cheadle, A., Greenwald, H. P., Pearson, D., Brousseau, R., & Nelson, G. D. (2005). Evaluating the legacy of community health initiatives: A conceptual framework and example from the California Wellness Foundation's health improvement initiative. *American Journal of Evaluation*, 26(2), 150-165. doi: 10.1177/1098214005275627

- Boucar, M., Franco, L. M., Sabou, D., Saley, Z., Jennings, L., & Mohan, D. (2011). Sustaining better maternal and newborn care and quality improvement in Niger: challenges and successes. *Research and Evaluation Report*. Bethesda, MD: University Research Co., LLC.
- Bracht, N., Finnegan, J. R., Rissel, C., Weisbrod, R., Gleason, J., Corbett, J., & Veblen-Mortenson, S. (1994). Community ownership and program continuation following a health demonstration project. *Health Education Research: Theory & Practice*, 9(2), 243-255.
- Brown, L. D., Feinberg, M. E., & Greenberg, M. T. (2010). Determinants of community coalition ability to support evidence-based programs. *Prevention Science*, 11(3), 287-297. doi: 10.1007/s11121-010-0173-6
- Brown, L. D., Feinberg, M. E., & Greenberg, M. T. (2012). Measuring coalition functioning: Refining constructs through factor analysis. *Health Education & Behavior*, 39(4), 486-497. doi: 10.1177/1090198111419655
- Bustamante, R., Hurtado, E., & Zeribi, K. A. (2012). Improving the quality of Guatemala's public health system: A view to institutionalization *Research and Evaluation Report*. Bethesda, MD: University Research Co., LLC.
- Carbone, S., Fraser, A., Ramburuth, R., & Nelms, L. (2004). Promoting inclusion of vulnerable families in antenatal and universal early childhood services: A report on the first three stages of the project *Breaking Cycles, Building Futures*. Melbourne, Victoria: Department of Human Services.
- Cooper, B. R., Bumbarger, B. K., & Moore, J. E. (2015). Sustaining evidence-based prevention programs: Correlates in a large-scale dissemination initiative. *Prevention Science*, 16(1), 145-157. doi: 10.1007/s11121-013-0427-1
- Edwards, N. C., & Roelofs, S. M. (2006). Sustainability: The elusive dimension of international health projects. *Canadian Journal of Public Health*, 97(1), 45-49.
- Emukah, E. C., Enyinnaya, U., Olaniran, N. S., Akpan, E. A., Hopkins, D. R., Miri, E. S., . . . Katarbarwa, M. N. (2008). Factors affecting the attrition of community-directed distributors of ivermectin, in an onchocerciasis-control programme in the Imo and Abia states of south-eastern Nigeria. *Annals of Tropical Medicine and Parasitology*, 102(1), 45-51. doi: 10.1179/136485908X252241
- Enders, C. K. (2010). *Applied missing data analysis: Methodology in social sciences*. New York, NY: Guilford Press.
- Feinberg, M. E., Gomez, B. J., Puddy, R. W., & Greenberg, M. T. (2008). Evaluation and community prevention coalitions: Validation of an integrated web-based/technical assistance consultant model. *Health Education & Behavior*, 35(1), 9-21. doi: 10.1177/1090198105282413

- Feldstein, A. C., & Glasgow, R. E. (2008). A practical, robust implementation and sustainability model (PRISM) for integrating research findings into practice. *Joint Commission Journal on Quality and Patient Safety*, 34(4), 228-243.
- Gaven, S., & Schorer, J. (2013). From training to practice transformation: Implementing a public health parenting program. *Australian Institute of Family Studies*(93), 50-57.
- Glisson, C. (2002). The organizational context of children's mental health services. *Clinical Child and Family Psychology Review*, 5(4), 233-253. doi: 10.1023/A:1020972906177
- Goodman, R. M., & Steckler, A. (1989). A model for the institutionalization of health promotion programs. *Family and Community Health*, 11(4), 63-78. doi: 10.1097/00003727-198902000-00009
- Gruen, R. L., Elliott, J. H., Nolan, M. L., Lawton, P. D., Parkhill, A., & McLaren, C. J. (2008). Sustainability science: An integrated approach for health-programme planning. *The Lancet*, 372(9649), 1579-1589. doi: 10.1016/S0140-6736(08)61659-1
- Gurtler, R. E., Kitron, U., Cecere, M. C., Segura, E. L., & Cohen, J. E. (2007). Sustainable vector control and management of Chagas disease in the Gran Chaco, Argentina. *Proceedings of the National Academy of Sciences of the United States of America*, 104(41), 16194–16199. doi: 10.1073/pnas.0700863104
- Hodge L. M. & Turner K. M. T. (2015). Sustained Implementation of Evidence-based Programs in Disadvantaged Communities: A Conceptual Framework of Supporting Factors. Manuscript submitted for publication.
- Hodge, L. M., Turner, K. M. T., Sanders, M. R., & Filus, A. (2015). Sustained Implementation Support Scale: Validation of a measure of program characteristics and workplace functioning for sustained program implementation.
- Hodgins, S., Crigler, L., Lewin, S., Tsui, S., & Perry, H. (2013). Scaling up and maintaining effective community health worker programs at scale. 1-18. Retrieved from HREOC (Human Rights and Equal Opportunity Commission) 1997. Bringing them home. Report of the national inquiry into the separation of Aboriginal and Torres Strait Islander children from their families. Sydney: HREOC.
- Kitau, R., Tsey, K., McCalman, J., & Whiteside, M. (2011). Adaptability and sustainability of an Indigenous Australian family wellbeing initiative in the context of Papua New Guinea: A follow up. *Australasian Psychiatry*, 19(1), S80-S83. doi: 10.3109/10398562.2011.583050
- Klein, K. J., Conn, A. B., & Sorra, J. S. (2001). Implementing computerized technology: An organizational analysis. *Journal of Applied Psychology*, 86(5), 811-824. doi: 10.1037/0021-9010.86.5.811

- Lehman, W. E. K., Greener, J. M., & Simpson, D. (2002). Assessing organizational readiness for change. *Journal of Substance Abuse Treatment, 22*(4), 197-209. doi: 10.1016/S0740-5472(02)00233-7
- Livet, M., Courser, M., & Wandersman, A. (2008). The prevention delivery system: Organizational context and use of comprehensive programming frameworks. *American Journal of Community Psychology, 41*(3-4), 361-378. doi: 10.1007/s10464-008-9164-1
- Loman, S. L., Rodriguez, B. J., & Horner, R. H. (2010). Sustainability of a targeted intervention package: First Step to Success in Oregon. *Journal of Emotional and Behavioral Disorders, 18*(3), 178-191. doi: 0.1177/1063426610362899
- Mancini, J. A., & Marek, L. I. (2004). Sustaining community-based programs for families: Conceptualization and measurement. *Family Relations, 53*(4), 339-347. doi: 10.1111/j.0197-6664.2004.00040
- Massatti, R. R., Sweeney, H. A., Panzano, P. C., & Roth, D. (2008). The de-adoption of Innovative Mental Health Practices (IMHP): Why organizations choose not to sustain an IMHP. *Administration and Policy in Mental Health, 35*(1-2), 50-65. doi: 10.1007/s10488-007-0141-z
- McDermott, R., Tulip, F., & Sinha, A. (2004). Sustaining better diabetes care in remote indigenous Australian communities. *BMJ, 327*(7412), 428-430. doi: 10.1136/bmj.327.7412.428
- McPherson, K., Sanders, M. R., Schroeter, B., Troy, V., & Wiseman, K. (2015). Acceptability and feasibility of Peer Assisted Supervision and Support (PASS) for early intervention practitioners: A Q-methodology evaluation.
- Michealis, B., Stegmaier, R., & Sonntag, K. (2009). Affective commitment to change and innovation implementation behavior: The role of charismatic leadership and employees' trust in top management. *Journal of Change Management, 9*(4), 399-147. doi: 10.1080/14697010903360608
- Michealis, B., Stegmaier, R., & Sonntag, K. (2010). Shedding light on followers' innovation implementation behavior: The role of transformational leadership, commitment to change, and climate for initiative. *Journal of Managerial Psychology, 25*(4), 408-429. doi: 10.1108/02683941011035304
- Novins, D. K., Green, A. E., Legha, R. K., & Aarons, G. A. (2013). Dissemination and implementation of evidence-based practices for child and adolescent mental health: A systematic review. *Journal of the American Academy of Child and Adolescent Psychiatry, 52*(10), 1009-1025. doi: 10.1016/j.jaac.2014.02.003
- Perkins, D. F., Feinberg, M. E., Greenberg, M. T., Johnson, L. E., Chilenski, S. M., Mincemoyer, C. C., & Spoth, R. L. (2011). Team factors that predict to sustainability indicators for

- community-based prevention teams. *Evaluation and Program Planning*, 34(3), 283-291. doi: 10.1016/j.evalprogplan.2010.10.003
- Prinz, R. J., Sanders, M. R., Shapiro, C. J., Whitaker, D. J., & Lutzker, J. R. (2009). Population-based prevention of child maltreatment : The U.S. triple P system population trial. *Prevention Science*, 10(1), 1-12. doi:10.1007/s11121-009-0123-3
- Reed, P., & Wu, Y. (2013). Logistic regression for risk factor modelling in stuttering research. *Journal of Fluency Disorders*, 38(2), 88-101. doi: 10.1016/j.jfludis.2012.09.003
- Quality Assurance Project and UNICEF/Nicaragua. (2006). The Nicaragua mother and baby friendly health units initiative: Factors influencing its success and sustainability. In B. R. Burkhalter, I. González, N. Herrera, O. Nunez, S. L. S. & F. I. Sandino (Eds.), (Vol. U.S. Agency for International Development (USAID)). Bethesda, MD: U.
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York: Free Press.
- Sanders, M. R., & Burke, K. (2014). The "hidden" technology of effective parent consultation : A guided participation model for promoting change in families. *Journal of Child and Family Studies*, 23(7), 1289-1297. doi: 10.1007/s10826-013-9827-x
- Sanders, M. R., Markie-Dadds, C., & Turner, K. M. T. (2013). Practitioner's manual for Standard Triple P (2nd ed.). Brisbane, QLD, Australia: Triple P International Pty. Ltd.
- Sanders, M. R., & Turner, K. M. (2005). Reflections on the challenges of effective dissemination of behavioural family intervention: Our experience with the Triple P – Positive Parenting Program. *Child and Adolescent Mental Health*, 10(4), 158-169. doi: 10.1111/j.1475-3588.2005.00367.x
- Savaya, R., & Spiro, S. E. (2012). Predictors of sustainability of social programs. *American Journal of Evaluation*, 33(1), 26-43. doi: 10.1177/1098214011408066
- Schneider, B., Ehrhart, M. G., Mayer, D. M., Saltz, J. L., & Niles-Jolly, K. (2005). Understanding organization-customer links in service settings. *Academy of Management Journal*, 48(6), 1017-1032. doi: 10.5465/AMJ.2005.19573107
- Shapiro, C. J., Prinz, R. J., & Sanders, M. R. (2012). Facilitators and barriers to implementation of an evidence-based parenting intervention to prevent child maltreatment: The Triple P - Positive Parenting Program. *Journal of Child Maltreatment*, 17(1), 86-95. doi: 10.1177/1077559511424774
- Shapiro, C. J., Prinz, R. J., & Sanders, M. R. (2014). Sustaining use of an evidence-based parenting intervention: Practitioner perspectives. *Journal of Child and Family Studies*, 24(6), 1615-1624. doi: 10.1007/s10826-014-9965-9
- Simpson, D. D. (2002). A conceptual framework for transferring research to practice. *Journal of Substance Abuse Treatment*, 22(4), 171-182. doi: 10.1016/S0740-5472(02)00231-3

- Simpson, D. D., & Flynn, P. M. (2007). Moving innovations into treatment: A stage-based approach to program change. *Journal of Substance Abuse Treatment, 33*(2), 111-120. doi: 10.1016/j.jsat.2006.12.023
- Spoth, R. (2007). Opportunities to meet challenges in rural prevention research: Findings from an evolving community-university partnership model. *Journal of Rural Health, 23*(Suppl), 42-54. doi: 10.1111/j.1748-0361.2007.00123.x
- Spoth, R., Greenberg, M. T., Bierman, K., & Redmond, C. (2004). PROSPER community-University partnership model for public education systems: Capacity building for evidence-based, competence-building prevention. *Prevention Science, 5*(1), 31-39. doi: 10.1023/B:PREV.0000013979.52796.8b
- Spoth, R., Gyll, M., Trudeau, L., & Goldberg-Lillehoj, C. (2002). Two studies of proximal outcomes and implementation quality of universal preventive interventions in a community-university collaboration context. *Journal of Community Psychology, 30*(5), 499-518. doi: 10.1002/jcop.10021
- Tibbits, M. K., Bumbarger, B. K., Kyler, S. J., & Perkins, D. F. (2010). Sustaining evidence-based interventions under real-world conditions: Results from a large-scale diffusion project. *Prevention Science, 11*(3), 252-262. doi: 10.1007/s11121-010-0170-9
- Turner, K.M.T. (2008). *Supporting Indigenous Health Professionals: Key issues and supports for the adoption of evidence-based behavioural family intervention in Indigenous communities*. Report prepared for the Australian Research Alliance for Children and Youth.
- Turner, K. M. T., Markie-Dadds, C., & Sanders, M. R. (2010). Facilitator's manual for Group Triple P (3rd ed.). Brisbane, QLD, Australia: Triple P International.
- Turner, K. M., Nicholson, J. M., & Sanders, M. R. (2011). The role of practitioner self-efficacy, training, program and workplace factors on the implementation of an evidence-based parenting intervention in primary care. *Journal of Primary Prevention, 32*(2), 95-112. doi: 10.1007/s10935-011-0240-1.
- Turner, K. M., Richards, M., & Sanders, M. R. (2007). Randomised clinical trial of a group parent education programme for Australian Indigenous families. *Journal of Paediatrics and Child Health, 43*(6), 429-437. doi: 10.1111/j.1440-1754.2007.01053.x
- Turner, K. M. T., & Sanders, M. R. (1996). Parent consultation skills checklist. Brisbane, QLD, Australia: Parenting and Family Support Centre, The University of Queensland.
- Turner, K. M. T., Sanders, M. R. (2007). Positive Parenting: A Survival Guide for Indigenous Families [DVD]. Brisbane, QLD Australia: Families International.

- Turner, K. M., Sanders, M. R., & Hodge, L. (2014). Issues in professional training to implement evidence-based parenting programs: The preferences of Indigenous practitioners. *Australian Psychologist, 49*(6), 384-394. doi: 10.1111/ap.12090
- Turner, K. M. T., Sanders, M. R., & Markie-Dadds, C. (2006). Every parent's workbook for Indigenous Triple P. Brisbane, QLD, Australia: Triple P International.
- World Health Organization. (2012). From evidence to policy: Expanding access to family planning. Geneva: Department of Reproductive Health and Research.

Chapter 5

Conclusion

This chapter reviews and discusses the findings and implications of this thesis. The key findings are presented, and limitations and implications for future research are outlined. It is argued that program, workplace capacity and process and interaction factors (including perceived program benefit versus burden, workplace support, cohesion and leadership style, partnership support, supportive coaching, and supervision and peer support) are important factors to increase the likelihood of evidence-based program (EBP) implementation and sustainment in disadvantaged communities.

Key Findings

Health worker education and training systems have been building discipline-specific competencies for professional practice for over a century (e.g., Flexner, 1910). However, many health training systems around the world are not equipping health workers with the competencies to routinely implement programs and spread change (USAID, 2014). Consequently, evidence-based high impact programs are not reaching the most vulnerable families that need them most. Using the University of Queensland's Indigenous Triple P – Positive Parenting Program (including groups and an individual program delivery variant) as an example EBP, this thesis aimed to establish the mechanisms that enhance a practitioner's and community's likelihood of delivering and maintaining evidence-based parenting support in child protection and family support services. Such knowledge has the potential to inform implementation efforts of high impact health programs in different service delivery settings, and thus improve the social fabric of both family units and entire communities.

This thesis developed and evaluated a framework for EBP sustained implementation support to enhance program implementation effectiveness for Indigenous child protection agencies. The thesis provides a systematic review of the contextual factors that influence evidence-based program implementation and sustainment in disadvantaged communities and presents a framework for sustained implementation support. The review synthesized studies addressing program sustainment in disadvantaged communities, defined as disadvantaged based on Tony Vinson's (2007) five domains of disadvantage (social, health, community safety, economic and education). The supportive framework developed through the review proposes implementation support through program, workplace capacity and process and interaction factors. The framework was used to form a measurement tool for factors that influence sustainment and tested with an international sample of accredited Triple P providers. The measure demonstrated good internal consistency and predictive validity for sustained program use. The validated measure was then used to evaluate factors that are associated with and predict implementation and sustainment of Triple P with Indigenous family

support providers in child protection agencies across Queensland. The findings suggest that partnership support is significantly associated with program implementation, and in particular, providing support to EBP trained providers through supervision and peer support (Hodge, Turner, Sanders & Filus, 2015) and supportive coaching after practitioners are trained in a new program can enhance program sustainment (Hodge, Turner & Sanders, 2015).

Sustained Implementation of Evidence-Based Programs in Disadvantaged Communities: A Conceptual Framework of Supporting Factors

There is much existing research around evidence-based programs that can effectively address global health issues (including Triple P), but there is a large gap in empirical literature relating to successful delivery of programs in the real world, especially with disadvantaged communities. This systematic review found that program sustainment is a serious concern, with only 43% of programs sustained in vulnerable communities. The review identified many shortcomings as few empirical studies had strong study designs. Sample sizes were usually small, only half identified a conceptual framework and most used measurement tools that were not validated. This methodology gap highlighted the need to develop a conceptual framework and a measure to guide and evaluate capacity building in EBP implementation and sustainment in low resource community settings.

The systematic review identified and defined 18 enablers and barriers to the sustainability of programs in disadvantaged communities, grouped into three broad thematic categories of potential influences: 1) program characteristics, 2) capacity factors within the workplace, and 3) process and interaction factors. The findings align with many of the commonly cited influences on sustained implementation, however, relating specifically to disadvantaged communities, the review also highlighted a need to focus on program burden, program familiarity and perceived competence in program skills, workplace support for the program, staff mobility and turnover, supervision and peer support, and ongoing technical assistance.

These themes were used to develop a sustained implementation support framework for EBPs and the *Sustained Implementation Support Scale*, an evaluation measure of enablers and inhibitors to sustained EBP implementation.

Validation of a Measure of Program Characteristics and Workplace Functioning for Sustained Program Implementation

The lack of sustainment of high impact programs in real world practice is costly to funders and organizations that train staff in the EBP, and has negative implications for community members depending on program continuation for treatment. To enable researchers and organizations to assess and address the factors that influence sustainment and thereby enhance the chances of sustained implementation, this thesis adapted and validated a 28-item measurement tool of program and

workplace functioning factors that influence successful program implementation and sustainment. The preliminary validation of the *Sustained Implementation Support Scale*, that measures enablers and inhibitors (program benefits, program burden, workplace support, workplace cohesion and leadership style) to EBP sustainment, demonstrated good internal consistency and reliability, and good convergent, discriminant and predictive validity.

This study confirmed five of the program and workplace factors, identified in the literature review, as influences on program sustainment for providers who attended Triple P training over three years prior to the study. Practitioners sustaining implementation at least three years post training were more likely to have supervision/peer support, reported higher levels of program benefit, workplace support and positive leadership style within their workplace, and lower program burden compared to practitioners who were non-sustainers. The results also suggested that providing supervision and peer support can improve sustainment even if the program is considered a burden and the reported leadership style within the workplace is ineffective. This speaks to the importance of providing supervision and peer support for program providers, which many organizations working in constrained human resource contexts and vulnerable communities often lack.

An interesting finding emerging from this study was the failure to find significant correlations between workplace cohesion and program sustainment. Although the literature suggests that cohesion and unity in the workplace contribute to sustainment, our study did not support this. Workplace cohesion should be evaluated further to determine if it has an indirect influence on sustainment. For example, it is possible that workplace cohesion could impact other factors (e.g., workplace support) that then impact sustainment.

The findings from this initial validation study suggest that the *Sustained Implementation Support Scale* is psychometrically sound and therefore a promising measure that can be used to assess program characteristics and workplace functioning for professionals trained to deliver EBPs. This measure was next used in the child protection agency setting to gather a more in-depth understanding of the impact of program characteristics, workplace functioning and process factors on sustained program implementation.

QATSICPP Partnership Implementation and Sustainment Project

The goal of this partnership project was to evaluate the state wide implementation of Triple P through Queensland Aboriginal and Torres Strait Islander Child Protection Peak (QATSICPP) family support services. Fifty-nine Indigenous family support providers from 16 rural, remote and urban Queensland sites were trained in Triple P. The study found high consumer satisfaction with the Triple P training, and improved confidence in parent consultation skills following training and accreditation. It also showed that acceptable levels of program implementation (42.9%) and

sustainment (48.6%) can be achieved in vulnerable communities despite losing staff due to turnover or redeployment.

Indices of program implementation fidelity included program reach, dosage and adherence. According to formal attendance records, program reach was 18.4% of the projected reach for the entire training cohort (based on 30 parents per trained provider). However, reach for the 17 sustaining providers was 73.3% of that projection ($M = 22$ parents out of 30 targeted). On a less formal retrospective estimate of the number of parents actually exposed to Triple P in some way (e.g. tip sheet, advice on strategies, enrolling in an 8-session program) reach was 73% of the projection for the entire training cohort (1460/2000 parents) or based on 17 implementing providers 286.7% ($M = 86$ parents out of 30 targeted). This suggests that consideration should be given to intervention targets in disadvantaged communities, and also that training fewer, carefully chosen and well-supported providers may have greater reach than training many providers who are not committed or able to implement from the outset. Dosage was also acceptable: 76% of Group Triple P sessions (often omitting individual follow-up sessions because they were seen as unnecessary, unwanted or not possible due to workplace restraints) and 95% of Standard Triple P sessions. Adherence to core program content was extremely high (97.3%), as session checklists were used by providers as agenda prompts, and flexible delivery tailored to individual needs was encouraged (to cater for personal, learning style, and cultural preferences). This is equivalent to studies of Triple P in other settings (Gaven & Schorer, 2013; Shapiro, Prinz & Sanders, 2014).

In sync with the current literature, the data from this trial suggest that providing support to trained providers in program delivery through key partners (internal and external) is associated with program implementation, and providing technical assistance and supportive coaching after professionals are trained in a new program enhances the likelihood of program sustainment.

As expected, there was a trend for providers who reported program implementation at 18 months to report higher levels of program benefit, workplace support and workplace cohesion than non-implementers however, only partnership support was significantly associated with implementation. The hypothesized association between program sustainment at 36 months and program characteristics, workplace characteristics, supervision and peer support and sustainability planning was not confirmed. These factors may indirectly influence implementation and sustainment success, or their predicted relationship based on implementation literature may be minimized when other factors are considered (e.g. partnership support, supportive coaching). Exploring direct and indirect relationships further with other implementation settings and EBPs is crucial to understanding the relationships between factors in more detail and will add to the implementation science literature greatly. However, one key finding here was that providers who

received supportive coaching were fifteen times more likely to sustain the program compared to providers who did not receive supportive coaching.

Limitations and Future Research Directions

The implementation and sustainment support framework highlighted in Chapter 2 emphasizes three areas important to the implementation process (program, workplace, and process and interaction factors) across various health service delivery settings with vulnerable communities. The systematic review uncovered extra factors that could be relevant to implementation in disadvantaged communities, but raises the question as to whether these factors are specific to disadvantaged communities or to all community practice settings. Given that the review only covered disadvantaged communities, further research could evaluate and compare health program implementation for both disadvantaged and non-disadvantaged communities to further examine if these factors are relevant for both groups.

Much of the existing implementation research points to the importance of the entire context of the service provider system when evaluating implementation. However, it is impossible to study all of the factors that impact sustainment in one, short-term funded research project with a small pool of participants. The small sample size in the final study ($N = 59$) could not meet the recommended item to participant ratio (1:10) to allow for evaluation of all program, workplace and process factors from the thematic review of the literature. Therefore, those factors that were quantifiable without direct observation and most relevant to child protection settings were selected for the scale validation and implementation and sustainment studies. Future studies should evaluate a greater scope of potential influences identified in the review (i.e., program fit, program familiarity and competency, program integration in the workplace, engagement, training strategies, key program champion, funding and policy factors).

The measure development data was cross-sectional, thereby limiting causal inferences that can be attributed to the sustained implementation characteristics. Also, the scale validation was measured at the level of the individual practitioner and did not look at inter-rater reliability to show if other organization and partnership members would rate the variables the same way. Future studies are needed to evaluate this measure with respondents at different levels within and outside of the organizations, with other EBPs, longitudinally, and in diverse service delivery settings to gather a more in-depth understanding of the direct and indirect effects of all program, workplace functioning and process factors identified in this thesis on sustained program implementation.

Whenever possible, comparison groups should be used in place of one-group designs to strengthen confidence regarding the relationship between implementation and the identified factors. In the partnership project detailed here, a comparison group was not possible as the participating peak body had one wave of dissemination and no ability to establish randomized or staged

implementation. Future studies in other settings should look at implementation factors using comparison groups where possible to strengthen outcomes.

Implications for Future Researchers, Clinicians and Policy Makers

The sustained implementation support framework for EBPs proposed here adds to implementation research by providing a model for program sustainment in disadvantaged community family support settings, with an emphasis on a supportive partnership approach and ongoing evaluation of appropriate program, workplace and process elements. This form of evaluation and monitoring, if it takes place in the early stages of the implementation process, can identify systemic barriers to successful implementation and identify practitioners requiring further clinical and technical support, allowing for remedial action (DuFrene, Noel, Gilbertson & Duhon, 2005; Greenwood, Tapia, Abbott & Walton, 2003). The use of validated measures in future implementation research is recommended.

This thesis has highlighted the potential for significantly improved program implementation planning if partnership support and supportive coaching are adequately incorporated. In relation to such efforts in disadvantaged communities, there are many challenges when working towards closing the gap in health and social disparity in disadvantaged communities. The way to overcome these challenges is to have a program, proven effective at producing positive change, that is beneficial and desired by the community, continuously supported through key partners and technical assistance (i.e. ongoing supportive coaching), and sustainable.

To ensure that high impact interventions reach families every time, we need to equip local health care and welfare agencies and professionals, who work with Indigenous families and other vulnerable communities, with the skills to implement programs by scaling-up post-training support. This thesis adds to the field of implementation science by piloting a framework for EBP implementation and sustainment in an Indigenous child protection service delivery setting. Findings suggest that providing support in the workplace through supervision and supportive coaching after professionals are trained in a new program can enhance program sustainment. Through further exploring strengths and weaknesses of program, workplace and process and interaction factors, successful program implementation and sustainment can be achieved in the community.

In order to provide globally relevant and innovative outcomes, future research should focus on transferring research to practice by improving training and program delivery support for Indigenous community health and family support providers who work with Australia's most vulnerable population. An issue equally important for other disadvantaged communities. Scaling up evidence-based programs is a real world global issue in health care that we can address by bringing together program developers, researchers, program providers, NGOs, communities and policy-

makers to work in unison to successfully evaluate and implement high impact programs. Supervision and peer support, and supportive coaching and technical assistance, should be provided to all practitioners being trained in a new EBP to enhance the likelihood of successfully sustained program implementation, and substantial return on training investment in the long term.

Most importantly, characterizing implementation effectiveness as distinct from treatment effectiveness is crucial for transporting high impact health programs from the university laboratory setting to community-based practices. If interventions fail to be implemented and sustained in real world practice, it is important to know whether this failure is due to intervention ineffectiveness (intervention ineffective in the new setting) or implementation ineffectiveness (good intervention deployed incorrectly). To address implementation effectiveness and advance this area of research there is a need for implementation scientists to continue to refine comprehensive implementation models with clearly defined constructs, conceptualize a measurement model to evaluate the key constructs and an analytic model hypothesizing links between measured constructs (Proctor et al., 2009). This thesis provides foundational steps in addressing this need in vulnerable communities.

References

- DuFrene, B. A., Noell, G. H., Gilbertson, D. N., & Duhon, G. J. (2005). Monitoring implementation of reciprocal peer tutoring: Identifying and intervening with students who do not maintain accurate implementation. *School Psychology Review*, 34, 74–86.
- Flexner A. (1910). *Medical education in the United States and Canada: a report to the Carnegie Foundation for the Advancement of Teaching*. New York: The Carnegie Foundation for the Advancement of Teaching.
- Gaven, S., & Schorer, J. (2013). From training to practice transformation: Implementing a public health parenting program. *Australian Institute of Family Studies*(93), 50-57.
- Greenwood, C. R., Tapia, Y., Abbott, M., & Walton, C. (2003). A building-based case study of evidence-based literacy practices: Implementation, reading behavior, and growth in reading fluency, K-4. *The Journal of Special Education*, 37, 95–110.
- Hodge L. M. & Turner K. M. T. (2015). Sustained Implementation of Evidence-based Programs in Disadvantaged Communities: A Conceptual Framework of Supporting Factors. Manuscript submitted for publication.
- Hodge, L. M., Turner, K. M. T., Sanders, M. R., & Filus, A. (2015). Sustained Implementation Support Scale: Validation of a measure of program characteristics and workplace functioning for sustained program implementation. Manuscript submitted for publication.
- Hodge, L., Turner, K. M. T., Sanders M. R., & Forster, M. (2015). Factors that Influence Evidence-based Program Implementation and Sustainment for Indigenous Family Support Providers in Child Protection Services. Manuscript submitted for publication.
- Proctor, E. K., Landsverk, J., Aarons, G. A., Chambers, D. A., Glisson, C., & Mittman, B. (2009). Implementation research in mental health services: An emerging science with conceptual, methodological, and training challenges. *Administration and Policy in Mental Health*, 36(1), 24-34. doi: 10.1007/s10488-008-0197-4
- Shapiro, C. J., Prinz, R. J., & Sanders, M. R. (2014). Sustaining use of an evidence-based parenting intervention: Practitioner perspectives. *Journal of Child and Family Studies*, 24(6), 1615-1624. doi: 10.1007/s10826-014-9965-9
- USAID Applying Science to Strengthen and Improve Systems Project, (2014). USAID ASSIST Project Five-year Cooperative Agreement. University Research Co., LLC (URC)
- Vinson, T. (2007). The web of social disadvantage. *Developing Practice: The Child, Youth and Family Work Journal*, 19, 56-55.