Knowledge and Use of Intervention Practices by Community-based Early Intervention Service Providers

Abstract

This study investigated staff attitudes, knowledge and use of evidence-based practices (EBP) and links to organisational culture in a community-based autism early intervention service. An Evidence-Based Practice (EBP) questionnaire was completed by 99 metropolitan and regionally-based professional and paraprofessional staff. Participants reported greater knowledge and use of EBPs compared to emerging and unsupported practices. Knowledge and use of EBPs were linked to each other independent of significant correlations with organisational culture and attitudes. Knowledge and use of EBPs was greater in metropolitan than regional locations and paraprofessionals reported greater use of unsupported practices and lower levels of knowledge and use of EBPs than professionals. The implications of these findings for the facilitation of knowledge transfer are discussed.

Keywords: Evidence-based practice; implementation; knowledge transfer; early intervention; research-practice gap

Intervention Practices in Early Intervention for Autism Spectrum Disorders

For the 1 in 68 children diagnosed with an Autism Spectrum Disorder (ASD; Centers for Disease Control and Prevention, 2014) early intervention (EI) provides an important pathway to achieving positive outcomes. It is clear from the research that interventions must be of high quality to maximise these outcomes (Boyd et al., 2014). Our understanding of what constitutes 'high quality' intervention continues to grow with 27 intervention practices for children with ASD now considered to have sufficient research evidence to demonstrate their effectiveness (Wong et al., 2013). In addition to these evidence-based practices (EBPs), there are practices that lack scientific support (unsupported practices), or require further investigation to confirm preliminary research suggestive of benefits (emerging practices; National Autism Center [NAC], 2009).

Research suggests that parents and professionals draw on a mixture of EBPs, emerging, and unsupported practices. Surveys of parent-reported treatments reveal unsupported treatments (e.g., sensory integration therapy, vitamin supplements, and elimination diets) are widely used with children with ASD (for a review see Carlon, Stephenson, & Carter, 2014). Parents also report that some professionals (e.g., educators, speech therapists, and occupational therapists) recommend the use of unsupported treatments (Miller, Schreck, Mulick, & Butter, 2012). In addition, professionals report using unsupported treatments. For example, Kadar, McDonald and Lentin (2012) looked at strategies used with Australian children with ASD by occupational therapists (OT). They found 62.5% of OTs surveyed reported using sensory integration "often" or "always" with their clients despite recent reviews showing it to be ineffective and concluding that services that purport to use EBPs should not use this treatment (Lang et al., 2012).

That unsupported practices are being accessed by parents and professionals even though the number of EBPs is increasing, highlights the dearth of research concerning the effective translation of research into practice (Cook, Cook, & Landrum, 2013; Parsons et al., 2013). Emerging research suggests community-based ASD EI and preschool providers use a range of strategies ranging from those considered evidence-based to those that have been found to be ineffective (Hess, Morrier, Heflin, & Ivey, 2008; Stahmer, Collings, & Palinkas, 2005). For example, no EBPs were in the five most common strategies used in a questionnaire study of educators of children with ASD form preschool to year 12 (Hess, et al., 2008). Across age-groups the five most common strategies were a mixture of emerging (e.g., assistive technology) and limited evidence (e.g., sensory integration) strategies.

In addition, Stahmer and colleagues (2005) conducted focus groups to investigate practices used by EI providers (professionals such as teachers) in the US across a range of services. They found that providers reported using a mixture of both EBPs and unsupported practices with only about a third of practices having some evidence base. In addition, four participants reported not using any specific strategies and three of these four providers were from rural areas. Participants were reported to describe any intervention they were using as being evidence-based, regardless of the actual evidence (e.g., sensory integration training). Participants reported adapting practices based on child characteristics, preferences (of the participant), and external factors (e.g., funding, support). They also discussed using/not using strategies based on personal reasons such as whether it appealed to them. They talked about their need for professional development, particularly for paraprofessionals, who tended to miss out on training despite providing *"an extensive amount of service"* (p.76). Some teachers thought they could train paraprofessionals, but lacked time to do so.

Little research has investigated potential barriers or facilitators to the use of EBP by community service providers (Stahmer & Aarons, 2009). Variables that have received some

attention in the literature include attitudes towards EBP (Aarons, 2004; Stahmer & Aarons, 2009) and organisational culture (Stahmer et al., 2005). Both Aarons (2004) and Stahmer and Aarons (2009) demonstrated the utility of a scale developed by Aarons (2004), the Evidence-Based Practices Attitudes Scales (EBPAS) in understanding aspects of attitudes that may be linked to use of EBP. Stahmer and Aarons (2009) investigated attitudes towards EBP in providers of EI for children with ASD comparing mental health and EI service providers. They found significant differences across these groups with EI providers showing more positive global attitudes towards EBP, as well as reporting they were more likely to adopt EBP if it was required, or appealed to them, and they were generally more open to trying new interventions. They were also less likely to see EBP as divergent from their usual practice. However, this study failed to investigate whether attitudes were linked to actual practice, and the authors acknowledge previous research that found EI service providers report organisational barriers such as time and training can form barriers to actual implementation (Stahmer, et al., 2005). There is a clear need to investigate how attitudes towards EBP may interact with organisational factors, as well as individual factors such as knowledge, to influence the use of EBP. Such research is important, as both attitudes and organisational factors may be malleable, and if they act as significant barriers or facilitators to the use of EBP, may be targets for intervention to increase the use of EBP.

In summary, there appears to be a serious research to practice gap in EI and learning (e.g., preschool) services for children with ASD. Factors such as staff attitudes and organisational culture which may impact on the uptake of EBPs in these community-based organisations, are little understood. The present study was undertaken to expand our knowledge of factors that may facilitate or hinder the use of EBPs in community settings. Specifically, the study addressed the following questions:

1. What is the level of knowledge and use of EBPs and unsupported practices among EI community service providers?
2. What is the relationship between reported knowledge and use of EBPs and organisational, attitudinal, and demographic factors (geographic location, staff role, and experience)?

Tentative hypotheses based on the limited research to date, were that knowledge and use of EBPs would be linked to each other; more positive individual attitudes towards EBP would be linked to greater use of EBP; and a more supportive organisational culture would be linked to greater use of EBP. No specific predictions regarding demographics were made due to the limited research in this area.

Method

Setting

The study was conducted in a medium-sized (100-150 staff), multi-site, ASD EI service with metropolitan and regionally-based centres. The organisation delivers an intensive centre-based program to approximately 200 children with ASD aged 2½ to 6 years. Each of the nine centres has a director and a team of educators, therapists (smaller centres share a therapist), and paraprofessionals (teaching aides). A small team of metropolitan-based senior therapists work across the organisation. The intervention program is not manualised, and staff are not mandated to use specific practices or interventions, although there is a common curriculum provided across the organisation (see Paynter, Scott, Beamish, Duhig, & Heussler, 2012 for further information about the program). Staff can apply individually to access professional development opportunities externally, but there is no consistent or manualised internal training or development program associated with the use of EBPs.

Participants and Procedure

At the commencement of the study, a total of 131 staff were employed at the organisation working across nine centres in Queensland. Of these, 105 worked directly with children with ASD. The study was conducted at the organisation's annual staff conference, attended by 104 of these 105 staff. A total of 99 staff (95%) completed the survey that took approximately 20 minutes to complete and included 113 questions including demographic information and questions on organisational culture, use and knowledge of intervention practices, and attitudes towards evidence-based practices. Demographic information included age bracket, centre location, role, academic qualifications, disability qualifications, and time working with children with ASD. For the purposes of anonymity, it was decided *a priori* not to collect data on staff gender due to the small number of male staff at the organisation (n = 3). Participants reported working with children with ASD for an average of 44.81 months (SD = 38.73, range 1-240 months), approximately 40% were under 30 years of age, and approximately 54% were working in the metropolitan area, about half of participants were paraprofessionals. Most participants reported having some form of post-secondary qualification (96/99), but few had a disability-specific qualification (see Table 1).

[Insert Table 1 about here]

EBP Questionnaire

The questionnaire consisted of a set of basic demographic questions and three sections: organisational culture; knowledge and use of practices and; attitudes to EBPs.

Organisational culture. The *Organisational Culture Questionnaire* (Russell et al., 2010) was used to assess organisational culture towards the use of evidence-based practice. This measure includes three scales: resources (four items, e.g., "*Mechanisms exist in my organisation that facilitate the transfer of research evidence into my organisation*"), culture (three items, e.g., "*Overall the culture in my organisation is one that highly values the use of*

research evidence in decision-making for program planning"), and supervisor (single item, *"My direct supervisor expects me to include research evidence in decision-making related to program planning"*). Participants rated their level of agreement with each item from 1 = *Not at all* to 10 = *To a great extent.* The scales with multiple items were found to have good reliability in the present study (Cronbach's α resources = .84; culture = .92).

Knowledge and use of practices. The *Early Intervention Practices Scale* was developed by the authors. A list of 40 practices, including evidence-based practices (*n* = 24), emerging practices (*n* = 6), and unsupported practices (*n* = 10) was compiled using categories and written definitions (embedded in the scale) drawn from the literature on EBP (Green et al., 2006; NAC, 2009; Odom, Collet-Klingenberg, Rogers, & Hatton, 2010). Intervention practices were ordered alphabetically to reduce potential bias from highlighting which strategies were EBPs vs. non-EBP. Participants were asked to rate their knowledge of each practice on a five-point scale that ranged from 0 = *Very little* (*Know nothing about this practice*) to 4 = *To a very great extent* (*Know a great deal and could instruct others on this*). Participants were also asked to rate their use of each practice on a five-point scale that included: 0 = *Never (I do not use this practice);* 1 = *On rare occasions (Less than once per week);* 2 = *Sometimes (One or more times a week but not every day);* 3 = *Often (About once per day);* and 4 = *Frequently* (*More than once per day*). These two rating scales were modelled on previous Australian EBP research with teachers (Carter et al., 2011). The full questionnaire is available from the authors.

Knowledge of EBP and use of EBP, were analysed as separate scales, each scale having good reliability (Cronbach's α = .94 and .90 respectively). Ratings for the six practices classified as emerging by the NAC (2009) were likewise averaged to create knowledge (Cronbach's α = .68) and use (Cronbach's α = .66) scales that showed adequate

reliability. Finally, ratings for unsupported practices (10 items) were averaged to create two scales (knowledge, Cronbach's α = .83; use, Cronbach's α = .78) that showed good reliability.

Attitudes to evidence-based practices. The *Evidence-based Practices Attitudes Scale* (EBPAS; Aarons, 2004) was used to assess individual's attitudes towards the use of evidence-based practices. It includes four subscales: requirements (e.g., "*If you received training in a therapy or intervention that was new to you, how likely would you be to adopt it if it was required by your state?"*), appeal (e.g., "*If you received training in a therapy or intervention that was new to you, how likely would you be to adopt it if it "made sense" to you?*"), openness (e.g., *"I am willing to use new and different types of therapy/interventions developed by researchers."*), and divergence (e.g., *"Clinical experience is more important than using manualised therapy/interventions."*). Agreement with each statement was rated on a five-point scale from 0 = *not at all*, to 4 = *to a very great extent*. Three subscales showed good reliability in the present sample: requirements (three items, Cronbach's α = .91), appeal (four items, Cronbach's α = .87), and openness (four items, Cronbach's α = .80). One subscale, divergence (four items, Cronbach's α = .59) showed poor reliability in the present sample and was excluded from subsequent analyses.

Results

The data were screened for missing data and for meeting assumptions for parametric testing. Missing values analysis using PASW 18 showed that less than 5% of values were missing from the data (4% of values were missing across the dataset) and these appeared to be missing completely at random (Little's MCAR test *Chi-Square* = 3358.609, *df* = 4855, *Sig.* = 1.00). Missing data for questionnaire measures was imputed using PASW Expectation Maximization and analyses run with this substitution and with complete cases using listwise deletion. As no substantive differences in outcome were observed, the data set with imputations was used for analyses to retain the full participant sample. Two subscales' data

were not normal (unsupported practices use scale was positively skewed and the appeal attitude scale showed high kurtosis); however as the statistics used (e.g., correlation, t-test) are robust to such violations (e.g. Havlicek & Peterson, 1977), parametric statistics were used for analyses.

Knowledge and Use of Practices

Table 2 shows participant ratings of knowledge and use of each intervention practice. The mean score for use of practices, regardless of whether supported, emerging, or unsupported, indicated that all were used by at least some staff rarely, sometimes, often, or frequently. The most commonly used practices across the organisation (ranging from daily to one or more times a week) reported by participants were (in order of most to least): Picture Exchange Communication System (PECS) (M = 3.68), visual supports and schedules (M = 3.37), reinforcement (M = 3.36), response interruption/brief interruption (M = 3.01), computer-aided instruction (M = 2.87), differential reinforcement (M = 2.79), prompting (M = 2.69), task analysis and chaining (M = 2.64), and academic interventions (M = 2.52). Nine of these were from the EBP category, and one (academic interventions) was from the unsupported category. The least used practices (less than once per week) were (in order from least to most): auditory integration training (AIT) (M = .22), brushing/Wilbarger protocol (M = .22), weighted vests or clothing (M = .34), holding therapy (M = .43), sensory diet (M = .56), massage/touch/deep pressure (M = .63), Prompts for Restructuring Oral Muscular Phonetic Targets (PROMPT) (M = .68), sensory integration (M = .68), and multisensory environments/Snoozelen (M = .68). Nine of these were from the unsupported category, and one (massage/touch/deep pressure) was from the emerging category.

[Insert Table 2 about here]

In terms of overall scale scores, participants differed significantly in their knowledge of each category of practice, F (2, 196) = 109.91, $p < .001$, $\omega^2 = .20$. Contrasts revealed that

participants reported being more knowledgeable about EBPs (M = 2.45, SD = .72) than emerging practices (M = 1.98, SD = .74), F (1, 98) = 58.26, $p < .001$, r = .61; further they reported being more knowledgeable about emerging practices than unsupported practices (M = 1.56, SD = .73), F (1, 98) = 54.85, $p < .001$, r = .60. Likewise, participants also reported differing in their use of each category of practice, F (2, 196) = 188.73, $p < 0.001$, ω^2 = .40. Contrasts revealed that participants reported using more EBPs (M = 2.29, SD = .66) than emerging practices (M = 1.50, SD = .79), F (1, 98) = 115.51, $p < .001$, r = .74; further they reported using more emerging practices than unsupported practices (M = .88, SD = .64), F (1, 98) = 72.38, $p < .001$, r = .65.

Correlations between Knowledge, Use, Attitude, and Culture

There was a significant correlation between knowledge and use of EBPs, see Table 3. There was also a significant correlation between each of the organisational culture variables (resources, culture, and supervisor) and knowledge of EBPs, with reports of a more supportive organisational culture linked to greater knowledge of EBPs. There were also significant correlations between the organisational culture variables of resources and culture, and use of EBPs, with again, a more supportive organisational culture linked to greater use of EBPs. Perceptions of supervisor were not linked to reported use of EBPs. In terms of attitude, only openness (to using EBPs) was linked to both knowledge and use, other attitude factors were non-significantly linked. There were no significant correlations with time working with children with ASD. Organisational culture scales were generally not significantly linked to attitude scales.

[Insert Table 3 about here]

Given that knowledge and use of EBPs were both significantly linked to organisational culture (resources and culture) and attitude (openness), as well as each other, the unique predictors of knowledge were of interest. As such, two Hierachical Multiple

Regression (HMR) analyses were conducted. For the first, organisational culture and attitude variables were entered at the first step, R^2 = .24, Adjusted R^2 = .21, F (3, 95) = 9.83, p < .001. At step 2, knowledge of EBPs was entered, and added a significant increment in the predicted variance in use of EBPs, R^2_{change} = .49, F_{change} (1, 94) = 164.63, p < .001. The beta weight for knowledge of EBPs was likewise significant, β = .82, t (94) = 12.83, p < .001, sr^2 = .49. The full equation was significant at the end of this step, *Multiple* R = .85, R^2 = .72, *Adjusted* R^2 = .71, F (4, 94) = 61.22, p < .001. Thus, knowledge significantly predicted use of EBPs once organisational culture and attitude variables linked in zero-order correlations were controlled.

A second HMR was conducted to investigate conversely, whether attitude and/or culture variables would be independent predictors of use of EBPs once knowledge was controlled. Thus, knowledge of EBPs was entered in the first step, R^2 = .71, Adjusted R^2 = .71, F (1, 97) = 235.00, p < .001. At step 2, organisational culture (resources and culture), and attitude (openness) were entered, and did not add a significant increment to the predicted variance in use of EBPs, R^2_{change} = .015 , F_{change} (3, 94) = 1.67, p = .18, *ns.* The beta weights for these variables were likewise non-significant, resources, β = .09, t (94) = 1.11, p = .27, sr^2 = .0036; culture, β = .03, t (94) = .44, p = .66, sr^2 = .00058; and openness, β = -.07, t (94) = -1.07, p = .29, sr^2 = .0034. Thus, organisational culture and attitude variables that showed significant zero-order correlations did not independently predict use of EBPs once knowledge was controlled.

Group Comparisons

Centre Location. Participants from within and outside metropolitan areas were compared; two participants who worked across multiple sites were excluded from analyses. Participants outside of the metropolitan area reported significantly lower knowledge and use of EBPs than those from within the metropolitan area, see Table 4. They also reported lower knowledge of unsupported and emerging practices. All other comparisons were non-

significant. Centre locations did not significantly differ on their highest academic qualification, χ^2 (4, N = 94) = 1.14, p = .89; disability qualification, χ^2 (1, N = 97) = 2.89, p = .09; age group, χ^2 (2, N = 97) = 2.54, p = .28; or role, χ^2 (4, N = 97) = 3.84, p = .43. They however, did differ on time working with children with ASD, with participants who worked in the metropolitan area reporting more time (M = 52.55, SD = 44.74) working with children with ASD than those working outside of it (M = 35.07, SD = 26.34), t (95) = 2.28, p = .03, r = .23.

As participants within and outside of the metropolitan area significantly differed on time working with children with ASD, as well as knowledge, it was of interest whether location would remain a significant predictor of use of EBPs once these factors were controlled. A HMR was performed with time and knowledge entered at the first step, R^2 = .71, Adjusted R^2 = .71, F (2, 96) = 116.40, p < .001. At step 2, location was entered, and added a significant increment in the predicted variance in use of EBPs, R^2_{change} = .02, F_{change} (1, 95) = 6.93, p =.01. The beta weight for location, was likewise significant, β = -.15, t (95) = -2.63, p = .01, sr^2 = .02. The full equation was significant at the end of this step, *Multiple R* = .85, R^2 = .73, *Adjusted* R^2 = .72, F (3, 95) = 84.70, p < .001. Thus, centre location was a significant independent predictor with a small effect on use of EBPs, once time working with children with ASD and knowledge of EBPs were controlled.

[Insert Table 4 about here]

Role. Comparisons were made between paraprofessional (teaching aides) and professional (allied health and teachers). Paraprofessionals reported significantly lower knowledge and use of evidence-based practices, see Table 5. They did not significantly differ in their knowledge or use of emerging practices. They reported lower knowledge, but greater use of unsupported practices. Paraprofessionals reported significantly lower perceptions of resources, culture, and supervisor-support for evidence-based practices on the Organisational

Culture Questionnaire. They also reported being less likely to use evidence-based practices if it was a requirement, but did not differ significantly on appeal or openness on the Evidence-based Practice Attitude Scale.

[Insert Table 5 about here]

Discussion

The present study sought to investigate the levels of knowledge and use of EBPs and unsupported practices in a community-based EI service for children with ASD. In addition, the links with organisational, attitudinal, and demographic factors were explored. Overall, the most commonly used practices (e.g., PECS, visuals, and reinforcement) were from the EBP category, with one exception, academic interventions. The least commonly used practices were generally from the unsupported category (e.g., AIT, brushing, and weighted clothing). Likewise overall participants reported greater use of EBPs than emerging practices, and greater use of emerging practices than unsupported practices. A similar pattern was found for knowledge. Use and knowledge of EBPs were significantly linked to each other as hypothesized. Organisational culture (resources and culture) and attitude (openness) variables were also linked to both knowledge and use of practices as hypothesized. However, after controlling for knowledge these did not independently predict use of EBPs. Knowledge was however an independent predictor after controlling for organisational culture and attitude. Significant differences in knowledge and use of EBPs were found between participants from metropolitan vs. regional/remote centres, as well as between professionals and paraprofessionals. In addition, paraprofessionals reported using unsupported practices more often than professionals did.

In line with previous research (Hess, et al., 2008; Stahmer, 2007) participants reported using a range of strategies, with all strategies being used at least occasionally including some unsupported by research (e.g., sensory integration). The finding that PECS was the most

frequently used strategy echoed previous research that also found this (Stahmer, et al., 2005). However, in contrast to previous research (e.g., Hess, et al., 2008) participants as a whole reported more frequently using EBPs than other practices. There are a number of potential explanations for this difference including differences in the participants, differences in education and training, or changes over time. In relation to participants, Hess et al (2008) included only teachers and special educators, whereas the present study also included paraprofessionals and therapists. Our sample size precluded analysis of potential differences between educators and therapists, so it is not possible to determine how the inclusion of therapists may have influenced the results and contributed to different findings across these studies. The samples in these studies may have also differed in levels of post-secondary education but this is difficult to determine as 50% of participants in the Hess et al. study did not report their highest degree earned. Finally, as EBP is being increasingly acknowledged as important, it may be that use and knowledge of EBP has changed over time. There is clearly a need for further research to address such possibilities.

As use of EBP was strongly related to knowledge of EBP, over and above organisational culture or attitudes, it is possible that staff were merely using the practices with which they were most familiar. That is, they may use fewer unsupported practices because of a lack of knowledge of those practices, rather than choosing not to use them because they lack evidence. For example, Carter et al (2011) in their study of teacher use of EBPs in schools, suggested that tertiary teacher preparation programs may emphasise the use of EBPs and inadequately address non-EBPs due to time constraints. Likewise, it seems reasonable to suggest the same may occur in allied health training, and certainly in training delivered within a limited resource environment like a community-based service. As such, staff in community-based interventions may have limited exposure to non-EBPs and thus use the strategies they are most familiar with, rather than actively choosing to use or reject a

particular practice. Variations between groups (paraprofessionals/professionals and metropolitan/regional and rural staff) may thus reflect differences in exposure to supported and unsupported practices in different groups.

In line with previous recommendations to provide paraprofessionals with further training (Stahmer, et al., 2005), this study provided the first evidence to the authors' knowledge of poorer knowledge and use of EBP, as well as greater use of unsupported practices, by paraprofessionals. Such a finding is important, as paraprofessionals are responsible for a high level of service (they constituted approximately half the staff in this organisation and sample), and the practices they use are likely to influence child outcomes. Emerging research provides promising avenues (see Rispoli, Neely, Lang, & Ganz, 2011), in regards to training paraprofessionals and a better understanding of their needs would yield valuable knowledge to inform such models of training for more effective knowledge transfer to increase use of EBP by paraprofessionals. It is recommended paraprofessionals, as well as professionals, receive training in EBP and knowledge about the limitations and hazards of using unsupported intervention practices.

Participants from regional Australia reported lower knowledge and use of EBP than metropolitan staff as found in previous research in the USA which suggested a lack of use of EBP in regional areas (Stahmer et al., 2005). This may be explained by commonly identified challenges in providing EI to children in regional/rural locations including: a shortage of staff with appropriate training; limited in-service professional development opportunities and; a general lack of resources (Olsen, Fiechtl, & Rule, 2012). The staffing structure of the EI organisation in this study, with centralised, metropolitan-based senior therapists providing service-wide support, further illustrates these issues with it likely that this leads to more limited in-service professional developmental opportunities and support for staff working in rural and regional areas relative to those staff who work in metropolitan areas.

Further research is needed to determine the mechanisms at play in staff selecting or rejecting a specific intervention practice, particularly the role played by knowledge and exposure to different practices. Whether staff may use more unsupported practices if knowledgeable about or exposed to them is an important question, particularly given that non-evidence based practices continue to be promoted and included in professional development activities for those working with children with ASD in the community (e.g., perceptual-motor programs in schools see Stephenson, 2009). It may be that training in evaluating the evidence-base for practices, encouraging positive attitudes towards use of EBP, and/or developing an organisational culture that supports use of EBP may be useful in enhancing the use of supported over unsupported practices. Implications for EI services are that training should focus not only on increasing knowledge of EBP, but also addressing individual attitudes (e.g., openness to trying EBP), as well as the broader organisational culture. For example, providing additional resources to implement EBPs may increase use, as resources were linked to use of EBP.

The present study provides an initial investigation of the use of EBP in Australian EI based on one community service-provider. This study addressed gaps in the literature through investigating how both organisational culture and individual attitudes linked to EBP, and by including both paraprofessionals and professionals. It was limited through the use of a single organisation and relatively small sample size. Future research with a range of service-providers is needed to investigate whether findings would generalise to better understand the level of use and knowledge of EBP in community settings more broadly and the factors related to their use (e.g., organisational barriers that may differ across organisations). This study along with previous published research (Hess et al., 2008; Stahmer & Aarons, 2009) has been limited to staff self-report and further insights could be gained from direct observation of staff use of intervention practices. This would provide information about the way in which

practices are actually used, whether they are implemented with fidelity, and whether they align with staff self-report. While results from this study are somewhat encouraging in that there is strong knowledge and use of EBPs, specific needs were identified for paraprofessionals and for staff working in regional areas. The question also remains as to whether reported use reflects best practice in implementation. These findings demonstrate the need for effective knowledge transfer mechanisms to support the use of high quality interventions for all children with ASD receiving services in the community whether the intervention is delivered by professionals and/or paraprofessionals in both metropolitan and regional areas.

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Ethical Standards

Ethical approval was granted through the Griffith University Human Research Ethics Committee, approval number END/C7/13/HREC and therefore has been performed in accordance with the ethical standards laid down at the 1963 Declaration of Helsinki and its later amendments. All participants gave their informed consent, through completion of the survey following receipt of informed consent materials, prior to inclusion in the study.

Conflict of Interest

The first author of this study was an employee of the community-based EI program where this study was conducted, but was not a participant in this study.

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Tables

Table 1

Participant Demographics

Demographic Variable	*Number (Percentage)**
Age Bracket	
Under 20	2 (2%)
21-30	40 (40.4%)
Over 30	57 (57.6%)
Centre Location	
Metropolitan Area	53 (53.5%)
Outside of Metropolitan	43 (43.4%)
Both	1 (1%)
Role	
Allied Health (Occupational Therapy or Speech Pathologist)	19 (19.4%)
Behaviour Therapist	7 (7.1%)
Teacher	16 (16.2%)
Paraprofessional	52 (52.5%)
Other (e.g., Centre Manager)	4 (4.1%)
Highest Academic Qualification (Any field)	
Vocational Training Certificate	10 (10.1%)
Vocational Training Diploma	29 (29.3%)
Bachelor Degree	37 (37.4%)
Postgraduate Degree	18 (18.2%)
Other (e.g., Advanced Diploma)	2 (2.0%)
Disability Specific Qualifications	
No	88 (88.89%)
Yes (e.g., Bachelor of Special Education)	11 (11.1%)

* Some percentages do not add to 100% due to missing data

Table 2

Mean (SD) Likert Scores of Knowledge and Use of Intervention Practices

Strategy	Category*	Knowledge	Use
Academic intervention	U	2.65 (1.01)	2.52 (1.25)
Auditory integration training	U	1.05 (1.14)	.22 (.63)
Brushing/Wilbarger protocol	U	1.34 (1.18)	.22 (.54)
Computer-aided instruction	EBP	2.93 (.96)	2.87 (1.09)
Developmentally-based	E	2.33 (1.13)	2.13 (1.43)
Differential reinforcement	EBP	2.79 (.93)	2.79 (1.22)
Discrete trial training	EBP	2.54 (1.12)	2.02 (1.39)
Exercise	E	2.33 (1.09)	2.04 (1.41)
Extinction	EBP	2.49 (1.10)	2.25 (1.15)
Facilitated communication	U	2.78 (1.09)	2.31 (1.58)
Functional behaviour assessment	EBP	2.65 (1.06)	2.45 (1.21)
Functional communication training	EBP	2.38 (1.20)	2.39 (1.33)
Holding therapy	U	.88 (1.22)	.43 (1.07)
Massage/touch/deep pressure	E	1.44 (1.28)	.63 (.96)
Multisensory environments/Snoozelen	U	1.57 (1.25)	.68 (1.00)
Music Therapy	E	2.06 (1.24)	1.16 (1.45)
Naturalistic intervention	EBP	2.08 (1.30)	1.93 (1.42)
Parent-implemented interventions	EBP	2.20 (1.23)	1.86 (1.23)
Peer-mediated instruction/intervention	EBP	2.15 (1.18)	2.03 (1.26)
Picture exchange communication system	EBP	3.32 (.83)	3.68 (.76)
Pivotal response training	EBP	1.48 (1.30)	1.22 (1.28)
PROMPT	U	1.23 (1.31)	.68 (1.10)
Prompting	EBP	2.67 (1.27)	2.69 (1.43)
Reinforcement	EBP	3.15 (.98)	3.36 (.97)
Response interruption/Redirection	EBP	2.91 (.99)	3.01 (1.08)
Self management	EBP	1.69 (1.39)	1.05 (1.34)
Sensory diet	U	1.48 (1.41)	.56 (1.02)
Sensory Integration	U	1.42 (1.21)	.68 (1.06)
Sign Language Instruction	E	2.24 (1.16)	2.06 (1.31)
Social narratives/Social stories	EBP	2.61 (.92)	1.69 (1.09)
Social skills training groups	EBP	2.26 (1.20)	1.92 (1.34)
Speech Generating Devices and other Alternative and Augmentative Communication (AAC)	EBP	2.30 (1.22)	2.17 (1.34)
Stimulus control/Environmental Modification	EBP	2.05 (1.35)	1.85 (1.37)
Structured work systems	EBP	2.48 (1.14)	2.40 (1.24)
Task analysis and chaining	EBP	2.69 (1.08)	2.64 (1.15)
Theory of Mind Training	E	1.50 (1.25)	.98 (1.07)
Time delay	EBP	1.63 (1.35)	1.34 (1.33)
Video modelling	EBP	2.15 (1.32)	1.84 (1.34)
Visual supports and schedules	EBP	3.19 (1.03)	3.37 (1.01)
Weighted Vests/Clothing	U	1.68 (1.30)	.34 (.72)

*EBP = Evidence-based practice; E = Emerging practice; U = Unsupported practice.

Table 3

Correlations between EBP Knowledge, Use, Organisational Culture and Attitude towards EBP

	EBP		*Organisational Culture*			*Attitude*		
	Knowledge	Use	Resources	Culture	Supervisor	Requirement	Appeal	Openness
Use of EBP	.84**							
Organisational Culture								
Resources	.39**	.42**						
Culture	.31**	.35**	.70**					
Supervisor	.22*	.17	.44**	.65**				
Attitude								
Requirement	.08	.03	-.04	.02	<.01			
Appeal	.17	.07	<.01	<.01	0.00	.53**		
Openness	.42**	.29**	.16	.04	0.08	0.08	.32**	
Time Working with ASD	.18	.16	.11	.12	.01	-.15	-.18	-.06

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

Table 4

Centre Location (Metropolitan vs. Rural and Regional)

	Location	*n*	*M*	*SD*	*t*	*df*	*p*	*r*
Evidence-Based Practices								
Knowledge	Metropolitan	53	2.62	.68	2.96**	95	< .01	.29
	Rural/Regional	44	2.21	.69				
Use	Metropolitan	53	2.48	.58	3.56**	95	< .01	.34
	Rural/Regional	44	2.04	.64				
Emerging Practices								
Knowledge	Metropolitan	53	2.12	.79	2.04*	95	.04	.20
	Rural/Regional	44	1.82	.65				
Use	Metropolitan	53	1.59	.91	.97	95	.33	.10
	Rural/Regional	44	1.43	.61				
Unsupported Practices								
Knowledge	Metropolitan	53	1.69	.81	2.11*	95	.04	.21
	Rural/Regional	44	1.38	.58				
Use	Metropolitan	53	.98	.72	1.58	95	.12	.16
	Rural/Regional	44	.77	.52				
Organisational Culture Questionnaire								
Resources	Metropolitan	53	6.48	1.73	.90	95	.37	.09
	Rural/Regional	44	6.14	1.99				
Culture	Metropolitan	53	6.66	1.81	1.16	95	.25	.12
	Rural/Regional	44	6.20	2.17				
Supervisor	Metropolitan	53	6.14	2.41	.03	95	.97	< .01
	Rural/Regional	44	6.12	3.20				
Evidence-based Practice Attitude Scale								
Requirements	Metropolitan	53	2.79	1.26	.02	95	.99	< .01
	Rural/Regional	44	2.79	.94				
Appeal	Metropolitan	53	2.82	1.07	-1.81	95	.07	.18
	Rural/Regional	44	3.20	1.00				
Openness	Metropolitan	53	2.60	.87	-1.02	95	.31	.10
	Rural/Regional	44	2.78	.83				

***** $p < .05$; ** $p < .01$.

Table 5

Role (Paraprofessionals vs. Professionals)

	Age bracket	*n*	*M*	*SD*	*t*	*df*	*p*	*r*
Evidence-Based Practices								
Knowledge	Professional	47	2.75	.61	4.31	97	< .001***	.40
	Paraprofessional	52	2.18	.71				
Use	Professional	47	2.47	.55	2.78	97	.006**	.27
	Paraprofessional	52	2.12	.70				
Emerging Practices								
Knowledge	Professional	47	2.10	.74	1.49	97	.14	.15
	Paraprofessional	52	1.88	.73				
Use	Professional	47	1.43	.72	-.84	97	.40	.08
	Paraprofessional	52	1.56	.86				
Unsupported Practices								
Knowledge	Professional	47	1.72	.73	2.10	97	.04*	.21
	Paraprofessional	52	1.42	.71				
Use	Professional	47	.72	.52	-2.46	97	.01*	.24
	Paraprofessional	52	1.03	.71				
Organisational Culture Questionnaire								
Resources	Professional	47	6.87	1.77	2.85	97	.005**	.28
	Paraprofessional	52	5.81	1.91				
Culture	Professional	47	6.70	1.94	2.74	97	.007**	.27
	Paraprofessional	52	5.89	1.97				
Supervisor	Professional	47	7.06	2.70	3.32	97	.001**	.32
	Paraprofessional	52	5.26	2.69				
Evidence-based Practice Attitude Scale								
Requirements	Professional	47	3.03	1.09	2.04	97	.04*	.20
	Paraprofessional	52	2.58	1.09				
Appeal	Professional	47	2.97	1.12	-.071	97	.94	< .01
	Paraprofessional	52	2.99	.98				
Openness	Professional	47	2.79	.83	.94	97	.35	.10
	Paraprofessional	52	2.63	.87				

***** $p < .05$; ** $p < .01$.