The impact of workplace factors on evidence-based speech-language pathology practice for
children with autism spectrum disorders

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Abstract

Although researchers have examined barriers to implementing evidence-based practice (EBP) at the level of the individual, little is known about the effects workplaces have on speech-language pathologists' implementation of EBP. The aim of this study was to examine the impact of workplace factors on the use of EBP amongst speech-language pathologists who work with children with Autism Spectrum Disorder (ASD). We sought to (a) explore views about EBP amongst speech-language pathologists who work with children with ASD, (b) identify workplace factors which, in the participants' opinions, acted as barriers or enablers to their provision of evidence-based speech-language pathology services, and (c) examine whether or not speech-language pathologists' responses to workplace factors differed based on the type of workplace or their years of experience. A total of 105 speech-language pathologists from across Australia completed an anonymous online questionnaire. The results indicate that although the majority of speech-language pathologists agreed that EBP is necessary, they experienced barriers to their implementation of EBP including workplace culture and support, lack of time, cost of EBP, and the availability and accessibility of EBP resources. The barriers reported by speech-language pathologists were similar, regardless of their workplace (private practice versus organisation) and years of experience.

Introduction

The term Autism Spectrum Disorder (ASD) refers to a continuum of neuro-developmental disorders affecting 1 in 88 children (Centers for Disease Control and Prevention, 2012) and characterised by impairments in social interaction, communication, and restricted, repetitive patterns of behaviours and interests (American Psychological Association, 2000). Although ASD is a lifelong disability, there is now clear evidence that early intervention can improve children's adaptive skills and reduce the severity of maladaptive behaviours (e.g., Dawson et al., 2010; Ganz et al., 2012). As early language and communication development are key prognostic indicators for long term outcomes for children with ASD (National Research Council, 2001), it is imperative that speech-language pathologists working to support communication development provide effective evidence-based services.

Research Developments in ASD

For speech-language pathologists working with children with ASD and their families, the burgeoning research into treatments for children with ASD can provide a firm empirical-footing on which to base treatment decisions. To illustrate, there is now strong evidence for a several comprehensive treatment programs (e.g., Dawson, Rogers, Munson et al., 2010) as well as focused communication interventions (e.g., Flippin, Reszka, & Watson, 2010). However, it is clear from the research that no single treatment works equally well for all children with ASD (Lord & Bishop, 2010), so clinicians have the arduous task of critically appraising the rapidly expanding body of literature in order to select the intervention that is most likely to be successful for each child and family. Given the challenges associated with selecting treatments for children with ASD, it is of both clinical and research relevance to examine the ways in which speech-language pathologists make evidence-based decisions

regarding the treatments they provide, as well as to explore workplace factors that impact on their decision making process.

Evidence-Based Practice

Evidence-based practice (EBP) involves the integration of (1) the best available research evidence; (2) best available evidence internal to clinical practice; and (3) the individual preferences and priorities of fully informed stakeholders (Dollaghan, 2007; Schlosser & Raghavendra, 2004). Evidence-based practice establishes a measure of accountability for health care receivers and providers, and gives policy makers information regarding efficiency and efficacy of interventions (Reilly, 2004). Engaging in EBP also enhances practitioners' skills through the process of critically appraising research evidence, applying the evidence to patients, and evaluating its impact (Upshur, 2005). To date, only a small number of studies (e.g., Auert, Trembath, Arciuli, & Roberts, 2012; Murphy, Trembath, Arciuli, & Thomas, 2011) have examined EBP in the context of service delivery for children with ASD and their families. Instead, researchers (e.g., Vallino-Napoli & Reilly, 2004; O'Conner & Pettigrew, 2009) have focused on the factors affecting the uptake of EBP across different allied health professions, irrespective of the client groups they service. The results of these earlier studies provide a context within which to examine the specific factors affecting the provisions of evidence-based services to children with ASD and their families.

Importance of EBP in Speech Pathology

There is strong evidence of support for EBP in the field of speech-language pathology amongst individual clinicians, researchers, and governing bodies. Metcalf *et al.* (2001) for example, surveyed 66 speech-language pathologists regarding their views on EBP, and reported that the participants held EBP in high regard and recognised its importance to their profession. Furthermore, Speech Pathology Australia (2010) and the American Speech-Language-Hearing Association (2006) have published strong endorsements of the use of EBP

in the provision of services to all clients, including children with ASD and their families. However, despite these efforts and strong support for its adoption, there is evidence to suggest that speech-language pathologists face a range of barriers to engaging in EBP.

In one of the first commentaries to examine the issue, Reilly (2004) proposed two key barriers to speech-language pathologists engaging in EBP. First, as the volume of research evidence increases, it becomes progressively harder for speech-language pathologists, like other health and education practitioners, to stay up to date with the latest research findings. Reilly suggested that speech-language pathologists need to be equipped with the necessary skills to search and critically appraise the burgeoning literature, in order to evaluate the potential benefits and risks of treatments for individual clients. Second, Reilly noted that speech-language pathologists also have difficulties translating research findings to clinical settings, where high clinician workloads, limited budgets, lack of specialist training, and long waiting lists may limit the feasibility of these models and protocols. Therefore, even if equipped with the skills to engage in EBP, speech-language pathologists face additional barriers to its implementation.

Further studies within the health sector have attempted to elucidate the common barriers to the implementation of EBP (e.g., Jette et al., 2003; Upton & Upton, 2005). Metcalfe *et al.* (2001) reported that 77% of the speech-language pathologists they surveyed regarding EBP cited difficulties accessing relevant literature as the most prominent barrier to implementing EBP, followed by insufficient time to read research (73%), and difficulties interpreting statistical analyses (71%). Dobbins, Rosenbaum, Plews, Law and Fysh (2007) conducted a cross-sectional study in which they completed a telephone questionnaire with health practitioners to identify barriers to their use of research evidence. The barriers identified by the participants included lack of time, lack of access to current research

literature, too much literature to review, limited critical appraisal skills, and environments that do not support research transfer and uptake.

To examine speech-language pathologists' attitudes towards EBP, and the barriers they face, Vallino-Napoli and Reilly (2004) surveyed 378 speech-language pathologists registered with Speech Pathology Australia. The majority of participants said they were aware of EBP and had the desire to keep abreast of clinical developments. However, similar to the findings of Metcalfe *et al.* (2001), the participants cited a lack of time available to read and appraise research literature as a key barrier to them engaging in EBP. O'Conner and Pettigrew (2009) also examined the perceived barriers to the application of EBP amongst speech-language pathologists. Over 50% of the clinicians who completed the questionnaire agreed that research literature was not readily available. In addition, participants noted that an underlying lack of research in the field of communication disorders may be an additional barrier, highlighting the multifaceted nature of barriers to speech-language pathologists' engaging in EBP.

Impact of Workplace Factors on EBP

Although previous studies have examined the barriers to speech-language pathologists engaging in EBP at the individual level, few studies have examined the barriers and enablers to EBP created by their workplaces, and certainly not in the context of the provision of services to children with ASD. There is preliminary evidence to indicate that having a supportive workplace plays an important role in facilitating engagement with EBP (Roddam & Skeat, 2010). Dobbins *et al.* (2007), for example, reported that health practitioners who worked in research-focused organisations (e.g., District Health Councils who influence health policies by making recommendations for programs and services) reported not only higher usage of research evidence in decision-making as compared to more practice-based settings, but also a workplace culture more conducive to applying research to practice. Nevertheless,

although these findings provide preliminary insights into the ways in which workplace factors may enable, or create barriers to, EBP, there is a lack of information about the specific factors impacting on the delivery of evidence-based speech-language pathology services to children with ASD.

Given that the focus of existing literature regarding barriers related to access to resources and EBP is at the individual level, the aims of this research is to instead explore the workplace factors that impact on the engagement with EBP by speech-language pathologists working with children with ASD. Specifically we sought to (a) explore views about EBP amongst speech-language pathologists who work with clients with ASD; (b) identify workplace factors which, in the participants' opinions, acted as barriers and enablers to their provision of evidence-based speech-language pathology services to children with ASD; and (c) determine whether or not speech-language pathologists' responses to workplace factors differed based on the type of workplace or their years of professional experience. The study was approved by the University of Sydney Human Research Ethics Committee.

Method

Design

We used a survey research design with mixed methods of analysis to explore the workplace factors that impact on the engagement with EBP by speech-language pathologists working with children with ASD.

Participants

The participants were 105 speech-language pathologists from across Australia who identified themselves as currently working with children with ASD. Email advertisements were distributed through the New South Wales EBP research network, the Australian Group on Severe Communication Impairment, the Australian Chapter of the International Society for Augmentative and Alternative Communication, and Autism Spectrum Australia. Additionally,

speech-language pathologists listed in the Speech Pathology Australia directory who indicated ASD as a special area of interest were emailed directly and invited to participate. In all, the research team sent direct emails to 772 potential participants, inviting them to participate in the study and to forward the invitation to their colleagues. The emails outlined the purpose of the study, explained confidentiality agreements, and provided an internet link to the anonymous online questionnaire. A reminder email containing the same information was sent again after two weeks.

Online Questionnaire

Participants were asked to complete an anonymous online questionnaire to examine the impact workplace policies and practices have on their application of EBP. The 25 questions which formed the basis for the results reported in this paper are listed in full in the Appendix. The questionnaire was based on a previous version (Togher et al., 2007) developed for the study of EBP amongst speech-language pathologists more broadly (not just those who work with individuals with ASD and their families) and was separated into 3 sections. Section 1 consisted of multiple choice and dichotomous questions regarding demographic details including the participants' workplace setting, clinical caseloads, and years of experience. Section 2 examined participants' views on EBP through multiple choice questions, open-ended questions, and a series of five-level Likert scales examining participants' agreement to a set of statements. Section 3 examined participants' knowledge and access to training in EBP, again using multiple choice and open-ended questions, and five-point Likert scales examining participants' level of agreement to statements regarding knowledge and access to EBP.

Data Analysis

Quantitative analyses were conducted using PASW statistics (2009, version 18.0.3). Descriptive statistics were used to summarise demographic details. Independent samples t-

tests and chi-square analysis were then used to investigate significant differences associated with workplace settings and also with years of professional experience. Parametric tests were used, consistent with the position of Norman (2010), who noted that parametric tests are appropriate for use with Likert scales, even with small sample sizes, unequal variances, and non-normal distributions. Nevertheless, the non-parametric equivalent to the independent samples t-test, the Mann-Whitney U test, was also conducted as a comparative measure. As there was agreement regarding significance in every case, only the results of t-tests are reported. Due to the number of t-tests being conducted a conservative alpha level of .01 was used to determine significance.

Qualitative data, in the form of responses to open-ended questions, were analysed using the process of thematic analysis outlined by Braun and Clarke (2006). This approach, which has grounded theory underpinnings, seeks to enable researchers to develop an explanatory theory of social processes and understand the patterns and relationships in the environments in which they take place (Strauss & Corbin, 1990). Braun and Clarke outlined six stages to conducting thematic analysis. These six stages involve a recursive process of familiarisation with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and production of the report in which the themes are presented. To ensure credibility of the findings, the second author reviewed the codes and themes identified by the first author to identify errors, misinterpretations, or differences in their interpretation of the participants' comments. Differences were then resolved through discussion and the coding amended accordingly.

Results

Participant Demographics

A total of 105 speech-language pathologists returned completed questionnaires over a period of six weeks, yielding a maximum response rate of 13.6%. The true response rate

could not be calculated, because we encouraged potential participants and organisations to distribute the invitation and so we do not know how many potential participants elected not to complete the questionnaire.

Table 1 summarises participant demographics. As can be seen from the table, speech-language pathologists working in private practice comprised nearly half the sample, with speech-language pathologists working in health and education settings, not-for-profit organisations, and government disability services comprising the remainder. The proportion of speech-language pathologists working in private and non-private settings in this sample is representative of the profession at large in Australia, as indicated by advice from Speech Pathology Australia, that 47% of current members work in private practice (M. Bundell, personal communication, September 21, 2010). Twenty nine percent of participants had completed postgraduate study and 88% of participants had three or more years of experience working as a speech-language pathologist. The extent to which children with ASD comprised the participants' clinical caseloads varied considerably, with the majority (65%) indicating that children with ASD comprised 20% or more of their caseload. Given that some participants worked across more than one workplace, they were asked to respond to the questions in the survey with regard to the main workplace in which they saw individuals with ASD and their families.

[Insert Table 1 about here]

Views on EBP

The first aim of the study was to examine views on EBP amongst speech-language pathologists who work with children with ASD. In response to the statement listed in Q7, "Application of EBP is necessary in the practice of speech-language pathology", 97% of participants were in agreement (as calculated by adding both 'Agree' and 'Strongly Agree' responses). In addition, 64% of participants reported that they had received training in EBP

(either in their workplace or as a student) and more than three quarters of participants (76%) said they searched for research evidence on a regular basis. However, despite the apparent commitment to EBP at an individual level, only 23% of participants agreed in response to Q11 that “Most speech-language pathologists work according to the principles of EBP when providing services to children with ASD.” Indeed, 11% of participants indicated that the adoption of EBP places unreasonable demands on speech-language pathologists, and 41% expressed the view that there is a divide between research and practice.

The participants’ responses to open ended questions were consistent with the quantitative data, indicating that although they support and value the use of EBP, providing evidence-based speech-language pathology intervention to children with ASD is not always a straightforward process. As illustrated by a sample of comments provided in Table 2, participants identified EBP as being fundamental to effective and ethical practice, but reported that they faced a number of barriers associated with time, availability of relevant research evidence, and workplace support when attempting to engage in EBP. Identifying and understanding the workplace factors that promoted and inhibited their use of EBP was the second aim of this study.

[Insert Table 2 about here]

Participants’ Knowledge and Access to Training in EBP

Both qualitative and quantitative data were analysed in order to identify workplace factors which, in the participants’ opinions, acted as barriers and enablers to their provision of evidence-based speech-language pathology services to children with ASD. Using the process of thematic analysis outlined by Braun and Clarke (2006), four themes emerged to account for the participants’ views and experiences (*workplace culture and support, time, cost of EBP, and availability and accessibility of EBP resources*). Both the quantitative and qualitative data are presented according to these four themes. It is important to note that in qualitative

research, the views of all participants are considered to be equally relevant and important to answering the research question, regardless of how many other participants share those particular views (Starks & Brown Trinidad, 2007). Therefore, unlike the quantitative analyses, only broad statements regarding the number of participants who expressed any given view are indicated in relation to qualitative data. As all participants of the study were anonymous, participant identification numbers, reflecting their order of enrolment into the study, were used to identify their comments.

Theme 1: Workplace culture and support. The participants' responses indicate that the culture within a workplace has strong bearing on the extent to which EBP is promoted and supported. To illustrate, although 82% of participants indicated that EBP was supported in their workplace, only 66% of participants indicated that decisions regarding service delivery and types of treatments provided were based on the available research evidence. The extent to which the culture in a workplace encourages speech-language pathologists to advocate for the use of EBP may account for some of the reluctance or failure to base decisions on available research. To this end, although 80% of participants indicated they would feel confident suggesting to a junior colleague that they should increase their use of research evidence in their clinical practice, 67% agreed that they would be confident suggesting this to a colleague of the same level, and only 50% would make the suggestion to a senior colleague or manager.

In their open ended responses, participants highlighted the importance of workplaces valuing EBP and the impact this has on their practice. As illustrated by the following quote, a common criticism expressed by clinicians was that managers and administrators often lacked a good understanding of the importance of EBP.

“Management staff of my organisation are not clinicians and therefore have limited understanding of the need to use EBP. Resources for accessing research are therefore not deemed to be a priority and service delivery

decisions are made from an administrative point of view, rather than being evidence based.” (#82)

Several participants suggested that an effective way to ensure speech-language pathologists set aside the time necessary to engage in EBP, including critically appraise research papers and better engaging clients and families in decision making, could be to stipulate these activities in their job descriptions.

“EBP [needs] to become part of [the] job description and incorporated into the framework of the department.” (#91)

Theme 2: Time. The second workplace factor impacting on EBP identified by participants was time. Clinicians indicated that there was limited time available for EBP activities (e.g., critically appraising papers), with 10% of participants accessing EBP resources (e.g., electronic databases, journals) less than once a month. In addition, although 46% of the participants accessed EBP resources more than once a week, almost half the sample (44%) said they did not have enough time to review research literature before making clinical decisions. Workplace culture appeared to impact on the availability of time, with 18% of participants indicating that in their workplace, managing the waiting list was more important than delivering evidence-based interventions.

“[A barrier is] the time needed to review enough literature to make an accurate decision based on evidence without [the] sampling bias of only looking at some papers.” (#16)

Participants suggested that in order to promote and support their use of EBP, they must be allowed and supported to allocate time to engage in EBP activities such as reading journal articles and accessing electronic resources. As one participant explained, to ensure that time spent on EBP activities is valued, it must be documented and protected as part of their workload allocation.

“[Workplaces should] allow hours for EBP/research activities to be included in our client information system (database) - which would demonstrate that management and funding bodies value the time we spend doing these activities.” (#65)

Theme 3: Cost of EBP. The third workplace factor identified by speech-language pathologists was the high cost required to access and engage in EBP related activities such as subscriptions to journals and professional development courses. The burdens of these costs tended to fall on workplaces, with 34% of participants indicating that their workplace lacked sufficient funding to engage in EBP activities. Several participants suggested that the high costs of training courses and the limited amount of funds available, may force workplaces to compromise by offering fewer professional development opportunities across the board.

“Cost of EBP seminars and courses are very expensive thus [workplaces] have to allocate a certain amount [,] and limit the [amount of] experience you receive per year.” (#39)

Most participants advocated for reduced costs for professional development activities and fully supported workshops to obtain free training as a means of encouraging the use and application of EBP. Another suggestion for individuals to access EBP in a more affordable manner, and which workplaces may be able to adopt, was proposed by a participant.

“Being able to access uni libraries as part of Speech Pathology Australia membership would make me more inclined to look for EBP articles.” (#46)

Theme 4: Availability and Accessibility of EBP Resources. The final factor participants identified was the impact that access to EBP resources (e.g., database access, journal subscriptions) and appropriate training at the workplace level has on their ability to provide evidence-based speech-language pathology services. Approximately one third of the participants (28%) indicated that they lacked the electronic tools necessary to find appropriate

research, and less than half (48%) indicated having adequate training to use these tools efficiently. In addition, only forty eight percent of participants agreed that they had access to adequate training in the broader EBP process involving (a) defining questions, (b) identifying sources for clinical evidence, (c) finding research evidence, (d) appraising the literature, (e) applying findings to relevant clinical questions for a specific client's needs, and finally (f) evaluating the effectiveness of this process.

Although participants identified availability and access to EBP resources in their workplaces as a barrier to their use of EBP, they proposed solutions to this problem in their responses to open ended questions. One participant suggested that stronger links between the workplaces and universities could be established to facilitate the dissemination of research.

“It would be great if facilitators could go between academics and clinicians to disseminate information and look at practical ways of applying research into practice.” (#9)

Other participants suggested that more training in accessing evidence, conducting literature searches, and critically appraising articles could be provided in the workplace.

“Being taught about our access to research papers, literature searches, etcetera.” (#101)

“[Workplaces can provide training for] specific skilling on EBP tools and how to use them efficiently/regularly.” (#43)

Participants also suggested that workplaces could also support clinicians to engage in EBP by facilitating access to journal subscriptions and online training to ensure easier access to electronic resources, particularly for those working in rural and remote areas.

“Online access to training through SPA would help allow access at suitable times for therapists” (#54)

“Easier access for regional therapists to journal articles is also a must. It is very difficult for me to get my hands on full-text articles.” (#102)

The Influence of Workplace Setting and Professional Experience

The third aim of this study was to identify whether the type of workplace (private practice versus working in an organisation) or the participants’ years of experience (greater than or less than 10 years) influenced their views and responses towards workplace barriers to, and enablers of, EBP.

The influence of workplace. To investigate possible differences in EBP as a product of workplace setting, comparisons were made between speech-language pathologists working in private practice versus those working in organisations (including those working in government, education, health care or not-for-profit organisations). Question 7 asked participants whether they agreed with the statement “Application of EBP is necessary in the practice of speech-language pathology”. Participants responded on a five-point Likert scale where 1 indicated Strongly Disagree and 5 indicated Strongly Agree. Both those working in private practice and those working in organisations seemed to be in agreement with this statement, with means for both groups above 4. There was no significant difference between the views of speech-language pathologists in either the private ($M = 4.43$, $SD = 0.61$) or non-private setting ($M = 4.61$, $SD = 0.49$) in terms of the perceived necessity of EBP within the speech-language pathology profession.

With regard to workplace culture, participants were asked whether they agreed with the statement “Evidence based practice is supported in my workplace” (Q10). Both those working in private practice and those working in organisations seemed to be in agreement with this statement and there was no statistically significant difference between private ($M = 4.04$, $SD = 0.72$) versus non-private practitioners ($M = 4.02$, $SD = 0.84$) in terms of whether they felt EBP was encouraged in their workplace. Similarly, private ($M = 2.92$, $SD = 1.18$)

and non-private practitioners ($M = 2.77$, $SD = 1.03$) did not differ regarding the issue of time as a barrier to EBP, as demonstrated by the amount of time they have to review literature to make decisions (Q21). However, responses to the statement “In my workplace, managing the waiting list is more important than delivering evidence based interventions” (Q22) revealed significant differences between the two groups with private practitioners expressing more disagreement ($M = 2.22$, $SD = 0.94$) than non-private practitioners ($M = 2.81$, $SD = 0.96$). It is noted however that the means from both groups clustered around ‘neutral.’

In Q23 participants were asked whether they agreed with the statement “There is sufficient funding available in my workplace to engage in EBP activities”. The group means indicated that both private practitioners and those working within organisations tended to disagree with this statement ($M = 2.82$, $SD = 1.16$ and $M = 2.98$, $SD = 1.12$, respectively). There was no significant difference between the two groups in terms of their level of disagreement. Question 16 asked participants to provide a Yes/No response to the question “Have you received training in EBP?” For this categorical data, a chi square analysis was conducted, examining the proportion of private practitioners who have received training (33.33%) versus those that have not (15.68%), compared against practitioners working in organisations who have received training (30.39%) versus those who have not (20.59%). Analysis showed no significant difference between the proportion that were trained in EBP across the two groups ($\chi^2 (1) = 0.775$, $p = 0.38$).

The influence of experience. To determine whether years of experience was associated with differences in the way speech-language pathologists viewed EBP and barriers to EBP in their workplace, comparisons were made between speech-language pathologists who have worked for 10 years or less versus those who have more than 10 years experience practicing speech-language pathology. Participants’ levels of agreement in response to the statement “Application of EBP is necessary in the practice of speech-language pathology”

were analysed (Q7). No significant difference was found between clinicians with 10 or less years of experience ($M = 4.54$, $SD = 0.50$) and those with more than 10 years of experience ($M = 4.50$, $SD = 0.61$) in terms of the perceived necessity of EBP with both groups in fairly high agreement. This result suggests that varying degrees of experience does not appear to be a factor impacting upon the recognition that it is necessary to apply the principle of EBP in the workplace.

However, in regards to workplace culture, Q12 asked participants whether they agreed with the statement “I would feel confident suggesting to a junior colleague that s/he could increase his or her use of EBP”. There was a statistically significant difference between speech-language pathologists with less than 10 years experience ($M = 3.85$, $SD = 0.80$) and those with 10 or more years experience ($M = 4.22$, $SD = 0.62$), where clinicians with more experience were more likely to agree with the statement. Similarly, when participants responded to the statement “I would feel confident suggesting to a senior colleague or manager that s/he could increase his or her use of EBP” (Q14), a statistically significant difference was found between speech-language pathologists with less experience ($M = 2.85$, $SD = 0.99$) and those with more experience ($M = 3.83$, $SD = 0.79$). These results suggest that more experienced therapists are more willing to suggest to those more senior to themselves that they should increase use of EBP. Table 3 shows the results of the t-tests reported above.

[Insert Table 3 about here]

Discussion

The aims of this study were to (a) determine the views of speech-language pathologists who work with clients with ASD towards EBP, (b) identify workplace factors which, in the participants’ views, acted as barriers or enablers to their provision of evidence-based speech-language pathology services to children with ASD, and (c) whether or not

speech-language pathologists' responses to workplace factors differed based on the type of workplace or their years of professional experience.

Views on EBP

The results provide preliminary evidence that speech-language pathologists working with children with ASD in Australia tend to have a strong positive attitude towards the necessity of EBP, with the vast majority (97%) of participants in agreement with this view. These results are consistent with those of previous studies. Metcalfe *et al.* (2001), for example, reported 98.5% of speech-language pathologists surveyed believed research to be important for professional practice, though the integration of clinical expertise and patient preferences was not discussed. Despite the agreement regarding the importance of EBP, we found that only 23% of participants were in agreement with the statement “Most speech-language pathologists work according to the principles of EBP when providing services to children with ASD” (Q11), and 11% of participants indicated that the adoption of EBP places unreasonable demand on speech-language pathologists. Although the results reflect the participants' perception of EBP, as opposed to a measure of actual practice in the profession, they are similar to those of Zipoli and Kennedy (2005), who reported that although speech-language pathologists expressed positive attitudes towards research and EBP, their use tended to lag behind. Therefore, our findings indicate that the issues for speech-language pathologists working with children with ASD are reflective of the issues for the profession more broadly. This situation may be accounted for or influenced by workplace and workplace barriers such as workplace culture, time, cost, and availability and accessibility of EBP resources.

Workplace Factors Influencing EBP

An important factor perceived by speech-language pathologists working with children with ASD as preventing the successful implementation of EBP, involved workplace culture and support. Although the quantitative data indicated that the majority of speech-language

pathologists reported EBP was supported in their workplace, around one third (34%) of participants did not agree that decisions regarding service delivery and treatment provision in their workplace were based on available research evidence. The qualitative analysis further revealed that a lack of understanding regarding the importance of EBP by management and administration staff was a contributing factor in their failure to provide practical support to clinicians. Reilly (2004) argued that it is the responsibility of the employer to create a culture of EBP in the workplace, which includes the provision of materials, necessary training courses, and creating an environment where clinical questioning and discussion is the norm. The participants in this study indicated that in addition to these supports, workplace changes such as scheduling time dedicated to EBP activities and encouraging EBP need to be incorporated into the practice framework.

It appears that another workplace factor limiting the application of EBP is time. In this study, 44% of speech-language pathologists indicated that they did not feel they had sufficient time to review research literature before making clinical decisions. This percentage is considerably smaller than that of other published studies such as O'Conner and Pettigrew (2009), where 72% of speech-language pathologists surveyed rated lack of time to read research as barrier, and Vallino-Napoli and Reilly (2004), with 88% of the 359 participants agreeing that they lacked time for research. This discrepancy may simply reflect a sampling bias in our study, whereby speech-language pathologists (potential participants) who were busy at the time they received the survey may have elected not to take part. In addition, our qualitative analysis confirmed time to be one of the most prevalent workplace factors impacting on clinicians' ability to implement EBP. Overcoming this barrier may involve allocating time to engage in EBP related activities and documenting these hours as part of a normal clinical workload.

Yet another perceived workplace factor relates to the costs involved in EBP related activities. Around a third (34%) of participants indicated that they believed their workplace lacked sufficient funding to engage in activities such as attending conferences and subscribing to journals. The financial burden associated with staying up to date with the latest research evidence has been identified in other studies such as that reported by Bernstein Ratner (2006), who stated that many speech-language pathologists found it difficult to gain access to literature unless they or their workplaces were affiliated with well funded university libraries, as the purchase of these articles are costly, and require database or per-print subscriptions. To this end, several participants suggested that reduced costs for workshops or access to university libraries through membership to professional bodies may be a more financially viable alternative for clinicians and workplaces.

The availability and accessibility of EBP resources is the final workplace factor identified by participants as impacting on their practice. The results indicate that there may be a lack of skills and training necessary to access and critically appraise research, with just over half of the participants agreeing they have access to adequate training in the EBP process. This limited training is also reflected in the research literature. Kamhi (2006) stated that many speech-language pathologists do not possess the necessary skills to determine the quality of evidence, and O'Conner and Pettigrew (2009) indicated that 37.5% of the 32 speech-language pathologists who participated in their survey did not feel capable of evaluating the quality of the research. While the quantitative data in our study identified this lack of training as a barrier to EBP, the qualitative data provided participants' ideas and strategies addressing this issue. Participants stated that adequate workplace training programs for speech-language pathologists to learn, to use, and to apply EBP tools efficiently would be a beneficial means of overcoming this barrier.

Impact of Workplace Setting and Years of Experience

We examined whether the type of workplace settings or years of professional experience, impacted upon the participants' views and responses towards the barriers and enablers of EBP in their workplace. Results of comparisons made between speech-language pathologists working in private practice, versus those working in workplace settings (such as government, education, healthcare, and not-for-profit organisations), indicated no differences in terms of their support for EBP. In addition, no differences were identified between the responses of speech-language pathologists working in either setting in terms of other workplace factors such as time, cost of EBP and access to training. However, the differences in workplaces regarding management of waiting lists was more pronounced, with speech-language pathologists working in the organisations more inclined to feel that their workplace prioritised managing the waiting list above delivering evidence-based interventions, than those in private practice. This may reflect the level control speech-language pathologists have over their individual caseloads in private practice versus organisations, with private speech-language pathologists able to choose the size of their caseload.

Analysis of the influence that speech-language pathologists' years of professional experience have on their views and responses towards barriers and enablers to EBP in their workplaces, indicated that clinicians with more than 10 years experience appeared more confident in making suggestions to others (particularly senior colleagues) to increase the use of EBP in their workplace. Although the figure of 10 years is to some extent arbitrary, the results suggest that leadership from senior speech-language pathologists in the workplace is likely to be beneficial. Therefore, efforts to promote EBP in the workplace may rely on leadership from more experienced and senior clinicians who have the confidence to promote positive changes in the workplace.

Clinical Implications

For the individual. The results of this study indicate that while speech-language pathologists in general approve of the principle of EBP, the implementation of EBP is challenging. The challenges faced by speech-language pathologists working with children with ASD appear to be the same for speech-language pathologists working with broader populations. Indeed, the fact that only 14 participants (13%) of our sample had a caseload comprising 80% or more children with ASD, demonstrates that many of the issues raised in this study are relevant to broader speech-language pathology practice. Although motivated, the speech-language pathologists in this study faced a number of barriers to accessing and using research evidence as part of EBP, and workplaces may influence these. Perhaps what is needed is the support of strong leadership from senior and more experienced speech-language pathologists, to make changes in their workplace to ensure they have the time, resources and training to engage in EBP.

For workplaces. From this study, a key implication is that managers should take the time to listen to their staff regarding the issues they face in implementing EBP. Speech pathologists can provide clear ideas and strategies on how to address barriers to EBP. Managers and administrators need to understand the importance of EBP and can play a key role in ensuring that speech-language pathologists have the necessary time, resources, and support to engage in EBP.

For professional organisations. Professional organisations such as Speech Pathology Australia and the American Speech-Language-Hearing Association have an important role in promoting and supporting the application of EBP across the speech-language pathology profession. This may include the facilitation of EBP accreditation in speech-language pathology services, and encouraging dialogue between researchers and clinicians to identify gaps in literature to direct research efforts. Additionally, professional organisations are in a position to help speech-language pathologists help themselves by establishing forums to share

ideas and strategies on how EBP can be implemented effectively. They can also encourage discussion regarding practical ways of applying research into practice, for example, the Speech Pathology Australia private practitioner's network, where clinicians across similar situations share tips and ideas for facilitating EBP.

Limitations

The results need to be considered with caution given that our method for recruitment (e.g., distributing through our networks and word of mouth) meant that we were unable to calculate a true response rate, and workplace factors (e.g., time constraints) are likely to have influenced who did and did not respond to the invitation to participate. The participants were self-selecting, and thus participants of this study may be biased towards speech-language pathologists with pre-existing interest and knowledge regarding EBP. In addition, the fact that we did not ask for sufficiently detailed information about each participant's location (except to say that they were in Australia) meant that we were unable to look for any differences in response based on geographical area. It is possible that differences in workplace practices, particularly within Government service providers in different States and the Northern Territory, may exist and thereby impact on their perception of barriers and enablers to EBP.

It is also important to note that while EBP is a multifaceted paradigm combining the latest research evidence, with clinical experience, and the preferences and priorities of fully informed stakeholders, the participants in this study focused on the challenges associated with accessing, critically appraising, and acting on research evidence. This outcome may have been due, in part, to the nature of the questions asked in the survey, with a focus on the research component. Nevertheless, the participants' responses to the open-ended questions were also focused on the research aspect of EBP, suggesting it is currently the most significant issue affecting their practice. Finally, it is important to reiterate that the survey was based on a previous version developed by Togher et al (Togher et al., 2007) which was found to be

effective in eliciting speech-language pathologists views towards, and uptake of, EBP.

However, we did not pilot the survey used in this study, and so are not able to provide evidence regarding its reliability and validity as an instrument.

Future Research Directions

The participants' responses reflect their subjective interpretation and response to the questions, based on their clinical experience. Future studies could incorporate the use of workplace observations and interviews with all key stakeholders to triangulate the data. Research investigating the subgroup of participants who reported the best outcomes regarding workplace factors in this study may yield beneficial results as the focus can shift from barriers that prevent the implementation of EBP to factors that successfully promote and support its use. Finally, existing research has focused primarily on programs supporting individuals' uptake of EBP with many studies revealing significant barriers. However, the current study has highlighted the fact that, at least in the case of those working in organisations, it is difficult to isolate the individual from their workplace structure. It is therefore important for further research to evaluate changes at the workplace level.

Conclusion

The findings of this study indicate that although speech-language pathologists working with children with ASD agree EBP is necessary in speech-language pathology practice, there are barriers that impede the implementation of EBP. These barriers not only pertain to characteristics of the individual, but also to the workplace. It is hoped that through the identification of these barriers, workplaces may become more aware and proactive in implementing changes to address these issues and thereby encourage and support speech-language pathologists to provide evidence-based services to their clients.

Declaration

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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Appendix

Survey Questions

Demographic information

1. What is your main place of work?
 - i. Private practice
 - ii. Not for profit organisation
 - iii. Government disability service
 - iv. Education or health care setting
2. Approximately what proportion of your caseload are children with autism?
 - i. Less than 20%
 - ii. 20-80%
 - iii. More than 80%
3. How long have you worked as a speech-language pathologist?
 - i. 0-2 years
 - ii. 3-10 years
 - iii. Over 10 years
4. What is your highest attained educational qualification?
 - i. Undergraduate studies in speech-language pathology
 - ii. Postgraduate studies in speech-language pathology
5. Do you have a supervisor / manager?
 - a) Yes
 - b) No

Views towards EBP

6. How do you feel about Evidence Based Practice?

For questions 7 to 15 please circle indicating the extent to which you agree with the following statements.

7. Application of EBP is necessary in the practice of speech-language pathology.
8. The adoption of EBP places an unreasonable demand on speech-language pathologists.
9. There is a definite divide between research and practice.
10. Evidence based practice is supported in my workplace.
11. Most speech-language pathologists work according to the principles of EBP when providing services to children with ASD.
12. I would feel confident suggesting to a junior colleague that s/he could increase his or her use of EBP.
13. I would feel confident suggesting to a colleague at my level that s/he could increase his or her use of EBP.
14. I would feel confident suggesting to a senior colleague or manager that s/he could increase his or her use of EBP.
15. In my workplace, decisions regarding service delivery and types of treatments provided are made based on the available research evidence.

Knowledge and access to training in EBP

16. Have you received training in EBP?
 - a) Yes
 - b) No

17. What kinds of EBP activities do you regularly engage in? (*Circle as many as appropriate*)
 - i. Journal clubs
 - ii. Critically appraising research papers
 - iii. Searching for evidence
 - iv. Writing research papers
 - v. Training others
 - vi. EBP networks
 - vii. Special interest groups
 - viii. Academic collaborations
 - ix. Postgraduate study
 - x. None
 - xi. Other, please specify.

18. Overall, how often do you access EBP resources?
 - i. Daily
 - ii. Weekly
 - iii. Fortnightly
 - iv. Monthly
 - v. Every few months
 - vi. Never

For questions 19 to 23 please circle indicating the extent to which you agree with the following statements.

19. I have access to the electronic tools (e.g., electronic databases, library access) necessary for efficiently finding appropriate research.
20. I have access to adequate training in the use of electronic tools necessary for efficiently finding appropriate research.
21. I have time to review research literature in order to make decisions.
22. In my workplace, managing the waiting list is more important than delivering evidence based interventions.
23. There is sufficient funding available in my workplace to engage in EBP activities.
24. In your opinion, are there barriers to integrating EBP into your practice? If so, what are the barriers to integrating EBP into your practice?
25. If there are barriers, what support/s would you like to put in place in your workplace to help you and/or other staff to engage in EBP?

Table 1

Participant Demographics

Demographic Details	Respondents (%)
<i>Main place of employment</i>	
Private practice	50
Not for profit organisation	24
Education or health care setting	17
Government disability service	9
<i>Proportion of caseload children with ASD</i>	
Less than 20%	35
20-80%	51
More than 80%	14
<i>Years working as a speech-language pathologist</i>	
0-2 years	12
3-10 years	38
Over 10 years	50
<i>Highest Education Level</i>	
Undergraduate studies in speech-language pathology	71
Postgraduate studies in speech-language pathology	29
<i>Have a supervisor/manager</i>	
Yes	59
No	41

Table 2

Selection of Comments Outlining Views of EBP

Theme	Comments
Accountability	“I feel EBP is extremely important in optimising services for our clients and being accountable. EBP consistently helps inform my clinical decision making.” (#16)
Time	“I think it needs to guide our practice – I am concerned about the time it takes and pressure from management to put hours on our database for direct client work (currently no measure for time spent doing research and attending EBP).” (#65)
Lack of research	“EBP principles should be used to direct decisions about intervention where possible. Specific to autism, much more research is needed to examine the efficacy of different treatment approaches. At present, when working with children with ASD, intervention decisions are often derived from professional judgment and experience due to a current lack of quality research.” (#88)
Workplace support	“I feel it is important to be involved in EBP on many levels including individually, as part of a group (e.g. the EBP network) and as part of a workplace/organisation. I feel that while EBP can be difficult to apply to all situations, it should be the goal and should be supported in all workplaces. It needs to be allowed to be built into a clinician's work timetable. Having worked previously in private practice, I know that this is not always the case.” (#9)

Note. Participant identification numbers are presented in brackets.

Table 3

Influence of workplace setting and professional experience on workplace barriers and enablers of EBP

	Factors	Independent Samples t-test
Influence of Workplace		
Q7	Application of EBP is necessary in the practice of speech-language pathology	$t(103) = -1.67, p = 0.10$
Q10	Evidence based practice is supported in my workplace.	$t(102) = -0.93, p = 0.35$
Q21	I have time to review research literature in order to make decisions	$t(102) = 0.68, p = 0.50$
Q22	In my workplace, managing the waiting list is more important than delivering evidence based interventions	$t(102) = -3.19, p = 0.002^*$
Q23	There is sufficient funding available in my workplace to engage in EBP activities	$t(102) = -0.71, p = 0.482$
Influence of Experience		
Q7	Application of EBP is necessary in the practice of speech-language pathology	$t(102) = 0.35, p = 0.73$
Q12	I would feel confident suggesting to a junior colleague that s/he could increase his or her use of EBP	$t(100) = 2.63, p = 0.01^*$
Q14	I would feel confident suggesting to a senior colleague or manager that s/he could increase his or her use of EBP.	$t(100) = 5.58, p < 0.001^*$

Significant at $p = .01$