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Abstract

Little research has been conducted on the evidence base for educational interventions implemented by teachers targeting students with high-functioning autism spectrum disorder (HFASD). Research examining particular techniques perceived as effective may facilitate guidelines for the application of evidence-based practices. A principal and teacher of students with HFASD from each of 29 different schools provided information on their current teaching interventions. Principals participated in an online survey designed to ascertain support for HFASD learners in their school, whereas teachers completed an online reflective journal to document methods they used in the classroom. Both teachers and principals found numerous strategies such as structure and incorporating needs to be successful. Inappropriate communication, disorganisation, and a lack of understanding were considered unhelpful. These results have implications for current practices in classrooms.

Keywords

autism spectrum disorder, school, intervention, education, best practice

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Those with autism spectrum disorder (ASD), which now subsumes the diagnoses of Asperger syndrome (AS) and autism into single category (*Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; American Psychiatric Association [APA], 2013), face many difficulties resulting from their social and communication impairments. These deficits can negatively affect learning, play skills and friendship development, and social behavior in general, further impeding optimal outcomes for children with ASD. The prevalence of diagnosed ASD is now reported to be as high as 2% (Blumberg et al., 2013); few educational systems are able to offer specialised classrooms to this number of children. Within Victoria, Australia, children with high-functioning ASD (HFASD; those with ASD with intelligence in the normal range) are frequently included in mainstream schools assisted by support teachers otherwise known as integration aides (Department of Education and Early Childhood Development, Victoria, 2016). Inclusive classrooms have been put forth as one solution to the burgeoning population of children diagnosed with ASD. Research suggests benefits of this environment for both children with ASD and typically developing (TD) children (Rotheram-Fuller, Kasari, Chamberlain, & Locke, 2010). However, it is not clear that the benefits of inclusion are substantial for students with ASD. Some studies report that inclusion does not result in improved outcomes (Rotheram-Fuller et al., 2010) and may be detrimental (Ochs, Kremer-Sadlik, Solomon, & Sirota, 2001), resulting in bullying for those with ASD and reduced educational outcomes for TD peers due to their increased social monitoring load. Furthermore, while one recent study evaluating an inclusive strategy (Learning Experiences and Alternative Program for Preschoolers and their Parents [LEAP]) documented improvements in educational outcomes for children (Boyd et al., 2014), it did not find that these improvements differed from a program that does not emphasize this aspect (Treatment and Education of Autistic and Related Communication-Handicapped Children [TEACCH]). Hence, inclusive programs are one solution, but there may be others. It is therefore important that educators' perceptions about the most effective teaching strategies are identified to enhance implementation of evidence-based approaches within mainstream classrooms (McLeskey & Waldron, 2007).

The evidence base for educational approaches delivered in school settings by teachers and other practitioners for learners with HFASD has several limitations (Boyd et al., 2014; Filipek, Steinberg-Epstein, & Book, 2006; Hess, Morrier, Heflin, & Ivey, 2008). Unfortunately, much research has been conducted in non-educational settings (i.e., homes, laboratories, etc.) and few researchers have established ecological validity (generalizability beyond the research domain; Ospina et al., 2008). Consequently, many results may not be replicable and instead be due to uncontrolled aspects of the research environment. Moreover, much practice-based research is methodologically weak, using small samples and a short-term focus (Hess et al., 2008). Many studies simultaneously employ several different methodological approaches, confounding the results (Wong et al., 2014). These issues pose challenges for providing evidence-based recommendations for classroom use (Delmolino & Harris, 2012; Ollet, 2005).

Schools possess a wealth of data on children's educational programs and the educational targets they are aiming for, but these data are not currently being fully utilized

to inform practice. Therefore, this study aimed to gather information about successful teaching strategies directly from teachers who had students with HFASD in their classroom to understand not only what strategies staff believe works in classrooms but also current practices with these students in an educational setting.

Method

Subjects and Recruitment

Ethical clearance to undertake the project was obtained from Deakin University Human Research Ethics Committee (DUHREC 2011-199). Letters and emails of invitation to participate were sent to 117 school principals. These were followed up with phone calls to each school to confirm participation. All schools were located in the state of Victoria, Australia (18 primary and 11 secondary). Schools were only eligible to participate if a teacher had one or more students in his or her classroom with a confirmed diagnosis of HFASD. Twenty-nine schools participated, each with a principal (13 male, 16 female) and a teacher (six male, 23 female). Although this research was undertaken after the release of *DSM-5*, almost all children had received a diagnosis under *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*; APA, 2000) and thus had been classified as having either HFASD or AS. Nonetheless, we treated these two groups herein as being ASD as specified under *DSM-5*. All students with ASD had an established full-scale IQ of 70 or over and subsequently were considered as having HFASD. All diagnoses were confirmed by clinical psychologists independent of this study. Participation was voluntary and participants were not reimbursed for their participation.

Materials

Principals completed a 30-min online survey. Principals were asked about the number of students on their school roll and to describe their pupils with ASD as to whether they required special language and if they were diagnosed as high functioning. The survey also included questions aimed to determine how the school provides for students with ASD, how the school is staffed, what approaches or teaching methods principals find particularly helpful, and where they seek further information and advice to inform practice.

Teachers completed 12 journal entries over 5 months, which were submitted confidentially online. The foci of this study were responses relating to current practice in the classroom to establish what interventions teachers used and how they perceived their effectiveness. Therefore, here we report on the outcome of only one of the 12 topics:

What do you find works for the child/children in your class that have HFA? What do you find does not work, and what would help you with this?

We did not further define phrases such as “what works” or “would help.”

Procedure

Principals were emailed or phoned to ask them to complete their 30-min online survey. Participating teachers were given a personal journal account, emailed the list of journal topics, and prompted to start their first journal entry. They were encouraged to write 500 words per entry and it was suggested that they only complete one entry per week to allow time for reflection between journal entries. It was made clear that a polished piece of work was not expected, but instead a more free-flowing entry with the intention of tapping into their raw thoughts. Most teachers chose a particular day of the week that they wanted an email reminder sent for their next journal entry. If teachers' diary entries were not submitted on the due date, follow-up emails were sent or phone calls made to the school to politely remind them to submit entries. This process resulted in all diary entries being regularly submitted.

Analytical Approach

Principals' survey responses and teacher journal entries were reviewed and then coded using a grounded theory approach (Charmaz, 2006; Namey, Guest, Thairu, & Johnson, 2007), allowing the development of a set of conceptual categories from text-based data. All data were initially hand coded by one researcher. Initial coding was left open to allow themes to emerge rather than be a priori defined, consistent with grounded theory guidelines (Charmaz, 2006). Thereafter, codes were iteratively grouped and regrouped, reduced or merged, and then recoded into themes. Following this, sub-categories were extracted from each theme. This coding was then independently evaluated by a second researcher. Where disagreement occurred, researchers discussed the issue until consensus was achieved between the two researchers. For teacher responses, frequency of response was also derived (Namey et al., 2007).

Results

Principal's Survey

General statistics. There was an average of 498 enrolled children (range = 49-1,250, total = 14,442) across the 29 schools. On average, there were 13.21 enrolled children with ASD (range = 2-50, total 382) with the average ASD proportion being 2.65%. Of the 29 schools, 25 were mainstream, one was independent mainstream, one was specialist (focusing on a specific subject area), and two did not provide an answer. Schools had an average of 33.16 ($SD = 28.23$) teachers, giving a staff to student ratio of 15 students per teacher. Specialist teachers were employed in five schools; teaching assistants were present in most schools. Educational psychologists were employed in fewer than 50% of schools, as were speech and language therapists, occupational therapists, social workers, and nurses, although most schools had staff in one of these roles. All schools had access to these resources through various state programs.

Twenty-seven (93%) schools had pupils with ASD who were mostly taught in classes alongside mainstream peers, one school had a general intake of pupils with special education needs, some of whom were diagnosed with HFASD, and one described itself as “other provision” (its students have different programs according to their needs, varying according to current circumstances). Twenty-four (82.8%) schools reported having an eclectic program for students with ASD, offering a range of methods and approaches, four (13.8%) considered themselves to be specialised, favouring one particular method or approach, and one (3.4%) reported that it was other.

Methods used for supporting ASD students. The majority of principals stated that their schools found communication strategies particularly helpful. For instance,

Communication strategies such as use of pragmatic language, stepped/staged responses or tasks, clear expectation/consistent “rules” for situations. (Respondent r)

Communication strategies such as use of pragmatic language, . . . for students who are overwhelmed. (Respondent a)

Specific strategies reported to be effective by most principals included developing the use of pragmatic language by children, using visual aids to assist children, and having children use visual diaries.

We utilise language support funding for students . . . to employ our own speech pathologist who works one-on-one with students [with ASD] experiencing . . . pragmatic language [difficulty]. (Respondent n)

We use visual aids and prompts, Social StoriesTM, safe time out places. (Respondent r)

Most principals reported the ability to be flexible and embrace variety and individuality assisted many students. But some stated that they did not use a single approach, instead using a combination of approaches including team-based, with constant reflection and input.

[We use] no one set approach, rather a combination of anything and everything that shows growth towards an expected outcome. Involves a team approach with constant reflection and input. (Respondent d)

Principals frequently mentioned the need to identify students’ individual learning needs.

Each student has an individual learning program that is develop[ed] twice each year in consultation with visiting specialists, classroom teacher . . . and parents. (Respondent q)

Modification of the curriculum to match individual needs, the child’s particular interests or obsessions to stimulate learning. (Respondent r)

Many principals reported the need for a safe withdrawal zone and regarded this as effective and important to reduce anxiety and fatigue, and avoid the likelihood of a “melt down.”

Many ASD students need “rest breaks” and time at home as they become highly anxious due to tiredness. This is when the majority of “melt downs” occur. (Respondent x)

Students who are struggling and need a break are allowed to bring their work to the Foundation Room or alternatively to just take a break. The Foundation Room has a television, lounge suit, and kitchen area, so it is like a home base for these students. Spare resources, rulers, pencils, hats, money, lunch, etc. is [*sic*] available from the room, which helps to decrease anxiety and provides a point of access for help and assistance. The room is also open and staffed at break times for students who find the school yard overwhelming or have had an incident where they require some quiet space and time to regain their composure. (Respondent v)

Many, but not all, principals deemed teacher aides a valuable asset in supporting their students with ASD socially and academically, and for intervening with children with ASD when social issues arose with other children in the classroom.

Teacher[’s] aide[s] support classroom programs and help children with special needs to access the curriculum to their full potential . . . [and] . . . help children manage different situations. (Respondent ac)

One principal stated that early intervention with specialist clinicians was the most effective form of assistance.

I find that early intervention with speech, OT, psychologists are the most effective. (Respondent g)

Clear expectations, staged tasks, and consistency were widely regarded as effective practices in the classroom.

. . . stepped/staged [i.e., graduated responses contingent upon prior outcomes] responses or tasks, clear expectation/consistent “rules” for situations . . . for students who are overwhelmed. (Respondent a)

In spite of the increase in technologically delivered interventions and the understanding that individualized programming is desirable, the benefits of individual learning plans (ILP) and assistive technology, such as computers and iPads, were less commonly reported.

Information sources used to inform practice. Most commonly, schools reported that they sought information and advice from specialists, particularly psychologists, to inform their practice. This information was often pursued in the form of internal and/or

Table 1. Strategies Identified by Teachers as Working in Their Classroom.

Strategies that are reported to work	References	%
Structure	42	29.4
Consistency	13	9.1
Concrete instructions	10	7.0
Timetables	10	7.0
Preparing for changes	5	3.5
Clear expectations	4	2.8
Teaching strategies	32	22.4
Visual aids	23	16.1
Social stories	9	6.3
Teacher–student relationship	30	21.0
Praise and rewards	7	4.9
Flexibility and modification	7	4.9
Trust and rapport	5	3.5
Positive attitude	5	3.5
Understanding and acceptance	3	2.1
Incorporating interests	3	2.1
Additional strategies	39	27.3
Activities and clubs	6	4.2
Safe withdrawal space	6	4.2
Support staff	5	3.5
Computers and iPads	4	2.8
Discussions with parents	2	1.4
Verbal warnings	2	1.4
Miscellaneous	14	9.8
Total	143	100.0

external professional development (PD). It was also sought directly from the specialists and specialist organisations knowledgeable in the area. Information was less commonly sought from parents and teachers of students, and the students themselves. Teachers reported rarely seeking information from the Internet to assist them understanding their student. In over 143 entries to the questions, the use of the Internet was mentioned a single time.

Teacher's Reflective Journals

What worked in the classroom (as defined by teachers). Teachers were asked to report on the strategies that they have found were successful when working with their student(s) with HFASD. Three main groups of classroom strategies emerged from the teachers' journals (Table 1). Of the 143 references of effective classroom strategies, the most common were structure (42 references, 29.4%), visual approaches (32 references, 22.4%), or the relationship between teacher and student (30 references, 21.0%).

Teachers identified several strategies relating to structure as ones that worked. These included consistency, providing concrete instructions, using timetables, preparing for and informing students of changes to routine, and providing clear expectations to students. Teachers made frequent statements about the functional importance of consistency for their student with HFASD. They indicated that concrete instructions worked best if they were short, clear, explicit, and repeated. The use of timetables was reported to help students see what needed to be done during the day and letting students know in advance of any changes to the timetable ensured they were prepared. Finally, having clear expectations of what was required was reported to help students understand how to behave.

Two main types of visual strategies were reported to work well in the classroom. These included various visual aids and Social Stories™. The types of visual aids used varied and included, but were not limited to, coloured timers, picture icons, behavior charts, visual cues, hand signals, posters, number charts, counting aids, and anger scales. Social Stories™ were seen as helpful for specific situations such as explaining change, telling a student that explicit language is not okay, and for coping in the playground.

Several strategies based on the relationship between the teacher and students were identified as working in the classroom. In particular, use of praise and rewards were reported to lead to improvements in behavior and motivation. Being flexible and making modifications to the environment or task based on the child's needs was also reported to result in children's increased participation. Developing trust and rapport were reported as important for making students feel comfortable while maintaining a positive attitude while being calm was reported to reduce stress of students. Acceptance of the student without giving them "special attention" so they were less likely to feel different was noted as an important practice to make students more likely to succeed. Finally, paying attention to and incorporating the student's interests was reported to result in increased student engagement.

There were several additional strategies that were mentioned less frequently and not clearly related to the three overarching themes above. The importance of activities, outings, and clubs was reported to help with learning opportunities and to let the students express their interests. The use of technology, such as an iPad, helped a student who struggled with handwriting, and playing music on an iPhone helped calm another student. Maintaining contact with parents helped forewarn teachers of issues. Verbal warnings helped two teachers get their student back on track. Other miscellaneous strategies that teachers felt worked could not be grouped due to their uniqueness of nature and infrequency of mention. These included removing rewards, making lessons physically active to reduce restlessness, teaching self-management, and getting students to put their hands up when they wanted to ask a question.

What did not work in the classroom. Three main groups of strategies that did not work in the classroom emerged from the teacher's journal entries. As seen in Table 2, of the 52 references to what did not work in the classroom, ineffective strategies related to

Table 2. Strategies Identified by Teachers as Ineffective in Their Classroom.

Ineffective strategies and barriers to effective teaching	References	%
Flawed communication	21	40.4
Using complex language	12	23.1
Involving emotions	6	11.5
Confrontation	3	5.8
Disorganisation	10	19.2
Unstructured tasks	6	11.5
Change	4	7.7
Lack of resources	7	13.5
Lack of understanding of ASD by teacher	3	5.8
Lack of support	2	3.8
Lack of time	2	3.8
Additional strategies	14	26.9
Group work	4	7.7
Giving in	2	3.8
Noise	2	3.8
Miscellaneous	6	11.5
Total	52	100.0

Note. ASD = autism spectrum disorder.

flawed communication, disorganisation, and lack of resources were most commonly reported.

Three dysfunctional strategies that were related to flawed communication included inappropriate communication, involving emotions, and confrontation. More specifically, involving emotions by talking about the child's feelings was reported as ineffective. Furthermore, teachers indicated that students did not like to be confronted or made the focus of class attention. Other strategies that were reported as ineffective included speaking too fast, yelling, using insulting or belittling terms, and using humour that students with HFASD could not interpret successfully.

Two other strategies deemed as ineffective were related to disorganisation. The use of unstructured tasks with unclear boundaries, unclear expectations, and too many options were found ineffective and meant that the student was likely to waste time, not commence a task, or not complete work in a meaningful way. In addition, students were unsettled by changes to routine.

Teachers often mentioned that a lack of resources made it difficult for them to implement effective teaching. These included lack of understanding of the child, lack of support in the form of teacher aides, and lack of teacher time to work independently with and appropriately support the child. Without an understanding of their student's HFASD, teachers felt that they were less equipped and more likely to use ineffective strategies. A lack of support for teachers and time to support the child directly was reported to be a barrier for teachers assisting students to reach adequate educational outcomes.

There were a few instances of other strategies that teachers reported as ineffective that were not related to the three overarching themes above. In four instances, students with HFASD were reported to be unwilling to participate in group work, and consequently group work was seen as particularly problematic. Other ineffective or even disruptive strategies that were reported were lowering expectations for the student and, unsurprisingly, high noise levels were particularly disruptive for children with HFASD. A group of additional miscellaneous strategies that were reported not to work could not be grouped. These included rewards for encouraging students with HFASD not to focus on their circumscribed interest, keeping a child in the class when they were escalating, timers for distractible students, and a selection of unpredictable occurrences such as the presence of a particular student or teacher.

Discussion

The aim of this research was to gather information about teaching strategies that teachers are currently using and found to be successful for their students with HFASD in their classroom. It was also hoped that results would reveal what teachers find acceptable in terms of existing interventions with an evidence base. Principals completed an online survey while teachers completed 12 journal entries, with their entries focused on one of their students with HFASD. Across 29 schools, an average of 13 students with HFASD was reported for each school. Due to the significant number of students with HFASD (Blumberg et al., 2013), it is important that interventions targeting these students are assessed as valid, effective, and accepted by school staff.

Among the many approaches identified by principals, a strong emphasis was placed upon the benefits of Individual Education Programs (IEP; in the Australian context these are known as Individual Learning Plans) to improve teaching outcomes (Ruble, McGrew, Dalrymple, & Jung, 2010). These results concur with the literature on the use of IEP (Ruble et al., 2010). However, as Ruble et al. (2010) pointed out, this approach in practice is often plagued by problems such as inconsistency with recommended practice, a frequent lack of measurable goals, and unrealistic expectations. Moreover, Ruble et al. reported that most goals in IEPs they assessed were not adequately connected to the state educational requirements and the outcome measurements were poorly described. Nonetheless, others report that teachers find IEPs very effective and that pupils with ASD had greater involvement and improved educational outcomes when involved in decision making about their IEP goals (Charman et al., 2011). Principals also mentioned the use of teacher aides, assistive technology, communication strategies, and consistency as helpful tools. Principals also thought that it was important to focus on a combination of approaches, with a team effort and constant reflection making this easier. The utility of many of these approaches are more fully discussed elsewhere (cf. National Autism Center [NAC], 2015; National Research Council [NRC], 2001; Odom, Collet-Klingenberg, Rogers, & Hatton, 2010; Wong et al., 2014); however, in general, reports by principals for this study were consistent with broad ideas commonly promoted as “best practice.”

Teachers most frequently reported visual aids, structure in the form of consistency, concrete instruction, timetables, and Social Stories™ as working best. Many of these strategies accord well with the conception of ASD as involving executive function, as each of these strategies compensate for executive function challenges (Attwood, 2007; Landry & Al-Taie, 2016). Many of these strategies are also commonly considered good instructional practice and improve outcomes for all students (Håkansson, 2015). The use of concrete instruction, consistency, timetables, and clear expectations have all been documented as techniques to help compensate those with reduced executive function (Hess et al., 2008; Ozonoff, South, & Provençal, 2005; Welterlin, Turner-Brown, Harris, Mesibov, & Delmolino, 2012; (for reviews, see NAC, 2015; NRC, 2001; Wong et al., 2014), detailed or concrete instruction (Holmes, 2007; Pennington, Collins, Stenhoff, Turner, & Gunselman, 2014), and structured time management (O'Reilly, Sigafos, Lancioni, Edrisinha, & Andrews, 2005). Although, the use of Social Stories™ and scripts have less evidence for their effectiveness and utility, much of the current literature has emphasized their use (cf. Aboulafia, 2012; Cihak, McMahon, Smith, Wright, & Gibbons, 2015). Although some evidence supports the use of Social Stories™ for children with ASD (Cihak et al., 2015), other evidence does not (Holmes, 2007). Scattone, Tingstrom, and Wilczynski (2006) used Social Stories™ to teach appropriate social interactions to two boys with ASD resulting in an increase in appropriate social interactions. Cihak et al. (2015) found video Social Stories™ improved on-task behavior in two children aged 13 to 14, but without maintenance. Crozier and Tincani (2007) found that Social Stories™ increased appropriate play in a single boy with HFASD, but again this improvement was not maintained. However, Chan et al. (2011) found Social Stories™ marginally improved classroom behavior in three children with ASD. Holmes (2007) found mixed evidence of improvement in compliance, change management, task transition, instruction following, and temper control in the classroom in a single-case design, while Sansosti and Powell-Smith (2006) found only slight and unmaintained improvement in pro-social behavior in a small sample design. Unfortunately, many studies into Social Stories™ have been undertaken with single cases or very small samples and have usually not found robust results. Given the mixed results, larger, more rigorous research is required to understand the utility of this method.

Another strategy frequently reported was the use of structure. A number of small experimental studies or single-case designs on this appear to have been undertaken, though many have not been published in the peer reviewed literature (e.g., Cale, Carr, Blakeley-Smith, & Owen-DeSchryver, 2009; Gerdzt, 2000). Gerdzt (2000) evaluated a 16-year-old with HFASD in a classroom environment modified by instituting frequent breaks from the classroom and the use of a clearly written daily schedule, and found reduced classroom disruption. Cale et al. (2009) evaluated three children with increased structure in the classroom and reported improved classroom behavior. Neither author reported on upon maintenance or generalization. As concluded by others, few of the above studies had adequate sample sizes allowing robust conclusions and many have been insufficiently rigorous (Hess et al., 2008; Simpson et al., 2005).

Another area teachers reported as effective was using strategies to incorporate student interests, reported upon previously (cf. Iovannone, Dunlap, Huber, & Kinkaid, 2003; NRC, 2001). However, there are a number of problems within this area. First, such interventions have been found to not maintain (Talebi, 2007). Koegel, Kim, Koegel, and Schwartzman (2013) only found two of the seven adolescents in their study maintained improvement in peer interaction, and only where the interaction focused upon their circumscribed interest. When a child's special or circumscribed interest is the focus of a social interaction, social reciprocity is lost, thus longer term success and maintenance of this intervention for improving everyday interactions is unlikely (Corbett, Qualls, Valencia, Fecteau, & Swain, 2014).

Strategies that were reported to be ineffective were commonly related to flawed communication. These included using inappropriate communication such as yelling, speaking too fast, and confronting the student. Furthermore, disorganisation in the form of unstructured tasks and changes to classroom routine were disruptive, which is unsurprising, given that children with ASD find new situations problematic (Attwood, 2007). Finally, a lack of understanding of ASD and a lack of time and support in the classroom were frequently mentioned as being unhelpful, which others have previously reported (Al-Sharbati et al., 2015; Lian et al., 2008). However, these considerations are directly addressed by methods such as TEACCH (Boyd et al., 2014; Mesibov & Shea, 2011; Welterlin et al., 2012), reflecting the widely acknowledged importance of these elements in the ASD field. Interestingly, a few principals stated that their schools were likely to seek information from teachers, parents, and students to inform their practice. Due to the heterogeneity of ASD, it would seem prudent to seek parents understanding of their children. Furthermore, programs such as LEAP and TEACCH both encourage parental involvement (Boyd et al., 2014), which suggests that experts consider this to be useful. Given the general lack of communication with parents to gather information, it is surprising that in over 143 teacher and principal responses, the use of the Internet to gain knowledge about ASD was mentioned only a single time. This concurs with prior literature (cf. Baker, 2012; Stahmer et al., 2015) that reports that teachers indicate that they do not use the web to obtain information. Research suggests that teachers predominately seek and obtain information through PD activities, advanced degrees, and higher levels of training (Baker, 2012). Furthermore, Beamer and Yun (2014) suggested educators rely more upon prior coursework and their own experiences and perceptions to inform their understanding of ASD. The reliance of teachers upon these approaches may explain why they do not implement what is known (Stahmer et al., 2015); perhaps teachers are not being well served by those providing PD, or that the demands on their time are already overstretched. However, these speculations need evidence. Nonetheless, Paynter et al. (2016) found that PD programs for those working in the ASD field result in a greater understanding of and use of Evidence Based Practices, while Kilham (2008) found training given to teachers in TEACCH improved measurable outcomes for children with ASD, indicating that when provided and appropriate, teachers benefit from ASD-focused PD.

Another area often mentioned by teachers and principals and regarded as beneficial was the use of teacher aides and specialists in the classroom. Mandell et al. (2013)

reported that team cohesion between teaching assistants and teachers predicted the quality of program implementation for children with ASD. French (2001) found that when teacher aides are well supervised, have clearly defined roles, and have frequent and clear communications with teachers, IEP implementation and student support were enhanced. Nonetheless, while schools in this study consistently employed teacher aides, educational psychologists were employed in fewer than 50% of schools, as were speech and language therapists, occupational therapists, social workers, and nurses although most schools had staff in one of these roles. Given that teachers appeared to rely upon PD from specialists, this finding was surprising and suggests that ASD-specific PD is either rare or provided on an ad hoc basis.

Implications and Future Research

The results reveal that teachers and principals use a wide range of well-supported strategies in the ASD field. However, these techniques require additional research in educational contexts. Interestingly, improved research could be achieved while improving PD for teachers. Teachers placed high value upon access to educational psychologists and other specialists for the provision of PD. Should more of these be employed through the education system, these could act to provide active learning and research skills, and support research by teachers while improving the research base of these interventions. Nonetheless, future research needs to evaluate whether increasing the number of educational psychologists and other specialists actually increases teacher's reliance on well-established interventions.

Limitations

The current study has a number of limitations that suggest caution in interpreting the results. These include that the sample was not a random sample, but rather consisted of a convenience sample of state schools. Furthermore, within these schools, teachers would have been self-selecting. Those who had little or no experience of ASD would have been unlikely to participate. Another issue is the self-report nature of data collection. Potentially, more extreme problems or less obvious and subtle strategies may not have been reported. Finally, as the method employed relied upon researcher interpretation, even though there was agreement between coders, the possibility of bias cannot be excluded, though this approach has the advantage of richness of data. Nonetheless, the method used was chosen to ensure that themes were generated directly from teachers and principals; thus, the results likely reflect the experiences of principals and teachers in similar contexts, adding to knowledge base for practices used and valued by school staff.

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