

ORIGINAL ARTICLE

Application of an Evidence-Based Early Intervention Model for Children With ASD in Mainstream Early Childhood Education and Care Settings via a Targeted Professional Development Program[†]

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Abstract

Viewing all children as active participants in their own learning is central to inclusion. That children with atypical development experience a level of belonging that enables this in mainstream early childhood education and care (ECEC) settings remains a topic of hot debate and very much an unmet goal across the sector. Children with autism spectrum disorder (ASD), in particular, face significant challenges in ECEC settings, their educators continually seeking solutions for greater support. Given the escalating demand on mainstream ECEC settings to include these children, it was important to identify the specific supports needed by educators to achieve this with confidence and competence. This study investigated the outcomes of applying an evidence-based model of intervention to mainstream services via a targeted professional development program. Results of the study found that the benefits of engagement with mainstream ECEC settings extended beyond child outcomes to educators who were supported to develop the knowledge, understanding, and strategies to engage and teach children with ASD and manage their behaviours.

Keywords: Early Start Denver Model; professional development; early childhood intervention; early childhood education and care; autism spectrum disorder; inclusion

There is an increasing body of evidence to suggest that outcomes for children with autism spectrum disorder (ASD) can be enhanced through evidence-based early intervention (Roberts & Williams, 2016). Research is also showing that intervention in the first years of life offers the best potential for children with ASD, as the ability of the neural networks in the brain to change through growth and reorganisation is greatest during this period, enabling the establishment and reorganisation of neuronal networks in response to environmental stimulation (Dawson, 2008). Many children are already enrolled in mainstream services prior to diagnosis; by building the capacity of educators, rather than following current trends of relying on additional support personnel without specialist skills, these children could potentially be supported to participate more fully in these programs. Considerable data is emerging regarding the effectiveness of educator capacity building for achieving child-related outcomes. No criteria or guidelines currently exist, however, to assess the capacity of mainstream early childhood education and care (ECEC) settings to deliver ASD early intervention, and there is limited understanding of staff perspectives, expectations, and experiences in regard to this service delivery model.

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According to Bene, Banda, and Brown (2014), teachers who are not specifically trained in educating children with ASD often struggle to meet the children's needs and require further professional development in evidence-based instructional practices to ensure that children with ASD are involved and confident learners, with a strong sense of identity and wellbeing (Bene et al., 2014). To achieve this, children with ASD need to be supported by differentiated teaching strategies tailored to meet their individual needs, enabling them to learn and participate to their fullest capability (NSW Department of Education, 2019). This is reliant on educators possessing the necessary skills to engage and facilitate children's learning effectively and to feel confident in doing so. Therefore, these settings need to be well resourced with evidence-based programs and strategies, and professional development, with access to specialists in the field, to enable young lives to realise their full potential (NSW Department of Education, 2019).

Early Start Denver Model

The Early Start Denver Model (ESDM) is a manualised, comprehensive play-based intervention that integrates applied behaviour analysis and pivotal response training with developmental and relationship-based approaches (Rogers & Dawson, 2010). The teaching principles used in this model are informed by expertise from relevant allied health and early childhood education professions. Major child learning goals include skills that enable social learning and engagement in naturalistic social interaction and cooperative activities (e.g., spontaneous imitation, joint engagement, verbal and nonverbal communication; Rogers, Vivanti, & Roch, 2017). The ESDM is a naturalistic model that is not tied to a specific delivery setting. Therefore, it can be delivered by multidisciplinary teams and/or parents in group programs, clinical settings, or in the child's home, potentially rendering it suitable also for mainstream application with regular staff.

Using the ESDM to promote inclusion within mainstream settings

The ESDM is a comprehensive intervention that lends itself well to mainstream ECEC settings because it is underpinned by play-based learning, the development of secure and reciprocal relationships, the promotion of all forms of communication, and the following of child interests and choices. These principles are reflective of the Australian Early Years Learning Framework (EYLF; Department of Education, Employment and Workplace Relations for the Council of Australian Governments, 2009), acknowledging that a child's earliest development takes place within the context of secure and reciprocal relationships. These relationships are essential for the child to become an involved and confident learner and effective communicator. However, research has demonstrated that working within this framework is not always as achievable for mainstream ECEC settings when endeavouring to include a child with ASD.

In terms of group delivery of the ESDM, research has only evaluated its impact on children attending autism specific early learning and care centres (ASELCCs) with a teacher-to-child ratio of 1:4 (Eapen, Črnčec, & Walter, 2013; Fulton, Eapen, Črnčec, Walter, & Rogers, 2014; Vivanti, Dissanayake, Zierhut, Rogers, & The Victorian ASELCC Team, 2013; Vivanti, Trembath, & Dissanayake, 2014; Vivanti et al., 2018). It is not known whether ESDM can be effectively implemented by regular educators in mainstream ECEC settings working with a significantly higher staff-to-child ratio of 1:8/1:10. According to Melhuish (2014), the importance of staff ratios needs to be considered within the context of staff qualifications, which is the determinant for measuring ECEC service quality. For this reason, the focus needs to be on building educator skills, knowledge, understanding, and confidence to investigate how their existing quality of practice can be enhanced by intensive and targeted professional development and mentoring. The practices of educators have been linked to the level of their qualifications and to the quality of their ongoing professional development (Siraj, Kingston, & Melhuish, 2015). The combination of these two factors may well impact on educator ability to facilitate

a high level of participation in a wider range of learning experiences for children with ASD in mainstream ECEC settings.

The authors of the ESDM have developed an advanced training and certification program for degree-qualified professionals who have experience working in the field of ASD (Rogers & Dawson, 2010). However, given the critical role played by the educators who make up a mainstream ECEC team, an additional level of professional development is needed to facilitate implementation of the model and to address a range of educator qualifications. In response, a paraprofessional training and mentoring program was developed by the first author for diploma- and certificate-trained staff in ECEC settings to sit alongside the existing advanced level of training and certification. This professional development program (PDP) is titled 'One of the Kids' and incorporates strategies for understanding, engaging, and guiding the behaviour of young children with ASD in mainstream settings. It is based entirely on the ESDM teaching principles and Curriculum Checklist (Rogers & Dawson, 2010) but modified to be more accessible for staff without university qualifications and inclusive of essential elements in the EYLF (Department of Education, Employment and Workplace Relations for the Council of Australian Governments, 2009) and the regular ECEC environment. The design of the PDP is outlined in Appendix A.

The Purpose of the Study

This is the third in a series of studies that have highlighted (a) the significant impact of the ESDM on reducing maladaptive behaviour in young children with ASD (published in Fulton et al., 2014); (b) priorities identified by parents of children with ASD, which have indicated a strong desire for their child to be educated alongside typically developing peers in mainstream services within their local communities (Blackmore, Aylward, & Grace, 2016); and (c) the level of maladaptive behaviour that coexisted for many of these children, combined with a gap in specialist skills and training across the ECEC sector, preventing inclusion from being achieved effectively and consistently (Blackmore et al., 2016). The goal of the current study was to examine the capacity for early childhood educators to include children with ASD in mainstream ECEC settings and to identify barriers to their inclusion, the supports needed to facilitate inclusion, and the specialist skills required for educators to engage and teach children with ASD. In order to address the gap in specialist skills, the effect of a PDP, based on the ESDM teaching principles, was investigated. It was predicted that such a targeted program could assist in removing critical barriers to successful inclusion. As the focus was staff outcomes, only data relating to educator perception of the value of a PDP, based on the ESDM teaching principles, in removing the critical barriers to successful inclusion in ECEC settings are included for analysis.

Method

An interpretative phenomenological approach was used in this study. This approach was chosen because it added depth to the exploration of educator experiences and the way in which they gave meaning to their current situations (van Manen, 2007). Ethics approval for the study protocol was obtained from the University of Wollongong's Human Research Ethics Committee (Ethics Approval Number: 2017/147). All participants provided written informed consent for their involvement in the research.

Participants and Settings

Educators were recruited from three community-based, not-for-profit mainstream ECEC settings in the south-west Sydney region. There were up to five children with a diagnosis of ASD already enrolled at each service. The children were aged between 3 and 5 years and attended for 15 hours per week. The three centres had each received ratings of 'exceeding' in all areas of their assessment and rating scale (Australian Children's Education and Care Quality Authority [ACECQA], 2012). Each service had 25

Table 1. Centre Demographics

Centre	Director qualification	Educator qualification	Licensed places	Child-staff ratio	SEIFA ranking	ACECQA ranking
Centre 1	MSpecEd & BECT	Diplomas/CCEs	25	3:1	1	Exceeding all areas
Centre 2	BECT	Diplomas/CCEs	25	5:1	1	Exceeding all areas
Centre 3	MSpecEd & BECT	BECT/Diplomas	25	8/10:1	10	Exceeding all areas

Note. MSpecEd = Master of Special Education; BECT = Bachelor of Early Childhood Teaching; CCEs = childcare certificates; SEIFA = Socio-Economic Indexes for Areas; ACECQA = Australian Children's Education and Care Quality Authority.

licensed places and a history of including children with ASD aged 3–5 years. The selection of services was made in an attempt to capture services that were classified as high quality, with a diverse mix of child and family populations. The quality of the ECEC settings had very recently been assessed through the ACECQA assessment and ratings process where services are given a rating for each of the seven quality areas (ACECQA, 2012). There were no exclusion criteria, and all educators participated willingly. An overview of centre demographics is included in Table 1.

Measures

Prestudy interviews were conducted with all educators. The same educators completed questionnaires at the end of the study. Fidelity of program implementation was measured weekly as this was an essential part of the mentoring and coaching component.

Semistructured interviews

Individual semistructured interviews were conducted with all participants prior to commencement of the PDP. Questions targeted the following areas: educator knowledge and understanding; skills and capacity; attitudes towards, and barriers to, inclusion; professional development goals; and educator competence and confidence in working with children with ASD. Responses to questions were used to inform the design of the PDP. The 10 questions that guided the interview are included in Appendix B.

Posttest questionnaire

Posttest questionnaires were used to assess educators' perceptions of the impact of the intervention on their own professional growth and practice. This was a purpose-built questionnaire that was generated by the mentor alongside the ECEC directors at monthly forums. The questionnaires were administered at the completion of the study and included 10 open-ended questions, which addressed educator perceptions of the PDP and sense of value, whether there was a shared understanding of the intervention and its outcomes, challenges they faced along the way, insights and learning, and workforce development. The questions are included in Appendix C.

Fidelity of implementation and self-monitoring

Fidelity checking was a key component of the approach to coaching and mentoring. Educator effectiveness and adherence to the delivery of the ESDM intervention was evaluated by using the ESDM Teaching Fidelity Rating System (Rogers & Dawson, 2010) and the Self-Monitoring Checklist (Rogers & Dawson, 2010). These measure adult fidelity against 13 key therapist behaviours — that is, the ESDM teaching principles (e.g., management of child attention, sensitivity and responsivity, managing unwanted behaviour, and dyadic engagement). Meeting fidelity can be demonstrated by achieving a

score of 80% or more across all samples being measured. Each educator had been trained and mentored to master and generalise these teaching principles across three different children engaged in multiple activities. The Self-Monitoring Checklist was used to encourage continuous reflective practice across coaching and mentoring sessions and worked alongside the ESDM fidelity tool to scaffold and monitor the educator's progress towards fidelity in the delivery of the intervention approach.

Procedure

Implementation of the PDP

Following the prestudy interviews, all educators were invited to participate in a targeted PDP 6 months prior to the study commencing. Educators were trained in one of the two levels of PDP, according to their level of qualifications. All degree-qualified educators were trained in the advanced level of ESDM PDP. The remaining educators were trained in a paraprofessional PDP developed by the first author, enabling the implementation of a whole-team approach. The evidence-based intervention applied to each service was the group version of the ESDM (Vivanti, Dissanayake, & The Victorian ASELCC Team, 2016), which is a manualised adaptation of the ESDM for group models.

Although the primary focus of this study was the educators themselves, it was important to also follow the protocol of the ESDM by ensuring each child with ASD received an ESDM Curriculum Checklist assessment (Rogers & Dawson, 2010) prior to the intervention being applied. These were delivered by certified ESDM therapists who were not on staff in any of these settings. From this assessment, each child's learning objectives and task analyses (Rogers & Dawson, 2010) were developed by certifying ESDM therapists, at each service. There were 10 learning objectives set for each child. Objectives were reviewed quarterly. They were targeted through play, small and large group experiences, and daily routines by all educators. The achievement of these objectives was assessed using data collected by certifying educators who were the degree-qualified early childhood teachers and directors in each service. Child data were reported by Fulton et al. (2014) and are not reported as part of the current study.

All educators continued to receive weekly guided practice (GP) in both the practical and data components of the intervention throughout the 12-month study. The GP component of the PDP, also developed by the first author, was included in this paraprofessional level of training to replace the certification component of the advanced level of training. Essentially, the GP is a mentoring model intended to empower professionals by matching them with a mentor already certified in the ESDM but with similar qualifications to those being mentored. These 'like' mentors (Heider, 2005) were engaged to coach, model, and guide educators 'in the moment on the floor', on a weekly basis.

In order to analyse the feasibility and educator effectiveness of applying this model of intervention to mainstream ECECs, it was necessary to collect quantitative data on every educator to evaluate level of fidelity to the ESDM both pre and post study. Meeting fidelity required each educator to achieve 80% or higher on all samples coded. Fidelity coding sheets (Rogers & Dawson, 2010) were used for this purpose. Following the formal training and certification or accreditation processes, educators' application of the ESDM teaching principles was checked weekly by a certified ESDM therapist. If participants did not meet fidelity at 80% agreement, they were given additional GP and booster coaching sessions with follow-up fidelity checks. Self-monitoring checklists were also used throughout the study to scaffold the process for each educator reaching fidelity. These were completed via random video sampling and weekly observations, of all participants, and documented by the mentor.

Data Analysis

Data coding and reliability

A systematic team approach was adopted in analysing the qualitative data (prestudy semistructured interviews and poststudy questionnaires; Giorgi, 2012). In the first instance, the first author used multiple readings to become familiar with the data, followed by an inductive process whereby initial codes

were ascribed semantically. To ensure reliability in coding, initial codes and raw data were provided to the second author for checking, with instances of disagreement resolved through ongoing discussion and re-reading of raw data. Agreed codes were then categorised to generate higher order themes. For example, the subthemes of personal benefits, deeper understanding of impact of ASD, preventive practices, helping parents, increased skills, peer mentoring and GP, inclusive program, and clinical supervision were all grouped under the higher order theme of 'sense of value'. A final reiterative process involving both authors was conducted to ensure these accurately reflected the raw data.

Processes adopted to ensure the trustworthiness in these data included the use of multiple cases/educator perspectives, crosschecking of data and themes with participants, as well as crosschecking of themes with the practitioners who delivered the GP component of the intervention. This inclusive process of crosschecking of themes enhanced the robustness of the data and enabled corroboration of findings. Debrief strategies between the two authors were also used to critically review and challenge assumptions during the analysis and writing stages (Creswell, 2014). Only the data for the poststudy questionnaires are included in the current study.

Results

Prior to the implementation of professional development plus coaching and mentoring model, each of the participating services met with a senior special education consultant to explore the design principles and assist with challenges around inclusion. During the initial forum, participating educators identified a preference for a peer-to-peer mentoring program with the peer being an educator who was a certified ESDM therapist, rather than a certified ESDM therapist from another discipline, as it was perceived that educators would better understand the intricacies of an ECEC program.

At the commencement of the study, the only expectation of the educators was that they focus their ESDM teaching principles (Rogers & Dawson, 2010) on the five children with ASD in each setting. However, several weeks in, at the first monthly clinical supervision forum, there was a consensus reached by the directors of each service that ESDM teaching principles were 'simply best practice', preferring to use them to guide their interactions with all children across their programs. From the educator perspective, 'this created a significant shift in practice towards a higher quality program, with a higher level of involvement and participation from all children across the daily program' (poststudy questionnaires: response from Early Childhood Teacher [ECT] Director, Centre 3), aligning closely with the Department of Education's most recent definition of inclusion where all students, regardless of ability, should not only access but also fully participate alongside their similar-aged peers, supported by necessary program adjustments and teachers with specialist skills (NSW Department of Education, 2019).

Educator Perceptions of the Impact of the PDP

An analysis of the poststudy questionnaires identified five main themes: enhanced outcomes, sense of value, challenges, insights and learning, and workforce development. The subgroups within each main theme are outlined in Table 2.

Enhanced outcomes: Increased capacity and teamwork

Participants attributed the positive child outcomes and reduction in maladaptive behaviour to the increased capacity and team work of educators: 'We gained greater confidence, not just as individuals but as a team and it has brought us all onto the one page now' (Educator, Centre 2); 'The professional growth of our team and our increased confidence, understanding and knowledge in really teaching children with ASD was the greatest outcome for me' (Educator, Centre 2). The PDP, followed by the GP component, facilitated the sharing of goals, information, critical reflection, and continuous improvement of practice: 'ESDM is fully embedded in our program now for all children and it has

Table 2. Educator Perceptions Surrounding the Impact of the Professional Development

Enhanced outcomes	Sense of value	Challenges	Insights and learnings	Workforce development
Increased confidence	Personal benefits	Data collection	Reflective practice	Application of principles
Increased competence	Deeper understanding of impact of ASD	Physical environment	Quality of practice increased significantly	Peer support
Team work	Preventive practices	Controlling materials	Staff-child interactions now rich and frequent	Child participation
Shared understanding	Helping parents	Sharing attention	Realistic expectations	Manage behaviours
Consistency across the team	Increased skills	Changing habits	Tuning into children's nonverbal cues	Intuitive responsiveness
Skills for engaging children with ASD	Peer mentoring and guided practice	Unlearning practices	Understanding the functions of behaviour	Work as a team
Children with ASD fully participating	Inclusive program	Time for certification	Child development and impact of ASD	Apply new skills to engage all children
Confidence to prevent/manage behaviours	Clinical supervision	Qualifications	Science of learning — why we do what we do	Respond with confidence to all behaviours

strengthened our consistency and team approach' (ECT Director, Centre 3). In ECEC settings, a team approach that incorporates a shared understanding and leadership can result in educators who are committed to a culture of continuous learning, respect, and support (Hadley, Waniganayake, & Shepherd, 2015). By adopting this approach, educators can inspire, affirm, and challenge the practice of their peers. This can enrich the team by bringing together different perspectives and experiences.

Enhanced outcomes: Opportunities for peer interaction

Increased skills and reduction of maladaptive behaviour was also associated with the multiple opportunities children with ASD had to practise and generalise their developing skills with typically developing peers. Prior to the implementation of the PDP, educators were concerned about their own level of interactions with children with ASD and that the children with ASD were not able to engage with typically developing children enough of the time: 'Before the training and guided practice, we didn't know how to interact with these kids and we couldn't interact long enough to even complete an activity or engage them in a group experience' (Educator, Centre 1). Perhaps the children with ASD had not learned, prior to the PDP, that an adult can be a highly affective play partner who is fun, helpful, and worth attending to.

Educators in the current study spoke of increased capacity and skill as a result of their involvement in the PDP: 'Children with ASD are participating fully in the program now because our team has developed the skills to engage them and scaffold their interactions with peers' (ECT Director, Centre 1). A paradigm of inclusion is that all children, regardless of ability, can not only access but also fully participate alongside their similar-aged peers, supported by necessary program adjustments and teachers with specialist skills (NSW Department of Education, 2019). This was achieved once educators had completed the entire scope of the targeted PDP: 'For the first time, we had confidence to work with these kids in a meaningful way and facilitate peer-to-peer interactions and higher levels of participation across the day' (Educator, Centre 3). It seems plausible to suggest that this was an outcome of the PDP.

Educators' sense of value

Involvement in the PDP also resulted in enhanced sense of worth and value and a reduction in stress as perceived by the educators:

Our team was scared of the behaviours that we experienced with our children with ASD, but now we know how to identify the function of child behaviour and replace inappropriate with appropriate behaviours . . . this is the best thing that has happened to all of us. (Educator, Centre 3)

This is a clear demonstration of educators developing a deeper understanding of child development and behaviour through the PDP process. It would be reasonable to suggest that this resulted in an important finding in the current study, which was the significant reduction in stress as a result of participating in the PDP: 'As the team leader, I value most the reduction of stress and burnout that my staff were experiencing prior to this professional development program' (ECT Director, Centre 1).

Challenges faced by educators

The GP component of the PDP facilitated the abilities of educators to overcome many of the barriers they faced initially. With the regular and ongoing support of their mentor, who could model, guide, and facilitate the brainstorming of solutions, educators developed the skills and confidence to target the individualised objectives with all of their children with ASD: 'Without the follow-up guided practice we would have struggled to master and embed the skills of targeting individual child objectives and collating the data. This helped us keep up the momentum of our new learning over time' (ECT Director, Centre 2).

Part of the program requirements was collection of data on each child. This presented a challenge to educator participants: 'Data collection was a challenge initially, until the role could be shared and the data modified to fit the Mainstream ECEC context' (ECT Director, Centre 3). Once all educators were working with an acceptable level of fidelity in the use of the ESDM, the additional load of the data collection could be modified and shared across the team. The GP model also ensured that educators were challenged to develop reflective practices and become more analytical about their own practice, thereby helping educators to achieve greater autonomy and ownership of their work. Overwhelmingly, the benefits of the program far outweighed any challenges faced:

The challenges didn't compare to the stress, anxiety and even fear that we were challenged by before this PD program. Our team was scared of the behaviours that we experienced with our children with ASD, but now we know how to prevent/manage and replace them with appropriate behaviours . . . this is the best thing that has happened to all of us. (ECT Director, Centre 3)

Insights and significant learning for educators

Participant responses demonstrated a shared understanding of the purpose of the model and the key characteristics and processes of intervention being applied to their settings. The weekly fidelity checks, which measured the integrity of delivery, validated this outcome by demonstrating that the intervention had been implemented as intended:

Working through the rigorous process of becoming certified in the ESDM equipped us with the understanding, knowledge, skills and strategies to optimise child motivation enabling us to engage children with ASD long enough to target their objectives through rich and highly affective interactions within activities that lasted for more than 2 minutes. (ECT Director, Centre 3)

The educators found it very empowering to understand, justify, and be able to articulate the evidence and rationale behind their approach to children: 'Finally, I am applying the science of learning so

I know why I do what I do and how it relates to the neurology of the child's brain and I know how to articulate this to others' (ECT Director, Centre 3). To this end, the insights and learning that were most significant to the study participants included increased reflective practice combined with a deeper knowledge and understanding of the impact of ASD on the child's development and behaviour: 'My thinking is altered, my reflections are different, more useful because I see children's development and behaviour differently now, with deeper knowledge, understanding and so much more confidence' (ECT Director, Centre 1). The ESDM Curriculum Checklist (Rogers & Dawson, 2010) gave educators insight and clarity into the range of developmental impacts of ASD on a child's developing brain. With ongoing peer mentoring and support, there was a considerable shift in staff expectations of children, combined with a deeper understanding of their development: 'The deep knowledge of child development gained through this process has guided me to be more realistic in my expectations for all children' (ECT Director, Centre 2).

A particularly encouraging finding from the current study was the impact that the intervention had not only on children with ASD but also on the quality of each service as a whole. Educators participating in this study reported that the PDP and ongoing GP enhanced the delivery of their pedagogical practices: 'The Guided practice component of this PD program made us more reflective and analytical about our own practice' (ECT Director, Centre 3). This fostered increased knowledge, understanding, and reflective practice, thereby enabling educators to become more effective in supporting children with ASD: 'We feel like we really know how to work with these kids now and their parents have confidence in us because we know what we are doing and why we are doing it and it works' (Educator, Centre 3).

Workforce development

Fidelity checks showed that all participating educators developed a specialist skill set, with percentage of fidelity of the ESDM teaching principles ranging from 80 to 86% with a mean score of 83%, by the end of the study. Each child's learning objectives were targeted through regular daily routines and planned individual and group experiences; however, the teaching practices adopted by all staff were different to their previous practice. They were developing a specialist skill set to promote higher levels of participation across the daily program, for all children with ASD. The aim of the PD seemed to have been realised.

The GP component of the PDP supported each service to embed sustainable practices that will continue to contribute to workforce stability over time and reduce the impact of including children with ASD on the staff team:

As a team, we have learned the direct cause and effect of our own behaviours on the child's. This was scary at first because we could see that we actually triggered that behaviour in that child, but then it empowered us. (ECT Director, Centre 1)

This is supported by all priority areas of the Early Childhood Education Workforce Strategy (NSW Department of Education, 2018), which includes (a) promoting the critical role of well-trained early childhood educators in a child's educational journey, (b) supporting the workforce to obtain specific skills and experience that will prepare them for their workplace, (c) building the skills and capability of the workforce by supporting educators to participate in professional development, and (d) supporting all services to embed sustainable practices that contribute to workforce stability and reduce the impact of staff turnover (NSW Department of Education, 2018):

Our stress levels and anxiety over child behaviours have completely disappeared, so we are able to focus and problem solve in the moment. We couldn't do this before because our stress and anxiety got in the way and stopped us thinking clearly. (Educator, Centre 1)

Once educators had a sound knowledge and understanding of challenging child behaviour, they knew how to prevent it or how to respond to it if prevention was missed. Through the PDP, they developed the skills to manage challenging behaviours in an efficient and effective way, enabling the child to participate more fully in the learning opportunities provided:

We have learned to replace a challenging behaviour with an appropriate behaviour, just like any other skill that the child needs to learn . . . like learning to use scissors or jumping with 2 feet, as opposed to something scary for us to stress about. This normalised it for us. (ECT Director, Centre 1)

This comment ties directly back to one of the main findings in the study on parental perceptions (Blackmore et al., 2016), which identified that parents believed that positive developmental change in their child was the direct result of service quality and the skills and knowledge of the staff. They also valued staff knowledge of child development and the importance of nonverbal communication that the staff were able to pass on to them, which enabled them to have more realistic expectations of their child's development (Blackmore et al., 2016).

Educators were not only better placed to support children with ASD but also became more attuned to all children and drew on the knowledge gained through participating in the PDP in supporting their approach to behavioural management and responsiveness at a room and centre level: 'I am able to pick up on subtle cues in every child now and respond to them sensitively. This prevents most behaviours from ever occurring' (Educator, Centre 2). An ongoing challenge faced by many interventions is the lack of sustainability and contextual relevance. In the current study, shifts in practice were embodied across the service and were seen as a meaningful component of future planning and practice: 'Because this process has pulled our team together with a united focus and approach, we will continue to apply this model . . . it has empowered us as educators and it has empowered the children' (Educator, Centre 1).

Discussion

Findings from the current study attest to the effectiveness of a PDP, based on the ESDM teaching principles, in enhancing the capacity of early childhood educators to include children with ASD in mainstream ECEC settings. Although the inclusion of children with ASD into mainstream ECEC settings has increased over the past decade, many educators lack the specialist skills required to effectively engage and teach children with ASD, resulting in educators feeling ill-equipped and overwhelmed. Findings from the current study showed participation in the PDP resulted in increased confidence and competence in working with children with ASD and their families. Moreover, the benefits generalised to all children, thus improving the behavioural and emotional climate of the service as a whole.

Staff stress, burnout, and high turnover have been issues experienced across the sector when including children with ASD and challenging behaviours (Grace, Llewellyn, Wedgwood, Fenech, & McConnell, 2008). A 2015 Australian Education Union survey found that 61% of respondents in NSW claimed that their preservice training and professional development had not given them the skills, confidence, and expertise to teach children with ASD (NSW Department of Education, 2019). In 2016, the Auditor-General reported that teachers felt they lacked skills and strategies and needed greater support to help manage the challenging behaviours and mental health needs of children with ASD (NSW Department of Education, 2019).

A notable finding from this study was the reduction in stress experienced by participating educators that was largely attributed to the reduction in maladaptive behaviours evidenced among the children with ASD, a pattern of results supported by findings from previous studies suggesting that the ESDM program may be an effective tool in not only improving core developmental domains but also decreasing maladaptive behaviours in preschool-aged children (Fulton et al., 2014). This finding is important, given previous research demonstrating the negative impact of maladaptive behaviours and

developmental delays on the child's learning acquisition and the development of social relationships with both peers and educators (Berg et al., 2000). The relatively quick reduction in maladaptive behaviours observed in the Fulton et al. (2014) study may allow children to participate more effectively in and benefit more from learning opportunities, including the intervention itself, and may be a key factor in the developmental gains observed in previous research (Dawson et al., 2010; Eapen et al., 2013; Fulton et al., 2014; Vivanti et al., 2013).

A particularly encouraging finding was the impact that the intervention had not only on children with ASD but also on the quality of each service as a whole. Educators participating in this study reported that the PDP and ongoing GP enhanced the delivery of their pedagogical practices. Notable enhancements in practice and improvements in the social and emotional climate of the service stands in sharp contrast to previous work, which has raised concerns regarding the potential negative impact associated with high demands related to the educational needs of children with ASD taking priority over all children (Hornby, 2014). Despite an initial reluctance to minimise physical environments (competition for the child to attend to adults), educators in the current study were able to see the benefits for all children in terms of more productive and more cooperative play.

According to Vivanti, Paynter, et al. (2014), the implementation of the ESDM in group settings potentially posed many challenges that could discourage educators from embedding evidence-based early intervention in these group programs. These challenges included potential difficulties in addressing specific learning needs of individual children within the group, difficulties in ensuring the quality of the therapy delivered within constraints of the regular ECEC environment, the risk of segregation, and the lack of family involvement. It was anticipated that these would be compounded in a mainstream ECEC setting; however, the current results demonstrated that each team was able to overcome these barriers with additional support, following the targeted PDP.

Building skills and capabilities across the ECEC sector by providing professional development and mentoring to educators is an initiative of the NSW Early Childhood Education Workforce Strategy (NSW Department of Education, 2018). The strategy has identified that targeted professional development opportunities are a key ingredient for educators and teachers. This study has added more evidence to the workforce strategy and provides an example of research influencing practice; as illustrated by one educator, 'We have applied this knowledge across our entire program for all children because it is promoting a higher level of participation and developmental progress for all . . . this is our responsibility as teachers of young children, isn't it?'

The providers participating in this study benefited from having a well-trained and empowered team of educators who could apply their knowledge to facilitate full inclusion for children with ASD. It was important for them to understand why they were doing what they were doing and why it worked for the children and for themselves. To this end, it is important to facilitate access to PDP opportunities in ways that are specialist by nature and sustainable. Targeted professional development strategies need to be accessed flexibly and in the most cost-effective way (NSW Department of Education, 2018).

Limitations of the Study

The data presented in this paper are part of a broader study and the findings are best considered together with other components of the research (Blackmore et al., 2016; Fulton et al., 2014). It is also important to note that the centres involved in this intervention were high quality, with experienced pedagogues and very good teacher-child ratios (see Appendix A). Given this, the robustness of these findings needs to be considered within the context of these supports, and it is recommended that this work be replicated across a range of centres and educational contexts with the possibility that results may not be as good if implemented in lower quality centres with much poorer teacher-child ratios.

Conclusion

The rising demand for inclusion of children with ASD has created a gap between the promise of inclusive education and the lived reality, which has resulted in low expectations, social exclusion, and inadequate educational outcomes for these children (NSW Department of Education, 2019). In support of these findings, the pretest interviews guiding the development and implementation of the PDP demonstrated that the rising demand had created stress, anxiety, fear, and loss of confidence across the early childhood sector when endeavouring to support inclusion.

Surveys of educators in NSW schools have highlighted the need for greater support and evidence-based strategies for managing child behaviour and for including children with ASD in their programs (NSW Department of Education, 2019). This was consistent with data collected from all educators participating in this study. It was feasible to apply an evidence-based early intervention to mainstream ECEC settings through a targeted PDP. Participant uptake and positive child outcomes, combined with adherence to the model, reduced staff stress, anxiety, and fear, suggesting that the application was acceptable to all stakeholders.

The benefits of engagement with ECEC services extended beyond child outcomes to the educators, who were the focus of this study. This suggests that the application of an evidence-based model of intervention, when applied via targeted professional development with follow-up support and mentoring, can help educators to develop competence and confidence in applying the teaching principles required to engage children with ASD in a high level of participation. Of equal importance, it also equipped them to prevent, manage, and replace the challenging behaviours of these children. Although Australian Government policy supports the inclusion of children with ASD in mainstream early childhood services and subsidy schemes to support these policies are embedded in the system (Australian Government Department of Education and Training, 2006), the effective achievement of this requires a specialist skill set that can only be realised through additional targeted professional development.

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Appendix A

Overview of the Professional Development Package Designed for Educators Without Degree Qualifications

‘One of the Kids’

Author: Elizabeth Aylward (2016)

Using the Early Start Denver Model (ESDM) to provide a helpful framework of strategies for understanding, engaging and guiding the behaviour of young children with ASD in mainstream Early Childhood Education and Care settings.

The ESDM is a Naturalistic Behavioural Developmental Intervention (NBDI) model for young children with autism with a strong and growing evidence base. It is heavily embedded in play and based around the child’s daily routines. It is a manualised program, which aims to reduce the severity of autism symptoms, while accelerating the child’s developmental rates in all areas, with particular emphasis in the areas of cognition, social-emotional, imitation and language.

A Professional Development package for Early Childhood Education and Care Educators

Intensive workshop	Booster coaching	Follow up guided practice	Evaluation
A three-day face-to-face workshop delivered by Certified ESDM Therapist and Trainer. This workshop balances the theoretical background of an evidence-based early intervention with its practical application. Participants work directly with a child with ASD to apply the curriculum and teaching principles of the ESDM with clinical guidance.	Three five-hour follow-up Booster coaching sessions are provided to each group of participants in the 3 preschool closedowns (April, July, October). These sessions are invaluable in terms of consolidating learning and reflection derived from the Intensive Workshop with face-to-face coaching and support from the trainers. It also serves to prevent any drift from the model.	Certified Therapists then provide weekly two-hour sessions of in-service guided practice to same participants while they are on the job. This occurs over a 12-month period, following the Intensive Workshop. Certified Therapists take short video clips of each practitioner implementing the ESDM Teaching principles in their workplace and code these against fidelity criteria.	Qualitative interview based on process evaluation criteria, combined with quantitative measures of practitioner fidelity will form the framework for evaluation of this Professional Development package. Ongoing review occurs through a reflective tool used by every educator – the Educator Self-Monitoring Checklist and ESDM Fidelity tool.

Appendix B

Overview of Prestudy Interview Questions

1. How do you perceive your own capacity, knowledge and understanding when including children with ASD in your setting?
2. Do you feel that you have the necessary specialist skill set to work with children with ASD?
3. Have you identified common goals, related to this work, for your team’s professional development?
4. Do you think it might be possible to apply an evidence-based model of intervention effectively and efficiently in your setting and do you think this might help your team?
5. What do you need in order for this to be achieved in your service?
6. Have you identified the barriers that might impede this application?
7. Would a targeted professional development program facilitate this process for you and your team?
8. Will it result in removing significant barriers to inclusion for children with ASD and lead to higher levels of participation?

9. Do you think this may lead to increased confidence in your team and perhaps greater job satisfaction?
10. What would you like your service to look like at the end of this process?

Appendix C

Overview of Survey Questions

1. Is there a shared understanding of the purpose of this model of intervention?
2. Has the intervention been delivered as intended?
3. Were any barriers to delivery experienced in your setting?
4. If so, what were the reasons for these barriers?
5. Were you able to overcome these barriers and if so, did this require additional assistance?
6. Can you identify the key supports that you needed to ensure program success?
7. What issues did you experience in maintaining fidelity across the day and program?
8. What do you see as the main impact of this professional development program on your staff?
9. What was the impact of the professional development program on your: (i) overall program; (ii) the target children; (iii) the other children in the service; and (iv) the families?
10. Do you have any suggestions regarding improvements that could enhance this project for future implementation?

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