

INPLASY PROTOCOL

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Conflicts of interest:
None declared.

INTRODUCTION

Review question / Objective: The research questions outlined for this review are as follows: 1. What are the factors that affect ABA programme procedural fidelity by caregivers of autistic children? 2. What are the barriers, challenges, and advantages of providing ABA training through telehealth?

ABA Telehealth Training for Caregivers of those with Autism: A Systematic Review

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Review question / Objective: The research questions outlined for this review are as follows: 1. What are the factors that affect ABA programme procedural fidelity by caregivers of autistic children? 2. What are the barriers, challenges, and advantages of providing ABA training through telehealth? 3. How does the effectiveness of ABA-based training interventions vary across target behaviours and symptom severity?

Condition being studied: Training in applied behavioural analysis that is delivered remotely via telehealth to informal caregivers of people with autism.

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3. How does the effectiveness of ABA-based training interventions vary across target behaviours and symptom severity?

Rationale: Autism Spectrum Disorder (ASD) is a lifelong developmental condition, characterised by impairments in social interaction and communication, and restrictions in behaviours (American

Psychiatric Association, 2013, Ferguson, Craig, & Dounavi, 2018). Worldwide, it is estimated that 1 in every 160 children have a diagnosis of ASD (Estes, Swaine, & MacDuffie, 2019). There is an ongoing need for support and services for children with a diagnosis of ASD, and their families (Estes et al., 2019; Yilmaz, Merve, Sahin, 2021). Caring for a child with ASD impacts the caregiver's ability to facilitate interventions for their child (Estes et al., 2019) and it can lead to parental stress (Wongpakaran & Wongpakaran, 2022), and declining mental health and social isolation (Ault et al., 2021).

Applied Behavioural Analysis (ABA) is the gold standard intervention for targeting symptoms and behaviours of ASD (Irwin & Axe, 2019). ABA aims to decrease problem and stereotypic behaviours and increase social, communicative, and self-care skills (Irwin & Axe, 2019). ABA is in demand for caregivers of those with ASD (Unholz et al., 2022). However, barriers can prevent families from accessing ABA programmes. Parents report dissatisfaction with the availability of services, and post-ASD diagnosis throughout Ireland and the UK (Liston, Gunning, & Harkry, 2022). There is also a lack of trained professionals able to fulfil the demand for services (Ferguson, Craig, & Dounavi, 2018). Due to these problems, parents can feel alone when they seek and find information about how they can support their child (Hall, Culler, & Frank-Webb, 2016). This is concerning as there is misinformation and "fake news" pertaining to ASD and relevant interventions on the internet (Keenan & Dillenburger, 2018; Hall et al, 2016).

Telehealth is the use of electronic communication technology to deliver clinical services, educational content, and the treatment of various health-related conditions (Ferguson et al., 2018; Unholz et al., 2020). Telehealth has been used to screen for signs of autism, using a play-based remote assessment called the BOSA (The Brief Observation of Symptoms of Autism). The BOSA was widely utilized during the COVID-19 pandemic (Pacifico et al., 2019) when the pandemic prevented families from receiving face-to-face

assessments for their children (Martin et al., 2022).

Previous systematic reviews have found that telehealth can be used effectively to deliver ABA-based training programmes to caregivers of those with ASD (Unholz et al., 2020). Indeed, this method may overcome the barriers to accessing traditional ABA training. However, this method of service delivery requires further investigation. Currently, it is unknown how the severity of ASD symptomatology impacts parents' experience of applying the skills they learn through telehealth ABA training. No reviews to date have examined the barriers and advantages of providing ABA training via telehealth, and the efficacy of the training that may be impacted by parental factors external to training. These factors may impact the procedural fidelity and the degree to which the intervention is delivered by parents as it was intended (Ledford & Gast, 2014). Moreover, the efficacy of ABA-based training programmes on various target behaviours of ABA; such as communication skills, has also not to date been examined.

The proposed systematic review aims to fill these knowledge gaps. It will provide an analysis of the barriers, challenges, and advantages of providing ABA telehealth training. It will also examine how contextual factors relate to program efficacy and adherence.

Condition being studied: Training in applied behavioural analysis that is delivered remotely via telehealth to informal caregivers of people with autism.

METHODS

Search strategy: The following databases will be searched by author, SW:

- ERIC
- PsychInfo
- Scopus
- Web of Science
- IEEEXplore
- PubMed
- ProQuest.

Author SW will search these databases using the following keywords (or as adapted to the needs of the database):

'pervasive develop*' OR 'ASD' OR 'Asperger*' OR 'Autism Spectrum Disorder' OR 'Developmental Disab*' OR 'Autis*' AND 'VR' OR 'Virtual Reality' OR 'Augmented Reality' OR 'AR' OR 'Virtual Environments*' OR 'Artificial 'Environment' OR 'Computer*' Simulations' OR 'Computer Based Simulation*' OR 'Telepresence' OR 'Computer Generated Reality' OR 'telehealth' OR 'ehealth' OR 'Remote Training' OR 'Telemedicine' OR 'Telecare' OR 'Artificial Reality' AND 'Applied Behavioural Analysis' OR 'ABA' OR 'Behaviour Analysis' OR 'Experimental Analysis of Behaviour' AND 'Informal Car*' OR 'Parent*' OR 'Fam*' OR 'Caregiver*' OR 'Guardian*' OR 'Caregiver-mediated Intervention' OR 'train*' OR 'program*' OR 'Intervention' OR 'Treatment*' OR 'Behavioural Skills Training' OR 'Functional Communication Training'.

Searches will be limited to studies published in English, from the year 2010 to the present day. Identified items will be imported into the software Rayyan [Rayyan – Intelligent Systematic Review - Rayyan].

Historical and Citation Searches: Additional studies will be identified through hand searching the reference lists of studies that are identified for inclusion in the review. Citations of the included studies will also be examined against the study eligibility criteria, using the google scholar citation index, to identify additional studies.

Participant or population: The studies included in this review will involve the parents and informal caregivers of people diagnosed with Autism Spectrum Disorder, who have received training in applied behavioural analysis delivered remotely through telehealth.

Intervention: The intervention is the applied behavioural training.

Comparator: Studies will be included if they have no comparator to the intervention. They will also be included if they examine they compare the training delivered remotely with applied behavioural analysis training delivered by traditional, face to face means.

Study designs to be included: Studies using all designs will be included.

Eligibility criteria: Studies will be included if they focus on the following outcomes of interest: Procedural fidelity in the implementation of Applied Behavioural Analysis by caregivers following telehealth and the efficacy of this training. Items will be excluded: Reports, reviews, and editorials; if the study methodology is not reported in detail; if the training examined involves clinicians or trainee clinicians and not informal caregivers of people with autism; studies involve the Caregivers of people with conditions other than Autism; Studies where caregivers have prior training in ABA procedures; Studies containing data collected by teacher/trainer, showing outcomes of Applied Behavioural Analysis interventions on child/caregiver behaviour.

Information sources: Electronic Databases, including grey literature, and citation and historical handsearching of relevant empirical studies as described above.

Main outcome(s): Procedural fidelity in the implementation of ABA by carers following telehealth-delivered training. Efficacy of telehealth-delivered ABA carer training.

Additional outcome(s): Factors that impact training outcomes and efficacy.

Data management: The items identified in the searches will be screened for eligibility. This will involve two levels of paper screening: Level One Screening: All items will be screened using the software Rayyan. In Rayyan, with the BLIND on, authors (KM, EH) will screen the title and abstract of 10% of items against the eligibility criteria. Authors (KM, EH) will then turn blind off and will compare and discuss their results and calculate their inter-rater reliability. If KM and EH cannot reach a consensus of 100% concerning the items' eligibility, the author SW will be consulted to determine the remaining items' eligibility for inclusion. KM and EH will then screen the title and abstract of the remaining 90% of the 10% of items. Then

SW will obtain the full text of all eligible studies.

Level Two Screening Authors (KM, EH) will then screen the full text of 10% items in Rayyan with the BLIND on. They will then turn off the BLIND and meet to discuss and compare their results. Again, if they cannot reach a 100% consensus SW will determine the eligibility of any disputed items. Following this process, KM and EH will then divide the remaining 90% of items (each receiving half of the items) and screen their full text. Then all authors will meet to discuss screening results and to reach a 100% consensus about the studies included in the review.

The search and paper screening results will be reported in a PRISMA diagram.

Quality assessment / Risk of bias analysis:

Items included in the review will be examined to appraise their strengths and weaknesses by authors (SW, EH, and KM), using the Critical Appraisal Skills Programme (CASP) checklists (<https://casp-uk.net/>). All authors will appraise and then discuss the quality of 5% of the included studies. EH and KM will both appraise half of the remaining 95% of the studies, and SW will appraise all the remaining 95% of studies. Authors will then meet to discuss their results and come to a consensus about the final appraisals.

Strategy of data synthesis: The data from the included studies will be extracted by KM and EM into a table, with the following headings:

- Study ID, No. Articles, and County
- Review Aims/Focus/Scope/Research Questions
- Methods (e.g. Overall Study Design/ Methodology, Research Context, Recruitment Methods).
- Caregiver Details (e.g. age, gender, ethnicity etc., and additional caregiver personal/contextual factors).
- Details of the Person Receiving Care (e.g., diagnosis, symptom severity).
- Training Intervention Details (i.e. of telehealth and ABA programme taught including the specific behaviours targeted).
- Overall Training Efficacy.
- Procedural Fidelity.

- Benefits/Advantages of Training.
- Challenges & Barriers of Training.
- Author Conclusions and Opportunities for Further Research.
- Study Strengths/Weaknesses/Quality Appraisal.

A narrative synthesis will be completed, with the authors developing theoretical knowledge of the literature on how ABA Telehealth interventions work and why.

Narrative synthesis (with no meta-analysis) will be conducted according to Cochrane Consumer and Communication Review Group Guidance (Ryan, 2013).

The authors will systematically analyse outcomes of included items, highlighting any important characteristics observed as relevant in included items (e.g., ABA intervention). Authors will then organise a comparison amongst item outcomes for the review as relevant to the research question (Ryan, 2016).

At present, no meta-analysis is planned for this study. A meta-analysis of some aspects of the data may be considered if it is suitable following the examination of the extracted data.

Subgroup analysis: It is not anticipated that subgroup analysis will be undertaken.

Sensitivity analysis: It is not anticipated that sensitivity analysis will be undertaken.

Language restriction: Yes, language limits will be imposed on the searches. Only studies that have been published in English will be including in the review.

Country(ies) involved: This study is being conducted in Ireland.

Other relevant information: Paper searches and paper selection processes will be reported in a PRISMA Diagram. Details of all the studies will be provided in a data extraction table.

Keywords: Applied Behavioural Analysis, Autism, Aspergers, Caregiver Training, Telehealth.

Contributions of each author:

Author 1 - Sally Whelan - conceiving the review; designing the review; coordinating the review; data management; analysis of data; interpretation data; writing the protocol and review).

Author 2 - Katie Mulvany - conceiving the review, designing the review, data collection; data management; analysis of data; interpretation data; writing the review.

Author 3 - Emily Higgins - designing the review, data collection; data management; analysis of data; interpretation data; writing the review.

Author 4 - Aoife Caher - conceiving the review.

Author 5 - Ciara Kilgarriff - conceiving the review.

Author 6 - Molly Robinson - conceiving the review.

Author 7 - Arlene Mannion - writing- editing and reviewing.

Author 8 - Geraldine Leader - Supervising, Writing- editing and reviewing.

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