The application of the Behaviour Change Technique Taxonomy (BCTT) to training for parents of children with a developmental language delay or disorder.

Background and summary of project

Language delay or disorder is the most prevalent childhood disability (Law, Boyle, Harris, Harkness, & Nye, 2000; Lee, 2008). If language difficulties are resolved by the time a child is five and a half years old, they will progress in the same way that children who have good speech and language skills do, so early intervention is crucial (Bishop & Adams, 1990; Broomfield & Dodd, 2011; Cantwell & Baker, 1991; Snowling, Adams, Bishop, & Stothard, 2001). Parents are ideally placed to adapt their child's language environment and deliver early speech and language therapy recommendations. As such, they are frequently enlisted in therapy and training (Davies, Marshall, Brown, & Goldbart, 2016; Falkus et al., 2016; Roberts & Kaiser, 2012), sometimes with the use of video as a tool to aid reflection (Girolametto & Weitzman, 2006). For example, the 'It Takes Two To Talk' Hanen Programme (Girolametto & Weitzman, 2006) was developed in direct response to research highlighting the vital role of parents in children's speech, communication and language development. Other approaches based on Parent Child Interaction (PCI) therapy (e.g. Buschmann et al., 2009) are frequently implemented by speech and language therapists (SLTs) in an effort to increase parents' understanding of and responsiveness to their child. All speech and language therapy interventions aim to effect behavioural change in clients. In contrast to precisely specified biomedical interventions, e.g. prescribed drugs or surgical procedures, successful speech and language therapy relies on complex combinations of techniques used by a therapist which are tailored to the client's needs (Campbell et al., 2000). These techniques form the key 'ingredients' required for effective treatment and are generally unspecified in intervention studies or described in such a way as they can be interpreted differently (Michie et al., 2011). This lack of methodology for universally specifying techniques undermines the development, reporting and replication of effective interventions. Michie et al. (2013) describe a taxonomy of ninety-three hierarchically clustered Behaviour Change Techniques (BCTs) used by public health practitioners to effect change in clients. There are some early studies that apply the Behaviour Change Technique Taxonomy (BCTT) to speech and language therapy interventions for acquired disorders in adult clients (Johnson, Best, Beckley, Maxim, & Beeke, 2016; Toft & Stringer, 2017) and to developmental disorders in children (Atkinson & Stringer, 2016; Spalding & Stringer, 2016). These studies have demonstrated

that the SLT, as the *provider* of therapy, is not always the *agent* of therapy. Instead, sometimes SLTs train parents, carers, or other professionals such as teaching assistants, to become *agents* of therapy and to deliver interventions to the children (the *recipients*). This is the case in widely used 'Parent-Child Interaction' (PCI) interventions, such as 'Hanen: It Takes Two To Talk' (Girolametto & Weitzman, 2006).

The BCTT is also a useful tool in supporting student SLTs to conceptualise and implement BCTs used in speech and language therapy interventions (Rees, Wood, & Cavin, 2016), as it allows students to be trained *explicitly* in techniques used by SLTs. No PCI interventions currently use the BCTT in training parents. It is posited in this study that this explicit training method could allow for the appropriate tailoring of interventions to the specific needs of the parent, i.e.to identify particular behaviours that need to change, and their barriers and enablers. This has been a significant issue for PCI interventions in the past, in terms of engaging with families across social and cultural spectrum, and in terms of efficacy in intervention studies, i.e. the wrong PCI behaviours being targeted in families and assumptions being made about barriers or facilitators. Using the BCTT in this way could therefore be positive in enhancing parents' interactions with their children. At Newcastle University the BCTT has also been combined with Video Enhanced Observation (VEO http://www.veo-group.com/) to provide student SLTs and their clinical educators with the opportunity to observe themselves delivering interventions and to precisely label the BCTs they use (MRC grant to Stringer & Nazlie). Video feedback is used to good effect, and with positive reaction, to improve parent's interactions with their children in PCI interventions. Furthermore, mobile apps and devices are used increasingly by healthcare professionals to increase the autonomy and agency in the client (Ventola, 2014). Using video technology in an app like VEO seems like a natural progression in parent training which allows reflection and clear feedback for parents. If effective, using this method of service delivery could both improve the cost-effectiveness of therapy and also increase participation of parents who would find attending appointments more difficult, as such an intervention could be done remotely. Combining BCTT with VEO could also allow for a transparent measure of treatment fidelity; treatment is videoed, and thus can be directly compared to therapy protocol with intended BCTs. This is a vital and neglected part of treatment and clinical trials in SLT (Kaderavek & Justice, 2010).

The first aim of this research is to identify the behaviour change techniques SLTs use in PCI interventions. This involves both the techniques SLTs use themselves when training the parent to become the agent delivering therapy, as well as the techniques the SLTs teach parents to use when they are delivering intervention to their child. For example, in a PCI session, the SLT may model to parents how best to give feedback to their child; in this example *modelling* is used as a technique to

train parents, and *feedback* is the technique that parents are being trained to use with their child. This study will thereby further add to the literature which can be used in creating an international consensus for BCTs in Speech and Language Therapy, providing a method to better report and replicate interventions and giving further insight into what makes SLT intervention effective. Secondly this study aims to evaluate the effectiveness of the BCT taxonomy combined with VEO as a tool for supporting interventions with parents of young children with language difficulties. This will demonstrate how the BCTT can be used in training parents, and whether or not this combined with the VEO is a worthwhile tool in enhancing parent's learning. Finally, this project will allow VEO to be trialled as a new method of measuring treatment fidelity. This research will be carried out in partnership with Northumbria Healthcare NHS Foundation Trust (NHCFT) and in collaboration with other NHS Trusts in the region.

Research questions and hypotheses

PHASE 1

Research question 1: Which BCTs are used by SLTs to implement parent training interventions for parents of young children with language difficulties?

It is hypothesised that SLTs implementing parent training interventions will use a similar range of BCTs to SLTs delivering speech and language interventions to older children and adults, and that the BCTs taught to parents to use with their child will be similar to those which SLTs have been found to routinely use with younger children.

PHASE 2

Research question 2a: Does the use of the BCTT increase the amount of PCI techniques parents implement with their children?

It is hypothesised that parents will more easily learn and implement techniques which have been taught through explicit use of the BCTT, than the same techniques taught in 'traditional' parent training sessions.

Research question 2b: Does the VEO+BCTT intervention method increase the speed of uptake of the prescribed PCI techniques, reflecting good treatment fidelity, and support their retention in the 6 weeks after intervention period?

It is hypothesised that due to the self-reflection needed for the VEO intervention, parents will begin to implement techniques more quickly, and continue to use them for longer after intervention, in their

interactions with their children than parents who do not use VEO. The VEO will allow for a measure of treatment fidelity that is not parent-report.

Research question 2c: Is the VEO+BCTT an acceptable intervention to parents?

It is hypothesised that parents may be uncomfortable with the VEO-BCTT training at first, but that they will find the intervention overall acceptable and useful, especially given the decreased time required and the technological aspects.

Research question 3: What is the impact of and difference between three different methods of PCI intervention on children's language levels?

It is hypothesised that parents trained using the BCTT combined with VEO will have a greater effect on the child's speech and language development, than BCTT alone, or no BCTT, as it provides a richer learning environment and greater opportunity for reflection for the parent implementing the intervention.

Details of project plan

Patient-Public Involvement

Throughout the project, members of the public will be enlisted to inform and contribute to the development of the study. This will include SLTs, other researchers in the field, and parents of pre-school children. Key points for their involvement will be during the initial phases of the study to judge the worthiness of the project and inform its development; questionnaire development; developing parent and SLT information sheets, consent forms, and feedback forms; creating tagset on VEO, and discussion of dissemination processes.

PHASE 1

An observational study to assign BCTs to SLT parent interventions for young children with language difficulties; January 2019 – October 2019. Answering Research Question 1: Which BCTs are used by SLTs to implement parent training interventions for parents of young children with language difficulties?

Participants

Responders to a UK-wide survey; Four SLTs delivering parent training interventions in Northumberland and Newcastle upon Tyne, as recruited through contacts between the NHS trusts in the North East and Newcastle University for observations and two focus groups; Parents not involved as participants in the study for a focus group discussion.

Procedures

A literature review of PCI interventions and BCTT research in speech and language therapy will be completed to develop firm insight into PCI interventions, including techniques used by the therapist to train parents and techniques taught to the parents i.e. the content of the intervention. From this, a list of BCTs that SLTs use when training parents will be formulated. Using a modified Delphi process of consensus decision making, this list will then inform the creation of a questionnaire regarding use of techniques by SLTs in training parents which will be sent out using platforms such as social media and the Royal College of Speech and Language Therapists, to SLTs across the UK who train parents of children with language difficulties. Results from this survey will further inform refining this list of techniques.

The list will then be discussed and modified where needed by a focus group of four SLTs from NHS Trusts in the North East of England who use PCI interventions when working with parents of pre-school children with language difficulties. After this, these SLTs will be observed training individual parents by the researcher, who is already trained and experienced in assigning BCTs to observed therapy sessions. The description of each BCT found to be used in these observations will be discussed with the SLTs to ensure it matches their intent.

It is expected that through this triangulation of sources; literature review/survey, discussions, and observations of SLTs in each condition, a comprehensive and robust list of the full range of BCTs being used by the SLTs in parent training will be included. The final list of BCTs, how they are combined, and when each are used, as seen in the survey and observations, will be used to develop the tag set on the VEO app which will be used in Phase 2. This tagset will be discussed with two focus groups; one comprising the SLTs previously involved, and one comprising parents of pre-schoolers, not otherwise involved in the study. This will be to ensure that it is user-friendly, the tags are clear, and the face-to-face training will effectively equip the parents to understand the BCT and use the VEO app. Feedback from this group will be used to modify the intervention, including the BCTT descriptors and the tags on the VEO app for the next part of the study.

This phase will also involve the development of a questionnaire regarding parent views on their role in their child's language development for use in the next phase. It will also involve the development of a treatment fidelity checklist derived from the list of components of PCI interventions. Liaison with PPI group regarding these will be sought.

PHASE 2

A controlled experimental evaluation of BCTT combined with VEO in parent training intervention for parents of young children with potential language difficulties; Recruitment from August 2019 – March 2020; Intervention trial January 2020 – July 2020. Answering Research Questions 2a, b, c and 3.

Participants

Parents and their pre-school children (aged 2;00-3;11 years) with potential language difficulties referred to speech and language therapy services in NHS Trusts in Northumberland. Thirty-six parent/child dyads known to the SLT services in these Trusts will be recruited through the participants' SLT between September 2019 and May 2020. Parents should have a good level of English to be involved in the study. Children are to have no comorbidities and are to be deemed appropriate for the study by their gatekeepers (SLTs familiar with the project within the Trust). Participants will only be eligible if, at the time between baseline and follow-up measures, they are not receiving any input from other speech and language therapy services. The participants will be divided into three groups using a purposive sampling, based on the time they are referred into the service: (1) Control (usual treatment) – referred between July and August 2019 (2) Experimental use of BCTT+PCI – referred between September and October 2019 (3) Experimental use of BCTT+VEO – referred between November and December 2019.

Measures

There will be one pre-intervention assessment point (baseline, maximum two weeks before intervention begins) and two post- intervention assessment points (outcome, within two weeks of finishing intervention, and follow-up, six weeks post-outcome assessment). Baseline and outcome assessment points will serve to determine which intervention types leads to the greatest gains in parent behaviour change and child language level. The follow-up assessment will allow monitoring of sustainability and progress of any gains found at outcome. The Project Leader will be blinded to all assessments scores at all points.

A questionnaire developed in Phase 1 will measure the parents' understanding of their role in the language environment and intervention for their child. This will be administered both at baseline and outcome. The speech and language skills of the children involved will be measured using appropriate standardised and observational assessments to measure effectiveness at all three assessment points; baseline, outcome and follow-up. These assessments are as follows: The Focus on the Outcomes of Children Under Six (FOCUS-34), and the MacArthur Bates Communicative Development Inventory (CDI), and an analysis of the child's language from the videoed interaction will be used as a measure of language level. Three measures of parent behaviours will be used: a type and frequency measure

of BCT use with their child; the Parental Responsiveness Rating Scale (PaRRiS); and a detailed rating of parental responsiveness. These will be measured at each assessment point, baseline, outcome and follow-up, from a videotape of a five minute interaction between the parent and their young child, on BORIS software (Friard & Gamba, 2016). This play interaction will occur in the same session as the language assessments and questionnaires parents will fill out. Finally, focus groups or parent interviews will be held immediately after the outcome assessments to evaluate the acceptability of the intervention to parents.

Procedures

Following baseline assessment of children and pre-intervention parent questionnaire, parents will be assigned to groups as above.

The control group (Group 1) will receive the usual treatment the Trust provides for preschool children with potential language difficulties; general and individualised advice given in initial appointments. Parents in the experimental BCTT/PCI Group 2 will receive a PCI intervention, but including explicit instruction of the BCTs to be used with their child, so that parents are confident in recognising them. This will involve intervention being individualised to each parent/child dyad. There will be two introductory sessions of two hours each at participant's homes, three targets for the child and three for the parent will be set in collaboration with parents in the second session. Following this, six weeks of home-based parent-child intervention will take place, making up one hour per week. Parents in the experimental BCTT/VEO Group 3 will attend two hour-long initial training sessions at participant's homes where they are introduced to the VEO/BCTT intervention, and in which three targets each are set for the parent and child. Like Group 2, this will include explicit BCT training, and in addition to this, parents in Group 3 will also be taught how to use VEO with the BCTT tags to label recordings of their intervention time with their children. As in Group 1 and 2, intervention will be individualised to each parent/child dyad. Following initial training sessions, six weeks of home-based parent-child intervention will take place, making up one hour per week.

Throughout the home-based intervention period (6 weeks), parents in Group 2 will be asked to make a record of their interactions with their child on a weekly checklist, and reflect on these. Reflections will comprise a short checklist and comment space related to their goals, how often they used the advice given or the PCI techniques taught, and whether techniques had the desired outcome on their child's communication. Those in Group 3 will be required to upload two videos per week of themselves interacting with their children to the VEO portal on their phone/tablet app, to be shared with their therapist (Project Leader) with parents' own tags as reflections. The videos and reflections (tags or checklist), in addition to treatment fidelity analysis of the initial training session for all groups, will

serve as treatment fidelity measures for the three groups. The treatment fidelity checklist made in Phase 1 will be used to check whether parents using BCTT have better fidelity than without and the impact of VEO on fidelity through analysis of 30% of each submitted video recording.

Data from the language assessments and parent responsiveness measures will be analysed using quantitative methods to determine whether intervention was effective, and if there is a significant difference between baseline, outcome and follow-up scores for the different arms. Effect sizes will be calculated. Data from the questionnaires and focus groups will be analysed using both quantitative and qualitative methods.

Ethical approval

Full NHS Ethical and Health Research Authority (R&D) approvals will be sought through the IRAS system for both Phase 1 and Phase 2, as both involve NHS patients in either an observation or clinical trial capacity.

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