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Review Article

Cognitive-behavioral approaches for children with autism spectrum disorder: A trend analysis

Betty P.V. Ho*, Jennifer Stephenson, Mark Carter

Faculty of Human Sciences, Macquarie University, NSW, Australia

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ABSTRACT

Background: Cognitive-behavioral interventions for children with autism spectrum disorders (ASD) have emerged in the last two decades, and these interventions are now regarded as evidence-based. However, reviews conducted so far often focus on specific areas and do not examine broad trends in the development of relevant research in this area.

Method: This current trend analysis provided an overview of the development in the research of cognitive-behavioral interventions for children with ASD.This study is based on a total of 103 reports located through a database keyword search and ancestral search.

Results: It was observed that early stage qualitative case studies have been gradually replaced by experimental studies, while the use of randomized, controlled trials is still limited. Participants included were mainly children with ASD and typical cognitive ability, and demographic description was often incomplete. Programs used were heterogeneous and often replicated. A heavy reliance on rating scales rather than behavioral observation and insufficient data on effect maintenance and generalization were observed. Very recently, researchers conducted supplementary analyses on intervention data and provided information not available in original trial reports.

Conclusion: A trend to include younger participants (i.e., children at or below 8 years of age) was observed. Although a substantial number of experimental group studies have been conducted, the proportion of randomized, controlled trials and sample sizes did not increase as expected. Consequently, there is the need for larger scale randomized, controlled trials. A major problem was incomplete participant description, in particular measures of autistic symptomology and intelligence. There is the need for more comprehensive participant descriptions that allow readers to identify the characteristics of children with ASD who may benefit from the intervention.

1. Introduction

Autism spectrum disorder (ASD) is a developmental disorder characterized by difficulties in social communication as well as restricted and repetitive patterns of behaviors and interests (American Psychiatric Association, 2013). ASD may also be associated with comorbid anxiety disorders, depression, other emotional difficulties, and problematic behaviors (Salazar et al., 2015). There is considerable variation in symptomology among affected individuals (American Psychiatric Association, 2013), and their intellectual ability may range from above average to intellectual disability (Centers for Disease Control & Prevention, 2016). Overall, the population with ASD is extensively heterogeneous which means that an array of interventions targeting different issues may be

* Correspondence author at: Macquarie University Special Education Centre School, Building X5A, Macquarie University, NSW 2109, Australia.
E-mail addresses: betty.ho@mq.edu.au (B.P.V. Ho), jennifer.stephenson@mq.edu.au (J. Stephenson), mark.carter@mq.edu.au (M. Carter).

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required.

Cognitive-behavioral interventions have been practiced widely with the general population since mid-last century and are considered to be evidence-based (Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012). Cognitive-behavioral interventions were developed from traditional behavioral strategies integrated with cognitive therapy, emphasizing social cognition, and facilitating behavioral changes through cognition (Beck & Fernandez 1998; Dobson & Dozois, 2010). Unlike traditional behavioral approaches, cognitive-behavioral interventions include both training to address specific areas of cognition and behavioral strategies to address skill and behavior deficits, with an emphasis on the development of self-control and coping skills, which are claimed to lead to greater generalization and maintenance (Feindler & Ecton, 1986). The application of cognitive-behavioral interventions to the population with ASD came several decades after initial use with the general population (i.e., first reported by Lord, 1996).

Research on Cognitive-behavioral interventions for children with ASD began to flourish in the mid-2000s, and now these approaches are regarded as evidence-based (National Autism Center, 2015; Wong et al., 2015 Wong et al., 2015). Intervention research often evolves from small-scale or less-controlled pilot studies which establish a *prima facie* case for an intervention, to more-controlled and larger experimental studies and, finally, to replications to confirm findings and provide evidence of external validity (Clark, 2013; Fraser & Galinsky, 2010). Single group pilot studies at earlier stages may assist in fine-tuning the intervention design, and controlled single subject studies can be used to evaluate the contribution of individual components to treatment effect at later stage (Kratochwill et al., 2010) with experimental randomized group studies at later stages also providing stronger verification of treatment effectiveness. It is thus of interest to track how research designs used to explore the effects of cognitive-behavioral interventions for children with ASD evolved over the last two decades.

Cognitive-behavioral interventions address a variety of mental disorders and psychological distress in the general population (Hofmann et al., 2012) and behavioral problems and skill deficits in typically developing children (e.g., Little & Kendall, 1979). Cognitive-behavioral interventions have also been used with individuals having different medical conditions, physical disabilities, and intellectual disability (Hofmann et al., 2012; Taylor, Novaco, Gillmer, & Thorne, 2002). Noting the versatility of cognitive-behavioral interventions when implemented with the general population, its feasibility with a wide range of individuals with ASD is suggested. Given their potentially widely different applications, it would be informative to examine the change over time in the focus of cognitive-behavioral intervention studies for children with ASD to determine the primary skills and problems addressed.

Cognitive-behavioral interventions are considered as a family of interventions for the general population (Hofmann et al., 2012), and the cognitive-behavioral intervention programs for children with ASD are found to be very diverse in their features (Danial & Wood, 2013) and are not limited to addressing psychological problems alone (Ho, Stephenson, Carter, 2015). Program features of particular interest would include manualization, intensity, setting, the professional administrating the procedures, and persons involved; all of which have the potential to mediate treatment effects. It would be of interest to outline this diversity and how such features change over time, as such information would provide a reflection of the evolution of cognitive-behavioral interventions.

Examination of the variations in participant demographics would help to identify the characteristics of children included in cognitive-behavioral intervention studies. In addition, clear information about such factors as severity of autistic symptomatology and intelligence of participants is important to forming judgments regarding the external validity of the research (Reynhout & Carter, 2011). Consequently, determining the extent to which such information is present in research regarding cognitive-behavioral interventions and changes over time may be of use in characterizing extant research and highlighting directions for future study.

A variety of measures have been employed in assessing outcomes of cognitive-behavioral interventions including self-reports and behavior observations (Hofmann et al., 2012). Each approach has potential advantages and disadvantages. For example, self-reports are easily conducted and provide access to subjective states, such as anxiety, but do not necessarily reflect objective changes in actual behavior or performance. Objective performance data is more difficult and resource intensive to collect, but can provide evidence of changes in real-world behavior, supporting self-report data. While changes in subjective outcomes, like anxiety, are undoubtedly desirable in themselves, it would be surprising if they were not accompanied by at least some objective behavioral change (e.g., reduced school refusal, increased social participation, etc.). Understanding the types of measures employed and their change over time may offer insight into the types of data on which evaluations of cognitive-behavioral interventions are based and suggest directions for future research.

It is suggested that one particular advantage of cognitive-behavioral interventions is the potential for generalization and maintenance of treatment effect (Chalfant, Rapee, & Carroll, 2007; Sofronoff, Attwood, Hinton, & Levin, 2007). Thus, an important outcome evaluation of cognitive-behavioral intervention studies would involve data on maintenance and generalization, and it is important to understand the extent to which these variables are addressed in research studies and how this may have developed since the early years.

A number of trend reviews have been conducted to provide a broad overview of the development of behavioral intervention research in children with ASD (e.g., Matson, Benavidez, Stabinsky Compton, Paclawskyj, & Baglio, 1996; Matson, Tureck, Turygin, Beighley, & Rieske, 2012). These trend reviews have identified the prevailing patterns in behavioral intervention research and suggested new directions for future research.

There are a number of systematic reviews of cognitive-behavioral interventions for children with ASD. For example, Danial and Wood (2013) examined the methods and results of cognitive-behavioral interventions targeting anxiety, disruptive behavior, and core autism symptoms. Ho, Stephenson, and Carter (2014) conducted a meta-analysis of cognitive-behavioral interventions effectiveness based on randomized, controlled trials. Another meta-analysis was conducted by Ung, Selles, Small, and Storch (2015) who included only anxiety treatments for youths with high-functioning ASD. These reviews all focused on specific areas and did not typically examine broad trends over time. Trend analyses, unlike systematic reviews, do not focus on effectiveness or specific areas but on the general characteristics and foci of research and how they change over time.