Title: Predictors of Attrition in an Early Intervention Trial for Infant-Toddlers at Risk for Autism

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Introduction: There are strong theoretical reasons for using parent mediated interventions to teach social communication in young children at risk for autism spectrum disorder (ASD). Parent child interactions are the most natural context in which to teach children social communication, they increase the dose of intervention children receive and are cost effective. Yet, parent mediated interventions on the whole have shown limited evidence of improving children's outcomes when tested in real world contexts (Oono et al., 2013; Nevill et al., 2018). Attempts should be made to reconcile the differences seen between the outcomes expected based on theory and what has been observed in clinical trials. These differences may be the result of practical, family level barriers such as limited resources to carry out the interventions (e.g. time, number of siblings; Pickard et al., 2016) as well as child level factors that moderate improvements (Yoder et al., 2020). The aim of this study is to explore both child and family level factors that may influence family's adherence to the protocols of an early intervention trial for infant-toddlers at risk for autism.

Method: This analysis includes data from 80 infants with ASD who met for mild to moderate concern on the ADOS Toddler Module (MAge= 17.66 months, 54% non-white, 80% Male) enrolled in a 10-week clinical trial for children at risk for ASD. Children were randomized to receive either a standard behavioral baby classroom or a classroom embedded with JASPER (Kasari et al., 2010) for two 3-hour sessions per week. There were three follow-up periods at 2, 4 and 10 months after study exit. At baseline children's developmental age was assessed using each domain of Mullen Scales of Early Learning and autism severity using the ADOS Toddler Module. Proximity to the university was recorded via a parent report survey at baseline. Demographic information including number of siblings was also collected at baseline.

Results: T-tests were used to test for differences in the characteristics of those who attrited to those who did not at study exit and those who missed any of the follow up visits compared to those who did not. On average those who attrited before treatment was complete had to travel 29.31 miles compared to 18.60 miles in those who stayed in the study ($p=.03$). No other child level factors including Mullen DQ, chronological age, number of siblings, or ADOS severity were significantly different (all $p>.05$). A similar pattern was seen during the follow-up period, with those who attrited at any point during follow up having to travel 23.75 miles compared to 16.31 in those who stayed in the study.

Next, logistic regression was used to test the multivariate influence of the above factors on the odds of attriting at study exit and at any point during follow up. Travel distance reduced the odds of remaining in the study before treatment was complete ($b=-.05$, $p=.04$, OR [.90,1.00]), whereas higher ADOS scores ($b=.29$, $p=.01$, OR[1.07, 1.76]) and higher Mullen DQ scores ($b=.09$, $p=.05$, OR[1.01,1.20]) increased the odds of a family remaining in the study by exit. No child or family level factors increased or decreased the odds of staying in the study through the three follow up periods (all $p>0.05$). The treatment the children were randomized to did not affect the odds of attriting by exit or follow-up (both $p>.05$).

Discussion: Factors such as family socioeconomic status, parent's level of stress and children's non-verbal IQ have been identified as barriers to participation in older children with ASD (Carr et al., 2016). This study builds on previous investigations by identifying other potentially modifiable barriers to participation including the time burden placed on families by the distance required to participate. The implication of this finding is that clinical researchers must develop practical solutions such as compensating families (either monetarily or by providing childcare) when they must come to university clinics or designing their studies to eliminate the need for travel by working in community settings such as schools or in the home.

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