

Effects of parent- implemented early start denver model on toddlers with autism sp...

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An evaluation of “Effects of Parent-Implemented Early Start Denver Model Intervention on Chinese Toddlers with Autism Spectrum Disorder: A Non-Randomized Controlled Trial” Bingrui Zhou, Qiong Xu, Huiping Li, Ying Zhang, Yi Wang, Sally J. Rogers, and Xiu Xu

INTRODUCTION

Bingrui Zhou, Qiong Xu, Huiping Li, Ying Zhang, Yi Wang, Sally J. Rogers, and Xiu Xu wrote a research article “Effects of Parent-Implemented Early Start Denver Model Intervention on Chinese Toddlers with Autism Spectrum Disorder: A Non-Randomized Controlled Trial” which was published in International Society for Autism Research in 2017.

In evaluating Zhou et al. article at this essay, they provided an intensive and sustained intervention at remarkable early years for children with autism, compared to previous research. They presented a both Naturalistic Developmental Behavioral and family-based treatment, targeting to follow the developmental sequences, enhancing the awareness and reducing the overall stress of the families in China.

My overall thesis to this work is mixed. My response is positive considering the above target goals. Although, I disagree with the selection of a non-randomized controlled trial. There are significant omissions in the aspects of research design, participants and intervention procedure which have negatively affect the dynamics of the research.

Therefore, potential changes are suggested briefly.

Whether I would recommend or not the fund roll-out of this intervention I have significant hesitations according to the bibliography, although is potentially promising and innovative.

SUMMARY

In this article, Zhou et al., study the effects of the Parent-Implemented Early Start Denver Model Intervention (P-ESDM) on Chinese Toddlers with ASD on their development of language, cognitive, social skills and their overall severity. At the same time, they focus at its effects on parental stress level. They recruited toddlers from 1.5 to 2.5 years old who were screened positive in ASD and they divided them non-randomized into two different groups; the P-ESDM and Community group of aged-matched toddlers.

After the baseline assessments, they started an intensive 1.5-hour parent coaching per week for the P-ESDM group and a regular treatment program for the community group for 26 weeks in total. The authors showed that toddlers in P-ESDM had significant positive effects on several developmental aspects and especially in the domain of their language and social skills, in comparison with community group. However, neither of both groups achieved any improvement at the ASD severity. Parental-stress at P-ESDM group decreased as well but is not correlated to P-ESDM.

Zhou et al. conclude that there is an undeniable need of early screening and intervention for children in ASD and as there is a shortage of professionals in early intervention in China an intervention approach which is natural and home-based would be appropriate for the Chinese population.

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BACKGROUND

Early intensive intervention in autism spectrum disorders is a crucial topic. There is an overall agreement amongst therapists, teachers, parents and etc. that the earliest an intervention starts the better the results are.

However, early diagnosis in ASD is a suppressive factor in early intervention as a diagnosis is difficult to be stabilized before the end of 3 years of life. In many states, intervention does not exist unless there is a formal autism diagnosis.

Recently, there is a degree of darkness in which early therapeutic techniques are effective and whether they can offer long-term results. Some researchers support behavioural approaches and other developmental approaches.

There is no agreement and the literature are limited.

Early start Denver Model (Rogers S. J, Dawson G. 2008), is a representative naturalistic developmentally focused approach. Its implementation has been explored in different contexts and there are some positive outcomes.

More and more studies, are exploring the parent-implemented of early intervention in ASD and they have supported its efficacy.

Rogers et al, (2012) developed the parent-implemented early start Denver model targeting, the social and communication aspects of ASD, the overall severity and parent's interaction improvements. The studies are few and its efficacy is currently explored.

Keywords: Early intensive intervention; Early diagnosis; Autism Spectrum Disorders (ASD); Early start Denver model (ESDM); Parent-early start Denver model (P-ESDM);

EVALUATION

Features of the intervention study

An intervention trial requires some pivotal characteristics in order to be considered valid and a concrete source of knowledge.

Below there will be an evaluation critique of the study considering the design, participants, intervention, results and conclusions.

The use of an enhanced P-ESDM program is a significant positive feature of this intervention study.

Literature have shown that the more intensive the intervention, the greatest the results were. That was especially positively correlated for the parents' fidelity and reduction of their stress. According to the research of Rogers et al (2012), the significant gains in interaction skills that parents achieved in the enhanced group were much greater than those in the non-enhanced group.

At the same study he mentions that both younger age and more intervention hours contributes in a significant positive way in the developmental rates of children with ASD.

Other positive features of this study are the detailed description of the recruitment's procedure, the use of appropriate diagnostic criteria and standardised assessments, and detailed analysis of study's limitations

Pre- and post- treatment assessments were administrated from professionals who were ' blind' to group assignment of each group.

The authors are completely aware of the original intervention study and its features.

It is interesting to note that Sally Rogers, director of P-ESDM has contributed to this study.

Regarding the measures, primary and secondary hypothesis at results have been clearly specified.

Pre- and post-test have been analysed and all the data have been included.

Lastly, conclusions have been drawn without bias and are consistently connected with the results.

Continuing the critical evaluation with the negative elements of the study, the selection of a proper research design should be in a high consideration feature. The specific intervention study used a non-randomized control trial; therefore, no strong conclusions about the efficacy of the experimental intervention can be drawn. A bias outcome is promoted through this research design and so a randomized control trial definitely would be more accurate for such a research. The biggest proportion of the literature at this

topic has used randomized control trials. The authors of this study have highlighted that as one of the limitations.

Regarding the participants, a recruited sample of 23 subjects in P-ESDM group and 20 in community-based group respectively cannot be evaluated as large enough for a strong research evidence.

The evaluation of IQ scores of children is an important missing as it should be considered in inclusion/exclusion criteria.

There is a big heterogeneity in both groups in the aspect of their language skills and that creates more difficulties to make conclusions.

Moreover, the overall clarification and detailed description of the intervention trial being used in the study plays a crucial role. Information regarding the nature of the therapy, who delivers it, the duration and the exactly number of sessions must be mentioned.

This intervention study, has not clearly defined the features of the community therapy services and it has not given in much details about what happened at every session at the P-ESDM group. Zhou et al, mention that the community services in china are low in quality so this is an important factor that may has contributed at the outcome.

Additionally, there is no a clear clarification of the intervention carried on from the parents at the P-ESDM group. There is no information about the total hours spent at each session and each week and how each session has been structured.

All the above features are valuable and can determine the results of the intervention.

The measures of treatment fidelity should be included as well. Are Pre-, Post- and follow up measures taken? Is treatment offered in the way it was intended?

The authors of the examined study didn't strictly follow the origins of P-ESDM. Indeed, it is a flexible intervention trial but therapists overlapped the parents' contribution and the outcomes may have been affected. The authors have highlighted this aspect.

Furthermore, there is not any provided information regarding the parents' fidelity but only therapists' fidelity.

There are numerous factors that may affect parents' fidelity. The most important are related with their socio-economic status, parenting style and how much the intervention suits with their style. (Wakeford, 2017)

Therefore, researchers should investigate these factors in order to examine the effects on participation of the parents in these types of interventions.

The use of a parent-rate scale as the communication and Symbolic Behavior Scales developmental, cannot be reliable since parents are involved in their children intervention. In the discussion, authors mention that as well.

The fact that there are no follow up measures should be negatively criticised as well, as it is a really crucial aspect of any research as has been indicated from Salkind (2012, p. 502-503)

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It is important to check if the subjects generalized their skills in other environments and everyday situations in a follow up measure, as the functionality of the child is the one that matters most at the end.

De Marchena et al, 2015 have highlighted that the biggest issue for children in ASD is the generalization of their acquired skills.

Lastly, at the original study (Rogers et al, 2012), therapists of P-ESDM were much more trained before the start of the trial compared to this study where therapists had less training; and that will have significantly affected the intervention process.

Potential Changes on the Research Design

Having evaluated the study in depth, some changes on the research design may would had contributed to the results in a different way.

First and foremost, the use of a randomized control trial instead of a non-randomized would enhance the effectiveness and feasibility of this intervention study.

A longitudinal study would be much more suitable in order to investigate the specific developmental changes of Children in ASD over time.

The selection of a bigger sample would had offered more fidelity to the results and it would be more likely to generalize the findings. The number of 23 subjects in the group of P-ESDM and 23 subjects in the community services group doesn't provide enough evidence and confidence.

Due to the big variation in language component a moderator analysis would be a tool to investigate the gains which each child acquired.

Furthermore, a follow-up measure after the intervention (months or years) seems essential in intervention trials as it was written above. With the follow-up could be investigated the long-term outcomes of this intervention and the generalization of the acquired skills in different environments. Especially for children with ASD who have difficulties on this aspect, would be undoubtedly essential.

An assessment of the developmental outcomes from teachers instead of parents would be much more objective.

A crucial question is whether P-ESDM is a better option compared to others early parental based interventions in autism spectrum disorder. Therefore, a third group receiving a different parental based early intervention would clarify in a better way the effectiveness of P-ESDM.

A last change of the research design that would offer greater results, is the evaluation of parents' fidelity as authors have mentioned as well in their study. The importance of this feature has been clarified above.

Recommendation of Intervention's Funding

Parent- early start Denver model seems to be a promising and innovative intervention according to the existing bibliography. However, further research should be conducted in order we fully understand its long-term outcomes and whether is indeed a useful intervention.

Below, there is a discussion for the reason why P-ESDM may be useful on the one hand and why is it difficult to recommend it as a beneficial intervention on the other hand.

The conclusion is that the absence of clarification upon crucial aspects of this intervention, overlap its really hopeful outcomes indicated from several studies.

On the one hand, it is well known that the starting of a very early intervention for infants at high risk for autism spectrum disorders is indeed essential.

First and foremost, neuroplasticity of the brain, can be defined as the motivation for starting a very early intervention.

At the First Autism research Matrix (IACC, 2003) cited in Webb et al (2014) article, they highlighted the importance of an early diagnosis and treatment in autism spectrum disorders for the infants at-risk. The possibility of altering the developmental trajectory of these children is much greater before the establishment of the autism core symptoms and while the brain is still developing.

From a study using the ESDM trial by measuring the effect on brain activation, researchers found more neurotypical patterns of cortical activation and increased neural response to social stimuli for the ESDM group, achieving similar results as the age-matched neurotypical controls. (Dawson et al, 2012)

Another factor that we need to take into consideration is the stability that define language skills of children after entering school and that means there is a need of acting as much earlier as possible. (Norbury et al., 2017)

In addition, Shattuck et al. (2009) have noted that as the enrolment of children with ASD in treatment programs is more likely to happened between 3 and 5 years, there is a greater established gap in their abilities and those of neurotypical peers.

Rogers et al. (2018) has indicated that there are great delays at the start of treatment. The use of P-ESDM at health and education systems could overlap this gap.

Lastly, there is an instability of diagnosis before the age of 3 and such a criterion cannot be ignored (Norbury et al., 2017)

This fact should not be a barrier at the implementation at P-ESDM as it can be used not only for children with ASD but in populations with various developmental difficulties.

Moreover, nobody can ignore the fact that the involve of the parent at their children intervention has significant positive outcomes for them and their children progress. That is more significant in toddlers. Indications from this study and different ones have demonstrated this statement.

It is interesting to mention that the active engagement of parents even when there is a delivery of individual treatment at low intensity may be effective.

(Devescovi et al, 2016)

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Bradshaw et al (2014) in their systematic review regarding the effectiveness and feasibility of very early intervention for infants at risk for autism there is a clear indication that this early intervention may be beneficial for both infants and parents.

The finding in Estes et al 2014 indicates that the P-ESDM group demonstrated lower levels of parenting stress compared to the Community group. But is the reduction permanent?

However, a lot of significant aspects has not been clarified in the existing studies.

First and foremost, there is only one research that has investigated the long-term outcomes of ESDM and there is not one on P-ESDM; This study proved that the results of the early intervention were maintained two years later and there were brain changes as well in EEG responses. (Dawson et al. (2010)

Follow up measures has not been administered at the most of the studies and that creates insufficient evidence for the usefulness of this intervention.

Autism is an ongoing disorder and such measures cannot be overlooked from researchers.

Features such as the intensity and duration of the intervention has not been clearly defined from several studies. There is no indication on how many hours parents implemented the intervention and such a missing information creates pivotal questions and disputes. It is interesting to note that Only

Dawson et al. (2010) was the only study that collected data on the amount of time as it has been written above.

All of the studies have compared the P-ESDM against community therapy services, but it would be reasonable to compare its outcomes with other parent implemented early intervention programs to fully understand and appreciate its effectiveness.

Furthermore, a big proportion of these studies have been conducted or assisted from the developers of this program (Drs. Rogers S, Vismara & Dawson G); therefore, more independent researchers should explore the effectiveness of P-ESDM.

P-ESDM indeed offers important gains for children in autism spectrum disorders as it has been shown from a few studies. Improvements in their social and language skills has been indicated most. However, none of these studies has proved any reduction at the overall severity of ASD except from Dawson's (2010) and Roger's studies (2012); and that is an important limitation.

It is interesting to note that at a previous research of Rogers et al,(2012) there is not any significant gain for children in the P-ESDM group in comparison with the control group, even when was offered an enhancing version of P-ESDM at his recent research. (Rogers et al, 2018)

Furthermore, the small sample sizes that has been used from almost all the studies is an inhibitory factor of making conclusions for the efficiency of P-ESDM.

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The special characteristic of this intervention is the parents' participation. This feature creates the need of a detailed description of their demographic data such as their Socioeconomic status, age, education level and etc. This information is not provided from all the studies. The results of P-ESDM may be a reflexing of these characteristics and cannot be ignored.

It is important to study the effectiveness of parent-implemented strategies by parents and other family members from alternative cultural, linguistic, economic, and social backgrounds. More studies where several mothers or even fathers are the main interventionists are needed. (Meadan et al 2009)

The crucial question is whether the intervention is applicable in the community settings. Studies currently are in progress and since then we cannot conclude if it can be used from the population of Children in ASD. P-ESDM requires highly trained therapists in order to achieve the best results; therefore, researchers should involve therapists from the community to implement this intervention.

The effects of ESDM in the community has been explored from Colompi et al 2018, Dawson et al 2010, Vivanti et al 2014, with gains mainly in cognitive and social skills. However, there was not parent – implemented.

Conclusion

Zhou et al, promote the use of a new intervention approach in the field of early intervention in autism spectrum disorders. Their intention to mobilize professionals, parents and all stakeholders in the field of early diagnosis and treatment is particularly welcome.

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The results of the survey are optimistic, but since there are research deficiencies cannot be generalized.

Possible changes, as proposed, could provide more accurate conclusions.

Overall, Parent Implemented Early Intervention for children in autism spectrum disorder is beneficial according to the existed literature and P-ESDM seems to be a representative one.

However, its efficacy should be investigated further in order to promote it in the community as a promising tool with long-term outcome.

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