ADHD: Environmental Risk & Protective Factors for Quality of Life*

According to a national parent survey in 2016, more than 6 million children in the United States have been diagnosed with ADHD (https://www.cdc.gov/ncbddd/adhd/data.html). This includes the three main subtypes of ADHD: inattentive, hyperactive/impulsive, a combined subtype. The prevalence of the hyperactive subtype is observed to decrease with age. Comorbid behavioral or emotional conditions are commonly reported with ADHD, and the comorbidity is reported as mediating the relationship between planning abilities and social functioning (Schei, Nøvik, Thomsen, et al., 2015).

While considerable research is reported on ADHD treatment, relatively little has been reported about environmental risk and protective factors. Risk factors are associated with a variety of problems. Protective factors can combat the effects of risk factors, leading to less severe symptomatology or even prevention of some conditions.

With respect to ADHD, various environmental factors often are suggested as affecting symptom severity and quality of life. These factors include but are not limited to prenatal exposure, environmental toxins and hazards, dietary factors, behavioral factors, and social factors. Protective factors associated with ADHD symptoms include prenatal factors, exercise, nutrition, as well as family and social factors. Hints about risk and protective, overall quality of life factors were highlighted by the Multimodal Treatment Study of Children with ADHD (widely referred to as the MTA study).

What the MTA Study Says About Environmental Risk and Protective Factors

The MTA study is the largest study on ADHD to date. It was conducted in 1999 and included 579 children with ADHD in four treatment conditions. Medication Management (MM), Multimodal Behavioral Therapy (BT), Combined Treatment of MM and BT, and finally community care; in which individuals received treatment within the community generally in the form of medication (MTA Cooperative Group, 1999). The MTA researchers reported that, while all treatment conditions proved to be effective at reducing ADHD symptoms, medication management and combined treatment were more significantly associated with positive results. Secondary analyses of the MTA study's data indicated that combined treatment showed a stronger effect size (Van der Oord and Daley, 2015) and reported significant mediators and moderators for the behavioral therapy and combined treatment conditions.

Mediators

Mediators tested in the study included attendance/acceptance, medication use in the community, and negative/ineffective parental discipline. All were found to be significant except attendance/acceptance in the behavioral category.

Attendance in MM was defined to be acceptance of treatment and attendance at 80% of scheduled doctor visits. For BT, it was acceptance of treatment and parent attendance at 75% of training sessions, child attendance at 75% of summer treatment programs, professional's attendance at 75% of meetings (MTA cooperative group, 1999). It was found that attendance/acceptance was a significant mediator variable for both the medication management and combined treatment conditions; this was seen as logical as the medications were prescribed at the doctor visits in MM (Hinshaw, 2007).

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As for reduction of negative/ineffective parental discipline as a mediator, significant results were observed in CT and BT conditions. The proposed mechanism suggests that if ineffective parents cannot employ behavioral training techniques their children's outcome will be affected. Finally this variable was also associated with small effects in social skills and teacher reports, suggesting it can impact academic and social functioning at school (Van der Oord & Daley, 2015).

Moderators

A variety of moderator variables were tested in secondary analysis of the MTA study including sex, comorbid conduct disorder or oppositional defiant disorder, and prior medication use; all were found not significant. In children with comorbid anxiety disorder, there was more significant improvement observed in the BT condition than in the MM condition; with an even greater positive effect in the CT condition. It was also found that for individuals with double comorbidity; comorbid anxiety disorder and either comorbid conduct disorder or oppositional defiant disorder, only CT seemed to provide significant positive improvements in ADHD (Van der Oord & Daley, 2015). Additionally, severity of ADHD seemed to moderate the effects of medication as children with more severe ADHD showed relatively worse response to MM and CT than those with less severe symptoms (Hinshaw, 2007).

Additional significant moderators include child IQ level, race, parental depressive symptomatology, and income level. It was found that children with mothers who reported mild or greater depressive symptoms had less beneficial outcomes in the MM and CT conditions; children in the last category with severe ADHD symptoms indicated less beneficial outcomes in the MM and CT conditions if their IQ was less than 100 points (Hinshaw, 2007).

Race was also found to be a significant moderator with African-American children showing greater improvement in the combined treatment condition relative to White children.

Children in low income families compared to higher income showed less bonding with their parents if they were in the medication management condition. Additionally regarding social skills as rated by teachers, children in low income families showed greater responsiveness to combined treatment (Hinshaw, 2007). These results show that not only are personal factors important but environmental factors are as well.

About the Research on Protective and Risk Factors

Clearly, it is important understand pre and post-natal risk factors that may impact an individual's development, learning, motivation, and general quality of life. The problem is that while studies have focused on a wide range of factors (e.g., caffeine use during pregnancy, medications used prenatally, post-natal environmental toxins such as organophosphates, phthalates, lead, and manganese), all the findings are correlational (Froehlich et. al., 2011).

Behavioral factors, such as overuse of electronic media, have also been hypothesized to increase symptom severity. While recent studies have suggested such a link, prior studies contradict this. Another example is the hypothesis that the "western diet" (e.g., excessive consumption of fats, refined sugars, sodium; low consumption of fiber, folate and fatty acids) contributes to ADHD symptoms (Froehlich et. al. 2011).

As to protective factors, a major focus has been on decreasing the negative effect of risk factors by improving quality of life indicators such as individual competencies, family cohesion, and social resources (Schei Nøvik, Thomsen, et al., 2012). A recent trend has been to reduce maternal stress and attenuate ADHD symptoms through mind-body practices (e.g., yoga, meditation, breathing techniques) (Sharma, Gerbarg, & Brown, 2012).

Implications For Schools

As with other learning, behavior, and emotional problems, students diagnosed with ADHD require schools to address barriers to learning and teaching and reengage disconnected students. This involves moving toward more personalized instruction, providing special assistance (including accommodations) in classrooms and, as necessary, out of classrooms; it involves classroom behavior management that's not just about controlling kids, but is focused on engaging and reengaging them in learning and enhancing intrinsic motivation.

On school-wide level, the need is to build upon the current emphasis on a mutitiered system of supports (MTSS) to a more comprehensive and organized approach to addressing the needs of all students.. Our Center stresses the importance of schools moving toward developing a unified, comprehensive, and equitable system of student/learning supports.

For resources related to the above implications for schools, here are three free works the Center has developed to provide online in depth aids to guide transformation planning:

>*Improving School Improvement*
>*Addressing Barriers to Learning: In the Classroom and Schoolwide*
>*Embedding Mental Health as Schools Change*

All three can be accessed at
http://smhp.psych.ucla.edu/improving_school_improvement.html

And here is a recently released policy analysis prepared for PACE:

>*Restructuring California Schools to Address Barriers to Learning and Teaching in the COVID 19 Context and Beyond*
https://edpolicyinca.org/sites/default/files/2020-11/pb_adelman_nov2020.pdf

(Note that this is not just relevant to California)

Concluding Comments

As the world around us changes at an exponential rate, so must the way we approach learning, behavior, and emotional problems. At this time, we all have a role to play. In responding, it is essential to have a broad understanding of what causes such problems and what society in general and schools in particular need to do to address them.

One area for future research is to further the work on risk and protective factors and moderating and mediating variables and their association with symptomatology, diagnosis, and intervention in general and related to specific groups such as those diagnose with ADHD. For schools, the need is to play a role in decreasing risk and increasing protective factors. In this respect, they can help reduce the opportunity and achievement gaps and minimize misdiagnoses and mischaracterization of students manifesting learning, behavior, and emotional problems.

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