THE EFFECT ON ADOLESCENTS WITH ADHD OF PROLONGED EXPOSURE TO MISSILE FIRE OR SECURITY THREATS: RESULTS OF THE STUDY

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Abstract: *For twenty years, the population of the south-western part of Israel has lived under the threat of missile fire from militant organizations in Gaza. The purpose of this study is to determine: a) If prolonged exposure to missile fire or security threats (PEM-FST) has an effect on the emotional, behavioral, problem-solving strategies, and social characteristics of adolescents; and b) Whether the effect on adolescents with ADHD is different from the effect on adolescents who do not have ADHD.*

Key words*: Emotional Aspects, Internalization, Externalization, Anxiety, Inhibitory Control, Aggressive Behavior, Social Problems, Coping Scale.*

Introduction

From 2001 until today, armed Palestinian organizations in the Gaza Strip have deliberately and indiscriminately fired thousands of rockets into civilian areas in Israel, mainly its southern region. Palestinian rocket-fire poses an ongoing threat to the nearly 800,000 Israelis living and working within its range. Over the years, rocket-fire has killed and caused injuries among adults and children and extensive property damage. Civilian buildings damaged in the attacks include schools,

kindergartens, synagogues, children's amusement parks, roads, buses, factories and private homes.

Palestinian rocket-fire poses an ongoing threat to the nearly 800,000 Israelis living and working within its range. Over the years, rocket-fire has killed and wounded adults and children and caused extensive property damage. Civilian buildings damaged in the attacks include schools, kindergartens, synagogues, children's amusement parks, roads, buses, factories and private homes.

One of the main effects of the attacks has been the creation of widespread psychological trauma among residents of 'Otef Aza-Israel' (OAI), as the area is called in Hebrew and the disruption of their daily routines. The aim of the present study is to examine the impact of the ongoing security situation on adolescents with ADHD.

Methodology

This study attempts to determine (a) whether Prolonged Exposure to Missile Fire or Security Threats (PEM-FST) has an effect on the emotional, behavioral and social characteristics of adolescents, and (b) whether this effect is different for adolescents with ADHD as opposed adolescents who do not have ADHD.

The research questions were:

1. Does living in the area of PEM-FST affect the behavior of adolescents with ADHD?
2. Does living in the area of PEM-FST affect the emotional lives of adolescents with ADHD?
3. Does living in the area of PEM-FST affect the social lives of adolescents with ADHD?
4. Does living in the area of PEM-FST influence the choice of problem-solving strategies used by adolescents with ADHD?

The survey sample included adolescent boys and girls ages 12-13, living in the area of PEM-FST and one of the parents and adolescents ages 12-13 and their parents who do not live in the area of PEM-FST. Some adolescents had ADHD while others did not. A total of 364 participants, parents and their children registered for the survey; however, only 322 (161 adolescents and 161 parents) completed the survey in its entirely and were included in the subsequent analysis. The adolescents were divided into four research groups: Two groups of adolescent boys and girls who live in the area of PEM-FST (OAI), one group of which had ADHD and the other did not. The control group consisted of adolescent boys and girls who didn't live in 'Otef-Aza'-Israel and 'No Otef-Aza'-Israel OAI/NOAI. One group of adolescents had ADHD, the other did not.

All subgroups were compared and a review of theoretical references that explained the data was conducted. The study instruments included: a) A questionnaire for parents (CBCL/6-18; Achenbach, 2001); b) A demographic questionnaire for parents regarding their child (age, gender, and place of residence); and c) Three questionnaires for the adolescents (ACS: Frydenberg & Lewis, 1993a, 1993b; STAI: Spielberger et al., 1970; MACL: Nowlis, 1965).

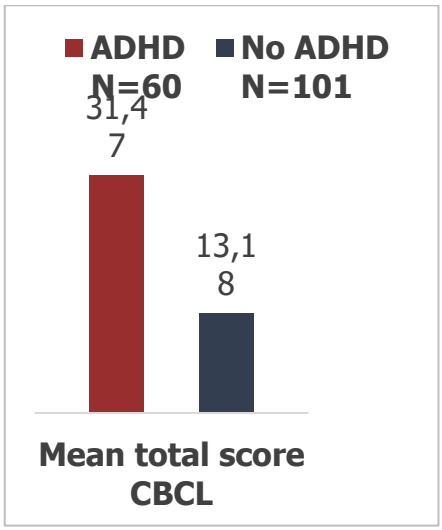
Results

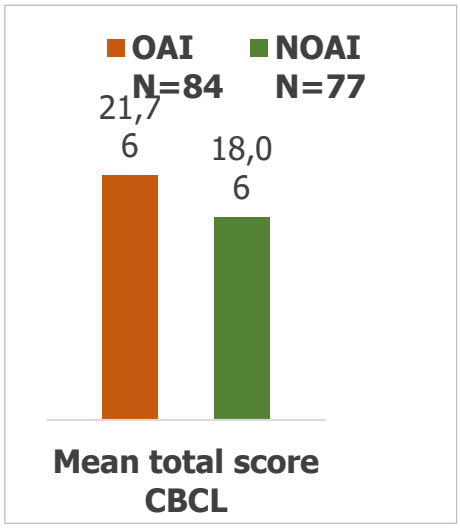
The data confirm the first two hypothesis of this research, namely that an ADHD diagnosis and prolonged exposure to missile fire or security threats (PEM-FST) affects the emotional and behavioral problems of all adolescents.

Adolescents who did not have an ADHD diagnosis had lower total mean scores on the Child Behavior Checklist (CBCL) than did adolescents with ADHD

Adolescents living in OAI had higher total mean scores on the CBCL than did adolescents living in NOAI.

Total score on the CBCL – Main Effects



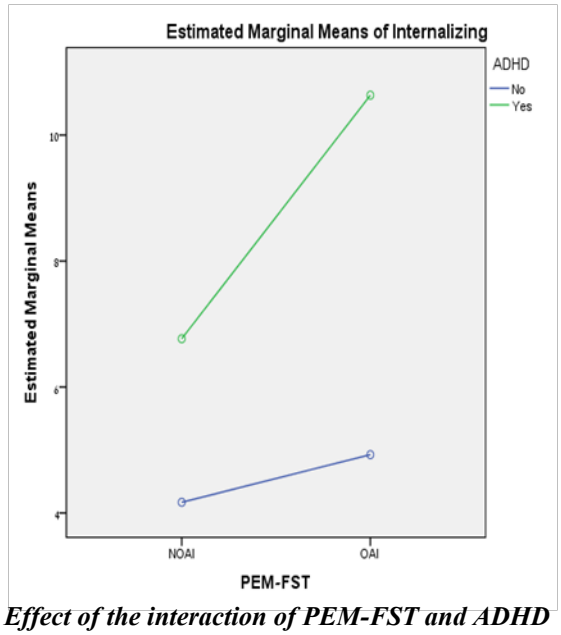


Scores on the Internalization subscale of the CBCL:

The Interaction of PEM-FST and ADHD

Adolescents who did not have ADHD had similar mean scores on the internalization subscale of the CBCL regardless of whether they lived in the area of PEM-FST or not

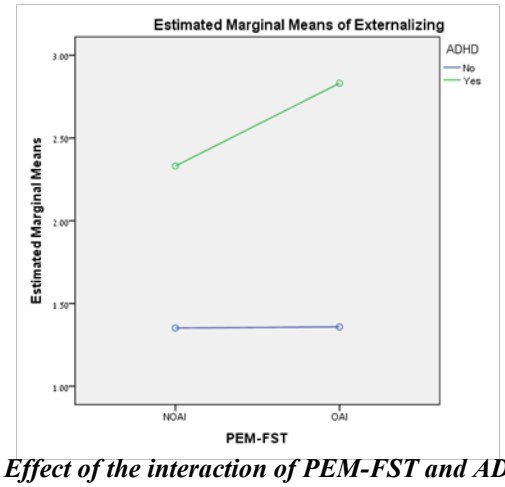
- Adolescents with ADHD who live in the area of PEM-FST had higher mean scores on the internalization subscale of the CBCL than did adolescents with an ADHD diagnosis who did not live in the area of PEM-FST.



Effect of the interaction of PEM-FST and ADHD on scores of the internalization subscale of the

The square rooted scores on the Externalization Subscale of the CBCL: The Interaction of PEM-FST and ADHD

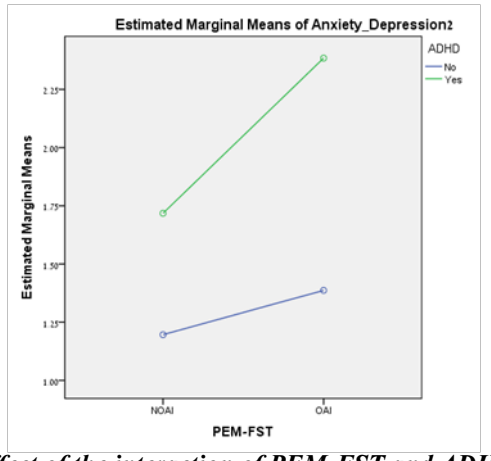
There is no significant interaction between PEM-FST and ADHD with respect to the square rooted scores on the externalization subscale of the CBCL.



Effect of the interaction of PEM-FST and ADHD on the scores of the externalization subscale of the CBCL

The square rooted scores on the Anxiety-Depression subscale of the CBCL: Main Effects

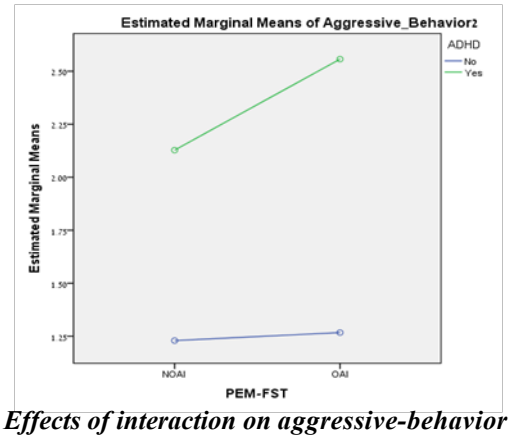
- Adolescents that did not have ADHD had lower mean scores on the anxiety-depression subscale of the CBCL than did adolescents with ADHD
- All adolescents living in the area of PEM-FST had higher mean scores on the anxiety-depression subscale of the CBCL than did adolescents who did not live in the area of PEM-FST.



Effect of the interaction of PEM-FST and ADHD on scores of the anxiety-depression subscaleof the CBCL

Scores on the Aggressive Behavior subscale of the CBCL: Main Effects

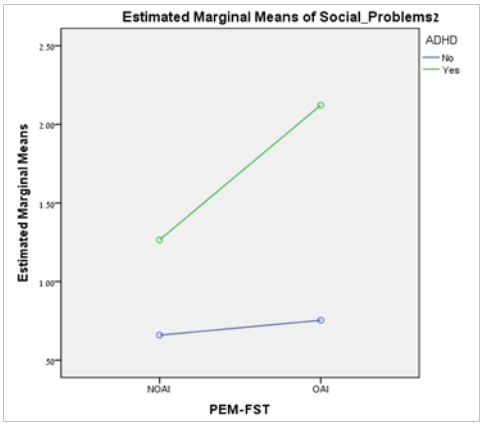
- Adolescents who did not have ADHD had lower mean scores on the aggressive behavior subscale of the CBCL than did adolescents with ADHD
- Adolescents had similar mean scores on the aggressive behavior subscale of the CBCL regardless of whether they live in areas of PEM-FST or not.



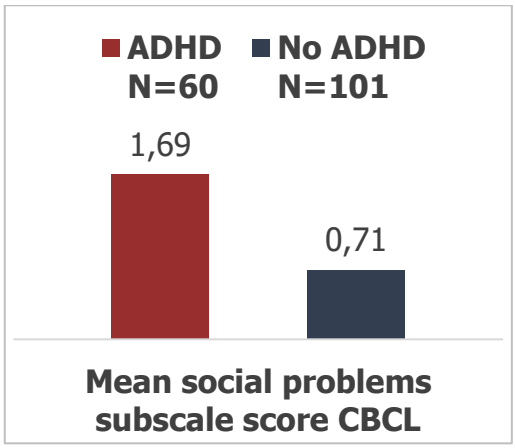
Effects of interaction on aggressive-behavior subscale score

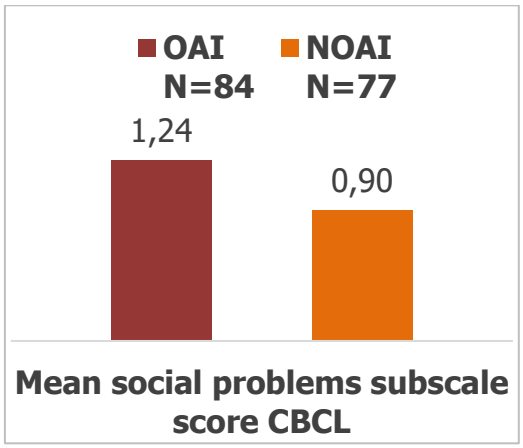
Social Problems and the square rooted score on the CBCL subscale: Main Effects

- Adolescents who did not have ADHD had similar mean scores on the social problems subscale of the CBCL whether or not they lived in areas of PEM-FST
- Adolescents with ADHD who lived in areas of PEM-FST had higher mean scores on the social problems subscale of the CBCL than adolescents with ADHD who did not live in the area of PEM-FST.



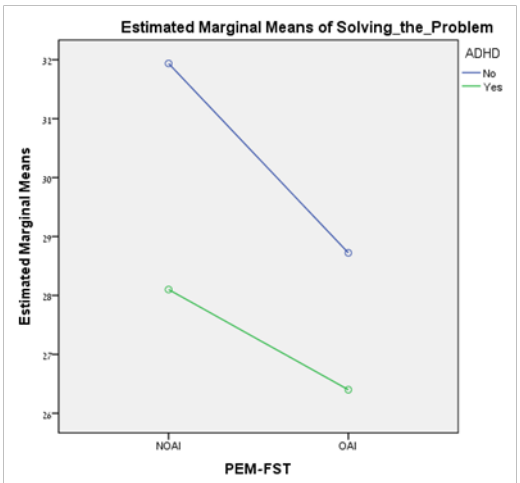
Effect of the interaction of PEM-FST and ADHD on the scores of the Social Problems subscale of the CBCL



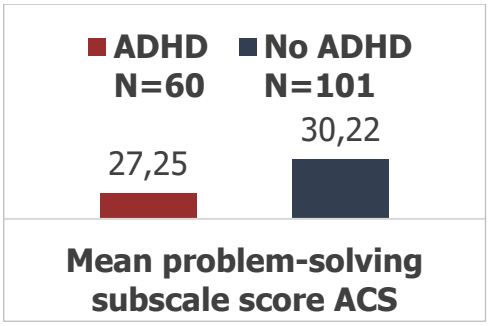


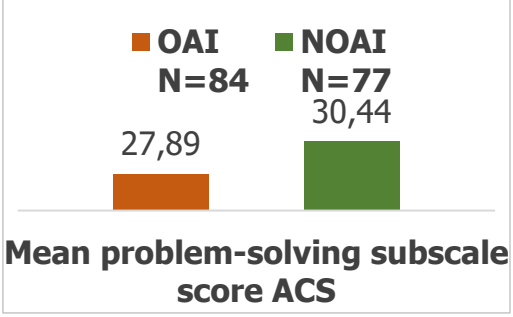
Scores on the Problem-Solving subscale of the Adolescent Coping Scale (ACS): Main Effects

- Adolescents who do not have ADHD had higher mean scores on the problem-solving subscale of the ACS than adolescents with ADHD
- Adolescents living in areas of PEM-FST had lower mean scores on the problem-solving subscale of the ACS than adolescents who did not live in the area of PEM-FST.



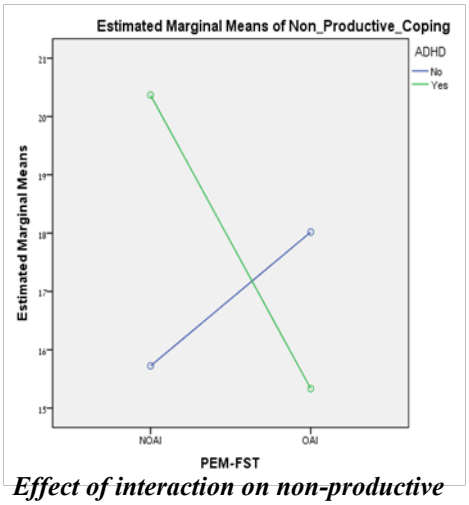
Effect of the interaction of PEM-FST and ADHD on the score of the problem-solving subscale of the ACS





Scores on the Non-Productive Coping Subscale of the ACS

- Adolescents with ADHD who live in the area of PEM-FST had lower mean scores on the non-productive coping subscale of the CBCL than adolescents with ADHD who do not live in the area of PEM-FST
- Adolescents who do not have ADHD but live in the area of PEM-FST had higher mean scores on the non-productive coping subscale of the CBCL than adolescents who do not have ADHD and who do not live in the area of PEM-FST.



Effect of interaction on non-productive coping subscale score

Summary of the results

The data confirm the first two hypothesis of this research, namely that ADHD and PEM-FST both have an effect on the emotional and behavioral problems of adolescents, as measured by the total score of CBCL questionnaire (Achenbach, 2001).

The data also confirm the third hypothesis that the interaction between PEM-FST and ADHD affects adolescents in different ways. Based on both these findings and the parents' reports of their children's emotional and behavioral problems, it seems that adolescents who do not have ADHD are not negatively affected by PEM-FST, while adolescents with ADHD who live under conditions of PEM-FST are especially prone to increased emotional and behavioral problems. This is especially true on the internalization and social problems subscales of the CBCL.

The data also confirm the hypothesis that a diagnosis of ADHD predicts the coping of adolescents as measured by the ACS questionnaire (Frydenberg & Lewis, 1993a). This is true with respect to problem-solving skills and reliance on others for support. The data also confirm the hypothesis that PEM-FST predicts the quality of adolescent coping with respect to problem-solving skills. Finally, the data also confirm the hypothesis that the interaction between PEM-FST and an ADHD diagnosis affects non-productive coping.

Strangely, it seems that PEM-FST has a positive effect on adolescents with ADHD, as they use less non-productive coping strategies. The findings reveal that adolescents with ADHD are affected by PEM-FST in that they do not report use of any of the coping strategies suggested to them.

The data does not confirm the hypothesis that an ADHD diagnosis predicts adolescents' anxiety levels, as measured by the STAI questionnaire (Spielberger et al., 1970). Also, the data does not confirm the hypothesis that PEM-FST predicts adolescents' anxiety levels. The data only confirm the hypothesis that the

interaction between PEM-FST and ADHD affects adolescents' self-reported anxiety. Again, it seems that PEM-FST has a positive effect on adolescents with ADHD, as they report less anxiety. However, this behavior exposes defense mechanisms such as repression and denial.

Finally, the data confirm the hypothesis that an ADHD diagnosis predicts adolescents' positive moods as measured by the MACL questionnaire (Nowlis, 1965). However, the data do not confirm the hypothesis that PEM-FST predicts adolescents' moods. Again, the data confirm that adolescents' moods are affected both positively and negatively by the interaction of PEM-FST and an ADHD diagnosis. Limited reporting behavior plays a role here as well as the effect of PEM-FST on adolescents with ADHD is seen not only in what they report, but also in their non-reporting of anxiety.

Connections between the research literature and the results of the study

According to Cohen and Eid (2007), children and adolescents are especially vulnerable to traumatic events like terrorist attacks and are prone to developing post-traumatic stress disorder (PTSD): The re-experience of intrusive thoughts, avoidance, and arousal (Barenbaum et al., 2004; Garbarino, 2001) and the development of somatic complaints such as headaches, stomach-aches, fatigue, attention difficulties, or behavior problems (Vogel & Vernberg, 1993). Nutman-Schwartz (2009) show a direct link between intensity of exposure to missile attacks and the intensity of anxiety.

Early self-regulatory deficits may lead to ADHD, which increases the prevalence of maladaptive levels of anxiety (O'Rourke, 2020; Safren et al., 2001). Consequently, problem-solving difficulties in individuals with ADHD may give rise to chronic worry (O'Rourke,2020; Safren et al., 2001). Anxiety disorders are commonly comorbid with ADHD with a prevalence ranging from 25-50% (Jarrett

& Ollendick, 2008; Jensen et al., 2001; Larson et al., 2011; Mancini et al., 1999). Social processes (e.g., parental consistency, family routines) may attenuate the presentation of symptoms of ADHD (Lanza & Drabick, 2011). Positive parenting may also act as a protective factor against the development of behavioral problems among children with ADHD (Chronis et al., 2007).

O'Rourke (2020) asserts that inhibitory control is the ability to override prepotent behavior, thought, or emotion in order to perform a sub-dominant, but typically more appropriate or adaptive response to the situation. (Bjorklund & Harnishfegar, 1990, as cited in O'Rourke, 2020; Diamond, 2013).

In Klemanski et al. (2017), difficulties such as decreased awareness, poor understanding, inhibited or inappropriate expression, and difficulty managing emotions have all been associated with anxiety and depression in adolescents (Klemanski et al., 2017; McLaughlin et al., 2011; Zeman et al., 2002, 2006; Southam-Gerow & Kendall, 2000). Friendship and social attachment are important in mitigating the effects of anxiety. "A friend group helps an adolescent better tackle stress [while] at the same time that adolescent is less prone to experiencing negative life events" (Undheim & Sund, 2017, p. 1000).

Coping mechanisms are an essential determinant of mental health. Coping strategies play an important role in physical and psychological well-being, especially when confronted with negative or stressful life events (Endler, 1990a, 1990b; Washington, 2009). Lazarus and colleagues first studied coping styles of individuals in different situations and defined the characteristics of coping. According to Pat-Horenczyk et al. (2006), coping represents behavioral and cognitive effort to manage the person-environment relationship. The seminal work in this regard was carried out by Lazarus and Folkman (Folkman & Lazarus, 1988).

Reducing routine activities may be regarded as a type of avoidance. There is a direct correlation between coping strategies of avoidance in times of crisis and

psychological distress among both adults and adolescents (Boyd-Webb, 2004). Pat-Horenczyk, Lazarus and Folkman (1984, as cited in Pat-Horenczyk, 2005) define coping as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p. 141). Frydenberg and Lewis (1993b) contend that 'solving the problem' reflects dealing with aggravating situations while remaining optimistic, fit, relaxed, and socially connected. Other strategies such as worrying, wishful thinking, ignoring the problem, reducing tension, keeping to oneself, self-blame reflect non-coping or helplessness are labeled as *non-productive coping.*

The psychological toll of years of rocket-fire has had an impact on many Israeli adults, adolescents, and children whose number far exceeds that of the physically injured. Boker (2019), citing data from a study by Dr. S. Shapira from Ben-Gurion University states that “Residents from Otef Aza-Israel (OAI) do not suffer from post-trauma – but from prolonged exposure to traumatic events. Of the respondents, 52% feel that their family lives are in danger, 37% fear that they are unable to protect their family, 48% experience mental fatigue to the point of inability to cope with what life demands of them.” One of the most difficult things involved in PEM-FST is living with daily uncertainty.

Conclusions

The results of the study confirm the research questions. They clearly show that adolescents with ADHD living in areas of PEM-FST have more emotional and behavioral problems, aggressive behavior, problems with internalization and externalization, problems with anxiety and depression, and more social problems than adolescents who do not have ADHD or who do not live in the area of PEM-FST.

The difficulties of this group, measured on the above indices exceed those of the other three groups. On all indices, adolescents with ADHD even those who do

not live in a PEM-FST zone deviate negatively from their peers. This study confirms that adolescents with ADHD experience difficulties and any disruption in their lives, for example, violence, family poverty, hunger, neglect, social abuse, natural disasters, terrorism or ongoing security threats exacerbates their existing difficulties. Any concurrence of these events further undermines the adolescent psyche whose neuro-biological genetic basis is very complex.

This study also shows that adolescents who do not have ADHD and who live in areas of PEM-FST also suffering from anxiety.

But not always with the knowledge of their parents or teachers, as they hide or repress their experience of anxiety.

References

1. Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for the ASEBA School-Age Forms and Profiles*. University of Vermont, Research Center for Children, Youth, and Families. https://www.scirp.org/(S(351jmbntvnsjt1aadkposzje))/reference/ReferencesPapers.aspx?ReferenceID=1855203
2. Barenbaum, J., Ruchkin, V., & Shcwab-Stone, M. (2004). The psychosocial aspects of children exposed to war: Practice and policy initiatives. *Journal of Child Psychology and Psychiatry, 45*, 4162. doi:10.1046/j.0021-9630.2003.00304.x
3. Boker, A. (2019, November 17). https://13news.co.il/item/news/politics/security/otef-gaza-research-939763
4. Chronis, A. M., Lahey, B. B., Pelham, W. E., Jr, Williams, S. H., Baumann, B. L., Kipp, H., Jones, H. A., & Rathouz, P. J. (2007). Maternal depression and early positive parenting predict future conduct problems in young children with attention-deficit/hyperactivity disorder.

Developmental psychology, *43*(1), 70-82. https://doi.org/10.1037/0012-1649.43.1.70

5. Cohen, M., & Eid, J. (2007). The effect of constant threat of terror on Israeli Jewish and Arab adolescents. *Anxiety, Stress & Coping, 20*(1), 47-60. doi:10.1080/10615800601167546.
6. Diamond, A. (2013). Executive functions. *Annual Review of Psychology*, *64*(1), 135-168. https://doi.org/10.1146/annurev-psych-113011-143750
7. Endler, N. S., & Parker, J. D. A. (1990a). *Coping Inventory for Stressful Situations (CISS): Manual.* Multi-Health Systems.
8. Endler, N. S., & Parker, J. D. A. (1990b). 'Multidimension assessment of coping: A critical evaluation. *Journal of Personality and Social Psychology, 68*, 844-854. https://doi.org/10.1037/0022-3514.58.5.844
9. Folkman, S., & Lazarus, R. S. (1988). Coping as a mediator of emotion. *Journal of Personality and Social Psychology, 54*(3), 466-475. https://doi.org/10.1037/0022-3514.54.3.466
10. Frydenberg, E., & Lewis, R. (1993a). *Administrator's manual: The adolescent coping scale*. The Australian Council for Educational Research.
11. Frydenberg, E., & Lewis, R. (1993b). *Manual: The Adolescent Coping Scale*. Australian Council for Adult Educational Research, Melbourne.
12. Garbarino, J. (2001). An ecological perspective on the effects of violence on children. *Journal of Community Psychology, 29*, 361-378. https://doi.org/10.1002/jcop.1022
13. Jarrett, M. A., & Ollendick, T. H. (2008). A conceptual review of the comorbidity of attention-deficit/hyperactivity disorder and anxiety: Implications for future research and practice. *Clinical Psychology Review, 28*(7), 1266-1280. https://doi.org/10.1016/j.cpr.2008.05.004

14. Jensen, P. S., Hinshaw, S. P., Kraemer, H. C., Lenora, N., Newcorn, J. H., Abikoff, H. B., March, J. S., Arnold, L. E., Cantwell, D. P., Conners, C. K., Elliot, G. R., Greenhill, L. L., Hechtman, L., Hoza, B., Pelham, W. E., Severe, J. B., Swanson, J. M., Wells, K. C., Wigal, T., & Vitiello, B. (2001). ADHD comorbidity findings from the MTA study: Comparing comorbid subgroups. *Journal of the American Academy of Child & Adolescent Psychiatry, 40*(2), 147-158. https://doi.org/10.1097/00004583-200102000-00009
15. Lanza, H. I., & Drabick, D. A. (2011). Family routine moderates the relation between child impulsivity and oppositional defiant disorder symptoms. *Journal of Abnormal Child Psychology, 39*(1), 83-94. https://doi.org/10.1007/s10802-010-9447-5
16. Larson, K., Russ, S.A., Kahn, R.S., & Halfon, N. (2011). Patterns of comorbidity, functioning, and service use for US children with ADHD, 2007. *Pediatrics, 127*(3), 462-470.https://doi.org/10.1542/peds.2010-0165
17. McLaughlin, K. A., & Nolen-Hoeksema, S. (2011). Rumination as a transdiagnostic factor in depression and anxiety. *Behaviour Research and Therapy, 49*(3), 186-193. doi:10.1016/j.brat.2010.12.006.
18. Nowlis, V. (1965). Research with the mood adjective checklist. In S. S. Tompkins & C. E. Izard (Eds.), *Affect, cognition, and personality: Empirical studies* (Vol. 464). Springer.
19. Nutman-Shwartz, A. (2009). *The effect of exposure to prolonged threat on the adult population – life under the threat of Qassam rockets. Dorot, June 2009 Issue*. (Hebrew)
20. Klemanski, D. H., Curtiss, J., McLaughlin, K. A., & Nolen-Hoeksema, S. (2017). Emotion Regulation and the Transdiagnostic Role of Repetitive Negative Thinking in Adolescents with Social Anxiety and Depression.

Cognitive therapy and research, *41*(2), 206-219. https://doi.org/10.1007/s10608-016-9817-6

21. Mancini, C., Van Ameringen, M., Oakman, J. M., & Figueiredo, D. (1999). Childhood attention deficit/hyperactivity disorder in adults with anxiety disorders. *Psychological Medicine, 29*(3), 515-525. https://doi.org/10.1017/S0033291798007697
22. O'Rourke, E. J. (2020). *Youth with ADHD: The impact of clinical anxiety on neuropsychological functioning* [Publication No. 28030617] [Doctoral Dissertation, University at Albany]. ProQuest Dissertations and Theses Global.
23. Pat-Horenczyk, R. & Doppelt, O. (2005). Screening posttraumatic distress among Israeli adolescents exposed to ongoing terrorism. I E. Somer & A. Bleich (Eds.), *Mental health in terror's shadow: The Israeli experience* (pp. 55-76). Ramot. (Hebrew) https://www.researchgate.net/publication/324529744_Screening_posttraumatic_distress_among_Israeli_adolescents_exposed_to_ongoing_terrorism
24. Safren, S. A., Lanka, G. D., Otto, M. W., & Pollack, M. H. (2001). Prevalence of childhood ADHD among patients with generalized anxiety disorder and a comparison condition, social phobia. *Depression and Anxiety, 13*, 190-191. https://doi.org/10.1002/da.1036
25. Southam-Gerow, M. A., & Kendall, P. C. (2000). A preliminary study of the emotional understanding of youth referred for treatment of anxiety disorders. *Journal of Clinical Child Psychology, 29*, 319-327. doi:10.1207/S15374424JCCP2903_3
26. Spielberger, C. D., Gorsuch, R. L., & Lushene, R. E. (1970). *Manual for the State-Trait Anxiety Inventory*. Consulting Psychologists Press.

27. Undheim, A. M., & Sund, A. M. (2017). Associations of stressful life events with coping strategies of 12-15-year-old Norwegian adolescents. *European Child & Adolescent Psychiatry, 26*(8), 993-1003. doi:10.1007/s00787-017-0979-x
28. Vogel, J. M., & Vernberg, E. M. (1993). Part 1: Children's psychological responses to disasters. *Journal of Clinical Child Psychology, 22*, 464-484. https://doi.org/10.1207/s15374424jccp2204_7
29. Zeman, J., Shipman, K., & Suveg, C. (2002). Anger and sadness regulation: Predictions to internalizing and externalizing symptoms in children. *Journal of Clinical Child and Adolescent Psychology, 31*, 393-398. https://doi.org/10.1207/153744202760082658