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## INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/13247

DOI URL: <http://dx.doi.org/10.21474/IJAR01/13247>



### RESEARCH ARTICLE

#### EVIDENCE-BASED PEDIATRIC COPING STRATEGIES FOR THE COVID-19 PANDEMIC

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#### Manuscript Info

##### Manuscript History

Received: 05 June 2021

Final Accepted: 09 July 2021

Published: August 2021

#### Abstract

While minimally susceptible to COVID-19, the pediatric population is most vulnerable to the psychosocial repercussions of this pandemic as they have faced setbacks and struggle to maintain normality in nearly every aspect of their lives. Duration of quarantine, fear of infection, limited social interaction, and more have had a significant positive correlation with poorer mental health, PTSD, anxiety, and anger. Young people have been burdened mentally and emotionally by the stressors of the COVID-19 pandemic. They have been thrown off their regular course and expected to quickly adapt to new parameters, restrictions, and limitations. The pandemic has undoubtedly had a significant impact on shaping their childhood trajectory as it has interrupted regular milestones and life checkoffs. In an aim to heal and ameliorate COVID-related anxiety, stress, and negative mental health consequences, utilization of appropriate coping strategies is encouraged and particularly important for disadvantaged groups who report multiple obstacles to pursuing treatment for mental health issues.

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#### Introduction:-

The COVID-19 pandemic has brought about a significant burden on healthcare systems globally, with over 125 million cases confirmed and over 2.8 million lives claimed by the novel virus.<sup>1</sup> While many burdens are quantifiable and easily observed, some impacts of the pandemic have slipped under the radar and require attention and due diligence. Beyond considerations of physical health, the impact of the pandemic on pediatric mental health is considerable, ranging from isolation, lack of peer interactions, and difficulty adjusting to online education, to exposure to loss of life and abuse at home. Studies show a strong correlation between quarantine due to health-related disasters and post-traumatic stress disorder, appearing in approximately 30% of children involved.<sup>2</sup> Furthermore, schools are reporting over 25% of their students working 20-40 hours a week on top of their schoolwork to financially support their families, specifically those of low-income and minority populations, who have disproportionately experienced job loss and economic instability.<sup>3</sup> School counselors have consequently noticed more anxiety attacks, bouts of depression, and failing grades.<sup>4</sup> As such, recovery and mental wellness following the pandemic are of utmost importance and are an essential consideration moving forward.

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### **Relaxation Coping Strategy**

One way of tackling the increasing rates of anxiety and depression in the pediatric population is via relaxation coping strategies.

Mindfulness meditation is one common practice that promotes anxiety reduction, pain alleviation, increased empathy, improved sleep, subconscious unlocking, and maturation of self-actualization, self-responsibility, and self-directedness.<sup>5</sup> Correlations have been found between stress and right amygdala activation; compared to control groups, children who performed mindfulness meditation reported less stress and exhibited reduced right amygdala activation to negative stimuli. This demonstrates the role mindfulness meditation has in building stronger functional connections between the right amygdala and ventromedial prefrontal cortex and promoting neuroplasticity beyond the active meditative state.<sup>6,7</sup> In a study evaluating psychotherapists, mindfulness meditation proved valuable in generating self-compassion and maintaining hope in the face of suffering, protecting against anxiety and promoting psychological resilience.<sup>8</sup>

Exposure to nature is another outlet that promotes health, prevents depression and anxiety, and improves immune and interpersonal functioning. Pathways to positive health effects may occur via physical and social activity as well as improved air quality.<sup>9</sup> Additional theorized mechanisms include a boost in one's immune system from contact with microbes or exposure to certain natural substances such as phytoncides from trees.<sup>10</sup> Preschool children recruited to participate in a 10-week structured nature-related program displayed a significant reduction in perceived stress, particularly in the frequency of anger, and an abundance of fecal serotonin, demonstrating the impact exposure to nature has on psychosocial behavior and mood.<sup>11</sup>

There is also a lot of research surrounding gratitude and its role in improving psychological health and reducing negative emotions. Functional connectivity (FC) has been examined during and after gratitude interventions, with results demonstrating modulations of neural network FC and heart rate.<sup>12</sup> Changes in posterior cingulate cortex (PCC)-based rsFC indicated that interventions required more neural activity in the task-positive regions than in the default mode network (DMN) regions. Gratitude improves not only emotion regulation but also self-motivation by modulating rsFC in emotion- and motivation-related brain regions.

Deep breathing, among the simplest relaxation techniques, is extremely effective in counteracting the body's natural response to stress via reduction in heart rate and blood pressure. Teaching children to take slow, deep breaths will help calm them physically and mentally, directing them away from their overwhelming emotions. Related research support that deep breathing can improve mood and stress both in terms of self-reported evaluations using Measurement of Psychological Stress (MSP) and Profile of Mood State (POMS) and of objective parameters, such as heart rate and salivary cortisol levels.<sup>13</sup>

One obstacle to preventing anxiety in children is their inability to recognize and describe their emotions. A solution to this is guided imagery, which uses imagination to make children more aware of the connection between what they think and how they feel physically. When picturing oneself in a positive environment, the body releases biochemicals based on one's feelings. The technique has been particularly effective in treating children experiencing sleep problems, anxiety, depression, and low self-esteem. One study suggests guided imagery reduces preoperative anxiety and postoperative pain in children; a statistically significant difference was shown, with less anxiety and less pain for children in the experimental group ( $p < .001$ ;  $p < .001$ ).<sup>14</sup> There were also decreases in heart rate and salivary cortisol level indicating relaxation was associated with the imagery-based relaxation approach.

Progressive muscle relaxation (PMR) offers another excellent way to relieve stress via tensing and then relaxing different muscle groups in the body. One meta-analysis demonstrated a reduction in anxiety levels following relaxation training. Nineteen studies were analyzed involving interventions such as PMR, autogenic training, visualization, meditation, stretch release relaxation, and behavioral relaxation techniques.<sup>15</sup> The use of PMR techniques was found to be more beneficial in the pediatric population, and exercises performed at home were more effective than therapy sessions alone, giving hope to families still under lockdown.

### **Movement Coping Strategy**

Active movement is another way to combat depression and anxiety experienced by children and adolescents. Physical exercise creates arousal and triggers the release of endorphins, noradrenaline, serotonin, and dopamine in

the brain that stimulate positive feelings and improve one's mood. Note: the combination of better nutrition and exercise has greater benefits in mental health than promoting one healthy lifestyle behavior alone.

One study, assessing both moderate and high physical activity levels, revealed an associated reduction in depressive and anxiety symptoms.<sup>16</sup> The study concluded there is a positive impact of physical activity on adolescent mental health, with some hypothesized mechanisms related to psychosocial, behavioral, and neurobiological factors. The psychosocial mechanism hypothesis recognizes that physical activity provides an opportunity for social interaction, self-efficacy, perceived competence, and improvements in body image. The behavioral mechanism hypothesis proposes that physical activity may improve self-regulation and coping skills which, in turn, helps adolescents effectively stay positive mentally. The neurobiological mechanism hypothesis proposes that physical activity enhances mental health via changes in the structural and functional composition of the brain. An appropriate amount of physical exercise was discovered to increase the weight of the cerebral cortex via increased blood circulation, sufficient oxygen for the movement of neurons, and improved stability and flexibility of the central nervous system function.<sup>17</sup> Physical exercise stimulates the brain and, as a result, is found to prevent anxiety, depression, and other psychological problems.

Furthermore, distraction through exercise helps take the mind off of whatever is creating anxiety in children and adolescents.<sup>18</sup> Physical exercise can divert attention from the pandemic and reduce panic, making it a positive coping mechanism in the face of COVID-19. Understandably, most families are isolated in their homes and their opportunities to exercise have been limited; however, children must find appropriate ways to exercise to improve their sleep quality and reactions to stress from the pandemic.

### **Distraction Coping Strategy**

In response to the tension induced by the pandemic, many people switched to screen-based hobbies and other forms of cultural entertainment as a coping resource.<sup>19</sup> The average American between the ages of 8 and 18 spends over 6 hours a day with media, so taking advantage of distraction strategies during quarantine can also be helpful.<sup>20</sup>

Listening to music is one way children and adolescents have found to relieve their stress and sadness and connect to others.<sup>21</sup> In a recent study, Australian university students' media consumption was measured to see if media usage was linked to improvements in life satisfaction. Participants (N = 127) were asked to complete six online questionnaires about their encounters before and after the COVID-19 pandemic. Media consumption differed greatly during the study period, and life satisfaction was positively correlated with music listening and negatively associated with viewing TV, videos, and movies at the within-person level.

A perfect example of how badly the pandemic needed a distraction was the release of the video game *New Horizon*, a virtual reality video game.<sup>22</sup> *New Horizon* allowed people to have social interactions with people all over the world while distracting them from the pandemic and the stress that comes with it. During the pandemic, it sold 5 million copies in its first month alone. No matter how much fear and escapism encountered, or how much social alienation and depression endured, *New Horizon* showed that the psychology of video games had much more to offer than previously known. In fact, escapism was found to be the best indicator for internet addiction in another study of online gaming, suggesting that players use online games to stop worrying about real-life issues.<sup>23</sup>

Given that the usage of digital technology helps bridge physical distance, its increased use will continue as long as social distancing and lockdown initiatives remain.

### **Processing Coping Strategy**

Coping via processing, pioneered by neuroscientist and psychologist Daniel J. Siegel, has also been proven effective in dealing with emotions and tackling stressors. In *The Whole-Brain Child*, Siegel discusses children's neurological development and introduces age-appropriate strategies for helping to regulate one's emotions. One such strategy termed "Name it to Tame it" encourages self-awareness and assists with emotional regulation; it makes stressors easier to manage and cope with.<sup>24</sup> "Engage, Don't Enrage" is another strategy that helps keep the child actively thinking and listening as opposed to continuing with reaction. It serves as a way to alter the child's focus and draw towards thought and ponderance rather than to negative emotion.<sup>24</sup>

A practice for reducing the effects of stress following traumatic experiences is expressive writing. It is a psychological-based strategy that is aimed at improving "psychological well-being through cognitive and emotional

processing of stressful or traumatic experiences.”<sup>25</sup> Writing out and processing stressful events and emotions allows for one to reframe the event and put it into view, leading to personal growth and cognitive processing.<sup>26,27</sup> Studies have shown success regarding its use in reducing post-trauma emotional distress.<sup>28</sup> The average effect of expressive writing in reducing emotion- and mood-related symptoms such as depression was significant across studies.”

### Conclusion:-

In acknowledging the impact and potential consequences of COVID-19, parents, guardians, and leadership can do their best to help the pediatric population properly respond and cope. It is important to highlight challenges and shortcomings, to strategize a compensatory plan, and to support and promote the overall health and wellbeing of these children during and following such unprecedented times.

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