Adverse Childhood Experiences and their Effects on a Later Diagnosis of Anxiety and Depression: A Literature Review

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Research Question: How do adverse childhood experiences impact a later diagnosis of anxiety or depression?

Abstract

This literature review examines the relationship between adverse childhood experiences (ACE) and the development of anxiety or depression later in life. This review highlights how different factors impact the later diagnosis and how ACEs impact cognitive function. Key themes include neurobiological changes, the number of ACEs, and high ACE scores. The review also explores ways policies could be formed or changed to inhibit the number of adverse childhood experiences one experiences. This review seeks to enhance the understanding of how adverse childhood experiences influence psychological well-being through a thorough analysis of existing research, ultimately guiding prevention strategies and therapeutic interventions for those affected.

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Introduction

Approximately forty million American adults have an anxiety disorder, making it the most common type of mental illness in the United States (National Alliance on Mental Illness, 2017). Anxiety disorder has many unique symptoms, including restlessness or irritability, shortness of breath, and upset stomach (National Alliance on Mental Illness, 2017). There are many different causes of anxiety disorders, including genetics and someone's environment (National Alliance on Mental Illness, 2017). Many times, a stressful event, such as abuse, violence, or prolonged illness, can be linked to the development of an anxiety disorder (National Alliance on Mental Illness, 2017). Anxiety and depression go hand in hand, with close to half of adults who are diagnosed with anxiety disorder also being diagnosed with depression (Advanced Psychiatry Associates, nd). Untreated, anxiety and depression can be significant issues in someone's physical and mental health (Advanced Psychiatry Associates, nd). Symptoms that are present when one is diagnosed with both anxiety and depression include substance abuse disorders, thyroid issues, and respiratory illnesses (Advanced Psychiatry Associates, nd).

Depression affects about sixteen million adults in the United States a year and can have many different symptoms (Centers for Disease Control, nd-b). These symptoms can include feeling sad or anxious, irritability, having trouble falling asleep, having little or excessive appetite, and having difficulty concentrating (Centers for Disease Control, nd-b). Depression can be caused by numerous things, including experiencing traumatic or stressful events, going through a significant life change, or having a medical problem (Centers for Disease Control, nd-b). In addition to this, adverse childhood experiences can be related to the diagnosis of depression.

Adverse childhood experiences, or ACEs, are potentially traumatic events that take place during adolescence (ages 0-17) (Centers for Disease Control, nd-a). They refer to varying forms

of childhood trauma, including violence in the home or community, abuse, substance abuse, and mental health problems in the household (Centers for Disease Control, nd-a). Around 64% of adults reported they had experienced at least one ACE before the age of 18 (Centers for Disease Control, nd-a). National surveys have shown that most pediatric providers are not knowledgeable about ACEs, and there is a lack of information about methods to assess and respond to ACEs (Bethell et al., 2017). ACEs impact a large portion of the population and, in many cases, can negatively affect overall health (Centers for Disease Control, nd-a).

ACEs can impact many areas of a child's life, leading to poor mental, physical, and behavioral outcomes that can persist into adulthood. People who experience ACEs can have cardiovascular, gastrointestinal, respiratory, and dermatological symptoms (Childhood Domestic Violence Association, nd). Around 66% of people who experienced ACEs had feelings of sadness or hopelessness (Centers for Disease Control, nd-a). In addition to this, people who experienced four or more ACEs were 7.3 times more likely to be diagnosed with anxiety or depression compared to those with less than four ACEs (Elmore & Crouch, 2020). Stress caused by ACEs can create chemical disruptions in the brain, leading to improper development and toxic stress (Childhood Domestic Violence Association, nd). Toxic stress is caused when a person is in a constant state of fight-or-flight, and adrenaline and cortisol build up in the body (Childhood Domestic Violence Association, nd).

While there is an association between ACEs and anxiety and depression, there is little research on how ACEs can impact a diagnosis later in life (Centers for Disease Control, nd-a). There is little epidemiological evidence for children or adolescents in lower and middle-class families experiencing ACEs (Ceccarelli et al., 2022). Finally, there is little knowledge about how

ACEs negatively compare to other unfavorable childhood circumstances when it comes to poor mental health outcomes like anxiety and depression (Children and Young People Now, 2020).

The purpose of this article is to analyze the risk factors for anxiety and depression among people who have experienced adverse childhood experiences. This study aims to clarify how ACEs can contribute to different mental health conditions, as well as identify different gaps based on the current research, to help aid with future research and intervention strategies.

Methods

For the literature review, a search was conducted between PubMed and APA PsycINFO databases for information on adverse childhood experiences and how they affect a later diagnosis of anxiety and depression. APA PsycINFO database offers 5,659,307 detailed studies, many of which cover the categories of anxiety, depression, and adverse childhood experiences. PubMed is considered a standard database for health-related literature, and it includes around thirty-seven million relevant articles and journals. The process for selecting the literature for this review is visualized in *Figure 1.*

For the APA PsycINFO database, a search for "(ACES) AND (Anxiety) AND (Depression)" yielded 393 results. To further narrow the results specific to the research question, the search "(ACES) AND ((Diagnosis of) (Anxiety) AND (Depression))" was searched and provided 41 results. The specific terminology was used to find articles that included how ACES impacts a particular diagnosis of anxiety and depression. This search resulted in four out of eleven chosen articles for this literature review.

A final search using the APA PsycINFO database was conducted using “ACEs* and brain development” to cover all necessary topics, resulting in 202 results. This search resulted in one of eleven of the chosen journals.

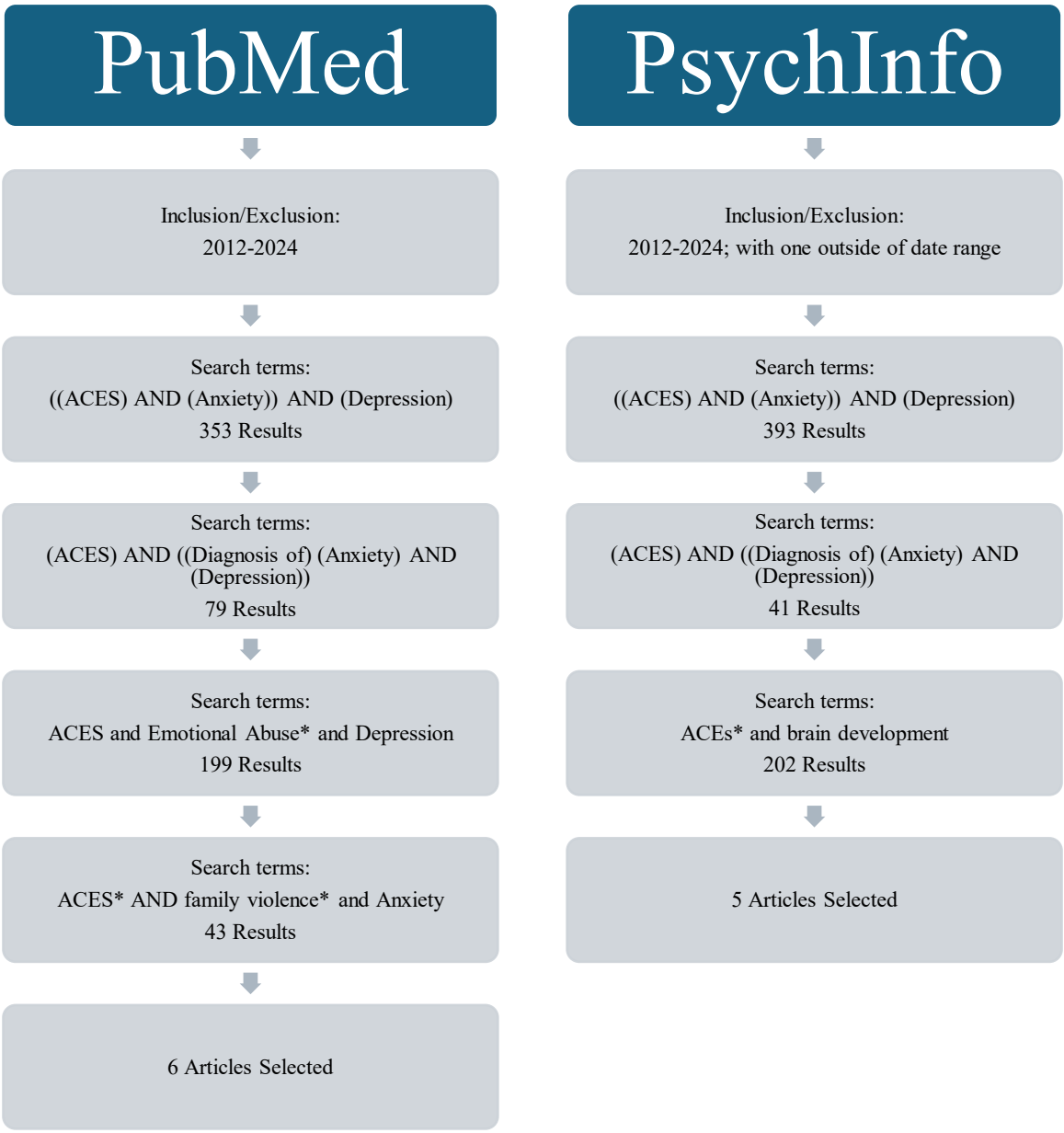
The same search process was used for the PubMed database. The search “(ACES) AND (Anxiety) AND (Depression)” yielded 353 results. To further narrow the number of articles, a more advanced search of “(ACES) AND ((Diagnosis of) (Anxiety) AND (Depression))” was used and provided 79 results. Third, a search of “ACES and Emotional Abuse* and Depression” was completed, and it yielded 199 results. These searches resulted in four of the eleven chosen journals.

To further the research needed for the literature review, a follow-up search for anxiety was performed using PubMed. The search “ACES* AND family violence* and Anxiety " produced 43 results. This search resulted in two of the final eleven journals used in this literature review.

Inclusion and exclusion criteria

Both databases were limited to articles from 2012-2024, so only the most recent and up-to-date articles were selected for the literature review. However, one article was chosen from outside the date range. In addition, only original research was selected; systematic reviews and literature reviews were discarded. Only peer-reviewed journals were selected. Furthermore, articles whose primary focus was a child's diagnosis were not chosen because the research question focused on a later diagnosis. To be included, journals had to include participants who had experienced adverse childhood experiences. Participants in the studies had to be diagnosed with anxiety and depression later in life. Studies that did not include this information were not selected.

Figure 1: Article Selection Process



Results

Adverse childhood experiences are something that many people experience around the world. Eleven research articles were reviewed and provided vital insight into how adverse childhood experiences can impact a later diagnosis of anxiety and depression. The literature offered many comprehensive explanations as to how ACEs affected mental health; however, three main factors were found. The first finding was that different ACE experiences can trigger anxiety or depression. The second finding showed that having a higher ACE score correlated with a higher risk for anxiety and depression. The third finding showed that ACEs can impact brain development and the stress response system, leading to a higher risk of anxiety or depression later in life.

Differing adverse childhood experiences

Many of the studies reviewed found that different adverse experiences had various impacts on mental disorders. People who experienced emotional abuse in their childhood were more likely to be later diagnosed with depression (Juárez-García et al., 2024), and people who experienced community violence or violence in the home were more likely to be diagnosed with anxiety (Karaağaç & İmre, 2024). Furthermore, child maltreatment was also shown to have an association with depression and post-traumatic stress disorder (Lee et al., 2020). Although community violence is correlated with high levels of post-traumatic stress disorder, there is no direct correlation between community violence and anxiety and depression (Lee et al., 2020). Conversely, experiences of violence are strongly associated with anxiety disorders, not only in adulthood but often symptoms appear in childhood (Karaağaç & İmre, 2024).

High ACE scores

The majority of the articles reviewed showed that having a higher ACE score could raise the risk for anxiety and depression. High-risk ACE groups had more significant symptoms of anxiety and depression compared to low-risk groups (Bing-Canar et al., 2024). A correlation between increased ACE exposure and mental health outcomes was discovered (Bing-Canar et al., 2024; Lee et al., 2022; Yu et al., 2023). High ACE scores of four or more indicated a more significant correlation with anxiety disorders, whereas depression did not have a significant correlation (Sareen et al., 2013). Additionally, there is also a noted correlation between gender and ACE score (Lian et al., 2024). Women with the same ACE score as men reported higher overall anxiety (Lian et al., 2024). Still, no notable interactions between gender and ACEs were found (Lian et al., 2024). Studies also found a correlation between smoking and drinking history and education levels (Yu et al., 2023). In addition to this, a connection was found between body weight and experienced ACEs (Yu et al., 2023).

Impact of ACEs on brain development

Many of the articles reviewed found that ACEs can impact brain development and the stress response system. These impacts can lead to a higher risk of anxiety and depression later in life. When a child is exposed to an adverse childhood experience, their fight-or-flight response is subjected to prolonged stressors (Anda et al., 2006). These prolonged stressors can cause detrimental effects on the developing neural networks as well as the neuroendocrine system (Anda et al., 2006). During childhood, the brain is still developing, and prolonged stressors can cause irreversible damage to the brain. For example, magnetic response imaging showed that there were reductions in the volumes of the hippocampus, as well as the amygdala, among women who experienced ACEs as children (Anda et al., 2006). Literature also showed that

stressful experiences in childhood may overstimulate the autonomic nervous system, causing dysregulation of the hypothalamic-pituitary-adrenal axis (Bing-Canar et al., 2024). Due to this disruption in the HPA axis, adolescents who were exposed to ACEs had difficulties with identifying and regulating emotions (Bing-Canar et al., 2024). These difficulties often lead to maladaptive emotion-processing strategies like emotion suppression, impulsivity, and rumination (Bing-Canar et al., 2024).

Table 1. Detailed Summary of Articles Reviewed

	Authors	Publication Date	Article Title and Journal	Purpose of Article	Sample Description	Type of Research	Research Findings	Limitations
1.	Anda. R.F. Felitti, V.J. Bremner, J.D. Walker, J.D. Whitfield, C. Perry, B.D. Dube, S.R. Giles, W.H.	2006	The enduring effects of abuse and related adverse experiences in childhood: A convergence of evidence from neurobiology and epidemiology **PsycInfo**	The aim of the article is to integrate findings from recent studies to the neurobiological effects on childhood abuse.	A sample of 17,337 participants participated in the study. The results were drawn from a study conducted by the Health Appraisal Center.	Secondary Data Analysis	Findings revealed that the fight-or-flight response is exposed to stressors like ACEs and cause detrimental effects on the developing neural networks and the neuroendocrine systems.	The first limitation would be the retrospective reporting of childhood experiences, due to the recall being incorrect or misconstrued or even blocked out due to trauma response.
2.	Bing-Canar, H. Stocks, J.K. Khan, H. Rauch, A.A. Obolsky, M.A. Lapitan-Moore, F. Phillips, M.S. Soble, J.R.	2024	Adverse childhood experiences, cognitive functioning, depression, and anxiety in adulthood. **PsycInfo**	The aim of the article is to investigate if those at a higher ACE exposure have a higher risk for adverse health events than those at a lower risk.	A sample of 216 adults who were consecutively referred for outpatient neuropsychological evaluation was used, with 49.6% being female.	Cross-sectional Study	Findings revealed that high-risk ACE groups had greater symptoms compared to low-risk groups. The results also found that there was not a cognitive difference between high and low risks for adverse health outcomes.	The cross-sectional study did not allow for speaking on the direct causality between ACE exposure and cognitive/psychological functioning. The sample was limited due to only using a middle-age adult sample. The questionnaire for ACE was retrospectively rated.

	Pliskin, N.H. Song, W. Resch, Z.J.							
3.	Bomysoad, R.N. Francis, L.A.	2020	Adverse Childhood Experiences and Mental Health Conditions Among Adolescents **PubMed**	The aim of this article is to examine the associations between ACEs and mental health conditions among youth in the United States.	Data was taken from the 2016-2017 National Survey of Children's health, in which 29,617 (49% female) youth aged 12-17, adult respondents were surveyed (96.7% parents)	Secondary Data Analysis	Findings revealed that there is evidence of an associate between ACEs and the mental health conditions of adolescents, that increase with increased ACE exposure.	The logistic regression analysis limited the ability to find the causality of poor mental health. The reports used were also from adults and there may be undiagnosed or unmet healthcare needs. In addition to this, the timing of ACE exposure was not addressed.
4.	Juárez-García, D.M. Téllez, A. Sánchez-Jáuregui, T. Castruita, D.A.A. García-Fuentes, K. Valdez A.	2024	Influence of Adverse Childhood Experiences and Resilience on Symptoms of Anxiety and Depression in Mexican Psychology Students **PsycInfo**	The aim of this article was to evaluate the prevalence and association of anxiety, depression, resilience, and the different types of ACEs amongst psychology students in Mexico.	337 students aged 16-35 years participated in the study, with the majority being women who were single, completed high school, and had a familial family income from 10,000 to 50,000 Mexican pesos. The students were from the metropolitan area of Monterrey, Nuevo Leon.	Cross-sectional Descriptive Study	Findings revealed that 70% of students surveyed had four or more ACES, which is consistent with child maltreatment in Mexico. 6% of participants reported depression, and 2% reported clinical anxiety.	The study only focused on psychology students and mostly women, s it cannot be translated to other health Ares. In addition to this, the low participant percentage may have limited the logistic regression statistics.

5.	Karaağaç, M. Imre, O.	2024	Adverse Childhood Experiences and Symptom Severity in Social Anxiety Disorder: The Role of Emotion Regulation. **PubMed**	This study aims to research if ACEs in individuals diagnosed with SAD were different from those who are in a healthy control group, to examine the relationship between ACEs and difficulties in emotional regulation.	The sample had 71 participants, with 53 being female and 18 being male. 51 of these were university graduates, and the majority had a moderate-income level.	Cross-sectional Study	Findings revealed that childhood traumas like abuse are associated with patients with SAD, and emotional regulation is related to the severity of SAD.	The limitations of this study are the small sample size, as well as its cross-sectional design. In addition, this study was self-reported and had a risk of bias, as well as the scale not including the severity.
6.	Lee, H. Kim, Y. Terry, J.	2020	Adverse childhood experiences (ACEs) on mental disorders in young adulthood: Latent classes and community violence exposure **PubMed**	This study aims to identify underlying ACE classes like violence and investigate the associations with the classes of ACEs and mental disorders in adulthood.	The sample used data from the National Longitudinal Study of Adolescent and Adult Health. The participants were students in grade 7-12, in which a final 10,686 participants were chosen.	Cross-sectional Study	Findings revealed that child maltreatment had the highest prevalence of depression, anxiety, PTSD. Community violence had high levels of PTSD but not anxiety or depression.	The limitations of this study include being a retrospective report, as well as the frequency, severity, or timing was not taken into account. In addition to this, information like household mental health issues was not fully reported on.
7.	Lee, R.Y. Oxford, M.L. Sonney, J. Enquobahrie, D.A. Cato K.D.	2022	The mediating role of anxiety/depression symptoms between adverse childhood experiences (ACEs) and somatic	This study aims to utilize a longitudinal cross-lagged path analysis to explore the concurrent and longitudinal relationships between ACES,	The sample used data from the Longitudinal studies of Child Abuse and Neglect. There were 1,354 children and their primary caregivers from ages	Longitudinal Cross-lagged Path Analysis	Findings revealed that ACEs did have a positive association with anxiety/depression at ages 12, 14, and 16, as well as somatic symptoms.	The limitations of this study include using data from primary caregivers, which has resulted in shared measure variance. In addition to this there may be biases

			symptoms in adolescents **PubMed**	anxiety/depression, and somatic symptoms among youth.	4-18. Data was collected in increments of two years starting at age 4 and ending at 18. The survey was in 5 sites aros the US, and 51% were female and 53% were African American.			in the official records of the child's adversity.
8.	Lian, J. Kiely, K.M. Callaghan, B.L. Anstey, K.J.	2024	Childhood adversity is associated with anxiety and depression in older adults: A cumulative risk and latent class analysis. **PsycInfo**	This study aims to explore the association between childhood adversity and mental health amongst older adults.	The sample used data from the Personality and Total Health Through Life Project in which 2,551 participants were selected from ages 60-66.	Cross-sectional Study	Findings revealed that high adversity and high parental disfunction is associated with poorer mental health outcomes, while moderate parental dysfunction and low adversity groups had normal scores. Women reported a higher overall anxiety score than men, but there were not notable interactions between ACEs and gender.	The large gap between childhood to the time of assessment may have caused a recall bias, as well as been limited by causal inferences by the cross-sectional data. 6.
9.	Sareen, J.	2012	Adverse childhood experiences in relation to mood and	The aim of this study is to understand the relationship between	The sample data came from the 2002 Canadian	Cross-sectional Study	Findings revealed that many personnel report ACEs, and	The limitations of this study are personality traits and disorders were

	Henriksen, C.A. Bolton, S. L. Afifi, T. O. Stein, M.B. Asmundson, G.J.G.		anxiety disorders in a population-based sample of active military personnel. **PubMed**	ACEs and mood and anxiety disorders, specifically amongst active military personnel.	Community Health Survey and contained 8,340 participants from the ages 18-54. Of these 5,155 were regular force and 3,286 were reserve.		higher ACE scores are generally linked to anxiety disorders.	not assessed and can be linked with childhood abuse. The cross-sectional study also did not allow for inferences to be made, and ACEs could have been affected by recall biases dur to the fact abuse is often not remembered well.
10.	McCutchen, C. Hyland, P. Maercker, A. Thoma, M.V. Rohner, S.L.	2023	The effects of social support on ACEs and mental health in Ireland. **PsycInfo**	The aim of the study is to determine the effect of social support on the relationship between anxiety and depression and ACEs among older adults in Ireland.	The sample was comprised of 535 participants from aged 50 to 86 years old, with 70% being under 70. 58% were female and 98% were Irish, and 5% lived in an institution in childhood or adolescence.	Cross-sectional Study	Findings revealed that ACEs were positively and strongly corelated with anxiety and depression and has an impact on adult mental health. In addition to this there were a larger amount of adults that reported ACEs than in previous studies.	The limitations of this study do not cover the entire population of Ireland, as well as the assessment provided only measures anxiety, depression, and CPTSD.
11.	Yu, P. Jiang, Z. Zheng, C. Zeng, P. Huang, L.	2023	Variety ACEs and risk of developing anxiety, depression, or anxiety-depression co-morbidity: the 2006–2022 UK Biobank data	The aim of this study is to analyze the correlation between levels of ACEs and anxiety and depression.	The sample was created with 126,064 participants in the UK Biobank from 2006-2022. They were aged 37-73.	Secondary Data Analysis	Findings revealed that 55.59% reported at least one ACE, any many correlated with psychiatric disorders, female, smoking history,	The limitations of this study first with disease, non-cancer diseases were selected, and many may have not been considered, in addition to this, chronic disease and genetic factors were

	Jin, Y. Wang, K.		**PubMed**				low education, drinking history, being overweight, and TDI being risk factors.	not used. In addition to this, the ACE scale is not suitable for Europeans and the prevalence of ACE combinations were not graded.

Discussion

Adverse childhood experiences impact many people as they age manifesting as anxiety and depression. There have been many correlations made between ACEs and anxiety and depression. The aim of this literature review was to determine the effects adverse childhood experiences had on a later diagnosis of anxiety and depression.

The overarching findings indicate that higher ACE scores, different ACE experiences, and hindered brain development all correlate with a diagnosis of anxiety and depression. This suggests that an experience of ACEs as a child does correlate with a later diagnosis of anxiety or depression. People with a higher ACE score have a higher risk of anxiety and depression (Lee et al., 2022; Sareen et al., 2013). It was shown that ACEs can affect neurobiological development and emotional regulation, leading to an altered stress response (Anda et al., 2006; Bing-Canar et al., 2024). Therefore, training programs for healthcare providers should be created in trauma care to recognize and respond to the needs of children affected by ACEs. Finally, different experiences like abuse or violence were shown to have differing effects on a diagnosis of anxiety or depression (Juárez-García et al., 2024; Karaağaç & İmre, 2024; Lee et al., 2020). Because of this, there should be policies in place to help curb community violence and recognize abuse in the home.

While a correlation between ACEs and a later diagnosis of anxiety and depression has been established (McCutchen et al., 2023), other correlations have also been established. For example, there is a correlation between maladaptive coping mechanisms like drinking or binge eating after experiencing ACEs (Yu et al., 2023). On the contrary, some studies found a higher correlation between ACEs and post-traumatic stress disorder (PTSD) (Lee et al., 2020). Since there is evidence of a correlation between ACEs and anxiety and depression, it is crucial to examine the efforts being

made to advance the knowledge about ACEs, which are shown to cause mental health disorders later in life (McCutchen et al., 2023).

Limitations

The primary limitation of this literature review stems from the fact that only 11 articles were reviewed. There is extensive research done on the topic of adverse childhood experiences and anxiety and depression, and this literature review was only capable of covering a portion of it. The limited research may have skewed the perception of the prevalence of anxiety and depression when someone has experienced ACEs. In addition to this, it is possible that there was not adequate focus on other factors such as parental occupation, birth order, or ethnicity. Additionally, there could have been differing definitions of what people include in the definition of adverse childhood experiences. Different studies could define adverse childhood experiences in various ways and include differing events. For example, parents' mental health disorders were added as a qualifying experience in 2018, and some articles were published before the definition was changed, potentially leaving participants out of a study.

Further Research

The topic of adverse childhood experiences offers a vast opportunity to explore other areas in life that they may impact. In addition, further research must be completed to explore intervention options. Identifying and evaluating ways to implement more screening in schools would help intervene with early ACE exposure (Bomysoad & Francis, 2020). Additional research can also work to examine how anxiety and depression may differently mediate the relationship between ACEs and symptoms (Lee et al., 2022). Overall, future research can gain more insight to form governmental policies to aid in intervention and screening.

Future practice

In the future, early intervention should be implemented to buffer the harmful effects of ACEs, particularly for those who lack access to mental health care (Lee et al., 2020). Policymakers should acknowledge that students and their families should receive screening and early interventions, as well as support, to reduce the ACEs children are experiencing (Bomysoad & Francis, 2020). In addition to this, schools should offer a more comprehensive approach to grief counseling interventions when exposed to community violence or ACEs (Lee et al., 2020).

Conclusion

Adverse childhood experiences are a topic of great interest due to their prevalence. This literature review examined 11 articles from PubMed and the APA PsycINFO database to determine how adverse childhood experiences affect a later diagnosis of anxiety or depression. The study found that ACEs can impact brain development, that different ACEs have different implications on diagnosis, and that more ACEs impact the prevalence of diagnosis. These findings can be used to inform governmental agencies and schools to reduce the amount of children exposed to adverse childhood experiences.

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