

## ADVERSE CHILDHOOD EXPERIENCES IN PSYCHOACTIVE SUBSTANCE USE DISORDERS: A STRUCTURED LITERATURE REVIEW

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**Abstract.** Adverse childhood experiences include psychological, physical, and sexual forms of abuse, as well as dysfunction in the home, including substance abuse among family members, and mental health problems in the family. These experiences are among the most intense and frequent sources of stress that children can experience early in life, and they also increase their risk of various behavioural disorders and substance abuse. Aim: The study aimed to investigate the prevalence and potential impact of childhood adverse experiences in connection to alcohol and other psychoactive substance abuse and addiction. Methods: A structured literature review was conducted, and an electronic search of the PubMed database was performed. The review process initially identified 653 articles, of which 11 were included in the review. Results: Smokers and alcohol users are more likely to report an adverse childhood experience compared to people who do not report harmful habits. Parental divorce was one of the most common negative experiences that affected 17-59.5% of the respondents. The results of the Adverse Childhood Experiences Survey are a potentially significant predictor of risky behaviour.

**Keywords:** Adverse childhood experience, alcohol use, mental health, psychoactive drug use, substance use

### To cite this article:

Bebere, S. & Vrubļevska, J. (2023). Adverse Childhood Experiences in Psychoactive Substance Use Disorders: a Structured Literature Review *Education. Innovation. Diversity*, 2(6), 6-16. DOI: <https://doi.org/10.17770/eid2023.1.7054>

### Introduction

Adverse childhood experience (ACE) includes psychological, physical, and sexual forms of abuse, as well as dysfunction in the household, including having a family member with a substance use disorder or mental health problem. These experiences can put the person at risk of various behavioural disorders and substance misuse (Chang, Jiang, Mkandarwire, Shen, 2019; Shin, McDonald, Conley, 2018; Hughes et al., 2019).

There is growing evidence that adverse childhood experiences are associated with negative mental and physical health outcomes, unhealthy and risky behaviours, increased healthcare use and even premature death (Almuneef, ElChoueiry, Saleheen, Al-Eissa, 2017; Musa, Peek-Asa, Jovanović, Selimović, 2018). These experiences are also one of the factors that can negatively affect an overall person's self-efficacy (Berent, Podgórski, Kokoszka, 2018). ACE such as substance-abusing parents, emotional neglect, and physical and sexual abuse are associated with opioid dependence and the earlier age of onset of injecting drugs (Stein et al., 2017).

Socio-economic changes in the country may contribute to an increased incidence of adverse childhood experiences. Studies are showing that housing insecurity, defined by a severe rent burden, was associated with increasing trends in child abuse and neglect during the COVID-19 pandemic (Barboza, Schiamberg, Pachel, 2021).

This article aimed to explore, through a structured review of the literature, the prevalence and potential impact of adverse childhood experiences in the general population and both inpatients and outpatients with the use and addiction of alcohol and other psychoactive substances.

In March 2022, an electronic search of publications was performed using Endnote software, and articles were selected from the PubMed database. Publications published in the last five years (2017-2022) were reviewed. Criteria for inclusion of publications: Adults (age 18+), includes people with alcohol and other psychoactive substance abuse and addiction, includes adverse childhood experiences, primary publications, publications in English, publications issued in the last five years, full text available.

## Methodology

The systematic review of the literature in this study was based on PRISMA 2020, and the diagram (Figure 1) is intended to represent the selection of articles and the flow of information throughout the review (Page et al., 2021).

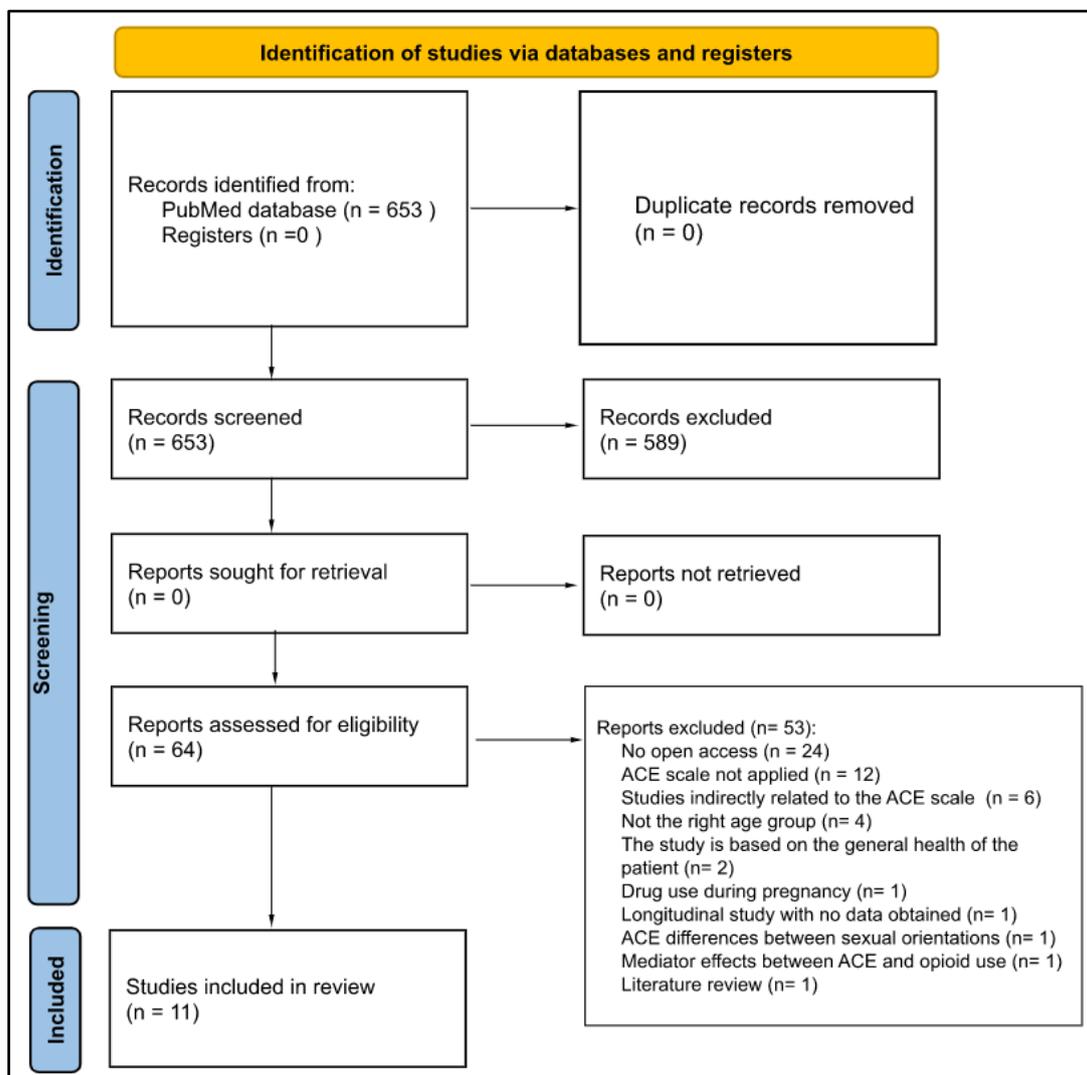


Figure 1 Selection of publications based on PRISMA 2020 (Page et al., 2021)

The search engine was searched using the keywords 'Adverse childhood experience' OR 'ACE' AND 'substance use' OR 'substance abuse' OR 'alcohol use' OR 'alcohol dependence' OR 'psychoactive drug use' OR 'psychoactive substance abuse' OR 'drug addiction' OR 'opioid use' OR 'opioid addiction' OR 'mental health'. Since the PubMed database begins the selection of

adults aged 19 years, in order not to lose data on patients aged 18 years, additional criteria were used: Adult: 19+ years, Adolescent: 13-18 years.

The literature review process identified 653 articles; no duplicates were found. After checking titles and abstracts, 589 articles were excluded. 64 articles were considered eligible, of which 53 were further excluded based on the inclusion criteria. Some of the reasons for exclusion were lack of open access (n= 24), use of other scales in adverse event analysis (n= 12), and indirect use of the ACE scale (n= 6). 11 articles from peer-reviewed journals were included in the qualitative analysis (Table 1).

*Table 1 Countries of origin and population sizes of publications*

Author	Country	Population considered	Count (N)
Almuneef et al. (2017)	Saudi Arabia	General population	10 156
Berent et al. (2018)	Poland	Hospitalised patients	196
Chang et al. (2019)	China	General population	1501
Fernandes et al. (2021)	India	General population	9010
Hughes et al. (2019)	10 European countries (Romania, Moldova, Russia, Poland, Serbia, Lithuania, Montenegro, Czech Republic, Ukraine, Macedonia)	General population	14 661
Jung et al. (2020)	USA	General population and Outpatients	25 552 and 1303
Kiburi et al. (2018)	Kenya	Hospitalised patients	134
Merrick et al. (2017)	USA	Outpatients	7465
Musa et al. (2018)	Bosnia and Herzegovina	Outpatients	400
Shin et al. (2018)	USA	General population	336
Stein et al. (2017)	USA	Hospitalised patients	457

## Results

### Adverse childhood experiences (ACE) scales

In the 10-question analysed studies, the Adverse Childhood Experiences questionnaire was used to describe experiences (some studies looked at additional events), as was used a questionnaire developed by the World Health Organisation (WHO).

Four studies - Almuneef et al., 2017, Fernandes et al., 2021, Chang et al., 2019, Kiburi, Molebatsi, Obondo, Kuria, 2018 - used the ACE-IQ (Adverse Childhood Experience International Questionnaire), which was designed by WHO and included 43 questions on adverse childhood experiences, including questions on ethnicity and sociodemographic. The WHO questionnaire divides the questions on adverse childhood experiences into domains. Alumneef et al. (2017) had one domain of adverse experiences as one item in their work.

Four other studies - Hughes et al., 2019, Jung et al., 2020, Musa et al., 2018, Stein et al., 2017 - used the 10-question ACE survey as a baseline. In these cases, one question is one point, and the score was analysed in the context of addiction or other mental health disorders.

Two studies (Chang et al., 2019; Fernandes et al., 2021) categorised adverse childhood experiences into specific categories or levels, where more than one experience could fall under. Fernandes et al. (2021) categorised adverse experiences according to a socio-ecological model: at an individual level (child maltreatment), microsystem (family) level, exosystemic (community) level, and macrosystem (collective) level. Chang et al. (2019) grouped experiences into negligence (physical or emotional), abuse (physical, emotional, or sexual), family dysfunction (parents separated or divorced, substance and mental health problems in the family, criminal activities in the family), collective violence (stalking, domestic violence, witnessing violence).

Three studies (Berent et al., 2018; Merrick et al., 2017; Shin et al., 2018) added additional questions on traumatic events that occurred before the age of 18, e.g., Berent et al. (2018) asked whether the respondent witnessed a family member's suicide attempt, experienced the death of a family member, or witnessed the death of a stranger. A study by Merrick et al. (2017) asked an additional question about experiencing spanking. Shin et al. (2018) The added events were caregiver verbal abuse of the caregiver, property crime and gang violence, and they created four classes that included the likelihood of adverse experiences: low ACE class (Class 1), dysfunction in home/community violence (Class 2), emotional ACE (Class 3), high/multiple ACE (Class 4). Shin et al. (2018), the first class was the control group, and the other classes were compared to it.

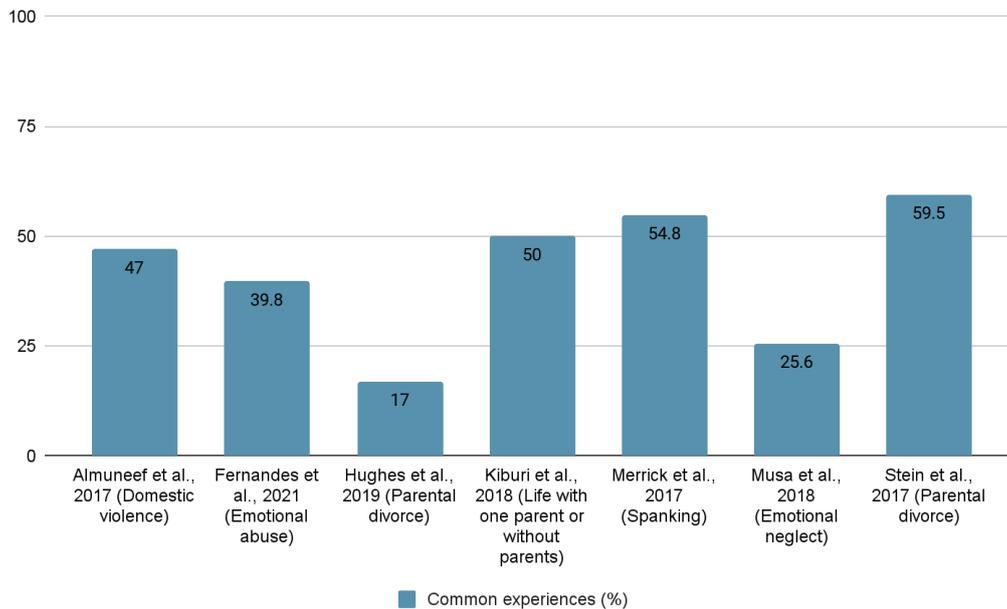
As the literature review included studies representing a sufficiently broad and diverse range of people, it was possible to observe that the number of ACE scores varied between the respondent groups. Data on the frequency of ACE points can be seen in Table 2.

*Table 2 Frequency of ACE in the populations covered in the articles*

Author	Country	ACE points
Almuneef et al. (2017)	Saudi Arabia	≥ 1 (80%) ≥ 4 (29%)
Berent et al. (2018)	Poland	3 to 10 (median 3)
Chang et al. (2019)	China	≥ 1 (66,2%) ≥ 4 (5,93%)
Hughes et al. (2019)	10 European countries (Romania, Moldova, Russia, Poland, Serbia, Lithuania, Montenegro, Czech Republic, Ukraine, Macedonia)	≥ 1 (46,2%) ≥ 4 (5,6%)
Kiburi et al. (2018)	Kenya	≥ 1 (92,5%)
Merrick et al. (2017)	USA	≥ 1 (>80%)
Musa et al. (2018)	Bosnia and Herzegovina	3 (8,4%) ≥ 4 (15%)
Stein et al. (2017)	USA	1-3 (36,8%) ≥ 4 (48,6%)

## Common adverse childhood experiences

Of the 11 studies reviewed, 7 provided specific data on the most common adverse experiences (Figure 2). In the remaining studies, adverse experiences were assessed within groups or by sex, therefore, no single event was identified within a population.



*Figure 2 Common adverse childhood experiences in the reviewed populations*

Musa et al. (2018), the most common ACEs were emotional abuse, reported by 24.5% of respondents, and emotional child neglect, reported by 25.6%, as well as physical abuse, reported by 10.3%, and physical neglect, reported by 11% of respondents.

Kiburi et al. (2018), living with one or no parents was the most common adverse experience (50%), affecting 46.6% of men and 75% of women. Domestic violence was the next most common experience (49%).

Berent et al. (2018), where the study population was alcohol-dependent hospitalised patients admitted to a psychiatric ward for psychotherapy or treatment of alcohol withdrawal syndrome, the most common adverse experience was the use of alcohol and/or drugs in the household. This ACE item was reported by 60% of female patients and 42% of male patients. The next most frequent ACE item for women was psychological abuse, which 50% of women. For men, the next most frequent experience was estrangement from parents, with 36% (Berent et al., 2018).

Hughes et al. (2019), parental divorce was the most common adverse experience, reported by 17% of respondents. The study highlighted the interconnectedness of negative experiences, emotional abuse co-occurred the majority of the time with physical abuse, while 4 out of 10 respondents who experienced domestic abuse typically coexisted with alcohol abuse, at home, physical abuse and parental divorce (Hughes et al., 2019).

Stein et al. (2017), parental divorce remained the most common adverse childhood experience, supported by 59.5%. Living with someone who uses alcohol and/or drugs was the next most common experience (51.4%), and 47.5% of patients experienced being frequently cursed at or humiliated.

Fernandes et al. (2021) observed that in the general population, the prevalence of adverse childhood experiences among young adults was 39.8% emotional abuse, 28.4% physical abuse, and 3.1% sexual abuse.

Merrick et al. (2017), the most common adverse childhood experience was spanking, reported by 54.8%. The next most frequent experience, out of the core questions, was using alcohol, drugs, or both in the household, which was noted by 28.3% (Merrick et al., 2017).

### **The association of adverse childhood experiences with psychoactive substance use and mental health problems**

Musa et al. (2018) indicated that patients with adverse childhood experiences are more likely to engage in risky behaviours (early sexual initiation, alcohol and drug use, and relationship violence) compared to patients without such experiences. According to Hughes et al. (2019), more men than women reported current smoking, early drinking, problematic drinking and drug use. On the contrary, there were more reports of suicide attempts among women (Hughes et al., 2019). To Fernandes et al. (2021), women were more likely than men to report ACE at the child, family and community levels, and substance use (tobacco, alcohol, cannabis) was reported more frequently by men than women (86.78% vs. 13.22%). Kiburi et al. (2018) observed that polysubstance use existed among the patients surveyed, 26.9% indicated that they used 4 different substances over a three-month period.

Chang et al. (2019) reported that higher ACE scores are associated with more frequent lifetime drinking, chronic diseases, depression, and the development of posttraumatic stress disorder in adulthood. A study by Merrick et al. (2017) suggests that there is a graded dose-response relationship between ACE and the probability of experiencing drug use and moderate or heavy alcohol use. The risk of multiple events will exceed the risk from a single adverse childhood experience (Merrick et al., 2017).

**Alcohol use disorders and adverse childhood experiences:** The study by Jung et al. (2020) analysed data from two independent surveys, NESARC-III (National Epidemiological Survey on Alcohol and Related Conditions-III) and NIAAA (National Institute on Alcohol Abuse and Alcoholism). The study looked at the impact of ACE on high-intensity binge drinking. Jung et al. (2020), the prevalence of ACE in the NESARC-III section ranged from 1.3 to 1.5 times more frequent in high-intensity drinkers compared with non-excessive drinkers. In the NIAAA section, the frequency of adverse childhood experiences increased similarly across all levels of alcohol use, varying from 2 to 5 times more frequently for extremely high-intensity drinking. Jung et al. (2020) the results for ACE were split. In NESARC-III experiences from non-binge level to high-intensity drinking: verbal abuse ranged from 26.57% to 38.59%, emotional neglect from 29.16% to 34.17%, physical abuse from 18.87% to 29.04%, physical abuse from 18.68% to 26.26%, and sexual abuse from 5.71% to 7.44%. In the NIAAA, from non-binge level to high-intensity drinking: emotional neglect from 19.19% to 42.69%, emotional abuse from 16.08% to 39.73%, physical abuse from 5.53% to 28.69%, sexual abuse from 5.03% to 19.19% and physical neglect from 3.54% to 18.40%.

According to Almuneef et al. (2017), the likelihood of substance use differed between genders, with 12% of men and 5% of women reporting regular alcohol use. Men with 4 or more points compared to those with 0 points had a 9.2-fold higher risk of heavy drinking, and women had a 3.9-fold higher risk of heavy drinking (Almuneef et al., 2017).

Chang et al. (2019), current alcohol users were more likely to report domestic violence compared to non-users, and psychiatric disorders in the family were associated with a 2.78-fold higher risk of lifetime alcohol use. Participants who reported experiencing parental divorce had a 2.4 times greater risk of engaging in alcohol use. The risk of alcohol use was 9.2 times higher

for respondents who reported 4 or more ACE items than for those who reported 0 items (Musa et al., 2018).

Merrick et al. (2017), heavy drinking was associated with all adverse events except having an incarcerated family member and parental divorce, and patients with 6 or more ACE scores were 2.84 times more likely to report moderate to heavy drinking. A study by Hughes et al. (2019) published that individuals with 4 or more ACE scores compared to individuals without adverse experiences were 4 times as likely to report problematic drinking.

Shin et al. (2018) observed that compared to a low ACE class, a high/multiple ACE class was associated with increased drinking problems. A study by Berent et al. (2018) revealed neglect, trauma, physical, and psychological abuse, and witnessing someone's death play a significant role in the development of harmful habits in patients with alcohol dependence. Kiburi et al. (2018), alcohol was the most used substance, reported by 82.1% of respondents; experiencing violence in a household increased the lifetime risk of alcohol use.

**Substance use disorders and adverse childhood experiences:** According to Musa et al. (2018), emotional abuse was associated with a 2.8-fold increased risk of drug use, and emotional neglect was associated with a 3.4-fold increased risk, and by comparing respondents, those with 4 or more ACE scores were associated with 15.9 times the risk of drug use than those with 0 scores.

Almuneef et al. (2017) observed that men are more likely to use illicit substances; 11% of men and 5% of women reported using drugs. Women who reported 4 or more ACE items were 3.8 times more likely to use drugs than women who reported 0 items. For men, the risk of drug use was 9.7 times higher for those with 4 or more ACE scores (Almuneef et al., 2017).

According to Merrick et al. (2017), compared to patients who did not report adverse experiences, individuals with 6 or more ACE scores were at a 3.73 times higher risk of drug use.

**Opioid use disorder and adverse childhood experiences:** Stein et al. (2017) study observed that a one-point increase was associated with a 1.10-fold increased lifetime risk of opioid overdose and a 1.11-fold increased likelihood of recent drug injection. For people with opioid use, the number of confirmed ACEs was correlated with 3 components of opioid use: age of onset, continuous use of injecting drugs and lifetime overdose (Stein et al., 2017).

**Tobacco use and adverse childhood experiences:** Smokers, compared to non-smokers, reported physical abuse, physical neglect, and childhood sexual abuse (Chang et al., 2019). Almuneef et al. (2017), 37% of the respondents reported tobacco use, of whom more than half remained men, although the risk of smoking is lower compared to alcohol or drug use.

Kiburi et al. (2018), childhood emotional abuse increased the lifetime risk of tobacco use by 22.8 times and the current risk of tobacco use by 5.3 times. Living in a household where someone has a mental health disorder increased the risk of tobacco use by 5 times (Kiburi et al., 2018).

**Other mental health problems and adverse childhood experiences:** A study by Musa et al. (2018) observed that patients who experienced emotional neglect were at a 2.6 times greater risk of experiencing relationship violence, and those who experienced emotional abuse were at a 2.3 times greater risk. According to Merrick et al. (2017), individuals who reported experiencing emotional abuse as a child had a 5.59 times higher risk of attempting suicide. In a study by Almuneef et al. (2017), compared to women who reported 0 ACE, women with 4 or more points had a 7-fold increased risk of developing depression, while this risk increased 3.1 times among men. In the Chang et al. (2019) study, participants who reported 4 or more ACE scores were at a 5.4 times higher risk of developing depression compared to participants who did not have adverse experiences. The study by Hughes et al. (2019) observed that individuals with higher ACE scores were 17 times more likely to report suicide attempts compared to participants without adverse experiences.

Kiburi et al. (2018) observed that sedative use was associated with experiencing physical abuse, emotional abuse and living with someone with a known mental health disorder. Patients who had 5 or more ACE were 15 times more likely to use sedatives compared to patients without adverse experiences (Kiburi et al., 2018).

## Discussion

The studies observed both the impact of a single adverse childhood experience and the impact of a combination of events on adult mental health. Similarly, to Merrick et al. (2017) and other studies, Shin et al. (2018) speculated that the presence of multiple adverse childhood experiences is a more important predictor of substance use risk than the presence of a specific experience. This finding suggests that the burden of multiple events is heavy and complex, making a person susceptible to mental health disorders, risky behaviours, and substance use.

Domestic violence and parental divorce were among the most common risk factors for alcohol use. Such events in childhood are emotionally difficult if the child does not have a support system to cope with the experience. Alcohol and other substance use can be thought to be linked to possible self-medication due to anxiety or emotional disturbance. The study by Musa et al. (2018) and Merrick et al. (2017) observed that the risk of drug use increased with experiencing emotional abuse. Experienced parental substance use is also a risk factor for substance use; children were exposed not only to an adverse situation but also to a negative role model, which they perceived as the norm as they grew up and thus remained susceptible to starting harmful habits.

Although the risk of smoking was lower compared to other disorders, it was associated with a sufficiently high score for adverse childhood experiences. Events associated with smoking included emotional abuse, living with someone with a mental health disorder (Kiburi et al., 2018), and physical abuse (Chang et al., 2019).

Women (Almuneef et al., 2017) were more likely to report a mental health disorder and were at higher risk of developing depression, while men were more likely to report substance use because of adverse experiences. This suggests that men use substances to cope with emotional burdens, whereas women internalise their experiences more, which may contribute to the development of anxiety and depression. A study by Hughes et al. (2019) observed that women were more likely to have attempted suicide than men. Reviewed studies suggest that societal gender expectations should be taken into consideration; in some cultures, substance use, or smoking could be acceptable among men but not women. Fernandes et al. (2021) and Almuneef et al. (2017) pointed to possible differences in responses to experiences, and women might choose not to report experiences or not to acknowledge substance use.

**Practical relevance:** The problem of substance use is widespread throughout the world, and studies have observed the impact of ACE on substance abuse, pointing out the need to screen for these adverse events, further identifying risk factors, and mitigating their impact on people's mental health (Kiburi et al., 2018). Assessing adverse experiences can help facilitate patient-centred treatment, as understanding at least some of the causes of the patient's condition can help to think about new or different therapeutic approaches.

Supportive relationships in childhood are seen as a key foundation for resilience that can help to prevent the impact of ACE in later life. Children exposed to traumatic events can benefit from support from extended family, communities, and social services (Hughes et al., 2019). The role of schools in protecting children was seen during the COVID-19 pandemic. Some studies concluded that child abuse decreased during the homestay period due to less contact with educational institutions and other people. Schools were closed and school staff were less

likely to observe the impact of negative events on children (Platt, Guedert, Coelho, 2020; Tierolf, Geurts, Steketee, 2021).

**Limitations and recommendations:** The results of this study must be seen in light of some limitations. First, publication bias should be considered. Only the PubMed database, one of the largest research databases in healthcare, was used to identify articles, and other sources, including grey literature, were not used. Authors of unavailable articles were not approached, which makes the data less informative. After article selection, fewer than 20 articles were available for the literature review, which is a notable limitation as the data pool remains relatively small.

Second, the literature review had sufficiently broad inclusion criteria, hence the heterogeneity of the data analysed. The general population was represented in about half of the studies, so data on hospitalised patients are less representative, and the patient populations considered were heterogeneous, which may have affected the reliability of the results.

Third, the studies used both the WHO questionnaire and the 10 core ACE questions, and added questions to the core questions; for this reason, it cannot be excluded that the value and reliability of the results may be undermined.

An important limitation of the study was the lack of patient interviews. Further research on adverse childhood experiences will require patient interviews and analysis of experiences, and research in this area in Latvia would be welcome, as it is not correct to generalise data from studies in other countries.

Studies have observed cultural differences in the frequency of ACE and substance use, as well as in the willingness to report these events. The significance of the results of this research may be diminished in different cultures.

## Conclusions

The review of the literature suggests that there is a link between adverse childhood experiences and alcohol and other psychoactive substance addiction. Adverse experiences are also associated with other mental health disorders and negative physical health outcomes. Smokers, alcohol users, and sedative and opioid users are more likely to report an adverse childhood experience than non-smokers or non-users. The results of the ACE questionnaire are a potentially important predictor of risky behaviour that should be considered in the treatment of addictions and other mental disorders, as well as in the prevention of these events.

## Acknowledgement

I am grateful to all those with whom I have had the pleasure to work during this project. I would especially like to thank Dr Jeļena Vrubļevska. As my teacher and mentor, she has helped me more than I could ever give her credit for here.

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