Narrative review

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Tobacco, alcohol and caffeine use during pregnancy and lactation: A narrative review

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ABSTRACT

INTRODUCTION: The perinatal period is crucial for maternal and fetal health, with lifestyle factors significantly shaping pregnancy outcomes and child development. This narrative review consolidates existing literature on the prevalence of substance use, its impacts on fetal and neonatal health, maternal risk factors associated with such behaviors, and management strategies for tobacco, alcohol, and caffeine consumption during pregnancy and lactation.

METHODS: This narrative review synthesized studies published in English from 2000 onwards, identified through electronic databases such as PubMed and Google Scholar, using specific key terms. Screening and data extraction were conducted independently by two investigators, with any disagreements resolved through discussion or consultation with a third investigator. A formal quality assessment of the included studies was not undertaken.

RESULTS: Global tobacco use during pregnancy ranges from 1.7% (95% CI: 0.0–4.5) to 21% (95% CI: 17–26), with smoking rates during lactation at 1.16% (95% CI: 1.11–1.21) in low- and middle-income countries. In Greece, rates vary from 12.4%–48% during pregnancy and 5.6%–22% during breastfeeding. Approximately 10% of pregnant women globally consume alcohol, with cultural norms influencing regional variations; Greece mirrors global trends. Alcohol use during lactation ranges from 5.5% in Greece to 47% in Australia. Caffeine consumption exceeds 80% in the United States and Greece during pregnancy, with lactation rates from 49.3%–84.8% in diverse national studies. Maternal use of these substances is associated with adverse outcomes, such as fetal growth restriction, developmental delays, and cognitive impairments. Psychosocial, cultural, and physiological factors are key risk factors, highlighting the importance of tailored interventions.

CONCLUSIONS: Evidence-based strategies, including cessation programs, education, and tailored support, are vital for reducing risks and encouraging healthier maternal behaviors. Combining pharmacologic and non-pharmacologic approaches enables healthcare providers, particularly midwives, to enhance maternal and infant outcomes during pregnancy and postpartum.

INTRODUCTION

The perinatal period represents a critical window in maternal and fetal health, as various lifestyle factors significantly impact pregnancy outcomes and both short- and long-term child development. Among these factors, the consumption of tobacco, alcohol, and caffeine stands out due to its widespread prevalence and substantial evidence linking it to adverse fetal and neonatal outcomes (Bednarczuk et al., 2020; Henriksen et al., 2004; Hoyt et al., 2014; James, 2021; Kesmodel et al., 2002; May et al., 2016; McCreedy et al., 2018; Patra et al., 2011; Popova et al., 2021; Tigka et al., 2023). Tobacco use during pregnancy has been robustly associated with low birth weight, preterm delivery, and sudden infant death syndrome (SIDS), largely due to nicotine's vasoconstrictive effects and carbon monoxide exposure, which impair fetal oxygenation (Bednarczuk et al., 2020; Wickström, 2007). Alcohol consumption, even at moderate levels, has been identified as a leading preventable cause of fetal alcohol spectrum disorders (FASDs), developmental delays, and cognitive deficits (Popova et al., 2021). Similarly, while caffeine consumption is socially accepted and ubiquitous, excessive intake during pregnancy has been linked to miscarriage, low birth weight and intrauterine growth restriction (IUGR) (Kukkonen et al., 2024).

Despite the individual risks posed by these substances, their combined use often reflects broader socio-cultural and behavioral patterns that amplify health risks. The perinatal period presents unique challenges for cessation, as physiological, psychological, and environmental factors

often make it difficult for women to abstain from these substances entirely (Boateng-Poku et al., 2020; Popova et al., 2021). This necessitates comprehensive public health interventions and targeted healthcare guidance to mitigate risks and promote healthier maternal behaviors (Boschuetz & German, 2023; Morales-Suárez-Varela et al., 2022; Temple et al., 2017).

This narrative review synthesizes existing literature on the prevalence, impact on fetal and neonatal health, maternal associated risk factors with substance use, and management strategies for tobacco, alcohol, and caffeine use during pregnancy and lactation. It aims to provide a holistic understanding of their implications for maternal and fetal health, identifying key gaps in research and opportunities for future intervention strategies.

METHODS

Study Design and Quality Assessment

This study employed a comprehensive narrative review design to synthesize findings across diverse study types. This methodological approach facilitated a broad examination of the topic, integrating findings from studies with varied designs and objectives to provide a nuanced understanding of the research area. While a formal quality assessment of the included studies was not conducted, informal checks were applied to ensure the inclusion of studies with robust methodologies and relevance to the research focus. Priority was given to high-quality designs, such as systematic reviews and large-scale cohort studies, to enhance the reliability of the findings. Potential biases, such as regional and methodological differences, were noted to provide context and guide interpretation. This approach enables a balanced synthesis, highlighting key trends and gaps in the literature while maintaining methodological inclusivity.

Eligibility criteria

Inclusion Criteria: This narrative review included studies published from 2000 onward, encompassing prospective cohort studies, multicenter cohort studies, cross-sectional studies, experimental studies, case scenarios, case-control studies, narrative reviews, and systematic reviews with meta-analyses. The focus of eligible studies was on fetal and neonatal health outcomes associated with maternal exposure to tobacco, alcohol, and caffeine during pregnancy and breastfeeding. Only English-language publications were included to ensure accessibility and alignment with international research standards.

Exclusion Criteria: Studies published prior to 2000 were excluded to maintain relevance to contemporary healthcare practices and policies. Non-English publications were not considered to ensure consistency in data interpretation. Furthermore, studies were excluded if they addressed outcomes unrelated to fetal or neonatal health or if they lacked clear definitions of exposure to the substances of interest.

Search Strategy

A comprehensive search was conducted, including PubMed and Google Scholar, focusing on studies published from 2000 onward. The search strategy employed a combination of specific keywords and Medical Subject Headings (MeSH) terms related to maternal substance exposure to the specific substances and fetal and neonatal health outcomes. Key terms included combinations such as “maternal”, “tobacco”, “alcohol”, “caffeine”, “consumption”, “use”, “pregnancy”, “breastfeeding”, “lactation”, “postpartum”, “neonatal outcomes” and “fetal outcomes”. Boolean operators “AND”, “OR”, and “NOT” were applied to refine and combine search terms, ensuring precision in capturing relevant studies. Additionally, references of included studies were manually reviewed to identify any additional eligible articles, enhancing the comprehensiveness of the search. This method ensured the inclusion of high-quality, relevant research to address the objectives of this narrative review.

Selection Process

Two independent investigators (E.I. and C.N.) screened titles and abstracts to identify potentially relevant studies. Full-text reviews were conducted for studies meeting the eligibility criteria. Discrepancies between investigators were resolved through discussion or consultation with a third investigator (M.D.). This iterative process ensured the inclusion of studies with high clinical and contextual relevance.

Data Extraction and Synthesis

Data were extracted independently by two investigators (E.I. and V.V.) on study design, population characteristics, prevalence rates, risk factors, fetal and neonatal health outcomes, and intervention efficacy. Discrepancies between investigators were resolved through discussion or consultation with a third investigator (A.D.). A standardized data extraction template ensured consistency across sources. Data were synthesized narratively and grouped under themes.

Ethical Considerations

As a literature-based study, ethical approval was not required. However, the review adhered to high standards of research ethics, ensuring accurate representation and acknowledgment of all cited works.

RESULTS

This narrative review provides a comprehensive overview of the patterns and impacts of tobacco, alcohol, and caffeine use during pregnancy and the postpartum period. The results are organized into key themes: (1) the prevalence of tobacco, alcohol, and caffeine use during these critical phases, (2) the impacts of maternal consumption of these substances on fetal and neonatal health, (3) the risk factors contributing to their use, and (4) effective interventions and mitigation strategies. Together, these findings highlight the multifaceted challenges posed by substance use in the perinatal period

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and underscore the importance of targeted prevention and support efforts.

1. Prevalence of tobacco, alcohol, and caffeine use during pregnancy and postpartum

Tobacco Use: In their systematic review and meta-analysis, Lange et al. (2018) estimated the global prevalence of smoking during pregnancy at 1.7% (95% CI: 0.0 – 4.5). Regionally, the prevalence varied significantly: 8.1% (95% CI: 4.0 – 12.2) in Europe, 5.9% (95% CI: 3.2 – 8.6) in the America, 1.2% (95% CI: 0.7 – 1.7) in Southeast Asia, 1.2% (95% CI: 0.0 – 3.7) in the Western Pacific, 0.9% (95% CI: 0.0 – 1.9) in the Eastern Mediterranean, and 0.8% (95% CI: 0.0 – 2.2) in Africa. In contrast, the findings from Jafari et al. (2021) in their systematic review and meta-analysis reported significantly higher prevalence global rates of smoking among pregnant women. They found that 32% (95% CI: 22 – 42) of women had ever smoked, while 21% (95% CI: 17 – 26) were current smokers during pregnancy. The prevalence of smoking among pregnant women in Greece varies significantly across studies, with reported rates ranging from 12.4% to 48% (Diamanti et al., 2019; Skalis et al., 2021; Tigka et al., 2023; Tsakiridis et al., 2018; Vivilaki et al., 2016).

Regarding the breastfeeding period, a thorough review of the literature revealed data primarily on the global prevalence of smoking among lactating women in low- and middle-income countries (LMICs). Singh et al. (2022), in their cross-sectional secondary analysis of data from 0.32 million women across 78 LMICs, reported a tobacco smoking prevalence of 1.16% (95% CI: 1.11–1.21) among lactating women. The highest prevalence was observed in the Eastern Mediterranean region at 4.27% (95% CI: 3.88–4.67), while the lowest prevalence was found in the African region at 0.81% (95% CI: 0.76–0.86). In contrast, data on smoking prevalence among lactating women in upper-middle-income or high-income countries are limited to national-level reports. For example, the 2008 Turkey Demographic and Health Survey (DHS) indicated that 16.5% of lactating women smoked tobacco. Similarly, findings from the 2017 Jordan Population and Family Health Survey (JPFHS) reported smoking rates of 9.3% for cigarettes and 10.8% for water pipe use among breastfeeding mothers (Can Özalp & Yalçın, 2021). Tobacco consumption during breastfeeding in Greece is reported to vary significantly, with studies indicating a range from 5.6% (Tigka et al., 2023) to 22% (Iliodromiti et al., 2020) in the National Breastfeeding Study in Greece.

Alcohol Consumption: Around 10% of women globally continue to consume alcohol during pregnancy (Popova et al., 2021). The highest prevalence is observed in the WHO European Region, where an estimated 25.2% of pregnant women report alcohol use. Notably, the top five countries with the highest rates of alcohol consumption during pregnancy are all in this region: Ireland (60.4%), Belarus (46.6%), Denmark (45.8%), the United Kingdom (41.3%), and Russia (36.5%). In contrast, the Eastern Mediterranean Region has the lowest prevalence, estimated at 0.2%, which is 50 times lower than the global average. This is followed by the South-East Asia Region at 1.8%, five times lower than the global average. These lower rates are largely attributed to cultural and religious norms that promote abstinence from alcohol, particularly among women. Furthermore, the African Region was reported to have the highest prevalence of binge drinking during pregnancy, estimated at 3.1%, while the Western Pacific Region had the lowest prevalence, at 1.8% (Popova et al., 2021). Greece aligns with the global trend in maternal alcohol consumption during pregnancy, with an estimated prevalence ranging from 9.3% to 11% (Diamanti et al., 2020; Mourtakos et al., 2015). More recent research by Tigka et al. (2023) indicates an even lower prevalence of 5.7%, suggesting a potential decline in maternal alcohol use during pregnancy in recent years.

Limited research has explored the prevalence of alcohol consumption among breastfeeding mothers. In Norway, 29% of mothers reported binge drinking (defined as consuming more than five drinks in one occasion) at six months postpartum, despite low alcohol consumption rates during pregnancy. In the United States, 36% of breastfeeding mothers acknowledged consuming alcohol. Similar trends were noted in other countries, with 47% of Australian mothers and 20% of Canadian mothers reporting alcohol use while breastfeeding. In the Netherlands, the prevalence of alcohol consumption during breastfeeding ranged from 19% to 22% (May et al., 2016). In Greece, the reported prevalence of maternal alcohol use during lactation is reported to be 5.5% (Tigka et al., 2023). These findings suggest that alcohol use among breastfeeding mothers is a global concern, highlighting the need for awareness and potential intervention strategies.

Caffeine Intake: In the United States, approximately 80% of pregnant women continue to consume coffee during pregnancy (Hoyt et al., 2014). In contrast, lower rates of maternal caffeine consumption during pregnancy are observed in several European countries, including France (47.1%), Italy (42.3%), and Finland (31%) (Surma et al., 2022). In Greece, however, the prevalence of caffeine intake during pregnancy is notably higher, with 86.6% of pregnant women reporting consumption (Tigka et al., 2023). According to the American Pregnancy Association, the recommended daily dose of caffeine during pregnancy should not exceed 200 mg/day (American Pregnancy Association, 2024), whereas the World Health Organization recommends no more than 300 mg/day (WHO, 2016).

Global data on caffeine intake during lactation is limited. Existing studies report that caffeine consumption during breastfeeding ranges from 49.3% to 84.8% (Mattar et al., 2019; Rebhan et al., 2009; Tigka et al., 2023). In Greece, a prospective cohort study by Tigka et al. found that the prevalence of caffeine intake among breastfeeding mothers

varied from 63.8% on the fourth day postpartum to 84.8% by the sixth month of breastfeeding.

2. Impacts of maternal tobacco, alcohol and caffeine consumption on fetal and neonatal health

Tobacco: Maternal tobacco consumption during pregnancy and breastfeeding has significant adverse effects on both fetal and neonatal health. During pregnancy, smoking introduces harmful chemicals, such as nicotine and carbon monoxide, which reduce oxygen supply to the fetus. This can lead to restricted fetal growth, low birth weight, and premature birth (Wickström, 2007). Moreover, prenatal exposure to tobacco increases the risk of congenital anomalies, including cleft lip or palate, and long-term developmental issues, such as attention deficit/hyperactivity disorder (ADHD) and impaired cognitive development (Paludetto et al., 2016). Respiratory complications, including asthma and an increased risk of chronic obstructive pulmonary disease (COPD) in later life, are also linked to in-utero exposure (Beyer et al., 2009). During breastfeeding, nicotine is transferred to infants through breast milk, leading to several adverse effects. These include disruptions in sleep and wakefulness patterns, reduced iodine supply, histopathological damage to the liver and lungs, intracellular oxidative damage, a reduction in pancreatic β-cells, and impaired glucose tolerance. Smoking also diminishes milk production and can alter its composition, negatively impacting the infant's nutritional intake (Primo et al., 2013). Additionally, maternal smoking is recognized as a significant risk factor for both Sudden Infant Death Syndrome (SIDS) and Sudden Intrauterine Unexplained Death Syndrome (SIUDS) (Bednarczuk et al., 2020).

Alcohol: Alcohol is a teratogen that easily crosses the placenta and accumulates in the amniotic fluid, prolonging its effects on the fetus. This accumulation, combined with the fetus' reduced metabolic enzyme activity and limited ability to eliminate alcohol, contributes to significant harm to the developing embryo and fetus. Fetal exposure to alcohol is a well-established risk factor for numerous adverse outcomes, including stillbirth (Kesmodel et al., 2002), spontaneous abortion (Hoyt et al., 2004), preterm birth, intrauterine growth restriction, and low birthweight (Patra et al., 2011). Moreover, it is a primary cause of Fetal Alcohol Spectrum Disorders (FASD), which encompass a range of physical, behavioral, and cognitive impairments (Popova et al., 2021). There is no known safe level of alcohol consumption during pregnancy, as even low levels of alcohol use can significantly increase the risk of Fetal Alcohol Spectrum Disorders (FASD) (Popova et al., 2021). During breastfeeding, alcohol passes into breast milk at concentrations similar to those in maternal blood (Perez et al., 2023). This transfer can adversely affect the infant in multiple ways, including disrupting sleep patterns (Mennella & Garcia-Gomez, 2001) and reducing milk intake (Mennella, 2001). Furthermore, prolonged exposure to alcohol via breast milk has been associated with decreased body mass, lower verbal IQ scores, dose-dependent impairments in cognitive functions, and diminished academic performance in children. Sociability and behavioral outcomes may also be negatively affected (Perez et al., 2023).

Caffeine: Caffeine intake during pregnancy is linked to low birth weight, small for gestational age and fetal growth restriction due to its effects on placental blood flow and fetal metabolism. Higher maternal caffeine intake is associated with an increased risk for diverse pregnancy outcomes such as miscarriage and stillbirth (Kukkonen et al., 2024). Regarding the impact of maternal caffeine intake on nursing neonates, some reports suggest that it may cause irritability and sleep disturbances in infants (NHS, 2022). However, a recently published systematic review indicates that the current evidence is both limited and conflicting, making it challenging to draw definitive conclusions on the subject (McCreedy et al., 2018).

3. Risk factors for substance use

Substance use during pregnancy and the postpartum period is influenced by a complex interplay of psychosocial, cultural, and physiological factors. High levels of stress, whether due to financial instability, lack of social support, or pre-existing mental health conditions, are major drivers of tobacco, alcohol, and caffeine consumption during these critical phases. Women often turn to these substances as coping mechanisms to manage the challenges of pregnancy and motherhood (Boateng-Poku et al., 2020; Popova et al., 2021). There is also a strong correlation between maternal smoking during pregnancy and factors such as young age, unmarried status, and lower socio-economic strata (Wickström, 2007). Cultural norms also play a significant role, as regions where alcohol and caffeine consumption are socially accepted tend to have higher prevalence rates, and smoking behaviors are often reinforced by peer influence and partner use (Liu et al., 2017; Sudhinaraset et al., 2016). Physiological dependency further complicates cessation efforts, particularly for women who used these substances prior to pregnancy. Sleep deprivation and the physical demands of caring for a newborn can exacerbate reliance on substances like caffeine, while habitual behaviors tied to nicotine or alcohol addiction are difficult to overcome without targeted support (Pirie et al., 2000). These factors underscore the need for comprehensive and personalized interventions to address the underlying causes of substance use and support healthier maternal behaviors.

4. Effective interventions and mitigation strategies

Smoking, alcohol consumption, and caffeine intake during pregnancy and breastfeeding require targeted interventions to improve maternal and perinatal outcomes. Smoking cessation programs that incorporate counseling and nicotine replacement therapy (NRT) have been effective in

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reducing risks such as low birth weight and preterm delivery. Postpartum relapse prevention strategies, including stress management and support groups, further support sustained abstinence (Morales-Suárez-Varela et al., 2022). Similarly, alcohol use can be addressed through screening tools like the AUDIT-C questionnaire, with brief interventions combining education and motivational interviewing proving effective (Boschuetz & German, 2023). For severe cases, inpatient programs are essential for detoxification and relapse prevention (WHO, 2014). In the case of caffeine, public health campaigns and guidance from healthcare providers emphasizing safe consumption levels, rather than total abstinence, have encouraged adherence to recommended limits (Temple et al., 2017).

DISCUSSION

The findings of this narrative review offer a comprehensive understanding of substance use during pregnancy and the breastfeeding period, emphasizing the multifaceted challenges associated with tobacco, alcohol, and caffeine consumption in these critical phases. By synthesizing data from diverse geographical and cultural contexts, the review sheds light on the prevalence of substance use, its adverse impacts on fetal and neonatal health, and the key factors driving these behaviors. Moreover, it highlights evidence-based interventions that effectively address these issues, providing actionable insights for healthcare professionals and policymakers aiming to improve maternal and perinatal outcomes.

The variability in the prevalence of tobacco, alcohol, and caffeine use during pregnancy and postpartum across regions underscores the influence of cultural, social, and economic factors. The high rates of smoking in Europe, reaching up to 48% in Greece (Vivilaki et al., 2016) among pregnant women, suggest that societal acceptance and inadequate public health interventions may be key contributors. In contrast, lower rates in regions like Eastern Mediterranean and Africa, 0.9% and 0.8% respectively (Lange et al., 2018), may reflect stronger cultural stigmas against smoking. For alcohol use during pregnancy, the significant difference in consumption between Europe (e.g., Ireland at 60.4%) and the Eastern Mediterranean Region (0.2%) (Popova et al., 2021) may be attributed to the strict policies and enforcement in the latter. Measures such as limited alcohol outlet availability, penalties for violations, high taxes, and restricted distribution make alcohol both less accessible and prohibitively expensive, contributing potentially to the region's low consumption rates. Similarly, the global prevalence of caffeine use during pregnancy—most striking in Greece (86.6%) (Tigka et al., 2023)—demonstrates a lack of awareness or adherence to recommended limits. These findings suggest a need for both universal and region-specific strategies, including better education, regulatory measures, and support systems, to reduce substance use during these critical periods.

The documented impacts of maternal substance use on fetal and neonatal health reveal the urgent need for stringent preventive measures. Tobacco use remains a major public health concern and its potential consequences on the fetus and infant underscore the importance of smoking cessation programs before and during pregnancy and sustained abstinence postpartum (Tigka et al., 2023). Alcohol consumption presents unique challenges due to its teratogenic effects. The lack of a safe threshold for alcohol consumption necessitates public health messaging that promotes complete abstinence during pregnancy, reinforcing the need for long-term support to prevent relapse postpartum (Popova et al., 2021). For caffeine, while the evidence linking consumption to neonatal irritability and sleep disturbances remains inconclusive, its role in fetal growth restriction and increased risks of miscarriage and stillbirth cannot be ignored (Kukkonen et al., 2024). The discrepancies in findings suggest a need for further research to establish clearer guidelines and highlight the potential for harm reduction through moderation rather than abstinence (McCreedy et al., 2018).

The complexity of risk factors associated with maternal substance use highlights the intersection of individual vulnerabilities and societal influences. Stress emerges as a dominant driver, with financial instability, mental health challenges, and lack of social support pushing many women toward tobacco, alcohol, or caffeine as coping mechanisms (Boateng-Poku et al., 2020; Popova et al., 2021). The correlation between tobacco use and demographic factors such as young maternal age, unmarried status, and lower socioeconomic strata (Wickström, 2007) emphasizes structural inequalities that perpetuate unhealthy behaviors. Cultural norms further complicate these dynamics, with societal acceptance of alcohol and caffeine use normalizing their consumption during pregnancy and postpartum (Sudhinaraset et al., 2016). Physiological dependency, particularly for nicotine and caffeine, presents additional barriers to cessation (Pirie et al., 2000). The challenges of breaking habitual behaviors are compounded by the physical and emotional demands of pregnancy and caregiving, underscoring the importance of early intervention and sustained support.

The effectiveness of interventions to address maternal substance use depends on their adaptability to individual and contextual factors. Tobacco cessation programs that combine counseling with nicotine replacement therapy (NRT) success hinges on accessibility and consistent follow-up, particularly during the postpartum period, where relapse rates remain high (Morales-Suárez-Varela et al., 2022). For alcohol use, tools like the AUDIT-C questionnaire allow for early identification of at-risk women, enabling timely intervention. Brief interventions that integrate motivational interviewing and education have proven effective, but severe cases require more intensive approaches, including inpatient detoxification and relapse prevention programs (Boschuetz & German, 2023; WHO, 2014). These findings

point to the need for a tiered intervention system that aligns with the severity of alcohol dependence. Caffeine presents unique challenges, as public health efforts aim to promote moderation rather than abstinence. Campaigns emphasizing the risks of excessive caffeine consumption and encouraging the use of alternatives like decaffeinated beverages have shown promise, but their success depends on effective communication and engagement by healthcare providers (Temple et al., 2017). Finally, pregnancy and breastfeeding offer unique opportunities to foster healthier behaviors, as many women are particularly motivated to adopt lifestyle changes for the benefit of their infants. Healthcare professionals should leverage these periods to educate mothers about the risks of addictive substances, utilizing evidence-based resources and guidelines from authoritative scientific bodies. Antenatal care and parent education sessions provide crucial platforms for these discussions, reinforcing messages to optimize perinatal outcomes while promoting adherence to practical and scientifically informed recommendations (Tigka et al., 2024).

This narrative review has several limitations that must be acknowledged. First, it is based on studies published in English, which could introduce language bias and potentially exclude relevant research in other languages. The findings rely on a heterogeneous body of literature, with variability in study design, sample sizes, and methods of data collection, particularly in measuring substance use and its impacts during pregnancy and postpartum. Additionally, this review did not perform a formal quality appraisal of the included studies, which may affect the strength and reliability of the conclusions. Many studies rely on self-reported data, which can be subject to recall bias and underreporting, particularly for socially sensitive behaviors like smoking and alcohol consumption. Finally, differences in cultural norms, healthcare systems, and public health interventions across regions may limit the generalizability of these findings to broader populations, necessitating caution in applying them universally.

Despite substantial research on the individual impacts of tobacco, alcohol, and caffeine use during pregnancy and the postpartum period, significant knowledge gaps persist. To the best of our knowledge, no studies have examined the combined effects of these substances, leaving critical questions unanswered regarding their potential synergistic impacts on maternal and fetal health. Additionally, most existing research is conducted in high-income countries, making it difficult to generalize findings to low- and middle-income settings, where cultural norms, healthcare access, and substance use patterns differ significantly. Further, while high-dose consumption is well-documented, the long-term effects of low-to-moderate substance use on child neurodevelopment, maternal mental health, and caregiving abilities remain underexplored. Addressing these gaps requires culturally tailored research designs and longitudinal studies that can provide comprehensive insights into the multifaceted impacts of substance use during the antenatal and postpartum period.

CONCLUSIONS

This narrative review highlights the significant challenges posed by tobacco, alcohol, and caffeine use during pregnancy and the postpartum period, underscoring the need for targeted prevention and intervention strategies to mitigate their adverse effects on maternal and infant health. The findings emphasize that while substance use during pregnancy and breastfeeding remains prevalent across diverse regions, the impacts on fetal development, neonatal health, and long-term child outcomes are profound and multifaceted. Socioeconomic, cultural, and physiological factors play key roles in influencing maternal substance use, indicating that personalized, culturally-sensitive approaches to intervention are essential. Effective strategies, such as smoking cessation programs, alcohol screening tools, and public health campaigns focused on caffeine consumption, could demonstrate success in reducing risks. However, further research is required to standardize interventions and develop evidence-based guidelines for substance use management during the perinatal period. Moving forward, healthcare providers, particularly midwives and obstetric professionals, should leverage these critical periods to educate and support mothers in adopting healthier behaviors. By fostering a holistic approach that combines pharmacologic and non-pharmacologic interventions, we can improve both maternal and infant outcomes, ensuring safer pregnancies and postpartum experiences.

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DISCLAIMER
V. Vivilaki reports that she serves as the Editor-in-Chief of the European Journal of Midwifery (EJM), the President of the Scientific Association of Midwives in Athens (SEMMA), and the President of the European Association of Midwives (EMA).