

# Italian Guidelines for the diagnosis and treatment of Fetal Alcohol Spectrum Disorders: prevention and health promotion

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**Summary.** Alcohol consumption during pregnancy poses significant risks to maternal and fetal health, contributing to a range of adverse outcomes collectively known as Fetal Alcohol Spectrum Disorders (FASD). This article reviews evidence-based preventive strategies aimed at mitigating the detrimental effects of prenatal alcohol exposure. Drawing upon literature from various disciplines, interventions are categorized according to their level of prevention: universal, selective, and indicated. Training of personnel and availability of official guidelines are a pre-requisite for effective prevention. Universal prevention strategies include public health campaigns, educational initiatives, and policy interventions aimed at raising awareness about the risks of prenatal alcohol exposure and promoting abstinence during pregnancy. Integrating alcohol screening and brief intervention protocols into routine prenatal care settings can help identify and support women who may be at risk of alcohol use during pregnancy. Consequently, selective and indicated interventions, identifying drinking women, may provide targeted support to pregnant women at risk. Indicated prevention interventions also encompass treatment and rehabilitation strategies for women with a known alcohol abuse problem or who have already had alcohol-exposed pregnancies. Finally, ethical issues related to the stigma associated with alcohol consumption during pregnancy are highlighted, to be considered for an effective mother and child health promotion.

**Keywords.** Alcohol, FAS, FASD, health promotion, pregnancy, prevention.

*Linee guida italiane per la diagnosi e il trattamento dei disturbi dello spettro feto-alcolico: prevenzione e promozione della salute.*

**Riassunto.** Il consumo di alcol durante la gravidanza comporta rischi significativi per la salute materna e fetale, contribuendo a una serie di esiti avversi conosciuti collettivamente come disturbi dello spettro feto-alcolico (FASD). Questo articolo analizza le strategie preventive basate su prove scientifiche volte a mitigare gli effetti dannosi dell'esposizione prenatale all'alcol. Attingendo alla letteratura di varie discipline, gli interventi sono categorizzati in base al loro livello di prevenzione: universale, selettiva e indicata. Approcci di prevenzione universale includono campagne di salute pubblica, iniziative educative e interventi politici mirati a sensibilizzare sui rischi dell'esposizione prenatale all'alcol e a promuovere l'astensione durante la gravidanza. L'integrazione di protocolli di screening del consumo di alcol e di intervento breve nella routine dell'assistenza prenatale può aiutare a identificare e sostenere le donne che sono a rischio di consumare alcol durante la gravidanza. Questi interventi, selettivi e indicati, identificando le donne che bevono in gravidanza, consentono di fornire un supporto mirato alle donne a rischio. Le strategie di prevenzione indicata comprendono inoltre strategie individualizzate di trattamento e riabilitazione di donne con un problema di abuso di alcol già noto o che hanno già avuto gravidanze esposte all'alcol. Infine, vengono evidenziate questioni di tipo etico, legate allo stigma associato al consumo di alcol in gravidanza, da prendere in considerazione per una efficace promozione della salute della donna e del bambino.

**Parole chiave.** Alcol, FAS, FASD, gravidanza, prevenzione, promozione della salute.

## Introduction

The effects of alcohol consumption during pregnancy have been known for years<sup>1,2</sup>. Children exposed to alcohol in the uterus show growth delays, physical anomalies, specific facial features, and neurological defects, including intellectual disabilities

and behavioral problems<sup>3</sup>. Fetal Alcohol Spectrum Disorders (FASD) encompass the range of pathologies and disorders caused by alcohol exposure in the uterus. Despite the serious health risks, recent estimates show that the prevalence of alcohol consumption (any amount) during pregnancy globally is 9.8%, with Europe exhibiting the highest prevalence at 25.2%<sup>4</sup>. A safe level of consumption during preg-

nancy has not yet been established, leading several associations and boards to officially endorse complete abstinence (i.e. The American College of Obstetricians and Gynecologists, the American Academy of Pediatrics).

The quantity of alcohol consumed appears to be the primary risk factor for fetal damage<sup>5</sup>. In particular, binge drinking poses the highest risk, defined by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) as consumption resulting in a Blood Alcohol Concentration of 0.08 g/liter or higher<sup>6</sup>. Various studies show that consuming three or more drinks on a single occasion is highly correlated with morphological alterations and behavioral impairments in prenatally exposed children<sup>7</sup>. While studies examining the effects of light drinking have yielded conflicting results<sup>8</sup>, some evidence suggests that even moderate consumption can harm the fetus<sup>9</sup>.

The type of alcoholic beverage consumed also correlates with the risk of fetal damage. Animal studies comparing the effects of wine consumption with other alcoholic beverages during pregnancy have shown that wine administration produces changes in peripheral tissues but not in brain structures, while ethanol administration results in long-term alterations in behavior, brain areas, endocrine tissues, and the liver. This lower toxicity may be attributed to the protective effect of polyphenols found in red wine<sup>10,11</sup>.

Other factors influencing the potential harm from prenatal alcohol exposure include the mother's age and weight, parity, nutritional status, genetic and epigenetic factors, as well as socio-economic status and the consumption of other psychoactive substances<sup>12-16</sup>. Strong predictors of alcohol consumption during pregnancy include past mental illness, the presence of anxiety and depression, exposure to abuse, and domestic violence<sup>17</sup>.

The recurrence of problematic alcohol consumption in the family history of children with FASD was the most significant risk factor in an Italian active screening, where children with the worst neuropsychological test performance came from families with problematic alcohol consumption<sup>14</sup>. Finally, it should be noted that paternal alcohol consumption also plays a role in fetal alterations, with approximately 75% of children with FASD having a father with problematic drinking habits or alcoholism<sup>18</sup>. It would seem that even the sole consumption of alcohol by the father can provoke effects on the newborn comparable to those due to alcohol exposure in the uterus, as shown by both studies on animal models and humans<sup>19,20</sup>.

Regarding the reasons supporting alcohol consumption during pregnancy reported by women from 16 different countries examined through a review, prevalent motives include social pressure and the belief that only high-alcohol content beverages or

large quantities are harmful. Other reasons include unawareness of the damage, coping with negative life experiences, irrational behavior influenced by personal experience and social circles, beliefs about the beneficial effects of alcohol, healthcare provider advice, unplanned pregnancy, alcohol dependence, and cultural habits/traditions<sup>21</sup>. These reasons, along with the above-mentioned risk factors, already outline the path for designing preventive interventions and health promotion.

This work examines the following different levels of preventive interventions:

- training of personnel and availability of official guidelines;
- structural interventions (universal prevention);
- media campaigns (universal prevention);
- screening and early identification (selective prevention);
- intervention protocols (indicated prevention).

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### Training of personnel and guidelines

Personnel training is a prerequisite for effective prevention. To prevent the negative consequences of alcohol exposure in the uterus, it is essential to have professionals trained in implementing preventive interventions at various levels. An investigation by Messina et al.<sup>22</sup> found that only 19.1% of healthcare providers routinely informed patients about the risks associated with alcohol consumption during pregnancy, only 51.1% advised abstaining from consumption, and 41.0% tolerated moderate consumption.

The crucial role of healthcare providers in promoting healthy behaviors in patients is evident. In Italy, over the last 15 years, both the Alcohol Reference Center of the Lazio Region and the National Institute for Health (Istituto Superiore di Sanità - ISS) have provided training courses dedicated to all professionals involved in the prevention, identification, and treatment of FASD, and this path must continue to promote a cultural change in alcohol habits among the population. Knowledge of the subject is not the only obstacle to the diffusion of healthy behaviors during pregnancy regarding alcohol. Some authors<sup>23</sup> highlighted how the topic itself is uncomfortable to investigate and creates embarrassment among operators, also due to the stigma associated with such behavior. An approach that teaches operators how to enter into a genuine helping relationship with patients, adopting an attitude of acceptance and non-judgment, can help the operator to feel more confident in including uncomfortable topics among those discussed with the patient. Other barriers to adopting effective preventive measures include the clinician's lack of time and clarity on the pathways to refer patients for an appropriate treatment<sup>24</sup>.

Another essential element as a prerequisite for implementing preventive interventions is the ability to refer to clear and shared guidelines on alcohol consumption during pregnancy, thus increasing the intervention capacity of operators. The existence and dissemination of guidelines can also increase the credibility and acceptance of legislative interventions on alcohol use, even restrictive ones, among the general population, thus favoring the adoption of healthy behaviors<sup>25</sup>.

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## Structural measures

Structural measures seek to regulate people's behavior by modifying the availability of alcoholic beverages and making their use more difficult. In general, several structural measures have proven effective in reducing the harms resulting from alcohol use in the general population<sup>26</sup>. Among these, raising the legal minimum drinking age reduces harm, but only if this measure is enforced through regular checks. Also, increasing the prices of alcoholic beverages reduces consumption, provided that this increase is not part of a general rise in consumer prices or an increase in population income. Decreasing the density of retail outlets can be effective, but the risk of fueling illegal markets should always be kept in mind. Finally, limiting or banning alcohol advertising on various types of media seems effective in reducing consumption<sup>27</sup>.

Regarding structural measures specifically undertaken to prevent alcohol use during pregnancy, several States have made it mandatory to label alcoholic beverage bottles with warnings about the dangers of consumption during pregnancy. This labeling has been mandatory in the USA since 1989, in China since 2005, in France since 2006, in the Russian Federation and South Africa since 2007. Recently, in 2023, Australia also made the warning mandatory, while Ireland announced the adoption of such a measure in 2026. Several studies have evaluated the effectiveness of this measure, with mixed results: it seems to increase awareness of the risks associated with drinking during pregnancy<sup>28</sup>, people drink slower<sup>29</sup> and less frequently<sup>30</sup>, but the effect on quantity assumed is less clear<sup>31</sup>.

To explain these controversial results, the World Health Organization (WHO)<sup>32</sup> highlights the heterogeneity of criteria and methods used to evaluate effectiveness. For example, when assessing the effectiveness of warning labels, the purpose for which they were conceived must be considered, such as whether the label aimed to increase risk awareness or modify behavior. The form and content of the label can also lead to different results, as well as the time frame in which the effect is measured<sup>33</sup>. It also appears that this measure may influence the behavior of moderate

drinkers but not heavy drinkers<sup>34</sup>. Despite the need to carefully use data from various studies, labeling, by increasing awareness, can be an effective preventive measure, especially when combined with other prevention policies<sup>35</sup>.

One suggestion to consider when adopting measures and policy choices for preventing alcohol consumption during pregnancy comes from Wolfson and Poole<sup>23</sup>. The authors warn about the risk that these warnings may increase stigma and blame on women with alcohol use disorder, further alienating them from services and preventing them from seeking treatment, which could have a true preventive value for them. Additionally, the authors examine the consequences of adopting punitive laws against women who use alcohol during pregnancy. In States where this behavior is classified as neglect and abuse towards the child, with a punitive approach, the number of children entrusted to third parties increases, and the number of women accessing prenatal care decreases. Instead of punitive laws, the authors emphasize the importance of an approach that promotes the entry into the treatment of women and mothers who abuse alcohol.

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## Mass media campaigns

The effectiveness of communication campaigns through media is relative. Reviews attempting to evaluate this efficacy often find mixed results or studies of weak effectiveness. A review in 2010<sup>36</sup> on the use of mass media to reduce alcohol consumption, in general, reported that except for those studied to prevent drunk driving, campaigns aiming to reduce alcohol consumption, had poor efficacy. More recently, a review published in the *Lancet* in 2017<sup>37</sup> on the effectiveness of media campaigns to reduce alcohol consumption in general (not in pregnant women) reported that out of 24 studies included in the review, only 13 measured the effect of the campaign on alcohol consumption, and only 2 reported a statistically significant reduction in consumption. The authors conclude that media campaigns can improve knowledge of the subject, and sometimes also seem to influence attitudes and behavioral intentions, but do not seem to affect the consumption behavior directly. The effect on behavior may be indirect because they provide support and favor consensus toward other actions more capable of reducing consumption.

Even when looking at the results of campaigns specifically designed to prevent alcohol consumption during pregnancy, these do not seem to influence the consumption behavior<sup>38</sup>. After conducting a campaign in the Veneto region in Italy, Bazzo et al.<sup>39</sup> compared the knowledge of the effects of alcohol during pregnancy in the target population with that

of the control population and found no significant differences. In the absence of sufficient and clear indications from specific literature on preventing alcohol consumption during pregnancy, it seems prudent to rely on evidence-based indications from the general substance use prevention sector.

The European Prevention Curriculum (EUPC)<sup>25</sup> provides a detailed list of recommendations to follow when using media to construct messages capable of persuading people to change attitudes and behaviors regarding the use of psychoactive substances and alcohol. The premise of these recommendations is that media communication campaigns are crucial for conveying health messages, but only when planned according to recommendations from psychosocial sciences, based on solid theories, and considering existing evidences of effectiveness. What often happens instead is that they are based on common sense, with the idea that simply warning that certain behaviors are harmful to health will change people's habits. Certainly, the use of media allows for the easy dissemination of messages, fueling the naive belief that a large number of people can be reached with minimal effort, under the illusion that it is a truly cost-effective strategy. Drawing from the International Standards of the United Nations Office on Drugs and Crime (UNODC)<sup>40</sup>, the EUPC lists the characteristics of campaigns that have proven to be effective. From this list, the following recommendations can be extracted:

- precisely identify the target population for communication;
- plan campaigns within a theoretical framework;
- experiment with every element of the campaign before launching it;
- allocate an adequate amount of time to reach the chosen target;
- evaluate the effectiveness of the campaigns;
- direct campaigns aimed at reaching children to parents;
- give instruction on the desired behavior (i.e., not using substances) when the goal is to influence behaviors.

Further research has also shown the reasons for the failure of campaigns, indicating the mistakes to avoid in their planning. Among these, perhaps the most important to highlight because it is widely used in campaigns aimed at preventing the use and abuse of psychoactive substances is the use of content that scares recipients with the idea that this will keep them away from such behavior. Although substance use is certainly a dangerous behavior with extreme consequences, disability and overdose are statistically rare compared to the mass of people who commonly use them. If the message recipient knows someone who uses substances but has not experienced these con-

sequences, the reliability of the campaign is undermined, and the persuasive message is unsuccessful.

Similarly, campaigns aimed at young people that show individuals severely affected by substance use disorder, focusing only on the negative aspects without suggesting alternative behaviors to avoid such consequences, are at risk of failure. Messages that instill feelings of fear must be used with great caution because they risk shifting the recipient's focus to managing these feelings rather than the behavior flagged as dangerous. Instilling fear of problem behavior can be a valid strategy only if it remains at levels that stimulate a motivation to change, rather than activating defensive strategies. The likelihood of change is increased by messages that provide practical guidance and important information aimed at increasing the sense of self-efficacy, i.e., the belief in one's ability to succeed. Another important highlighted aspect is the need to promote media literacy education among message recipients. The advent of social media and on-demand TV has greatly expanded the channels for transmitting health messages, making it essential to increase people's ability to critically analyze what is conveyed through them. Media literacy education becomes an indirect strategy for preventing health behaviors. Finally, recently available pieces of evidences indicate the use of social media as a potentially effective means of disseminating preventive messages<sup>41</sup>.

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### Screening and early identification

In general, there is an increase in alcohol consumption among women of childbearing age worldwide<sup>42</sup>. Early identification of alcohol consumption during pregnancy and its recognition as a routine part of the medical history of women at childbearing age and in pregnant women by healthcare providers is an effective and recommended means of prevention<sup>43</sup>.

Often, inaccurate self-reports of alcohol consumption stem from the fear of social stigma, particularly regarding drinking during pregnancy. This reluctance to provide realistic answers leads to underestimations of personal consumption<sup>44</sup>. To overcome this obstacle, the medical history process must occur within an empathetic relationship between the woman and the healthcare provider, in a context perceived as safe and protected, where the objective is to promote and protect the health of the woman and the child, rather than merely identifying behavior that could potentially lead to blame or embarrassment<sup>45</sup>.

Various methods can be employed to obtain realistic information about alcohol intake, such as the quantity/frequency/variability method<sup>44</sup>, which assesses average daily consumption, frequency, and



peaks of consumption. Questions under this method may include inquiries about typical daily alcohol intake, weekly drinking frequency, and maximum drinks consumed on any occasion in the past month.

The Timeline Follow-Back method is another commonly used approach<sup>46</sup>, anchoring questions to significant past events to aid in recalling personal drinking behavior. While this method may enhance accurate recollection, it may not effectively capture consumption patterns in less regular drinkers, particularly during pregnancy<sup>47</sup>.

It could be also advisable to integrate questions about alcohol consumption within a dietary diary context<sup>48</sup>.

Additionally, individuals often struggle to accurately assess their alcohol intake due to variations in glass sizes. Visual aids, such as images depicting standard drink sizes and different types of alcoholic beverages, can help individuals to identify the alcohol quantities more accurately<sup>49</sup>.

While many screening tests aim to identify at-risk alcohol consumption in the general population, they often fall short when applied to pregnant women due to their focus on male drinking patterns and addiction identification, which is less common in prenatal care settings<sup>50</sup>. Instead, a gender-specific approach is recommended<sup>23</sup>. Specific screening instruments tailored for pregnant women have been developed. Among the most used are the TWEAK (Tolerance, Worried, Eye-opener, Amnesia, K/Cut Down)<sup>51</sup>, the AUDIT-C (Alcohol Use Disorders Identification Test-consumption subset)<sup>52</sup>, and the T-ACE/TACE-3 (Tolerance, Annoyance, Cut Down, Eye-opener)<sup>53,54</sup> (table 1).

A review<sup>55</sup> compared seven different screening tests, with the TWEAK, AUDIT-C, and T-ACE exhibiting higher sensitivity and specificity. Notably, the AUDIT-C demonstrated the highest sensitivity in detecting pathological abuse. The Tweak and the T-ACE seem to be optimized for heavy drinkers while they can fail to identify moderate consumption. It will be

**Table 1.** TWEAK, AUDIT-C and T-ACE description.

**TWEAK**

- T** Tolerance: How many drinks can you hold? (Score 2 points for more than 2 drinks; Score 0 for 2 drinks or less)
- W** Have close friends or relatives Worried or complained about your drinking in the past year? Score 2 points if Yes
- E** Eye Opener: Do you sometimes take a drink in the morning when you get up? Score 1 point if Yes
- A** Amnesia: Has a friend or family member ever told you about things you said or did while you were drinking that you could not remember? Score 1 point if Yes
- K(C)** Do you sometimes feel the need to Cut down on your drinking? Score 1 point if Yes
- A total score of 2 or more indicates at-risk drinking**

**AUDIT-C**

- How often do you have a drink containing alcohol?
  - Never (0)
  - Monthly or less (1)
  - Two to four times a month (2)
  - Two to three times a week (3)
  - Four or more times a week (4)
- How many units of alcohol do you drink on a typical day when you are drinking?
  - None, I do not drink (0)
  - 1 or 2 (0)
  - 3 or 4 (1)
  - 5 or 6 (2)
  - 7 to 9 (3)
  - 10 or more (4)
- How often have you had 6 or more units if female, or 8 or more if male, on a single occasion in the last year?
  - Never (0)
  - Less than monthly (1)
  - Monthly (2)
  - Weekly (3)
  - Daily or almost daily (4)
- In men, a total score of 4 or more indicates at-risk drinking
- In women, a total score of 3 or more indicates at risk drinking

**T-ACE/TACER-3**

- T** Tolerance: How many drinks does it take to make you feel high? (Score 2 points for more than 2 drinks; Score 0 for 2 drinks or less)
- A** Have people Annoyed you by criticizing your drinking? Score 1 point if Yes
- C** Have you ever felt you ought to Cut down on your drinking? Score 1 point if Yes
- E** Eye opener: Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover? Score 1 point if Yes
- A total score of 2 or more indicates at-risk drinking (3 or more according to TACER-3)**

up to the clinician whether to use screening tools to further explore what emerged during the conversation or inquiring directly about any amount of consumption through the AUDIT-C<sup>56</sup>. Interesting for its brevity is the 1-Question screen, which asks the woman when she last consumed a drink. The 1-Question screen shows an agreement rate of 94.7% with the T-ACE used as gold standard<sup>57</sup>.

Although screening questionnaires are commonly used, recent studies highlighted a significant underestimation of gestational alcohol consumption when compared to direct biomarkers such as ethyl glucuronide in urine samples<sup>58,59</sup>. Biomarkers like fatty acid ethyl esters (FAEEs) detected in meconium can also identify maternal alcohol consumption and fetal exposure, with accumulation occurring during the second and third trimesters of pregnancy<sup>60</sup>. This method, while not facilitating prenatal identification, may be valuable in identifying high-risk children. To address this limitation, FAEEs can also be traced in maternal hair<sup>61</sup>. Furthermore, ongoing research explores alternative biomarkers such as micro-RNA and potential proteomic and metabolic markers<sup>62</sup>. Although these methods yield objective results, it's important not to forget that identifying alcohol consumption during pregnancy aims to promote the health of both the woman and the child, increasing the likelihood that she will decide to change her behavior. This can only be achieved within a context of trust between the patient and the healthcare provider, rather than through a confrontational approach<sup>63</sup>.

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## Intervention protocols

The consensus among governmental agencies and medical associations is that complete abstinence from alcohol during pregnancy is the optimal approach. Key organizations like the American College of Obstetricians and Gynecologists, the American Academy of Pediatrics, the US Office of the Surgeon General, and the US Department of Health and Human Services advocate for prevention strategies that emphasize the vital role of healthcare providers in educating, counseling, and referring women at risk of alcohol-related pregnancy complications.

To effectively reach women of childbearing age, preventive efforts should begin before conception. Screening for alcohol use should be conducted for all women at childbearing age, as recommended by the Clinical Working Group of the Select Panel on Preconception Care from the American Center for Disease Control and Prevention (CDC)<sup>64</sup> and WHO's Guidelines for the identification and management of substance use disorders in pregnancy<sup>43</sup>. It's noteworthy that undergoing alcohol screening itself can lead to reduced alcohol consumption<sup>65</sup>.

The Choices Project has been widely used in the prevention of alcohol-exposed pregnancies during the preconception period<sup>66</sup>. The project utilized motivational<sup>63</sup> intervention and cognitive-behavioral strategies to promote the adoption of effective contraceptive methods for reducing alcohol use. A review of the literature suggests that its main effect was to improve contraceptive strategies in sexually active women at child-bearing age, rather than lowering alcohol intake<sup>67</sup>. Recent reviews of preventive interventions targeting both pregnant and non-pregnant women have shown mixed results, although further research is needed for conclusive evidence<sup>23</sup>. Nevertheless, WHO guidelines strongly recommend Screening and Brief Intervention (SBI) for the prevention of alcohol consumption during pregnancy<sup>43</sup>, as the potential benefits far outweigh the hypothetical risks. The midwife appears to be the most suitable professional figure to implement interventions based on the BI model, thanks to the typical approach of the figure, based on the relationship and the climate of trust created with the patients<sup>45</sup>.

In particular, Screening, Brief Intervention, and Referral to Treatment (SBIRT) is a proven, comprehensive public health approach employed to identify and tackle risky alcohol use during pregnancy<sup>68-70</sup>. It involves screening consumption to obtain a user's risk profile for deciding how to proceed with the intervention, which will be of low intensity for low-risk users and high intensity for high-risk users or those with alcohol dependence. Although traditionally SBIRT refers to three risk categories (no consumption or low consumption, moderate consumption, and significant consumption), here we prefer to separate the category of non-consumers from that of low consumers. Indeed, since a definitive safe threshold hasn't been established yet, all pregnant women who consume alcohol are considered potentially at-risk and should be educated about the dangers to their babies.

*Women at NO-Risk:* these are women who abstain from alcohol entirely during pregnancy. No intervention is needed but reinforcing the importance of complete abstinence to solidify this behavior and encourage these women to advocate for health-conscious choices within their social circles.

*Low-risk Women:* these are pregnant women with a low level of drinking. A low-intensity intervention is suggested. Advising total abstinence from alcohol is recommended. A brief counseling session may be sufficient to ensure a safe pregnancy in this group.

*At-risk Women:* these are pregnant women with positive screening results. For them, the implementation of a Brief Intervention (BI) protocol is needed. BIs frequently draw upon the principles of motivational interviewing (MI)<sup>63</sup> to enhance awareness of alcohol-related risks and consequences and foster motivation for change. By employing this collaborative and client-centered approach, providers assist

women in exploring and resolving any ambivalence they may have towards changing unhealthy behaviors, such as alcohol consumption at risky levels.

*High-risk Women:* these are cases where there is clear evidence of alcohol abuse or addiction. In such instances, it's strongly recommended to refer the patient to specialized alcohol treatment units and collaborate to maximize the chances of a safe pregnancy. Treatment for these cases requires intensive case management and collaboration among various agencies and healthcare services.

When dealing with substance use disorder and alcohol use disorder, it becomes essential to involve the patient in a joint management system among the various agencies involved in the issue. Interventions should respond supportively to the psychological and social needs of the individual, in a relational climate of acceptance and validation. Available strategies include clinical approaches to the problem. This type of intervention should maximize the likelihood that the woman remains in the care and treatment system, through intensive case management, home visits, parenting programs, and treatment for trauma and/or psychopathology underlying the alcohol use disorder, as well as specific, including pharmacological, treatment for alcohol use disorder<sup>45</sup>. Specific guidelines are available<sup>43,71</sup>. Preventive intervention should continue even after pregnancy, with support for parenting, relapse prevention programs, and support for social needs, to break the cycle of intergenerational distress transmission.

Early identification of alcohol consumption during pregnancy is crucial for both preventive and therapeutic purposes. It enables targeted interventions, including nutritional supplementation. Maintaining optimal maternal nutritional status is highly important for proper fetal development, which is often compromised by alcohol exposure. Numerous studies in both animal models and humans have investigated the role of prenatal nutrition as a potential intervention for FASD through various nutrient supplements, including vitamin A, docosahexaenoic acid, folic acid, zinc, choline, vitamin E, and selenium. These supplements may prevent or mitigate the development of FASD, as discussed in a review<sup>72</sup>.

## Conclusions

The starting point for the effective prevention of alcohol-related harm during pregnancy is undoubtedly the training of personnel involved in maternal and child health care. Conducting an alcohol history of patients is the most recommended strategy in the literature, but this requires acquiring skills unfamiliar to sector operators. The development and dissemination of official guidelines support and lay the groundwork

for training. Evidence-based knowledge from the science of prevention should finally be included in training curricula. This tells us that media campaigns should be carefully planned, that fear-based messages should be avoided, and their potential is best realized when launched in addition to or in support of interventions at other levels. Many structural measures have proven effective in limiting alcohol consumption in the general population. Others, such as labeling bottles with warnings about specific risks for pregnant women, could be effective if carefully planned but available research still does not allow definitive conclusions about the effectiveness of this measure. While alcohol history, screening, and brief intervention reduce consumption in the general population and also in at-risk populations, the presence of alcohol use disorder in pregnancy requires multi-service and multi-professional care.

Finally, some ethical issues related to the stigma associated with alcohol consumption during pregnancy must be considered. There is a risk that preventive messages, whether disseminated through media as universal prevention or communicated to patients in the primary care setting, focusing only on the mother's responsibility and behavior, may contribute to reinforcing the stigma associated with consumption behaviors and thus decrease the likelihood that the woman will confidently seek services, addressing her drinking. It is not always possible for the person to stop consumption, for example, when there is addiction or when drinking is used as a coping mechanism<sup>8</sup>. These elements need to be considered and managed to avoid falling into the simplistic expectation that highlighting the risks of behavior is sufficient to modify it. The risk of naive and stigmatizing intervention can be avoided by adopting a perspective of non-judgment and validation of the person, whether the woman is already in health facilities, or whether we address the imagined recipient of our prevention campaign.

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