

ORIGINAL

## Review of the questionnaires used to detect alcohol consumption during pregnancy and the Green Page

### *Revisión de los cuestionarios utilizados para la detección del consumo de alcohol durante el embarazo y la Hoja Verde*

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#### Abstract

Alcohol consumption during pregnancy is a leading cause of fetal alcohol spectrum disorder (FASD). Maternal reporting in childbearing women or pregnant women is the standard for the early detection of alcohol consumption. The Green Page (GP) is a screening questionnaire of environmental health which includes the alcohol intake record during pregnancy and/or lactation period. The aim of this paper is to review the features of the different questionnaires for the detection of alcohol consumption during the gestation period and the GP, as well as to make a comparison between them. Review of the scientific literature published over the last 10 years of indexed articles in Medline. Combined searching strategy with MeSH descriptors: 'pregnancy, alcohol drinking, surveys and/or questionnaires'. AUDIT, AUDIT-C and SURP-P are mainly self-administered and do not require training. SURP-P and 4P's are validated in pregnant women. Others detect quantity and frequency of exposure, need specific training and are administered face to face: TLFB, RD, ACOG antepartum record and the GP. ACOG antepartum record and GP are specific for pregnant population. GP detects alcohol consumption at the beginning of pregnancy in both women and their partner on a holistic and global environmental health approach. A careful face-to-face recording of alcohol exposure with trained staff, with an integrative and global environmental health focus throughout pregnancy, may help improve prevention and screening of pregnancy at risk for FASD.

**Key words:** pregnancy, surveys and questionnaires, alcohol drinking, Green Page, fetal alcohol spectrum disorder

#### Resumen

El consumo de alcohol en el embarazo es la causa del trastorno del espectro alcohólico fetal (TEAF). La información aportada por las mujeres en edad fértil o embarazadas es el estándar para la detección temprana del consumo de alcohol. La Hoja Verde (HV) es una herramienta de cribado de salud medioambiental que incluye el registro de la ingesta de alcohol durante el embarazo y/o lactancia. El objetivo del presente trabajo es revisar las características de los distintos cuestionarios de detección del consumo de alcohol durante la gestación y de la HV, así como hacer una comparación entre ellos. Revisión de la literatura científica publicada en los últimos 10 años de los artículos indexados en Medline. Estrategia de búsqueda combinada con los descriptores MeSH: 'pregnancy, alcohol drinking, surveys and/or questionnaires'. AUDIT, AUDIT-C y SURP-P se realizan mayoritariamente autoadministrados y no requieren entrenamiento. SURP-P y 4P's Plus están validados en embarazadas. Otros detectan cantidad y frecuencia, requieren entrenamiento previo y se realizan cara a cara: TLFB, RD, ACOG antepartum record y la HV. ACOG antepartum record y la HV son específicos para embarazadas. La HV detecta el consumo de alcohol al inicio del embarazo tanto en la gestante como en su pareja con un enfoque holístico y global de la salud medioambiental. Un cuidadoso registro de la ingesta de alcohol de forma presencial, con profesionales entrenados y con un enfoque holístico y global de la salud medioambiental durante el embarazo ayudaría a mejorar la prevención y cribado de embarazos en riesgo de TEAF.

**Palabras clave:** embarazo, encuestas y cuestionarios, consumo de alcohol, Hoja Verde, trastorno del espectro alcohólico fetal

■ Received: June 2021; Accepted: January 2022.

■ ISSN: 0214-4840 / E-ISSN: 2604-6334

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Despite alcohol being a socially accepted and readily accessible drug (Howlett et al., 2018) in Western societies, it has not been possible to establish a safe level of alcohol intake during pregnancy (Schambra, Lewis & Harrison, 2017; Schuchat, 2017). Abstinence is therefore recommended in pregnant women and women of childbearing age (Carson et al., 2010; Chang et al., 2005). The prevalence of alcohol use in Spain in women of childbearing age (15-44 years) in the last 12 months and 30 days is 70% and 54%, respectively (Observatorio Español de las Drogas y las Adicciones [OEDA], 2019), while consumption of around 40-70% has been found at the beginning of pregnancy (Blasco-Alonso et al., 2015; Ortega-García et al., 2012).

Alcohol during pregnancy is teratogenic and a powerful neurotoxin for the fetus, and can cause a wide range of physical and neurodevelopmental defects, all of which are included under the rubric of fetal alcohol spectrum disorders (FASD) (Hoyme et al., 2016). The prevalence of FASD in Western countries is estimated to be between 3-5% of the school population (Centers for Disease Control and Prevention [CDC], 2019; May et al., 2018). Scientific societies have highlighted the importance of identifying at-risk pregnancies in diagnosing FASD and emphasize screening for intrauterine alcohol exposure (Cook et al., 2016). Consensus clinical guidelines on alcohol and pregnancy further recommend that screening for alcohol use be carried out in women of childbearing age (Carson et al., 2010, 2017).

In clinical practice, detection of alcohol use in pregnancy is done by direct questioning regarding the quantity and/or frequency of drinking or through standardized questionnaires. The World Health Organization (WHO) supports this by promoting the development of environmental screening to detect and manage environmental risks in pregnancy and childhood (WHO, 2018). The Pediatric Environmental Health Specialty Unit

(PEHSU-Murcia) has adapted the WHO Green Page (GP) for pregnancy and lactation. This environmental, global and holistic screening tool for the pregnant couple includes, among other factors, the quantity and frequency of alcohol intake during pregnancy and lactation (Ortega García, Sánchez-Sauco, Jaimes-Vega & Pernas-Barahona, 2013a, 2013b).

This study aims to review the characteristics of the different questionnaires for detecting alcohol use during pregnancy and the GP, as well as to compare them.

## Method

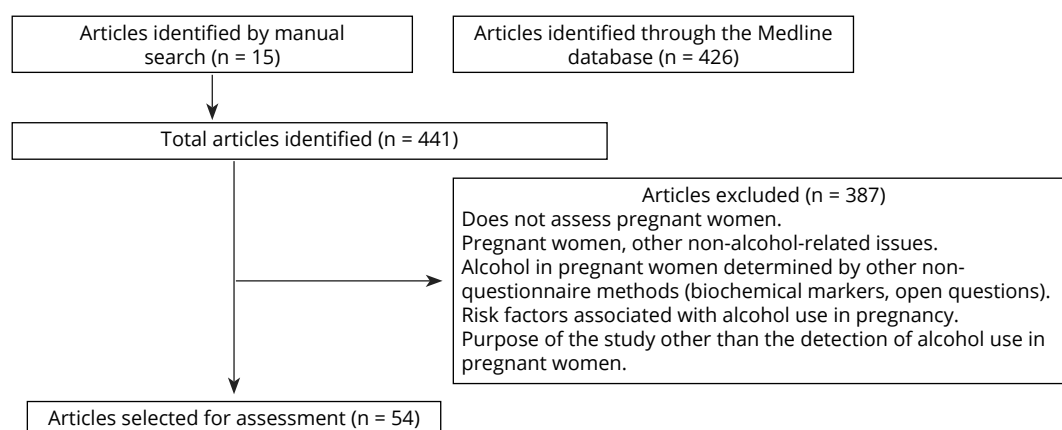
We reviewed the scientific literature published in the last ten years (up to December 2020) of articles published in Spanish or English indexed in Medline. The combination of the following descriptors was used as a search strategy: <<pregnancy>> [MeSH Terms] AND <<alcohol drinking>> [MeSH Terms] AND <<surveys and questionnaires>> [MeSH Terms]. Study types were limited to clinical trials, meta-analyses, observational studies, randomized controlled trials, clinical studies, case reports, government publications, clinical practice guidelines, reviews, systematic reviews, and validation studies. The search strategy was expanded with a manual review of the bibliographies of articles included in order to detail the methodology of the screening tools that were not sufficiently explained in the paper.

## Results

A total of 441 references were identified (426 by Pubmed search and 15 by manual search), of which 387 were excluded, leaving a selection of 54 articles for evaluation. Figure 1 shows the article selection algorithm.

In the selected studies, alcohol use is assessed in three ways: based on a scoring scale and cut-off point, and through

**Figure 1**  
*Algorithm for item selection*



**Table 1**  
*Questionnaires/screening tools for alcohol use in pregnant women*

Name	Records quantity and frequency	Alcohol use detection method	Number of questions	Pregnancy specific	Validated for pregnant	Other drugs considered	Partner considered	FtF / SelfA	Requires training	Time needed (min)	Includes other risk factors
<b>AUDIT</b>	Yes	Score	10	No	No	No	No	SefA	No	2	No
<b>AUDIT-C</b>	Yes	Score	3	No	No	No	No	FtF/ SefA	No	1	No
<b>CAGE</b>	No	Score	4	No	No	No	No	SefA	No	1	No
<b>NET</b>	No	Score	3	Yes	No	No	No	SefA	No	1	No
<b>T-ACE</b>	No	Score	4	Yes	Yes	No	No	SefA	No	1	No
<b>T-WEAK</b>	No	Score	5	Yes	Yes	No	No	SefA	No	1	No
<b>SMAST</b>	No	Score	13	No	No	No	No	SefA	No	2-3	No
<b>ASSIST 3.0</b>	Yes (only frequency)	Score	8	No	No	Tobacco and illegal drugs	No	FtF	No	5-10	No
<b>SURP-P</b>	Yes	Qualitative	3	Yes	Yes	Marijuana	No	SefA	No	1	No
<b>4P's Plus</b>	Yes	Qualitative	5	Yes	Yes	Tobacco	Yes	FtF	Yes	1	No
<b>TLFB</b>	Yes	Quantitative (SDU/gr)	-	No	No	No	No	FtF	Yes	10-15	No
<b>RD</b>	Yes	Quantitative (SDU/gr)	-	No	No	No	No	FtF	Yes	5	No
<b>ACOG antepartum record</b>	Yes	Quantitative (SDU/gr)	-	Yes	No	Tobacco and illegal drugs	No	FtF	Yes	10-15	Yes
<b>GP</b>	Yes	Quantitative (SDU/gr)	-	Yes	No	Tobacco and illegal drugs	Yes	FtF	Yes	5-7	Yes

*Note.* AUDIT (Alcohol Use Disorders Identification Test), AUDIT-C (Alcohol Use Disorders Identification Test-Consumption), CAGE (Cut Down, Annoyed, Guilty, Eye Opener), NET (Normal, Eye opener, tolerance), T-ACE (Tolerance, Annoyance, Cut Down, Eye Opener), TWEAK (Tolerance, Worried, Eye Opener, Amnesia, Cut Down), SMAST (Short Michigan Alcoholism Screening Test), ASSIST (Alcohol Smoking, and Substance Involvement Screening Test), SURP (Substance Use Risk Profile-Pregnancy), TLFB (time line follow back), RD (Retrospective Diary), American College of Obstetricians and Gynecologists (ACOG) antepartum record; GP (Green Page of pregnancy and lactation); FtF/SelfA: face to face/self-administered; SDU/gr: Standard Drink Unit/grams of alcohol.

qualitative or quantitative assessment (Standard Drink Units (SDU)/grams of alcohol consumed) (Table 1).

### **Questionnaires/instruments for assessing alcohol use based on scoring scale and cut-off point**

These instruments measure alcohol use by means of points scored on a completed questionnaire. A set cut-off point signals a certain drinking pattern which, although some consider quantity and frequency, does not correlate with the grams of alcohol drunk, where higher scores indicate a greater likelihood of risky or harmful drinking and/or alcohol dependence (WHO, 2001).

Table 2 shows the questionnaires/instruments assessing alcohol use based on a scoring scale and cut-off point.

The detection of alcohol use in pregnant women using the Alcohol Use Disorders Identification Test (AUDIT) uses the cut-off point (score  $\geq 6$ ) established to assess dangerous or harmful alcohol consumption in adult women (Comasco, Hallberg, Helander, Orelund & Sundelin-Wahlsten, 2012). AUDIT-C (short version of AUDIT) detects risky consumption using a score of  $\geq 3$ . When AUDIT-C is used in the pregnant population, changes are made in questionnaire structure and different cut-off points are applied to those validated in the general population (Comasco et al., 2012; Howlett et al., 2018; Mpelo et al., 2018).

T-ACE (Tolerance, Annoyance, Cut Down, Eye Opener) is the tool recommended by both the American College of Obstetricians and Gynecologists (ACOG) and the National Institute on Alcohol Abuse and Alcoholism (NIAAA) for

**Table 2***Alcohol use screening questionnaires/tools based on a scoring scale and cut-off point*

Name	Type of alcohol use assessed	Cut-off
<b>CAGE</b>	Alcohol dependence	≥2*
<b>SMAST</b>	Alcohol dependence	≥2*
<b>AUDIT</b>	Risky, harmful and dependent drinking	≥6*
<b>AUDIT-C</b>	Risky drinking	≥3*
<b>NET</b>	Risky drinking	Scoring range 0-4. No cut-off.
<b>T-ACE</b>	Risky drinking	≥2
<b>TWEAK</b>	Risky drinking	≥2
<b>ASSIST 3.0</b>	Risky drinking	≥5

Note. CAGE (Cut Down, Annoyed, Guilty, Eye Opener), SMAST (Short Michigan Alcoholism Screening Test), AUDIT (Alcohol Use Disorders Identification Test), AUDIT-C (Alcohol Use Disorders Identification Test-Consumption), T-ACE (Tolerance, Annoyance, Cut Down, Eye Opener), TWEAK (Tolerance, Worried, Eye Opener, Amnesia, Cut down) and ASSIST 3.0 (Alcohol Smoking, and Substance Involvement Screening Test).

Note. \*Cut-off points considered traditional (different cut-off points that may be obtained in each questionnaire result in different sensitivity and specificity). Higher scores on a questionnaire indicate a greater likelihood of risky, harmful, or dependent drinking.

detecting risky periconceptional drinking (Chiodo, Sokol, Delaney-Black, Janisse & Hannigan, 2010).

T-ACE and TWEAK (Tolerance, Worried, Eye Opener, Amnesia, Cut Down) are questionnaires designed and validated in pregnant women to assess risky drinking, defined as consumption equal to or greater than one ounce of alcohol daily (equivalent to 23.3 grams of alcohol). In both, risky drinking is considered to occur with a questionnaire score above 2 (Esper & Furtado, 2019; Kiely, Thornberry, Bhaskar & Rodan, 2011). A T-ACE cut-off point of 3 results in greater specificity in the identification of children with possible FASD (Chiodo et al., 2010).

The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) V3.0 was designed in the field of Primary Care to detect the use of alcohol and other drugs. The questionnaire score determines the type of intervention to be carried out. In pregnant women, a score of 5 identifies drinkers whose alcohol consumption puts the fetus at risk (Hotham, Ali, White, Sullivan & Robinson, 2013).

CAGE (Cut Down, Annoyed, Guilty, Eye Opener) and Short Michigan Alcoholism Screening Test (SMAST) questionnaires are rarely used in pregnant women since they are focused on detecting alcohol dependence.

Sensitivity and specificity of the different questionnaires varies depending on the definition of risky drinking used in each case, the cut-off point selected and whether it is applied at the periconceptional stage or during pregnancy, as well as on the population studied and the alcoholic drink standard used (Burns, Gray & Smith, 2010; Chiodo et al., 2010; Praestegaard, Kesmodel & Kesmodel, 2018). The most sensitive questionnaires for the detection of risky periconceptional drinking are TWEAK, T-ACE and AUDIT-C (Burns et al., 2010). Compared to T-ACE, TWEAK has better sensitivity but lower specificity.

Most of these questionnaires can be self-administered and do not need much experience.

### **Questionnaires/instruments for qualitative assessment of alcohol use**

4P's Plus and Substance Use Risk Profile-Pregnancy (SURP-P) include screening for alcohol and other legal and illegal substance and were developed and validated in the pregnant population. 4P's Plus and SURP-P return a positive value if any amount of alcohol or other drugs is reportedly consumed in the month prior to pregnancy confirmation. These tools have higher sensitivities than TWEAK (Chasnoff, Wells, McGourty & Bailey, 2007; Chasnoff et al., 2005; Yonkers et al., 2010), although specificity is lower.

### **Instruments for the quantitative assessment of alcohol use (Standard Drink Units (SDUs)/ grams)**

These are tools that allow the quantity, frequency and type of use (chronic or binge drinking) to be recorded in daily or weekly drink units or grams of alcohol. Professionals require training prior to using them. None has been validated in the pregnant population.

Time Line Follow Back (TLFB) and Retrospective Diary (RD) are tools that only record alcohol intake, and although they were not developed for pregnant women, they have been applied to this population (Dukes et al., 2017; Symon, Rankin, Butcher, Smith & Cochrane, 2017). In the case of TLFB, to obtain more precise information on the daily amount of alcohol consumed, it includes the type and brand of drink (the graduation varies for the same type of alcoholic beverage), frequency and quantity (Dukes et al., 2017).

RD, on the other hand, is a tool measuring weekly alcohol intake (Monday to Sunday), highlighting whether

**Table 3**  
*Green Page Pregnancy Spheres (Ortega García et al., 2013a, 2013b)*

Sociodemographic variables:

- Home
- Education level of both parents
- Socioeconomic level

Obstetric history and characteristics of current pregnancy.

Exposure to ionizing radiation (periconceptional and different periods of pregnancy).

Exposure to drugs, parapharmaceutical and herbal products.

Occupational exposure and risky hobbies.

Exposure to legal and illegal drugs.

Pesticides at home.

Personal perception of environmental risks.

the pattern of use remains the same in the time evaluated. It consists of a table detailing the different types of alcoholic beverages, specifying the amounts of each one drunk in ml. Cards are used to remember and specify the type of drink (Symon et al., 2017).

The ACOG antepartum record is a tool which, in addition to recording alcohol use, allows the medical and obstetric history to be recorded, as well as data on the current pregnancy (Bracero et al., 2017).

The pregnancy and lactation GP is an adapted version of the WHO recommendations. It is made up of a set of basic and concise questions to allow the environmental risks in the pregnant couple to be explored. The GP approach is based on a comprehensive overview evaluating physical, chemical, biological, social and psychosocial factors that affect the health of the pregnant woman and her child (Table 3). The different environmental risk factors include quantification of alcohol intake in daily grams during the different risk periods (spermatogenesis, periconceptional period, pregnancy and/or lactation). The GP is reproducible and has been adapted to the reality of different countries (de Moura Ribeiro, Texeira de Siqueira, Umbelino de Freitas, Carneiro Gomes Ferreira & Imperi de Souza, 2016). Training is required prior to use, and it is carried out face to face with the pregnant couple within a motivational interview framework in 5-7 minutes (Ortega-García et al., 2013a, 2013b).

ACOG antepartum record and GP have high specificity in the pregnant population.

Table 4 shows the advantages and disadvantages of the different questionnaires/tools for detecting alcohol use in pregnant women compared to the GP.

## Discussion

Tackling the issue of legal and illegal drugs in general and alcohol in pregnancy in particular is a taboo subject, given the biological, psychological, social and legal implications.

While information provided by pregnant women about their alcohol use is currently the gold standard in the detection of prenatal alcohol exposure, alcohol screening during pregnancy is still scarce, incomplete and/or relegated to self-administered questionnaires.

The factors found to be associated with alcohol use in pregnancy include the partner's alcohol intake, the number of bars in their neighbourhood, smoking, difficulty in accessing health services, as well as socioeconomic and obstetric factors (Cannon et al., 2012; May et al., 2008; Ortega-García, López-Hernández, Azurmendi Funes, Sánchez Sauco & Ramis, 2020). Overall, better results are obtained when alcohol is included in a comprehensive risk screening of pregnant women (Balachova et al., 2012; Symon et al., 2017).

In our environment, most pregnancies are wanted but often unplanned, so in most cases alcohol intake occurs during the first few weeks (early embryogenesis) when pregnancy has not yet been confirmed (Schuchat, 2017). In addition, pregnant women do not usually have an alcohol dependence profile. In fact, the vast majority of intakes of this toxic are related to festive periods (Christmas, Easter, summer) or social patterns. T-ACE, TWEAK and AUDIT (with assessment of alcohol use based on a score and cut-off point) frequently lead to the underreporting of low-to-moderate intake since they focus on detecting risky drinking and/or dependence (Burns et al., 2010). However, other tools such as TLFB, ACOG antepartum record, RD and GP are capable of collecting drinking patterns and levels, as well as establishing intake timing. T-ACE and TWEAK were developed and validated in pregnant women (Esper & Furtado et al., 2019; Kiely et al., 2011), while TLFB was not developed or validated in this population (Dukes et al., 2017). GP was developed for the pregnant population, although it has not been validated (Ortega García et al., 2013a). That said, however, while questionnaire validation is important, the lack of it does not imply a lower capacity for detecting prenatal alcohol exposure.

**Table 4**

*Advantages and disadvantages of the different questionnaires/tools for detecting alcohol use in pregnancy compared to the Green Page*

	Advantages	Disadvantages	GREEN PAGE	
			Advantages	Disadvantages
<b>Questionnaires/tools for assessing alcohol use based on a scale with a cut-off point</b>	<ul style="list-style-type: none"> <li>• Universally known</li> <li>• Mostly self-reported with pencil and paper</li> <li>• Do not require trained personnel</li> <li>• Allow mass screening</li> <li>• Short completion time (1-2 min)</li> <li>• T-ACE and TWEAK validated in pregnant women</li> </ul>	<ul style="list-style-type: none"> <li>• Does not quantify/Underreports alcohol use</li> <li>• Does not detect partner's alcohol use</li> <li>• Does not include other drugs</li> <li>• Does not consider other risk factors</li> </ul>	<ul style="list-style-type: none"> <li>• Comprehensive pregnancy evaluation</li> <li>• Integrated in motivational interview</li> <li>• Allows grams of alcohol consumed per drink/day to be obtained directly</li> <li>• Gender perspective</li> <li>• Possibility of intervention and/or early diagnosis of disorders related to drinking during pregnancy</li> </ul>	<ul style="list-style-type: none"> <li>• Needs longer completion time</li> <li>• Requires trained personnel</li> <li>• Not validated in pregnant population</li> <li>• Not possible to assess only alcohol</li> </ul>
<b>Questionnaires/tools with qualitative assessment of alcohol use</b>	<ul style="list-style-type: none"> <li>• Allow mass screening</li> <li>• Short completion time (1-2 min)</li> <li>• Validated in pregnancy</li> </ul>	<ul style="list-style-type: none"> <li>• Does not quantify alcohol use</li> </ul>		
<b>Questionnaires/tools with quantitative assessment of alcohol use</b>	<ul style="list-style-type: none"> <li>• Allows collection of obstetric data (ACOG antepartum record)</li> </ul>	<ul style="list-style-type: none"> <li>• Need longer completion time</li> <li>• Require trained personnel</li> <li>• Not validated in pregnant population</li> </ul>		

Another of the great discrepancies is found in data collection methods. There are notable differences between self-administered questionnaires, those carried out by interviewers, by untrained health professionals and by professionals trained in the detection and management of environmental risks, including drugs. Professionals trained in this type of interview can significantly reduce memory bias, identify and quantify alcohol intake in all critical periods of pregnancy (including spermatogenesis), intervene to eliminate such drinking and establish a follow-up to identify possible pathologies in the future individual born with this background. RD (carried out by trained personnel) detects higher alcohol use at the periconceptional stage, during pregnancy and binge drinking compared to AUDIT and AUDIT-C (mainly self-administered) (Symon et al., 2017). On the other hand, questionnaires carried out by trained personnel take more time to complete (Balachova et al., 2012). Completion time for the different questionnaires is variable and ranges from 1-2 minutes for AUDIT, T-ACE and TWEAK (Burns et al., 2010), and 5-7 minutes for GP (Ortega García et al., 2013b).

The inclusion of the partner in the clinical interview is key in the process due to the effects that drinking alcohol can have on spermatogenesis and due to the normal correlation between the consumption of the partner and that of the pregnant woman (Ortega-García et al., 2020). For this reason, joint intervention is much more effective, not only at a biological level, but also at a behavioural and emotional level. There are two tools that assess the partner's alcohol use, 4P'S Plus and the GP. The first

assesses problems related to alcohol and/or drug use, and the second quantifies the amount of alcohol drunk during pregnancy in daily grams and spermatogenesis.

Given the objectivity they provide, many of the advances in the early detection of alcohol during pregnancy are related to biomarkers. Different matrices have been studied, such as maternal hair in the first trimester of pregnancy and meconium in the newborn, and have proven to be sensitive and specific tools in screening for prenatal exposure to alcohol (Himes et al., 2015). However, they are not available in daily clinical practice because their analytical methodology is complex, expensive and not easily accessible (García-Algar et al., 2009; Manich et al., 2012). Biochemical markers alone are not sensitive enough in detecting prenatal alcohol exposure (Bakhireva & Savage, 2011). Thus, the combined use of GP with biomarkers such as carbohydrate-deficient transferrin (CDT) in early pregnancy increases the level of detection and improves the diagnosis of children at risk of FASD (Azurmendi-Funes et al., 2019).

Since there is no safe level of alcohol in pregnancy, effective detection and intervention must be complemented with other personalized preventive interventions (e.g., opportunistic interventions in women of childbearing age) or at a collective level with awareness campaigns. The clinical approach embodied in the motivational interview allows risk factors to be identified that improve the detection of alcohol in these critical periods and thus helps to intervene in the pregnant woman and her environment; it is also recommended that an environment of trust be created

to make it easy for pregnant women to communicate their alcohol use (Carson et al., 2017). Questionnaires carried out face to face by trained personnel will favour the creation of such environments. Specifically, when assessing alcohol within a set of risk factors, the GP will allow the health professional to gain the confidence of the pregnant woman when talking about periconceptional alcohol use.

The GP for pregnancy and lactation is a clinical tool which provides a comprehensive picture of the pregnant woman and her partner. It is a very versatile instrument given that it can be used in preconception consultations, during pregnancy and during lactation. These window periods in which the instrument can be used allow the diagnosis of prenatal exposure to alcohol to be fine-tuned and thus the interventions to be adapted to the needs of the woman and her environment (Johnson et al., 2006). The effective detection of alcohol use during pregnancy involves the consideration of a comprehensive approach, a motivational environment in which it can be applied, specific training of the health professionals who are to carry it out, as well as the inclusion of the partner/environment as part of the process (Balachova et al., 2012; Carson et al., 2010; Sánchez-Sauco, Villalona & Ortega-García, 2019). As all the factors mentioned are considered in the GP, this is a useful tool in the detection of prenatal exposure to alcohol.

## Conclusions

Given that there is no safe level of alcohol consumption in pregnancy, it is important to screen for children at risk of prenatal alcohol exposure.

Keeping a careful record of alcohol intake in women of childbearing age or pregnant women is a clinical act that contributes to improved primary prevention and screening for pregnancies at risk of FASD.

T-ACE, TWEAK, SURP-P and 4P's Plus are validated tools in pregnancy. However, the most effective in detecting drinking in pregnancy are those that approach the issue from the global perspective of environmental health by integrating the couple/environment and social networks, quantifying the grams of alcohol, and identifying the periods of intake. They should also be carried out in clinical and motivational interventions and with professionals trained in the detection and management of environmental risks, including drugs.

The GP is a global and holistic tool that allows the identification and management of exposures to environmental health risks (with special attention to exposure to legal and illegal drugs). It also promotes health protection factors in critical periods of pregnancy and lactation. Integrating environmental health into clinical practice will help develop new environmental skills and professional profiles for nurses and midwives.

## Acknowledgements

This work has been funded by the Fundación para la Formación e Investigación Sanitarias de la Región de Murcia (FFIS) (Health Training and Research Foundation of the Murcia region) through the program financed from the seized assets fund for the development of addiction programs of the Plan Nacional sobre Drogas, Ministerio de Sanidad, Consumo e Igualdad, España (National Plan on Drugs of the Spanish Ministry of Health, Consumer Affairs and Equality). The authors also wish to express their gratitude to Ecosistemas Saludables, Neurodesarrollo Saludables (Healthy Ecosystems, Healthy Neurodevelopment) and Asociación ZERO SAF.

## Conflict of interests

The authors declare no conflicts of interest regarding the development and publication of this paper.

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