

Alcohol in pregnancy: does the poor quality of Australian health education documentation undermine the message?

Objective: To review the content and design of existing documentation regarding alcohol consumption in pregnancy that is available to pregnant women in Australia. **Methods:** A document analysis was conducted involving the collection of a range of informational documents and systematically analysing the content of the written health education materials. The thematic and symbolic elements of each document were compared and contrasted using a modified version of the DISCERN instrument. **Findings:** Thirty-two documents in total were retrieved via general and targeted internet searching. Documents varied considerably in their purpose, language levels, accessibility, and quality. The majority of documents scored as low to moderate quality. **Implications:** Although there are many and varied existing documents relating to alcohol consumption during pregnancy in Australia these are not of high quality and could be substantially improved by including publication dates, using simple language, and providing sources of information. This may result in a more effective public health message and therefore may help in reducing the number of pregnant women continuing to drink during pregnancy.

Key words: Alcohol, pregnancy, health education, public health, evaluation, document analysis

The consumption of alcohol during pregnancy has long been known to pose a significant risk to the fetus (Clarren & Smith 1978; Jones & Smith 1975) and can result in physical defects and developmental problems for the infant, that continue through childhood and beyond (O'Leary 2002). As yet there is no known 'safe' level of alcohol consumption recognised during pregnancy (O'Leary & Bower 2012). For this reason, the current guidelines in Australia recommend total abstinence from alcohol for pregnant and breastfeeding women (National Health and Medical Research Council 2009). However, many women continue to drink during pregnancy (Callinan & Room 2012) despite these recommendations.

Prevalence and Predictors

Results from the 2010 National Drug Strategy Household Survey indicate that 47.3% of Australian women drank while pregnant before knowing about their pregnancy, with 19.5% continuing to drink after learning that they are pregnant (Callinan & Room 2012). This may be underestimated as women are often not asked about their alcohol consumption during pregnancy (France et al. 2010). Another recent study found that 34% of Australian women admitted to drinking alcohol in their last pregnancy and 31.6% would continue to consume alcohol if they were planning a pregnancy (Peadon et al. 2011). Furthermore, drinking in a previous pregnancy has been observed as an indicator of intention to drink in future pregnancies, along with higher levels of current consumption (Peadon et al. 2011). Women who continued to drink after learning of their pregnancy are also more likely to have a higher income, education, and socio-economic status (Callinan & Room 2012; Peadon et al. 2011). Moreover, there are several social factors that may influence a woman's decision to drink during pregnancy: socialising with people who drink regularly, attitudes of their social group, pressure to drink from friends, as well as their partner's use of alcohol

or other drugs (Chang et al. 2000; Peadon et al. 2011; Peadon et al. 2010; Testa & Leonard 1995).

Interventions

In an attempt to reduce alcohol consumption in pregnant women, a range of interventions have been assessed around the world (Gilinsky, Swanson & Power 2011; Stade et al. 2009). These interventions fall into two main categories: the clinical or public health approach. Clinical interventions target individuals and focus on a diagnosis and treatment approach. Clinical interventions can include pharmacological or surgical interventions, therapy-based approaches, and one-on-one treatment plans, where the framework remains based on the individual (Schoenbach 2000). Public health interventions, on the other hand, place less emphasis on diagnosis and treatment, and concentrate primarily on prevention at a community level (Schoenbach 2000). These interventions are forms of universal prevention and are often aimed at increasing knowledge among the general population. These can include mass media campaigns, educational interventions and government regulations such as alcohol warning labels. Public health interventions often involve the use of written health education materials, used to provide health information to both the general public and targeted patient populations. Written health education materials have a number of advantages and have been found to be effective in changing health knowledge and behaviour (Ley 1988; Redman & Paul 1997); however, there is limited research into the effectiveness of such publications.

With regards to alcohol consumption in pregnancy, many written health education materials provide information about alcohol consumption during pregnancy;

however, as almost 20% of pregnant women in Australia continue to consume alcohol during pregnancy, there is a need to evaluate these existing public health documents for their content and design. Therefore, a comprehensive review of all existing documentation has been identified to provide an understanding of what is in the documentation available to pregnant women, and how this may impact the effectiveness of health education materials in changing behaviour.

Aim

The aim of this paper is to review the content and design of existing health education documentation regarding alcohol consumption in pregnancy that is available to pregnant women in Australia.

Methodology

Study Design

A document analysis was conducted to provide insight into the written information that is available in Australia regarding alcohol consumption in pregnancy. Document analysis is a process of reviewing existing documentation from equivalent sources (ANU 2010). This involved a systematic analysis of the content of the written materials, and included an investigation of the thematic and symbolic elements of each document.

Procedure

To capture as many relevant documents as possible a comprehensive internet search was conducted. Firstly, a search was conducted via Google using a combination of the following search terms: pregnancy, alcohol, brochures/leaflets and Australia. In order to identify additional documents, the websites of the major

hospitals in the seven states of Australia, drug and alcohol services, and government health sites, as well as independent organisations were also searched for documents relating to alcohol consumption in pregnancy. These included: Royal Women's Hospital Melbourne, Mater Hospital Sydney and Brisbane, Royal Hobart Hospital Tasmania, Royal Darwin Hospital, King Edward Memorial Hospital, Women's and Children's Hospital, Turning Point, National Drug and Alcohol Research Centre (NDARC), Australian Drug Foundation (ADF), Drug and Alcohol Services South Australia (DASSA), SA Health, WA Health, NSW Health, TAS Health, QLD Health, NT Health, Russel Family Fetal Alcohol Disorders Association (RFFADA) and National Organisation for Foetal Alcohol Spectrum Disorders (NOFASD). The searches were conducted in March 2015. Documents identified through this search strategy were downloaded if they met specific selection criteria. Additionally, local hospitals including the Women's and Children's Hospital, Lyell McEwin Hospital, and Flinders Medical Centre, and major GP clinics in the Adelaide area were visited in order to obtain any other suitable documents.

Selection criteria

Inclusion criteria

Documents were defined as any written health education material described as a "fact sheet", "information sheet", "brochure", "pamphlet", "leaflet", "poster" or "booklet".

Exclusion criteria

Website forums, books and media articles were excluded. Any documents that were not relevant to pregnant populations and any documents not specific to alcohol

education were excluded. Further, documents that were not Australian were also excluded. No date restriction was applied to the search.

Data Analysis

The analysis of the health education documents involved a five stage process adapted from Appleton and Cowley (1997) which included: developing the criteria for critique; familiarisation with the data; grouping similar documents together; creating the analysis database; and the final analysis. Central to this process was the development of the criteria for critique; a pro forma which addressed a series of questions to the text. This pro forma was based on questions developed by the Academic Skills and Learning Centre (ANU 2010), as well as the poster analysis worksheet and written document analysis worksheet designed by The U.S. National Archives and Records Administration (The National Archives and Records Administration). The criteria for which each document was evaluated included: what type of document it was, when the document was produced, the author or producer of the document, the intended audience, the images used, if links to further support were provided, the level of readability, if alternatives to drinking were provided, if messages for partners were included, and if the sources of information were provided. In addition, three key messages were identified in each document and recorded so these textual messages could be analysed using thematic analysis techniques (Braun & Clarke 2006). For each of these criteria, data were quantified and are presented using frequencies and percentages. Additionally, level of readability was measured using the Flesch-Kincaid Grade Level readability test. (Kincaid et al. 1975).

Quality Assessment

In order to accurately assess the quality of each document, a modified version of the DISCERN quality assessment tool was used (Charnock et al. 1999). The DISCERN instrument was initially selected for use on the basis of a study by Ademiluyi et al. (2003) which evaluated tools used for the quality rating of web-based health information. The modified DISCERN instrument consists of 14 questions and an overall quality rating. Each of the 14 questions represents a separate quality criterion. Studies to date indicate that DISCERN has satisfactory internal consistency, good inter-rater agreement, and good face and content validity (Ademiluyi, Rees & Sheard 2003; Thakor et al. 2011).

A modified version of the DISCERN instrument (see Appendix) was developed to evaluate the quality of health education documents. The modifications consisted of: (i) adding specific descriptors for responses to questions 9 through to 11 (section two), (ii) removing question 12, (iii) changing question 13 from quality of life to the role of lifestyle factors, and (v) changing question 14 from possible treatment options to alternatives to drinking alcohol. Responses to the 14 questions were rated using a five-point Likert scale, ranging from one (low quality with serious or extensive shortcomings) to five (high quality with minimal shortcomings). The scores were then averaged in order to acquire the overall quality rating of the document.

An assessment of the reliability of the scoring system was undertaken as follows. Twelve documents were scored independently by two of the authors (F C-W and AF) using the modified DISCERN instrument. Documents which varied in design (four posters, three multi-page brochures, two single-page leaflets, and three online fact sheets) were selected for this purpose. Reliability, as measured by the Intraclass Correlation Coefficient (ICC) two-way mixed model, average measure model for agreement, was 0.97. This was considered to be a high level of agreement.

Results

Internet searching via Google resulted in 25 relevant documents, targeted hospital website searching produced three relevant documents, one document was retrieved from the Australian Drug Foundation, and three additional documents were retrieved by visiting local hospitals. This resulted in a total of 32 documents to be included in the analysis. Table 1 provides an online link to each document as well as basic details of the publication content.

Description of documents

The 32 documents included seven posters, twelve multi-page brochures, four single-page leaflets, three A4 fact sheets, four online information sheets, and two wallet cards. Documents varied considerably in size (between 1 and 30 pages), style (from glossy documents to plain, functional documents) and purpose (from targeting Aboriginal women to informing the general public). Fifteen documents (47%) did not provide a date of publication; however, the documents that did were produced between 2000 and 2014, of which five (15%) were produced before the change in government guidelines for alcohol consumption during pregnancy in 2009 (National Health and Medical Research Council 2009). Out of the 32 documents, 16 (50%) were developed by non-government organisations (such as RFFADA, NOFASD, and the Australian Drug Foundation), 10 (31%) were developed by government agencies (ID numbers 1, 2, 3, 13, 15, 19, 20, 23, 25, 32), three (9%) by hospitals (ID 11, 12, 18), two (6%) by the alcohol industry (ID 8, 24), and one (3%) by a university (ID 16). Eight documents (25%) were targeted specifically at Aboriginal women (ID 2, 4, 13, 17, 19, 25, 27, 32), five (15%) were targeted at women planning a pregnancy (ID 8, 10, 18, 22, 24), and one document (3%) targeted parents not just the pregnant

woman (ID 3). Only two documents (6%) contained any messages for partners. One (ID 24), created by DrinkWise Australia, used a quote from Dr Rochford (a media personality) stating “it’s safest for your partner not to drink while pregnant. Make sure you support her”. The other (ID 22), created by the Australian Drug Foundation, stated that “men planning a pregnancy are advised to stop or reduce their alcohol and drug use before conception”.

Twenty-four of the documents (75%) used textual messages with eight (25%) using both textual and visual messages. Most of the documents (n=25, 78%) utilised an image; with 10 of those images relating to pregnancy, seven of women refusing a drink, four relating to alcohol, three images of a baby, three images of Aboriginal art design, and two images of a child with Foetal Alcohol Syndrome.

A minority of the documents (n=7, 21%) provided the sources of the information. However, half of the documents (n=16, 50%) provided links to further support and information, such as Alcohol Drug Information Service and other phone helpline numbers and web sources.

Five documents (15%) provided alternatives to consuming alcohol, or suggestions of what to say when offered a drink (ID’s 11, 14, 16, 26, and 31). These included: substituting alcohol with non-alcoholic beverages; learning relaxation techniques; delaying the first drink; distracting yourself with other activities; and catching up in non-alcohol environments.

Only three documents mentioned the type of alcohol that can cause harm in pregnancy. One of these stated that “all alcohol will cause problems before your bub is born: beer, spirits (rum and scotch), mixed cans, bottled wine and cask wine, all grog” (ID 17). The other described the Australian standard drink and explained that

“beer, wine, spirits or hard liquor, liqueur, port, sherry and homebrew all contain different amounts of alcohol. The more alcohol a drink contains the stronger it will be” (ID 13). Both of these documents were targeted at an Aboriginal population. One document aimed at a general population stated “All types of alcohol are equally harmful, including all wines and beer” (ID 28). In all other documents there was a lack of information on whether all forms of alcohol had the same effects on the fetus.

Key themes in messages

Figure 1, shows that the overarching theme found was that alcohol is not safe during pregnancy; that is, there is no safe level of alcohol consumption during pregnancy, no safe time to consume alcohol while pregnant, and if you’re pregnant the safest option is not to drink alcohol. Key secondary themes included alcohol causes harm to the fetus, the effects of alcohol on the fetus, seeking support, and mother’s responsibility.

Quality of documents

Based on the DISCERN quality assessment instrument (Charnock et al. 1999), the selected documents were of relatively poor quality. Overall 28% (n=9) of the documents had a score of less than 2 (i.e. low quality), 69% (n=22) received a score between 2 and 4 (i.e. moderate quality) and no document received a score of 5 (i.e. high quality). The highest scoring document received a score of 4.14 (ID 14). The lowest scoring document was a poster with limited information provided and no publication details (ID 1, quality score = 1.29).

Although several documents achieved similar scores, the quality rating of individual questions was noticeably varied. Most of the documents received the lowest scores

in section two: how good is the quality of information. The worst performing items were question 13 (does it provide alternatives to drinking alcohol?), question 8 (does it refer to areas of uncertainty?), question 4 (is it clear what sources of information were used to compile the publication?), question 14 (does it provide support for shared decision making?), and question 12 (does it describe the role of other lifestyle factors?). Best performing items were question 7 (does it provide details of additional sources of support and information?), and question 3 (is it relevant?).

Based on the Flesch-Kincaid Grade Level readability test, the average grade reading level of the documents was 7.6, with seven documents scoring over grade ten (ID 3, 11, 20, 21, 26, 30, 31) and one document achieving a score of grade 2 (ID 9).

Discussion

This document analysis is the first study comparing posters, brochures, leaflets and other health education materials that are available in Australia regarding alcohol consumption in pregnancy. An analysis of this kind was deemed important as despite a number of public health campaigns and government warnings about the risk associated with drinking during pregnancy, a considerable percentage of women continue to drink (Callinan & Room 2012). The current study obtained a total of 32 documents providing information on alcohol consumption in pregnancy. The most significant finding was that the majority of the documents were of low to moderate quality, which may translate into poor efficacy of such public health campaigns. Awareness of the present study's results may lead to an improvement in future health education documents in this area.

Effective written health education materials and documents may play a key role in changing knowledge, attitudes and behaviour; however, limited research has been

conducted into what makes these public health materials most effective. Some studies have suggested that the characteristics of effectively written health information materials can be grouped into design characteristics and content characteristics (Griffin, McKenna & Tooth 2003; Hoffmann & Worrall 2004). In order to improve the content of documents providing information on alcohol consumption in pregnancy, the authors must ensure that the document is simple, clear, and accurate. As such, the document should be written at a suitable language level, use conversational tone, make use of headings and sub-headings, and include a publication date. To improve the design characteristics of such documents, the authors should utilise dark print on a light background, use ample spacing, include bold print for important messages, and use informative, striking illustrations (Griffin, McKenna & Tooth 2003; Hoffmann & Worrall 2004). Using eye-catching illustrations as well as written content may also allow for health education documents to reach a wider audience as effective health education materials need to be tailored to individual learning styles including visual and verbal styles (Redman & Paul 1997). Research suggests that the average reading level for most adults in the United States is at 8th or 9th grade (Ryan et al. 2014); however, studies have suggested that the most effective printed material should be written at a reading level of 5th or 6th grade (Badarudeen & Sabharwal 2010; Mayer & Villaire 2009). This suggests that the average reading grade of the documents in this study was slightly high at 7.7, and several documents (38%) were written at a reading grade level much higher than that which is most effective, grade 10. This corresponds to research in the U.S. which suggests that most health education materials are written at a reading level too high to be well understood (Ryan et al. 2014). The documents aimed at

Aboriginal women were written at a much lower and more appropriate reading grade level than the rest of the documents (between 3rd and 7th grade).

Many of the documents lacked references, meaning it was unclear what the sources of information were. This brings into question the credibility of the information provided, particularly of those documents that were not created by government agencies. One of the key components of effective written health education materials is to provide accurate information (Hoffmann & Worrall 2004). Not only could these documents have provided references to support the major statements, but it is important that all health education materials contain a publication date and are updated regularly. For instance, the Women's and Children's Hospital, South Australia, has a policy suggesting documents are updated every 4 years and it is essential that this policy is followed.

Although all of the documents followed the national guidelines (National Health and Medical Research Council 2009) and recommended that no alcohol was the best and safest option for pregnant women, many did not describe the harmful effects that alcohol may cause to the fetus. This information should be included in these documents as highlighting the reasons behind the recommendations may be a motivator for change. Past research has reported that factual information is an effective incentive for reducing alcohol consumption and plays an important role in information based prevention campaigns (Scheier & Botvin 1997). Furthermore research into alcohol and pregnancy has reported that although women may know not to drink during pregnancy, many women cannot explain the effects that alcohol can have on the fetus (Peadon et al. 2010). Previous research investigating the use of alcohol warning labels with regards to alcohol consumption in pregnancy found that the most effective warning labels are those attracting attention, identifying the

hazard, explaining the consequences, and providing advice for avoiding the hazard (Eurocare 2011). It is likely that the warning messages displayed on written health documentation must include similar information in order to be effective. Therefore, it would be beneficial for a majority of the documents analysed in this paper to have included an explanation of the consequences of alcohol consumption during pregnancy. As alcohol consumption is a prevalent part of Australian culture, it would also be beneficial for these documents to provide suggestions on how to avoid alcohol, or alternatives to drinking alcohol in various social situations.

The included documents exhibited a lack of information targeted towards partners and other supportive individuals. Expectant fathers play a key role in healthy pregnancy outcomes, especially as it has been found that women's alcohol consumption is often influenced and encouraged by other people including partners (Finkelstein 1994). Recent Australian research found that 38% of women would be less likely to drink alcohol if their partner or spouse encouraged them to cut back or stop drinking during the pregnancy (Peadon et al. 2011). Similar research in Canada noted that seven out of ten men would encourage their partner to stop drinking alcohol while pregnant, but only three out of ten men would be willing to stop consuming alcohol themselves while their partner was pregnant (Environics Research Group 2006). This suggests that messages aimed at the partner and other people supporting the pregnant women may enhance the effectiveness of health education documents in reducing alcohol consumption during pregnancy.

After conducting a quality assessment it was found that the highest scoring document was a multi-page brochure produced in 2011 by the National Organisation for Foetal Alcohol Syndrome and Related Disorders (NOFASARD). This brochure features the slogan "be kind to me, stay alcohol free" and follows the government

guidelines that no alcohol is the safest option for pregnant women and women planning a pregnancy (National Health and Medical Research Council 2009). Information is provided on the reasons not to drink alcohol during pregnancy, the harm that alcohol may cause to an unborn baby, a description of Foetal Alcohol Spectrum Disorders, the consumption of alcohol before pregnancy knowledge, as well as some tips on how to say no to alcohol when pregnant. The brochure encourages shared decision making, and provides links to further support; however, this document does not provide the sources of information, and provides no specific information for the partners of pregnant women. The documents with lower quality ratings tended not to include the sources of information, publication date, provided little factual information and featured no images or striking design features.

A thematic analysis of the text from each of the documents found that the key theme was one of safety. Many of the documents suggested that there was no safe type of alcohol; no safe amount of alcohol; and no safe time to consume alcohol during pregnancy. The wording of this message provides neutral information and allows individuals to make their own informed health decisions, rather than emphasising a negative message. A major secondary theme found in the documents was that alcohol can cause harm to the fetus, which included messages such as 'alcohol can affect your unborn baby for life' and 'alcohol may cause permanent damage to your unborn baby'. Although the theme that alcohol can cause harm to the fetus recurred in many of the documents, as previously mentioned many of the documents failed to provide details on the type of harm or method of harm that alcohol may cause. Furthermore, these messages generally used a negative or threat-based approach to inform women of the risks, which has the potential to make pregnant women feel guilty or reject the advice.

Limitations

Limitations associated with the conduct of this study include that firstly, the internet search was limited to a single search engine and a small number of targeted websites. Further, the documents were limited to English language publications only and did not include documents that may be aimed at other non-English speaking groups. Additionally, the search did not include documents on the topic of nutrition in pregnancy, or other topic areas that may have covered information about alcohol consumption in pregnancy.

Implications

Despite the studies limitations, the implications from this study are that current health education documents regarding alcohol consumption in pregnancy are of low to moderate quality, which may limit their effectiveness in changing behaviour. The largely moderate to low quality of the documents retrieved, and the valuable information that was lacking in many of the documents suggests that health education documentation in the area of alcohol consumption in pregnancy could be improved. Effective documents on the subject of alcohol consumption during pregnancy need to be written in simple, conversational language at a 5th to 6th grade reading level; should supply factual information, and include details about the risks including an explanation of the potential consequences of consuming alcohol in pregnancy. Further, documents could be improved by providing alternatives to drinking alcohol; providing information for the partners and other supportive individuals; stating the publication date; and utilising appropriate images and visual elements that attract attention. It is likewise recommended that documents target partners and other family members, as well as the pregnant women, as alcohol

consumption is heavily influenced by a woman's social circle. While the implications of this research are aimed at health education materials relating to alcohol consumption in pregnancy, the findings could be used to relate to any public health concern as it is important that health education messages are distributed in the most effective way in order to increase behaviour change.

Conclusions

The purpose of this study was to review and compare health education documents that provide information to pregnant women about alcohol consumption during pregnancy. The conclusion is that although there are many and varied existing documents on the topic they are of low to moderate quality, which may be contributing to Australian women who continue to drink during pregnancy. The results of this study highlight a need to enhance the quality of documents relating to alcohol consumption in pregnancy, which may result in a more effective public health message and therefore may help in reducing the number of pregnant women continuing to drink during pregnancy.

References

Ademiluyi, G, Rees, CE & Sheard, CE 2003, 'Evaluating the reliability and validity of three tools to assess the quality of health information on the Internet', *Patient Education and Counseling*, vol. 50, no. 2, pp. 151-155.

ANU 2010, Writing a document analysis, Australian National University, Canberra, viewed 8th April 2013, <<https://academicskills.anu.edu.au/resources/handouts/writing-document-analysis>>.

Badarudeen, S & Sabharwal, S 2010, 'Assessing readability of patient education materials: current role in orthopaedics', *Clinical Orthopaedics and related research*, vol. 468, no. 10, pp. 2572-2580.

Braun, V & Clarke, V 2006, 'Using thematic analysis in psychology', *Qualitative Research in Psychology*, vol. 3, no. 2, pp. 77-101.

Callinan, S & Room, R 2012, *Alcohol consumption during pregnancy: Results from the 2010 National Drug Strategy Household Survey*, Centre for Alcohol Policy Research, Canberra, viewed February 2012, <<http://urn.kb.se/resolve?urn=urn:nbn:se:su:diva-85744>>.

Chang, G, Goetz, MA, Wilkins-Haug, L & Berman, S 2000, 'A brief intervention for prenatal alcohol use An in-depth look', *Journal of Substance Abuse Treatment*, vol. 18, no. 4, pp. 365-369.

Charnock, D, Shepperd, S, Needham, G & Gann, R 1999, 'DISCERN: an instrument for judging the quality of written consumer health information on treatment choices', *Journal of Epidemiology and Community Health*, vol. 53, no. 2, pp. 105-111.

Clarren, SK & Smith, DW 1978, 'The fetal alcohol syndrome', *N Engl J Med*, vol. 298, no. 19, pp. 1063-1067.

Enviro-nics Research Group 2006, *Alcohol use during pregnancy and awareness of fetal alcohol syndrome and fetal alcohol spectrum disorder*, Enviro-nics Research Group Limited, Toronto.

Eurocare 2011, What's not on the bottle? Brief overview of state of play in alcohol labelling., The European Alcohol Policy Alliance, Brussels, Belgium, viewed 29th April 2013, <http://www.eurocare.org/resources/policy_issues/alcohol_and_pregnancy>.

Finkelstein, N 1994, 'Treatment Issues for Alcohol- and Drug-Dependent Pregnant and Parenting Women', *Health & Social Work*, vol. 19, no. 1, pp. 7-15.

France, K, Henley, N, Payne, J, D'Antoine, H, Bartu, A, O'Leary, C, Elliott, E & Bower, C 2010, 'Health professionals addressing alcohol use with pregnant women in Western

Australia: barriers and strategies for communication', *Subst Use Misuse*, vol. 45, no. 10, pp. 1474-1490.

Gilinsky, A, Swanson, V & Power, K 2011, 'Interventions delivered during antenatal care to reduce alcohol consumption during pregnancy: A systematic review', *Addiction Research & Theory*, vol. 19, no. 3, pp. 235-250.

Griffin, J, McKenna, K & Tooth, L 2003, 'Written health education materials: Making them more effective', *Australian Occupational Therapy Journal*, vol. 50, no. 3, pp. 170-177.

Hoffmann, T & Worrall, L 2004, 'Designing effective written health education materials: considerations for health professionals', *Disability & Rehabilitation*, vol. 26, no. 19, pp. 1166-1173.

Jones, KL & Smith, DW 1975, 'The fetal alcohol syndrome', *Teratology*, vol. 12, no. 1, pp. 1-10.

Kincaid, JP, Fishburne, RP, Rogers, RL & Chissom, BS 1975, *Derivation of New Readability Formulas (Automated Readability Index, Fog Count, and Flesch Reading Ease formula) for Navy Enlisted Personnel*, Research Branch Report Naval Air Station Memphis.

Ley, P 1988, *Communicating with patients: Improving communication, satisfaction and compliance*, Croom Helm, London.

Mayer, G & Villaire, M 2009, 'Enhancing Written Communications to Address Health Literacy', *Online Journal of Issues in Nursing*, vol. 14, no. 3, pp. 4-4.

National Health and Medical Research Council 2009, *Australian Guidelines to Reduce Health Risks from Drinking Alcohol* NHMRC, Canberra.

O'Leary, CM 2002, *Fetal alcohol syndrome : a literature review / prepared for the National Expert Advisory Committee on Alcohol* Commonwealth Department of Health and Ageing, Canberra.

O'Leary, CM & Bower, C 2012, 'Guidelines for pregnancy: what's an acceptable risk, and how is the evidence (finally) shaping up?', *Drug Alcohol Rev*, vol. 31, no. 2, pp. 170-183.

Peadon, E, Payne, J, Henley, N, D'Antoine, H, Bartu, A, O'Leary, C, Bower, C & Elliott, EJ 2010, 'Women's knowledge and attitudes regarding alcohol consumption in pregnancy: a national survey', *BMC Public Health*, vol. 10, p. 510.

Peadon, E, Payne, J, Henley, N, D'Antoine, H, Bartu, A, O'Leary, C, Bower, C & Elliott, E 2011, 'Attitudes and behaviour predict women's intention to drink alcohol during pregnancy: the challenge for health professionals', *BioMed Central*, vol. 11, p. 584.

Redman, S & Paul, C 1997, 'A review of the effectiveness of print material in changing health-related knowledge, attitudes and behaviour', *Health Promotion Journal of Australia: Official Journal of Australian Association of Health Promotion Professionals*, vol. 7, no. 2, p. 91.

Ryan, L, Logsdon, MC, McGill, S, Stikes, R, Senior, B, Helinger, B, Small, B & Davis, DW 2014, 'Evaluation of Printed Health Education Materials for Use by Low-Education Families', *Journal of Nursing Scholarship*, pp. n/a-n/a.

Scheier, LM & Botvin, GJ 1997, 'Expectancies as mediators of the effects of social influences and alcohol knowledge on adolescent alcohol use: A prospective analysis', *Psychology of Addictive Behaviors*, vol. 11, no. 1, p. 48.

Schoenbach, VJ 2000, 'Epidemiology and public health', *Understanding the Fundamentals of Epidemiology - an evolving text*, vol. Fall Edition 2000, University of North Carolina, Chapel Hill, pp. 551-563.

Stade, BC, Bailey, C, Dzendoletas, D, Sgro, M, Dowswell, T & Bennett, D 2009, 'Psychological and/or educational interventions for reducing alcohol consumption in pregnant women and women planning pregnancy', *Cochrane Database Syst Rev*, no. 2, p. CD004228.

Testa, M & Leonard, KE 1995, 'Social influences on drinking during pregnancy', *Psychology of Addictive Behaviors*, vol. 9, no. 4, pp. 258-268.

Thakor, V, Leach, MJ, Gillham, D & Esterman, A 2011, 'The quality of information on websites selling St. John's wort', *Complementary Therapies in Medicine*, vol. 19, no. 3, pp. 155-160.

The National Archives and Records Administration Document Analysis Worksheets, College Park, viewed 8th April 2013, <<http://www.archives.gov/education/lessons/worksheets/>>.

Table 1. Document characteristics and online links

ID	Web link	Style	Year of publication	Reading grade	Quality rating
1	http://www.dao.health.wa.gov.au/DesktopModules/Bring2mind/DMX/Download.aspx?Command=Core_Download&EntryId=771&PortalId=0&TabId=211	poster		3	1.29
2	http://www.health.vic.gov.au/vdapc/archive/kit_flipchart.pdf	multi-page brochure	2007	3	2.36
3	http://www.cyh.com/HealthTopics/HealthTopicDetails.aspx?p=114&np=122&id=1950	online information sheet	2013	11	2.93
4	http://www.healthinonet.ecu.edu.au/uploads/resources/17641_17641_2012.pdf	multi-page brochure	2009	4	2.79
5	http://www.nofasd.org.au/resources/nofasd-australia-resources	multi-page brochure	2012	8	2.86
6	http://rffada.org/images/stories/documents/Alcohol_can_harm_your_unborn_child_poster_A4_size.pdf	multi-page brochure		8	2.79
7	http://www.healthinonet.ecu.edu.au/key-resources/promotion-resources?lid=23903	poster	2012	6	1.64
8	https://drinkwise-production-assets.storage.googleapis.com/6.04-DrinkWise-Pregnancy-Brochure-2.pdf	poster	2011	10	1.57
9	http://rffada.org/images/stories/documents/Alcohol_can_harm_your_unborn_child_poster_A3.pdf	poster		2	1.5
10	http://www.adac.org.au/siteF/resources/p_fas_fae.pdf	poster	2000	3	2.93
11	http://brochures.mater.org.au/Home/Brochures/Mater-Mothers-Hospital/Alcohol-use-during-pregnancy-and-breastfeeding	online information sheet	2011	11	3.57
12	https://www.thewomens.org.au/health-information/pregnancy-and-birth/pregnancy-drugs-	online	2013	10	2.93

	alcohol/alcohol/	information sheet			
13	http://www.dao.health.wa.gov.au/DesktopModules/Bring2mind/DMX/Download.aspx?Command=Core_Download&EntryId=398&PortalId=0&TabId=211	multi-page brochure	2010	4	2.5
14	http://www.aodknowledgecentre.net.au/aodkc/key-resources/health-promotion-resources?lid=21769	multi-page brochure	2011	5	4.14
15	http://www.wacountry.health.wa.gov.au/fileadmin/sections/alcohol_and_pregnancy/WACHS_B_FetalAlcoholSpectrumDisorder.pdf	multi-page brochure		9	2.93
16	http://alcoholthinkagain.com.au/Portals/0/documents/No%20alcohol%20in%20pregnancy%20is%20the%20safest%20choice%20-%20wallet%20card%20for%20women.pdf	double sided wallet card		6	1.86
17	http://rffada.org/images/stories/documents/rffada_fasd_brochure_Indigenous1.pdf	multi-page brochure		6	2
18	http://www.druginfo.adf.org.au/attachments/190_FS_pregnancy2012.pdf	A4 fact sheet	2012	7	3.71
19	http://www.vibe.com.au/clients/staystrong/pdf/poster3.pdf	poster		5	1.93
20	http://www.alcohol.gov.au/internet/alcohol/publishing.nsf/Content/83B8C7EC9E890F23CA25767300752E39/\$File/pregnant.pdf	single-page leaflet	2010	11	2.64
21	http://www.seslhd.health.nsw.gov.au/Mothersafe/documents/AlcoholPregnancyFactsheet2014dk.pdf	A4 information sheet	2009	14	3.29
22	http://bookshop.adf.org.au/booklets/alcohol,-other-drugs-and-pregnancy.aspx?id=50	30 page booklet	2009	10	3.35
23	http://www.healthinonet.ecu.edu.au/uploads/resources/19111_19111.pdf	single-		7	2.43

		page leaflet			
24	https://drinkwise-production-assets.storage.googleapis.com/6.06-DrinkWise-Pregnancy-Brochure.pdf	multi-page brochure		9	2.29
25	http://www.healthinonet.ecu.edu.au/uploads/docs/HeLP/Pregnancy%20and%20alcohol%20don't%20mix.pdf	single-page leaflet		7	2.43
26	http://www.alcohol.gov.au/internet/alcohol/publishing.nsf/Content/0FF96125D3B433FDCA257CCF00055046/\$File/FARE%20WWTK%20Consumer%20DL_v14.pdf	multi-page brochure		11	3.14
27	http://www.aodknowledgecentre.net.au/aodkc/key-resources/health-promotion-resources?lid=27864	multi-page brochure		5	2.5
28	www.nofasd.org.au/LiteratureRetrieve.aspx?ID=174047	single-page leaflet		10	2.29
29	www.nofasd.org.au/LiteratureRetrieve.aspx?ID=181483	poster		7	1.43
30	http://www.den.org.au/wp-content/uploads/2013/07/AlcoholPregnancy_DEN.pdf	online factsheet		12	2.86
31	http://www.druginfo.adf.org.au/attachments/article/1702/FS_PregnancyBreastfeedingAlcohol_Dec2014.pdf	A4 factsheet	2014	11	3.93
32	http://alcoholthinkagain.com.au/Portals/0/documents/publications/Alcohol%20and%20Health/Sssf-Wallet-Card.pdf	wallet card		9	1.93

Figure 1 - Modified DISCERN quality scoring system

Section 1 – Is the publication reliable?

1. Are the aims clear?
2. Does it achieve its aims?
3. Is it relevant?
4. Is it clear what sources of information were used to compile the publication?
5. Is it clear when the information used in the publication was produced?
6. Is it balanced and unbiased?
7. Does it provide details of additional sources of support and information?
8. Does it refer to areas of uncertainty?

Section 2 – How good is the quality of information?

9. Does it describe how alcohol affects the foetus?
10. Does it describe any benefits for reducing alcohol use in pregnancy?
11. Does it describe the risks?
12. Does it describe the role of other lifestyle factors?
13. Does it provide alternatives to drinking alcohol?
14. Does it provide support for shared decision making?

Section 3 – Overall rating of the publication

15. Based on the answers to all of the above questions, rate the overall quality of the publication as a source of information about treatment choices

Adapted from DISCERN: an instrument for judging the quality of written consumer health information on treatment choices (Charnock et al. 1999)

Figure 2 – Key themes in documents

