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Developing an Alcohol Education Leaflet for Pregnant Women Using Qualitative and Quantitative Data

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Abstract:

Objective: This article summarizes the process of developing and evaluating a series of alcohol educational leaflets with pregnant women.

Methods: Four group interviews were conducted with a total of 33 pregnant women.

Results: The copy, font, and color should be tailored to pregnant women. Scientifically compelling information was preferred; the use of too many colors and objects was considered distracting and reducing the seriousness of the information. The facts presented through a patient's photo of fetal alcohol syndrome and a graph impressed the participants, since they were tired of the illustrations found in many other materials. Pregnant women who are interested and motivated to learn about alcohol consumption valued the quality of the information, rather than visual appeal.

Conclusions: Testing a draft leaflet with the target population before final development and dissemination is a critical component of an educational outreach effort. Incorporating feedback can help enhance the quality of the end product.

Keywords: fetal alcohol syndrome, printed educational materials, tailored leaflet, Japanese, drinking during pregnancy

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Introduction

Prenatal exposure to alcohol is one of the leading causes of preventable birth defects and developmental disabilities.¹ During the past 30 years, fetal alcohol spectrum disorders (FASD), including fetal alcohol syndrome (FAS), have gradually begun to attract attention. However, awareness and understanding of the disorders remains low. Pregnant women and women who might become pregnant, including high school and university students, continue to consume alcohol, placing themselves at risk of having a child with the effects of prenatal alcohol exposure.² Although prevalence of FASD in Japan is as low as 1 per 10,000 to 20,000 live births,³ more than 50% of female university students had never heard of FAS.⁴

Many educational materials for pregnant women have been developed by the government, organizations, and health care providers. However, those materials are often developed without input or feedback from members of the targeted group. In most cases, tailored health educational materials are more effective than non-tailored ones.⁵

This study used group interviews and questionnaires to obtain feedback on a draft educational leaflet developed specifically for this study. The author combined the qualitative and quantitative methods since open-ended comments were useful for redesigning the leaflets and quantitative evaluation helped the author to make a decision objectively. The information obtained will be used to develop a final leaflet for a program on alcohol education intervention for pregnant women who are enrolled in maternity classes held at municipal health centers. The information collected will allow the author an “insider’s perspective” that helps the author better tailor the educational material to the specified target population.

Methods

Participants and sampling

To avoid sampling bias, two recruitment methods were used. The National Institute of Public Health Institutional Review Board approved the study procedures (NIPH-IBRA#09032 for convenience sampling and NIPH-IBRA#10006 for recruitment via a research company).

Convenience sampling

In Japan, municipal health centers run maternity classes to provide health education to female residents who are pregnant for the first time. Most maternity classes consist of four sessions with each session being held on the same day of the week over a one-month period. The frequency of the maternity classes depends on the population administered by the center; some small towns, for example, hold only three courses of maternity classes each year, while some health centers in Tokyo’s 23 wards run maternity classes once a month.

The author recruited pregnant women participating in maternity classes held at three municipal health centers in Saitama Prefecture (A town and B city) and Tokyo (C ward) in Japan. To recruit participants, fliers were distributed at the first session to advertise that a group interview would be held on the same day as the last session. To call for 10, nine, 10, and nine participants applied at the sites of A town, B city, and C ward, respectively. However, on the day of the group interview, three and two applicants did not appear at the B city and C ward sites, respectively. In return for participation in the group interview, each participant received an honorarium, a receipt for which was collected in lieu of written informed consent.

Recruitment by a research company

Another sample of pregnant women comprised members of a national Internet panel maintained by Yahoo! Value Insight JAPAN (hereafter simply referred to as Yahoo), a custom research company located in Tokyo. At the time of recruitment, the Internet panel consisted of 5,890 pregnant women in Japan. Inclusion criteria were based on residence (ie, living in Tokyo or the neighboring prefectures [Saitama, Kanagawa, or Chiba]), being in months 5–8 of a first pregnancy, and not being engaged in a medical profession. To avoid selection bias, the detailed themes of the intended group discussion were not mentioned at the time of recruitment; rather, participants were simply informed that they would be interviewed about their lifestyles. A group interview was held at the National Institute of Public Health in Saitama Prefecture. In return for participating in the group interview, each participant received monetary compensation from

Yahoo. On the author's behalf, Yahoo obtained written informed consent from each participant.

Course of group interviews

The first group interview was conducted with A town participants on February 17, 2010 (Fig. 1). The second, third, and fourth interviews were conducted with Yahoo, B city, and C ward participants, respectively. The participants were told that group interviews were being carried out to obtain their thoughts about educational leaflets. They were informed that all information shared would be strictly confidential and that they would not be identified by name because their seat number was substituted for their name during the interview. The author conducted all interviews, with each interview lasting about 90 min. Notes were taken by two assistants at all interviews. All interviews were audiotaped with the permission of the participants, and the audiotapes were later professionally transcribed.

Evaluation of a draft leaflet

Upon arrival, the participants were offered refreshments. After reviewing a draft educational leaflet developed

specifically for this study (Appendix A), each participant was asked to rate the material on eight dimensions—ie, 1) first impression, 2) design, 3) readability, 4) density of words, 5) understandability, 6) information, 7) message, and 8) content—using a five-point Likert scale and to complete a feedback questionnaire. After providing their ratings, participants were asked comments on each component, like title, photos, text, and a bar chart etc.

There are no foreign language versions since this leaflet was developed for study purpose and all the study participants were Japanese. For publication purpose, English translation was given in the leaflet near each sentence written in Japanese.

Evaluation of revised leaflets

Yahoo, B city, and C ward participants were also asked to evaluate the second, third, and fourth version of leaflets, respectively, by the same questionnaire used for the evaluation of the draft leaflet. After providing their ratings, participants were asked comments on the small components of a revised leaflet. In addition, only C ward participants

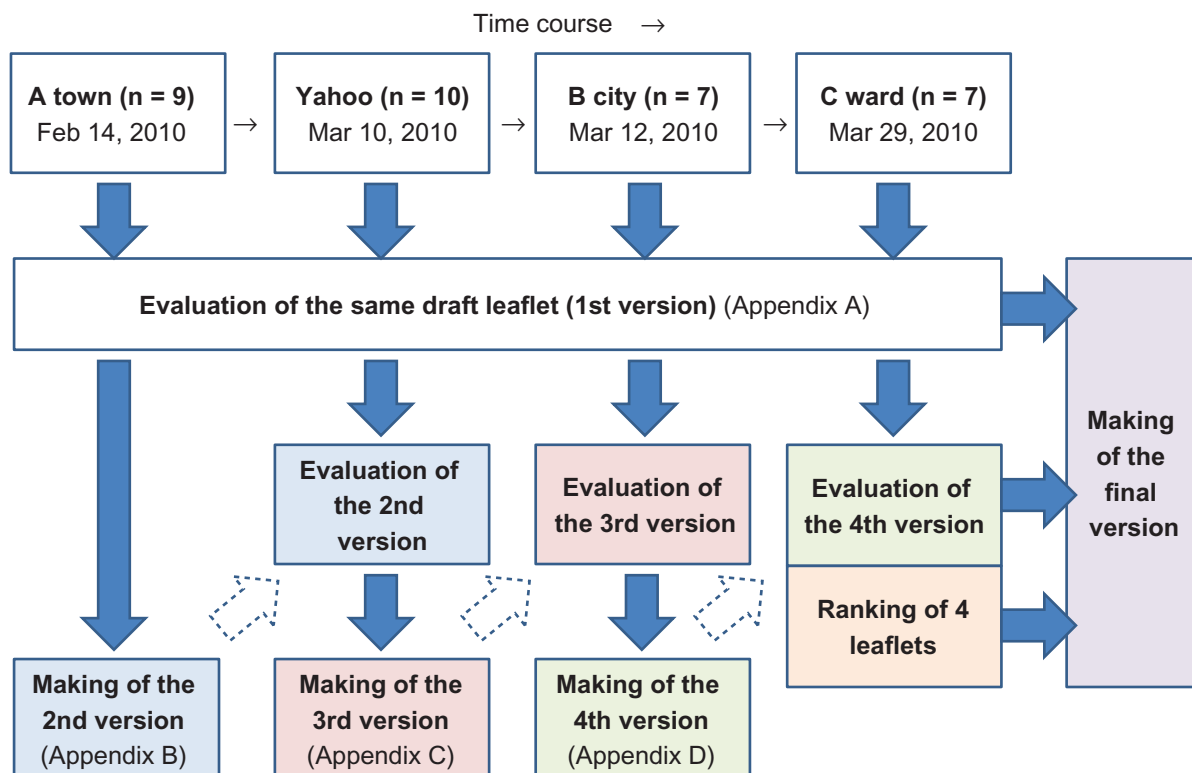


Figure 1. Course of four group interviews and development of leaflet.



were asked to rank all the four leaflets at the end of the interview.

Additional pre-interview questionnaire

Qualitative research often involves adding data-collection instruments during the study period, as the investigators themselves gain more understanding about the item under study as the research progresses.⁶ Following the interview with the A town participants, an additional questionnaire was distributed to the participants in B city and C ward, prior to their respective interviews. They were asked about alcohol-consumption habits before and after conception, if they had ever heard about the risks related to drinking during pregnancy and, if yes, the information source and their knowledge of FAS. Yahoo participants were asked these questions via the Internet, prior to gathering.

Statistical analyses

Scores gathered from the quantitative evaluation of the leaflets were compared among the four groups by a one-way analysis of variance (ANOVA) with a Bonferroni multiple comparison. Changes in scores among the first, second, third, and fourth versions were examined by paired t tests. The level of statistical significance was set at $P < 0.05$. All analyses were conducted using the Statistical Package for Social Sciences (SPSS Statistics Base 18 for Windows, 2009; SPSS Japan Inc., Tokyo).

Results

Evaluation of a draft leaflet

A total of 33 women participated in the interviews (Table 1). Each was in her first pregnancy. All of them evaluated the same draft leaflet. Table 2 shows a quantitative evaluation of the draft leaflet by a questionnaire. For all but readability dimension, no significant differences in evaluation were observed among the four groups. Comments for each component were as follows. Alphabets in parentheses followed the subheadings correspond to those in Appendix A. The numbers in parentheses following the *Italic* comments represent the seat number of participants in each site.

Title (A)

The copy, “What a mom can do for her baby to be born”, was evaluated as follows:

You'll pick it up at once since the title is impressive (No. 2, A town).

You'll want to know what it is all about (Nos. 3, 6, and 9, A town).

Even a non-drinker will pick it up (No. 9, A town).

You'll wonder what a mom can do (No. 1, Yahoo).

Interesting. You can't see what it is until you open it (No. 10, Yahoo).

It's attractive (No. 6, C ward).

Photo of a baby (B)

Generally, this photo on the front cover gave a good first impression.

You'll pick it up at once since the baby is sweet (No. 1, A town).

This large-size photo gives the impression that it's easy to read.

It's good (No.2, C ward).

Babies are sweet in photos than in illustrations, though illustrations are often used in leaflets for pregnant women. Illustrated leaflets are better than those only with messages but photos are more impressive than illustrations (No. 4, Yahoo).

Enough of illustrations (No. 7, C ward).

Q&A

As shown in Table 3, 97% of the participants preferred a Q&A format to regular text.

While there're a few technical terms, it's easy to understand in the form of Q&A (Nos. 1 and 3, Yahoo, No. 6, C ward).

It's effective (No. 2, Yahoo).

Bar chart (E)

As shown in Table 3, 91% of them liked the use of a bar chart. Many said; *it's scientific, impressive, persuasive, reliable, visually arresting, and effective.*

Photo of a FAS child (G)

Many said; *it's dissuasive, shocking, impressive, visually arresting, real, and effective.* On the other hand, some could not find any anomalies in the photo.

It is not clear that the child has disabilities (Nos. 6 and 7, B city).

It looks a normal child (Nos. 2 and 4, C ward).

Development of the second version

With the help of comments from the A town participants, the draft leaflet was improved in its second version (Appendix B).

**Table 1.** Characteristics of participants.

	A town (n = 9)		Yahoo (n = 10)		B city (n = 7)		C ward (n = 7)		Total (N = 33)	
	n	%	n	%	n	%	n	%	n	%
Age groups										
25–29 years	6	66.7	5	50.0	4	57.1	2	28.6	17	51.5
30–34 years	3	33.3	5	50.0	3	42.9	3	42.9	14	42.4
35–39 years							2	28.6	2	6.1
Education										
High school/technical school	1	11.1	3	30.0	2	28.6	1	14.3	7	21.2
Junior college	2	22.2	2	20.0	2	28.6	1	14.3	7	21.2
University	6	66.7	5	50.0	3	42.9	5	71.4	19	57.6
Term of pregnancy										
First/second trimester	4	44.4	8	80.0	5	71.4	2	28.6	19	57.6
Third trimester	5	55.6	2	20.0	2	28.6	5	71.4	14	42.4
Current drinking habit^a										
Drink more than once a week	—						1	14.3	1	4.2
Hardly drink	—		3	30.0	1	14.3	2	28.6	6	25.0
Never drink	—		7	70.0	6	85.7	4	57.1	17	70.8
Drinking before pregnancy^a										
Drank every day	—				1	14.3	2	28.6	3	12.5
Drank more than once a week	—		7	70.0			4	57.1	11	45.8
Drank more than once a month	—		1	10.0	1	14.3	1	14.3	3	12.5
Hardly drink	—				4	57.1			4	16.7
Never drink	—		2	20.0	1	14.3			3	12.5
Ever heard about drinking during pregnancy?^a										
Yes (answered the next questions too)	—		10	100.0	6	85.7	5	71.4	21	87.5
Information source (multiple choice)^a										
School	—				2	33.3			2	9.5
Health center	—		2	20.0	2	33.3	2	40.0	6	28.6
Hospital or clinic	—		3	30.0	2	33.3	1	20.0	6	28.6
Family member or friend	—		4	40.0	4	66.7	1	20.0	9	42.9
TV, book, or magazine	—		8	80.0	4	66.7	4	80.0	16	76.2
Leaflet	—		3	30.0	1	16.7			4	19.0
Other (eg, Internet)	—		1	10.0			1	20.0	2	9.5
Knowledge of fetal alcohol syndrome^a										
Know both name and what it is	—						1	14.3	1	4.2
Know only name	—		4	40.0	2	28.6	3	42.9	9	37.5
Heard it for the first time	—		6	60.0	5	71.4	3	42.9	14	58.3

Note: ^aparticipants from town A were not asked these questions.

Title (A)

The font of the title on the front cover was changed to a rounded pop font, and its color was changed from red to pink because:

The font is too formal. Rounded pop font would be better. Red letters are not good either (No. 8, A town).

Q&A

The headline, “Do you know? Pregnancy and Alcohol”, was added above the first Q of the two-page spread since *there should be a headline, not beginning with “Q: ...”* (Nos. 1 and 9, A town). The underlined text was colored red, the font was downsized from

original 14-point, and the text was double-spaced because:

The underlined texts should be in red (No. 3, A town).

The lines too close together are difficult to read. A smaller font size would be better (No. 6, A town).

Word balloons were used for the Q&A, along with illustrations of speakers. Pink, blue, yellow, and yellow-green were used to color the balloons.

There are no differences in the font and its size between questions and answers. It's not easy to read. The presentation could be more impressive, for example, by putting the question in

**Table 2.** Quantitative evaluation of a draft leaflet (first version) by a questionnaire.

	A town (n = 9)	Yahoo (n = 10)	B city (n = 7)	C ward (n = 7)	One-way ANOVA
First impression (1 = boring, 5 = caught attention)	3.56 (1.13)	4.20 (1.03)	3.29 (1.11)	3.86 (1.07)	$F(3, 29) = 1.12$ $P = 0.36$
Design (1 = poor taste, 5 = good taste)	2.89 (1.05)	3.60 (0.97)	3.00 (0.58)	3.00 (0.58)	$F(3, 29) = 1.34$ $P = 0.28$
Readability (1 = hard to read, 5 = easy to read)	2.78 (1.20)	4.20 (0.92)	3.71 (1.11)	3.86 (0.69)	$F(3, 29) = 3.35$ $P = 0.03^*$
Density of words (1 = too little, 5 = too crowded)	2.89 (0.78)	3.10 (0.32)	3.14 (0.38)	3.00 (0.58)	$F(3, 29) = 0.36$ $P = 0.78$
Understandability (1 = hard to understand, 5 = easy to understand)	3.78 (0.83)	4.60 (0.52)	3.71 (1.25)	4.14 (1.07)	$F(3, 29) = 1.79$ $P = 0.17$
Information (1 = uninformative, 5 = informative)	4.22 (0.83)	4.90 (0.32)	4.71 (0.49)	1.57 (1.13)	$F(3, 29) = 1.41$ $P = 0.26$
Message (1 = unconvincing, 5 = convincing)	3.78 (1.09)	4.70 (0.48)	4.57 (0.54)	4.43 (1.13)	$F(3, 29) = 2.09$ $P = 0.12$
Contents (1 = unimpressive, 5 = impressive)	3.89 (0.78)	4.60 (0.70)	4.57 (1.13)	4.29 (0.76)	$F(3, 29) = 1.37$ $P = 0.27$

Notes: Means (with standard deviations in parentheses); Women were asked to rate their evaluation on a draft leaflet (first version) using a 5-point Likert scale; Except for "density of words", in which 3 is the best score, a high score denotes good quality; *A town differed significantly from Yahoo, by Bonferroni's multiple comparison. $P = 0.03$.

a balloon with the questioner's face and the answer with the answerer's (or doctor's) face (No. 9, A town).

The bars should not be in mauve but in a lighter color (Nos. 2 and 8, A town).

It's not easy to read. How should we read it? (No. 5, A town).

It's completely unreadable (No. 8, A town).

Bar chart (E)

Although all the A town participants liked to have a bar chart (Table 3), some found it difficult to read the mauve bar chart on the draft leaflet. For this reason, it was replaced by another simple bar chart in the second version.

Photo of a FAS child (G)

A photo of a healthy child was added, for comparison to that of a child afflicted with FAS.

Table 3. Quantitative evaluation of a draft leaflet (first version) during the interview.

	A town (n = 9)		Yahoo (n = 10)		B city (n = 7)		C ward (n = 7)		Total (N = 33)	
How effective against drinking during pregnancy?										
Very effective	0	(0%)	7	(70%)	5	(71%)	4	(57%)	16	(48%)
Moderately effective	7	(78%)	3	(30%)	1	(14%)	3	(43%)	14	(42%)
Not really effective	2	(29%)	0	(0%)	1	(14%)	0	(0%)	3	(9%)
Not effective at all	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)
Preferred the former										
Glossy paper vs. matte paper	9	(100%)	8	(80%)	5	(71%)	7	(100%)	29	(88%)
Paper thickness of 0.095 mm vs. 0.144 mm	6	(67%)	7	(70%)	2	(29%)	3	(43%)	18	(55%)
White paper vs. colored paper	6	(67%)	6	(60%)	2	(29%)	1	(14%)	15	(45%)
Q&A vs. regular text	8	(89%)	10	(100%)	7	(100%)	7	(100%)	32	(97%)
Liked to have										
Bar chart (see E in Appendix A)	9	(100%)	10	(100%)	6	(86%)	5	(71%)	30	(91%)
Quiz (see K in Appendix A)	0	(0%)	7	(70%)	0	(0%)	0	(0%)	7	(21%)

Notes: Numbers (with percentages in parentheses). Data was collected by a show of hands during the interview.



Quiz (K)

The quiz was removed, since no one in A town liked it (Table 3).

Maternity mark (L)

All the A town respondents preferred the mark in the leaflet. It was moved from the back cover to the front cover to emphasize that leaflet is intended for pregnant women (Nos. 2 and 8, A town).

“Advice for family and friends” (M)

Five of nine respondents preferred this advice in the leaflet. The bells located on either side of “Advice for family and friends” in the draft leaflet were replaced by an exclamation point in yellow triangle, that is something like a warning mark (No. 4, A town).

“Refrain from drinking during lactation as well” (P)

This was newly added in the second version, as requested since *some may think they can drink after childbirth* (No. 6, A town).

Evaluation of the second version

The second version, which was developed based on the feedbacks from A town participants, received low evaluations from the Yahoo participants (Table 4).

Only the first impression improved, but it was not statistically significant, $t(9) = -0.361$, $P = 0.726$ (two-tailed). On the other hand, evaluations regarding information and the message had significantly degraded, $t(9) = 3.674$, $P = 0.005$ (two-tailed) and $t(9) = 2.689$, $P = 0.025$ (two-tailed), respectively.

The new version appears messy and has excessive dialogue balloons (No. 2, Yahoo).

Use of abundant colors makes the new version clear, but on the other hand, less impressive and more superficial (No. 3, Yahoo).

The image is full of colors and beautifully prepared, but the first version was more convincing. Surrounded by the photo of a boy eating ice cream and others, the photo of the child with FAS became less appealing (No. 4, Yahoo).

Development of the third version

With the help of comments from the Yahoo participants, the second version was improved and moved to the third version (Appendix C). The maternity mark reverted to the back cover, since when it was superimposed on the baby's photo, its white background stood out to poor effect. To simplify the leaflet, both the word balloons and the illustrations of speakers were removed. The photo of the healthy boy was

Table 4. Evaluation of revised leaflets, and differences from the first version.

	Yahoo (n = 10)		B city (n = 7)		C ward (n = 7)	
	2nd version ^a	1st–2nd ^b	3rd version ^a	1st–3rd ^b	4th version ^a	1st–4th ^b
First impression (1 = boring, 5 = caught attention)	4.30 (0.82)	−0.10	3.71 (0.95)	−0.43	3.71 (0.49)	0.14
Design (1 = poor taste, 5 = good taste)	3.20 (0.79)	0.40	3.14 (0.69)	−0.14	3.86 (0.69)	−0.86*
Readability (1 = hard to read, 5 = easy to read)	3.80 (1.14)	0.40	4.14 (0.69)	−0.43	4.14 (1.07)	−0.29
Density of words (1 = too little, 5 = too crowded)	3.10 (0.32)	0.00	3.14 (0.38)	0.00	2.86 (0.38)	0.14
Understandability (1 = hard to understand, 5 = easy to understand)	4.00 (0.94)	0.60	3.86 (0.69)	−0.14	4.14 (0.90)	0.00
Information (1 = uninformative, 5 = informative)	4.30 (0.48)	0.60*	4.57 (0.54)	0.14	4.14 (0.69)	0.43
Message (1 = unconvincing, 5 = convincing)	4.00 (0.82)	0.70*	4.00 (1.00)	0.57	3.57 (0.98)	0.86*
Contents (1 = unimpressive, 5 = impressive)	4.10 (0.74)	0.50	3.86 (0.69)	0.71	4.00 (0.82)	0.29

Notes: Women were asked to rate their evaluation on the revised leaflet using 5-point Likert scale. Except for “density of words”, in which 3 is the best score, a high score denotes good quality; ^aMeans (with standard deviations in parentheses); ^bDifference was calculated by subtracting the score of the revised version from that of the first version. A negative value denotes improvement; *Paired t test, $P < 0.05$.



removed, and the facial features of the FAS child were detailed, item by item, on the right side of the photo. Since Yahoo participants preferred the old chart to the new one on the back cover in the second version, the former was brought back in the third version. The phrases “it has not been demonstrated” were deleted from C and D in Appendices A and B, since they were *less persuasive* (No. 10, Yahoo). C and D were shortly rephrased as “Safety of alcohol consumption during pregnancy has not been established. **If you drink now, quit today**”. and “The fetal brain keeps growing throughout pregnancy. That is, **alcohol has a possibility of affecting fetal development whenever you drink**”, respectively (Appendix C).

Author information (O)

This was moved from the back cover to the front cover, to discriminate it at a glance from leaflets prepared for commercial purposes.

I'm not interested in leaflets prepared for commercial purposes.

The fact that the author is a decent organization is important
(No. 5, Yahoo).

The descriptions will be more reliable when the author information is on the leaflet (Nos. 1 and 2, Yahoo).

Evaluation of the third version

B city participants' evaluations of the third version were not significantly different from that on the first version (Table 4). Points improved from the first version were; *the addition of the headline (“Do you know? Pregnancy and Alcohol”), itemization of facial features, font size, pink color of the title, and brief and clear answers.*

Suggestions for further improvement included:

Headings of “Q” and “A” should not be deleted (No. 4, B city).

Author information should be the last item on the back cover
(No. 6, B city).

*“**FAS is 100% preventable if a woman does not drink alcohol during pregnancy**” (see I in Appendix C) should be bigger*
(No. 6, B city).

No color is necessary for the A(nswer)s (Nos. 6 and 7, B city).

Development of the fourth version

With the help of comments from the B city participants, the third version was improved and became the fourth version. The author information was moved to the back cover (see O in Appendix D). Font size of the phrase, “**FAS is 100% preventable if a woman does not drink alcohol during pregnancy**” (see I in Appendix D), was also enlarged. The quiz was removed, since no one in B city liked it (Table 3). The headings, “Q” and “A”, were brought back and numbered consecutively. Only the Qs were colored in red; the words pertaining to the Qs were made bold and enlarged because:

There should be differences in the letters. The difference between questions and answers should be clearer. (No. 4, B city).

Evaluation of the fourth version

Compared to the first version, the fourth version was significantly improved in terms of design, $t(6) = -2.521$, $P = 0.045$ (two-tailed), but the message was considered less convincing, $t(6) = 3.286$, $P = 0.017$ (two-tailed) (Table 4). Overall, however, the fourth version ranked more highly than the first version, finishing in first place among the four leaflets (Table 5).

Table 5. Ranking of the four leaflets, by the seven participants in C ward.

Leaflets Seat No	First version (draft)		Second version		Third version		Fourth version	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score
1	2	3	4	1	3	2	1	4
2	1	4	4	1	2	3	3	2
3	2	3	1	4	4	1	3	2
4	3	2	4	1	1	4	2	3
5	4	1	3	2	2	3	1	4
6	3	2	4	1	2	3	1	4
7	1	4	2	3	4	1	3	2
Total	2nd place	19	4th place	13	3rd place	17	1st place	21

Notes: When a leaflet's rank was first, 4 points were awarded to the leaflet; When its rank was second, third, or fourth, three, two, or one point(s) were awarded, respectively; The leaflet with the largest total score was given the highest ranking.



Future development of the final version

Since 55% of all participants preferred colored paper to white paper (Table 3), the final version will be printed on colored paper. The one paper color chosen by the largest number of participants ($n = 9$) was pink (data not shown in Table). The author also distributed a drawing of a FAS child with an explanation of his facial features, but all the participants preferred the photo to the drawing.

Addition of subtitle

Below the baby's photo on the front cover, the subtitle, "Do you know about fetal alcohol syndrome?" will be added because:

It's better to directly express what the purpose is, for example, with a question beginning with "Do you know ...?" Then, you'll have to ask yourself [if you know what the leaflet is talking about] (No. 1, B city).

A subtitle such as "fetal alcohol syndrome" will attract more readers (No. 6, C ward).

"What a mom can do" is good but the title should include "alcohol" (Nos. 3 and 5, C ward).

There should be "about FAS" or something like that. You'll have no idea at first sight, except that it's for pregnant women.

There should be "pregnant women and alcohol", for example, in parentheses or below (No. 2, Yahoo).

If something about alcohol is shown on the margin or blank space, more readers will pick it up (No. 7, C ward).

Discussion

Number of group interviews

The author conducted four group interviews. This number of group interviews was judged to be empirically sufficient, given that the variety of comments from the participants had approached the saturated point by the time the four sessions were over.⁷ On the title and baby's photo in the front cover, similar comments were raised by the four groups.

The author found that it should be avoided to redesign a leaflet based on the comments generated during only one group interview. For example, 70% of the Yahoo participants liked the quiz in the leaflet, but no one in any other groups did (Table 3). If the author had done only one group interview with the Yahoo participants, the quiz would have remained in the final leaflet. In addition, word balloons were used in the second version as suggested by a participant in

A town. However, it was far from popular with Yahoo participants. According to the ranking of the four leaflets by the C ward participants (Table 5), the second version came in the last place. These examples suggest that development of materials based on only one group interview should be avoided.

Combined usage of qualitative and quantitative data

In the course of leaflet development through four interviews, some components went back and forth. For example, maternity mark was moved to the front cover in the second version but it was back to the back cover since the third version. Also, author information was moved to the front cover in the third version but it was back to the back cover since the fourth version. It seemed that opinions from later group interview have a priority over those from the earlier interview. To confirm this, the author showed all the four leaflets to the C ward participants and asked them to rank the leaflets. It was unexpected that the draft leaflet had better evaluation than second and third versions but the third version was evaluated higher than the second version and the fourth version ranked first. Thus, from the second version at the bottom, the leaflets were improved step by step.

Tailoring for segmented audiences

Audience segmentation divides an audience into segments on the basis of shared characteristics, so that interventions and educational materials can be tailored to address their concerns and needs optimally.⁸ Current target population was pregnant women enrolled in maternity classes held at municipal health centers in the Tokyo area. They were pregnant for the first time, and 94% of them were 34 years or younger. In addition, they all lived in the same geographic area. On account of these criteria, they had already been segmented into a small and homogenous group. The tailoring of materials is a good approach to making them effective among such groups.

Effective title

An important contributor to the effectiveness of any leaflet is the extent to which it is read. In the draft leaflet, the front cover did not contain direct words like "alcohol" or "FAS". Instead, the title



bore certain implications, and it was evaluated as *impressive, interesting, and attractive*. As intended, the participants *wanted to know what it is all about and will open the leaflet because you can't see what it is until you open it*. In addition, by avoiding words like “alcohol”, *even a non-drinker will pick it up*. On the other hand, the addition of a subtitle that includes “alcohol” was requested by some participants. In the final version, therefore, a subtitle in a small-sized font will be added to the space below the baby’s photo.

Style of the text

It is important to tailor a leaflet for a target population, since needs differ according to the characteristics of that population. Patients with disorders of the hematopoietic system, for example, have found 12-point letters difficult to read.⁹ The author initially used a 14-point font size in the Q&A of the draft leaflet, but the participants said the letters were too large. It was not true, it seems, that the larger the letters, the easier it is to read; rather, for young adult women like those in this sample, a smaller font size could be better.

Photo or illustration

Adult women tend to like real photos rather than cartoons or drawings.¹⁰ The pregnant women in this study also preferred photos to illustrations. In designing an educational or informational leaflet, the tendency is to include a large amount of text, since we want to provide a great deal of information. In such cases, large photos that do not provide information are often considered wastes of space. However, the use of large photo, like a baby’s one on the front cover, gave the impression that it’s *easy to read*. The most important thing for the front cover would be that it grabs the reader’s attention and gets her to open the leaflet, especially in a half-fold leaflet.

Regarding the photo of the child afflicted with FAS, some participants said *it is not clear that the child has disabilities*. Nevertheless, all of the C ward participants preferred the photo to a medical illustration. Photos, it was suggested, offer a greater dimension of reality than illustrations, and they add deepness to the leaflet.

Elaboration likelihood model

According to the Elaboration Likelihood Model, attitudes can be changed or adopted by two routes: 1) centrally, by a thoughtful consideration and evaluation of the given information, and 2) peripherally, by simply using heuristics or peripheral cues like attractiveness, an expert source, or a number of arguments. When people have little interest, ability, and/or motivation to think about a message, they tend to process it peripherally.¹¹ My participants were pregnant and almost 80% of them were highly educated (ie, junior college or university graduates). Almost 60% of them drank more than once a week before pregnancy, but they abstained from drinking upon learning they were pregnant. In general, women become more health conscious when they get pregnant.¹² They seemed to have an interest, ability and motivation to think about the message provided by the leaflets. In this case, peripheral cues like attractiveness might be less important for them. In fact, the second version was most highly evaluated as “caught [my] attention” (Table 4) but the final ranking was the lowest (Table 5).

Regarding the problem of dioxin-contaminated breast milk, mothers’ attitudes toward breast feeding were adopted centrally by absorbing a full understanding of the given information, since they were highly motivated to consider the risk to their baby’s health.¹³ For mothers-to-be and mothers of babies who are conscious of their children’s health, it is important to support information-processing via the central route. Since they are already motivated to learn the information, content quality might be more important than peripheral cues.

In addition, prior knowledge may affect one’s information processing.¹⁴ Almost 90% of the participants had ever heard about drinking during pregnancy from a variety of information sources (Table 1). It is possible that participants had a great ability to process the message because they had prior knowledge about the topic.

Combination of the rational and the emotional

With regards to disseminating health-related messages, there is a debate as to whether the most effective persuasion is rational or emotional; however, this debate is misleading, since elements of both kinds are



required.¹⁵ The draft leaflet's approach on the front cover was emotional; it uses copy and a baby's photo that appeal to a mother's love and pride. On the other hand, the leaflet provided scientific evidence and rationally explained the risks of alcohol consumption during pregnancy within the two-page spread.

Slater and Rouner found that a greater number of message-relevant responses are generally obtained when the message is congruous with the recipients' own values regarding alcohol use.¹⁶ For recipients for whom the message was value-congruent, the message with statistical evidence was considered more persuasive and more believable than any containing anecdotal evidence. Gaston and Prapavessis also suggest that presenting pregnant women with factual information about the prevention of maternal–fetal disease may serve as an effective motivator.¹⁷

Limitations

There were different types of recruitment used. A part of this study used a convenience sample of pregnant women recruited from maternity classes at municipal health centers. Potential participants who were willing to spend some time discussing “alcohol education leaflets” were recruited. It may have been that those women were naturally curious about this topic and may have been better informed than individuals in the community at large. This is why the author added another recruitment method using a research company. By comparing two samples, potential selection bias was examined.

While Yahoo participants did not know of the topic beforehand, their sociodemographic characteristics and comments on the leaflets were comparable to those of the participants in the maternity classes; thus, overall, the participants seemed to be typical women in the Tokyo area, undergoing their first pregnancies. With regards to generalizability, the findings and recommendations from this study may not be applicable to other areas (for example, the rural areas of the country).

Conclusions

During the current study, the author drew the following conclusions about designing a half-fold leaflet that discusses FAS. To get women to take and open it, the front cover should be visually attractive and

eye-catching; further, the copy, font, and color should be tailored to pregnant women. They preferred photos to illustrations. On the other hand, information contained in the two-page spread should be scientifically convincing. Since pregnant women are interested and motivated in learning about the effects of alcohol consumption during pregnancy, the use of too many colors and objects can be distracting and can reduce the seriousness of the information. The educational effect of the final version of the leaflet will be examined in a subsequent study.

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Disclosure

This manuscript has been written by a single author. This paper is unique and not under consideration by any other publication and has not been published elsewhere. The author and peer reviewers report no conflicts of interest. The author confirms that she has permission to reproduce any copyrighted material.

References

1. Ryan DM, Bonnett DM, Gass CB. Sobering thoughts: town hall meeting on fetal alcohol spectrum disorders. *Am J Public Health*. 2006;96:2098–101.
2. Boulter LT. The effectiveness of peer-led FAS/FAE prevention presentations in middle and high schools. *J Alcohol Drug Educ*. 2007;51:7–26.
3. Tanaka H. Abnormalities of Japanese children due to maternal alcohol drinking. *Nihon Iji Shin Po*. 1995;3714:45–9 (in Japanese).
4. Mimura A, Sudo N, Kato N. Educational effects of a single distribution of a leaflet on alcohol and pregnancy among female university students. *Jpn J Public Health*. 2010;57:431–38 (in Japanese, only English abstract available).
5. Kreuter MW, Oswald DL, Bull FC, Clark EM. Are tailored health education materials always more effective than non-tailored materials? *Health Educ Res*. 2000;15:305–15.
6. Needleman C, Needleman MJ. Qualitative methods for intervention research. *Am J Ind Med*. 1996;29:329–37.
7. Rice PL, Ezzy D. *Qualitative Research Method* (M. Kihara and M. Kihara, Trans.). Tokyo: Sankosha; 2007 (Original work published in 1999);81.
8. Gust DA, Kennedy A, Wolfe S, et al. Developing tailored immunization materials for concerned mothers. *Health Educ Res*. 2008;23:499–511.
9. Goto M, Ohshima Y. Effects of a brochure prepared on the basis of know-how and employed for the preparation of corporate advertisement for chemotherapy-related guidance: validation based on the questionnaire survey in the patients with hematopoietic diseases. *Kango Sougou*. 2008;39:281–3 (in Japanese).
10. Parra-Medina D, Wilcox S, Thompson-Robinson M, Sargent S, Will JC. A replicable process for redesigning ethnically relevant educational materials. *J Women's Health*. 2004;13:579–88.
11. White K, Meyer G, Martell D. *Effective Health Risk Messages: A Step-by-step Guide*. California: Sage Publications; 2001;33–48.



12. Hiromori N, Nakamura Y, Yoshikawa Y, et al. The present conditions of health in the perinatal period in Aomori prefecture (part 1). *J Aomori Univ Health Welfare*. 2006;7:113–24.
13. Nakayachi K. *Risk-measuring Scale: Is Safety/Safe Life Available?* Tokyo: NHK Books; 2006 (in Japanese).
14. Hu Y, Sunder SS. Effects of online health sources on credibility and behavioral intentions. *Commun Res*. 2010;37:105–32.
15. O'Shaughnessy J, O'Shaughnessy NJ. *Persuasion in Advertising*. London: Routledge; 2004;25–53.
16. Slater MD, Rouner D. Value-affirmative and value-protective processing of alcohol education messages that include statistical evidence or anecdotes. *Commun Res*. 1996;23:210–35.
17. Gaston A, Prapavessis H. Maternal-fetal disease information as a source of exercise motivation during pregnancy. *Health Psychol*. 2009;28:726–33.

Supplementary Data

妊娠中のお母さんがお酒を飲んでも大丈夫なのは、どの時期でしょうか？①から③に○×をつけて下さい。

①妊娠初期 ()
②妊娠中期 ()
③妊娠後期 ()

(K) Quiz 答えは下

(M) ご家族やまわりの方へのお願い
妊娠中の女性にお酒をすすめるのは絶対にやめましょう。

(N) URL for the National Citizens' Association for Alcohol and Drug Problems
http://www.ask.or.jp

このリーフレットに関するご質問・お問合せ先
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国立保健医療科学院生涯保健部
〒351-0197 和光市南2-3-6 問題の答え：①×

(O) Author's name, affiliation, mailing address, and telephone number

これから生まれるわが子のために
(A) 今、ママができること What a mom can do for her baby to be born.

(B)

(C) Up to the present, it has not been demonstrated how much alcohol a pregnant woman can drink during pregnancy ... the safety of alcohol consumption during pregnancy has not been established. **If you drink now, quit today.**

(D) It has not yet been demonstrated which period of pregnancy is dangerous. As seen in the figure below, the fetal brain keeps growing throughout pregnancy. That is, **alcohol has the possibility of affecting fetal development whenever you drink.**

(E)
Effects of Alcohol on Fetal Development
(週) 1-2 3 4 5 6 7 8 12 16 20-36 38
通二つの胎芽の発達 通二つの胎児の発達
主として身体障害 運動障害と身体障害

(F) 胎児性アルコール症候群 (FAS) って何ですか？
A: 妊娠中の飲酒が唯一の原因となって起こる障害です。FASのお子さんは身体の成長が遅く、下の写真のような平面的な顔立ちが特徴です。知的障害もみられ、5歳になっても2歳児くらいのことしかできません。

(G) Photograph of a child with fetal alcohol syndrome (FAS)

(H) FASは、なおりますか？
A: 成長にともなって消えるものではなく、一生継続する障害です。FAS does not go away, and leaves lifelong defects.

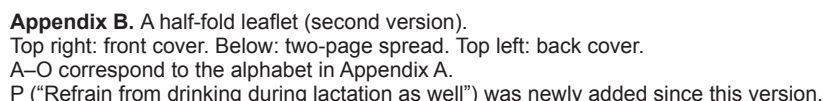
(I) 妊娠中にお酒を飲まなければ FASは100%予防可能です
FAS is 100% preventable if a woman does not drink alcohol during pregnancy.

(J) 妊娠に気づく前に飲んでしまったというのはよくあることです。その場合も、これから飲まないようにする切です。
お酒がやめられなくてお困りの方は、お近くのターにご相談ください。

Drinking before one realizes one is pregnant is something that happens quite often, and in such situations it is important to **stop drinking from this point on.** If you try to stop drinking but find that you cannot do it on your own, please contact a health center in your neighborhood.

Appendix A. A half-fold draft leaflet.

Top right: front cover. Below: two-page spread. Top left: back cover



L

妊娠中のお母さんがお酒を飲んでも大丈夫なのは、どの時期でしょうか？①から③に○×をつけて下さい。

K
①妊娠初期 ()
②妊娠中期 ()
③妊娠末期 ()

答えは下

授乳期もお酒を飲まないようにしましょう P

母乳にアルコールがふくまれ、赤ちゃんにもお酒を飲ませることになってしまいます。お酒は赤ちゃんにとって有害です。赤ちゃんの脳とからだを守りましょう。

M

ご家族やまわりの方へのお願い

妊娠中や授乳期の女性にお酒をすすめるのは絶対にやめましょう。

N
 胎児性アルコール症候群（FAS）に関する詳しい情報は特定非営利活動法人ASK（アルコール問題全国市民協会）のHPで！
<http://www.ask.or.jp>

問題の答え：①× ②× ③×

これから生まれる赤ちゃんのために

A
 今、ママができること

B

O

このリーフレットに関するご質問・お問合せ先
 須藤紀子（保健学博士）TEL: 048-458-6195
 国立保健医療科学院 生涯保健部 〒351-0197 埼玉県和光市南2-3-6

知っていますか？
妊娠とアルコール

妊娠中も少しならお酒を飲んでもよいでしょうか？

C
 Safety of alcohol consumption during pregnancy has not been established.
If you drink now, quit today.

お酒を飲んでも大丈夫な時期はありますか？

D
 The fetal brain keeps growing throughout the whole of the pregnancy term. That is, **alcohol has a possibility of affecting fetal development whenever you drink.**

E

デブラ・ベンゼン氏の資料を基にASKで構成

胎児性アルコール症候群（FAS）って何ですか？

F
 妊娠中の飲酒が唯一の原因となって起こる障害です。FASのお子さんは身体の成長が遅く、下の写真のような平面的な顔立ちが特徴です。**知的障害**もみられ、**5歳になっても2歳児くらいのことしかできません。**

G

Photograph of a child with fetal alcohol syndrome (FAS)

- ・蒙古皺
- ・短い鼻
- ・低い鼻梁
- ・不明瞭な人中
- ・うすい上唇
- ・平面的な顔

FASは、なおりますか？

H
 成長とともに消えるものではなく、**一生続く障害**です。

I
 妊娠中にお酒を飲まなければ、**FASは100%予防可能**です。妊娠に気づく前に飲んでしまったというのは、よくあることです。その場合も、**これから飲まないようにすることが大切**です。

J
 お酒がやめられなくて困りの方は、お近くの保健センターにご相談下さい。

参考資料：ASK「FAS国際シンポジウム報告集」

Appendix C. A half-fold leaflet (third version).

Top right: front cover. Below: two-page spread. Top left: back cover.

A–P correspond to the alphabet in Appendix B (second version). C and D were shortly rephrased hereafter.

① 授乳期もお酒を飲まないようにしましょう
母乳にアルコールがふくまれ、赤ちゃんにもお酒を飲ませることになってしまいます。
お酒は赤ちゃんにとって有害です。
赤ちゃんの脳とからだを守りましょう。

② ご家族やまわりの方へのお願い
妊娠中や授乳期の女性にお酒をすすめるのは絶対にやめましょう。

③ 胎児性アルコール症候群（FAS）に関する詳しい情報は特定非営利活動法人ASK（アルコール問題全国市民協会）のHPで！
<http://www.ask.or.jp>

④ このリーフレットに関するご質問・お問合せ先
須藤紀子（保健学博士）TEL: 048-458-6195
国立保健医療科学院 生涯保健部 〒351-0197 埼玉県和光市南2-3-6

これから生まれるわが子のために

⑤ 今、ママができること

⑥

知っていますか？
妊娠とアルコール

⑦ Q1 妊娠中も少しならお酒を飲んでもよいでしょうか？
A1 妊娠中の飲酒の安全性は確立されていません。
現在、**お酒を飲んでいる方は今日からやめましょう。**

⑧ Q2 お酒を飲んでも大丈夫な時期はありますか？
A2 胎児の脳は妊娠中ずっと成長し続けるので、妊娠中は**いつ飲んでも発達に影響する可能性があります。**

胎児の発達におけるアルコールの影響

(週)	週ごとの胎芽の発達				週ごとの胎児の発達			
	1-2	3	4	5	6	7	8	12
1-2	主として身体障害				機能的障害と身体障害			
3	脳				心臓			
4	心臓				脳			
5	心臓				脳			
6	心臓				脳			
7	心臓				脳			
8	心臓				脳			
12	心臓				脳			

デブラ・ベンゼン氏の資料を基にASKで構成
参考資料：ASK「FAS国際シンポジウム報告集」

⑨ Q3 胎児性アルコール症候群（FAS）って何ですか？
A3 妊娠中の飲酒が唯一の原因となって起こる障害です。
FASのお子さんは身体の成長が遅く、下の写真のような平面的な顔立ちが特徴です。**知的障害もみられ、5歳になっても2歳児くらいのことしかできません。**

⑩ Photograph of a child with fetal alcohol syndrome (FAS)

- ・蒙古眼
- ・短い鼻
- ・低い鼻梁
- ・不明瞭な人中
- ・うずい上唇
- ・平面的な顔

⑪ Q4 FASは、なおりますか？
A4 成長にともなって消えるものではなく、**一生継続障害**です。

⑫ I 妊娠中にお酒を飲まなければ、FASは**100%予防可能**です。
妊娠に気づく前に飲んでしまったというのは、よくあることです。
その場合も、**これから飲まないようにすることが大切です。**

⑬ J お酒がやめられなくてお困りの方は、お近くの保健センターにご相談下さい。

Appendix D. A half-fold leaflet (fourth version).
Top right: front cover. Below: two-page spread. Top left: back cover.
A–P correspond to the alphabet in Appendix C (third version).



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