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Jutta S. Thornberry

Kennan B. Murray
RTI International

M. Nabil El-Khorazaty
RTI International

Michele Kiely
CUNY School of Public Health

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Jutta S. Thornberry, BA[*], **Kennan B. Murray, MPH**[1], **M. Nabil El-Khorazaty, PhD**[2], and **Michele Kiely, DrPH**[3]

[1] Statistician

[2] Senior Research Statistician, RTI International

[3] Chief, Collaborative Studies Unit; Division of Epidemiology, Statistics and Prevention Research; *Eunice Kennedy Shriver* National Institute of Child Health and Development, National Institutes of Health

Abstract

This paper evaluates the acceptability, communication mode and use of audio computer-assisted self-interview (A-CASI) among minority pregnant women receiving prenatal care in six Washington, DC sites. A total of 2,913 women were screened for demographic eligibility (18+ years old, <29 weeks gestation, Black/African-American or Hispanic) and risk (smoking, environmental tobacco smoke exposure, depression, intimate partner violence). Questions were displayed on touch screen laptop monitors and heard through earphones. The mean length of time to complete the screener was almost 6 minutes.

A-CASI experience, which included difficulty in using the computer, acceptability (enjoyment), and preferred communication mode, was compared across sites, the eligibility and risk groups and a subset of 878 enrolled women for whom educational attainment and receipt of WIC (a proxy for income) were available. Respondents thought A-CASI was not difficult to use and liked using the computer. Black/African-American or Hispanic respondents enjoyed it significantly more than did respondents of other race/ethnicities. Respondents who were demographically eligible, Black/African-American or Hispanic, or with lower education levels listened to questions significantly more than did their counterparts. Mainly listening or listening and reading does not impact burden in terms of the length of time it took to complete the screener.

The acceptance of A-CASI as a screening tool opens the door for more uses of this technology in health-related fields. The laptop computer and headphones provide privacy and mobility so the technology can be used to ask sensitive questions in almost any locale, including busy clinic settings.

Keywords

computer-assisted interviewing; literacy; risk behavior screening; sensitive questions; touch screen

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[*]Senior Survey Director, RTI International, † 6110 Executive Blvd. Suite 902, Rockville, MD 20852. Tel: 301-230-4645; Fax: 301-230-4647; jps@rti.org.

INTRODUCTION

In order to implement behavior modification(s) in an at-risk population, individuals must first be identified. Self-reported risk behavior may be invalid if individuals refuse to disclose or minimize their reporting of this information; thus a screening process that elicits honest responses is essential. One means of achieving this objective is the use of audio computer-assisted self-interview (A-CASI). Not only does A-CASI provide a private environment in which to report risky behaviors, the touch screen makes the tool easy to use and the audio recording addresses the issue of illiteracy, an inherent problem when using self-administered data forms.

Although differences in prevalence rates of risky behaviors between studies may be explained by differences in question wording, characteristics of the populations, or other variations, differences in mode of data collection cannot be dismissed. A-CASI has demonstrated its impact as a viable data collection tool for reporting risky behavior. In two different studies, pregnant women self-reported 12% and 18% prevalence of high-risk drinking using A-CASI [1,2]. This compares with 6% and 11% prevalence of alcohol use among pregnant women identified through paper and pencil self-administered interviews [3,4]. In a study comparing A-CASI with telephone responses, when screened using A-CASI, 74% of African-American adolescents reported having engaged in sexual intercourse in the past 3 months compared with 56% who were interviewed by telephone (OR=1.9, 95% CI=1.1 – 3.5) [5]. In another study comparing A-CASI with conventional paper and pencil self-administered questionnaires, when using A-CASI male adolescents reported significantly more male-male sexual behaviors with adjusted odds ratios ranging from 2.3 to 7.8, significantly more drug use with adjusted odds ratios ranging from 1.3 to 9.6, and the combination of sexual contact with drug use adjusted odds ratios ranging from 1.9 to 17.1 [6]. Compared to paper and pencil questionnaires, when using A-CASI, HIV seropositive respondents were significantly less likely to give socially desirable answers in response to questions regarding condom use, condom use frequency, and preventive behaviors [7]. Sexually active women were significantly more likely to report engaging in anal sex (OR=9.0, 95% CI=1.1 – 71.0) [8], and injecting drug users reported significantly more unsafe drug related behaviors such as sharing, renting or selling used syringes [9]. Research conducted in Thailand suggests that A-CASI may lead to increased reporting of behaviors such as unprotected intercourse, coerced sex, unwanted pregnancy, sexually transmitted diseases, and drug use [10].

It is important that screening for risks and risk behaviors in health settings should become standard practice in order to provide appropriate interventions [11]. A-CASI has been successfully used across a broad range of risks and risk behaviors: depressive symptoms [12] and psychiatric disorders [13] among adolescents, alcohol screening [14], eating behaviors [15], intimate partner violence screening [16] and use among persons with disabilities [17] In particular, Renker and Tonkin (2007) reported that participants indicated not only preferring a computer format with the associated anonymity but responded more truthfully to the questions than they would have to an interviewer [16].

There is also evidence of acceptability of A-CASI by respondents. When queried about their A-CASI experience, African-American pregnant women overwhelmingly reported liking it and finding it easy to use [1]. A-CASI was acceptable to 89% of the respondents interviewed in urban sexually transmitted disease clinics [18], and adolescent boys and their fathers revealed a high level of acceptance of A-CASI during cognitive interviews [19]. In using A-CASI to measure medication adherence to treat latent tuberculosis infection, 86% of the respondents were very satisfied with the experience [20]. In a field test with injection drug users, participants were assigned to either a personal interview or a mixed personal and

A-CASI interview. In addition to reporting more risk behaviors, 92% of A-CASI respondents said they liked using the computer and 41% said they would prefer to use the computer solely [21]. In a randomized controlled trial (RCT) comparing A-CASI to interviewer administered questionnaires, over 90% of Brazilian drug users who completed A-CASI reported no problem using the computer [22].

The value of A-CASI has been well-demonstrated and the acceptability of A-CASI by respondents is good. It has been shown that self-administration of questionnaires for sensitive issues result in more accurate responses than those given to interviewers. In addition, A-CASI allows for use of complex fill, skip and edit checks as well as branching and providing prompts [23,24]. A-CASI permits accurate responses across a broad range of literacy levels. In particular it is appropriate for use where the respondents are not sufficiently literate to complete a paper and pencil questionnaire as it simplifies the response task. This factor is crucial because screening for risky behaviors often involves populations with low literacy capabilities. Listening and having the responses highlighted as they are heard and the use of the touch screen increases the likelihood that the questions and responses are well understood. However, little is known about whether respondents actually listen to the questions and responses. In this paper, we report on the acceptability, communication mode and use of A-CASI as a screening tool among minority pregnant women in the Healthy Outcomes of Pregnancy Education (Project DC-HOPE) Study.

METHODS

Project DC-HOPE is part of the NIH-DC Initiative to Reduce Infant Mortality in Minority Populations in Washington, DC (DC Initiative). The DC Initiative is a collaborative effort involving the Children's National Medical Center, George Washington University, Georgetown University, Howard University, the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD)/NIH/DHHS, and RTI International. This RCT was initiated with the goals of reducing the prevalence of specific risk factors linked to adverse pregnancy outcomes by providing integrated health behavior counseling to pregnant African-American women and Latinas in Washington, DC, and improving pregnancy outcomes [25–28]. Project DC-HOPE provided pregnant women with an individualized integrated clinic-based intervention targeting biological risk (active smoking or environmental tobacco smoke exposure) and psychosocial risk (depression and intimate partner violence) [26]. Women were approached, consented, and screened for eligibility in six Washington, DC prenatal clinics between July 2003 and October 2005, and, if eligible, were recruited and consented for the trial. After completing a baseline telephone interview, women were assigned to the intervention or usual care group, using site and risk block randomization methodology, which took into account the recruitment site as well as the number and type of declared risks. The study was approved by the institutional review boards of all participating sites.

Demographic eligibility and the presence of risk factors were determined through an A-CASI screening questionnaire. To be demographically eligible, women needed to be less than 29 weeks of gestation at recruitment; Black/African-American or Latina; at least 18 years of age; and living in the District of Columbia. Study eligibility also required self-report of at least one targeted risk factor: cigarette smoking or environmental tobacco smoke exposure (ETSE); depression; or IPV. Questions on cigarette smoking and exposure to tobacco smoke were adapted from the Smoke Free Families (SFF) core screening and baseline questionnaires [29]. The seven-item Beck Depression Inventory (BDI)-FastScreen [30] was used to identify depression risk. If a woman reported suicidal ideation, based on one of the BDI items, she was not eligible for the study. The screening questionnaire was

terminated, and the clinic staff was informed to intervene appropriately. Intimate partner violence was identified with items adapted from the Abuse Assessment Screen [31].

The A-CASI questionnaire began with six training questions. Women listened to digitally recorded questions on headphones that were connected to a laptop computer while the question was simultaneously displayed on the computer screen. As a response choice was heard, it was highlighted on the screen. The woman answered by touching the chosen response option on the screen. The audio does not need to be completed before touching a response option. A study staff member was available for assistance with the first six questions. There were 39 questions related to eligibility criteria. Finally there were three questions on the acceptability, communication mode and experience of using the computer. The first, *How difficult was it to use the computer to answer the survey questions?* was ranked on a three point scale from "Not difficult" to "Very difficult." Then the respondent was asked: *How much did you like answering the questionnaire using the computer?* ranked on a five point scale from "I liked it a lot" to "I disliked it a lot." Finally to assess communication mode and how women used the computer, they were asked whether they mostly listened, mostly read or both.

A total of 6,202 women were approached as they presented at the clinic sites, of which 1,989 were initially determined to be ineligible (not pregnant, non-English speaking, <18 years of age, too close to delivery) through a brief verbal interview by the research assistants. Of the remaining 4,213 approached for A-CASI administration, 649 refused, 651 consented but were unable to complete the screening and 2,913 women consented and completed the A-CASI screener. In most cases, women did not complete A-CASI because they were called in for their prenatal appointment before finishing and did not return to complete the screener.

Statistical Analysis

Bivariate analysis of completion time for sites by eligibility and communication mode was conducted. General linear models to predict completion time by site, eligibility, and communication mode were developed.

Response categories for the three questions on the experience of using the computer were collapsed to create three dichotomous outcome variables, because of small numbers in some response categories. These outcome variables were (1) difficulty of use: not difficult versus somewhat or very difficult; (2) enjoyment of use: liked a little or a lot versus feeling neutral or disliking it; and (3) preferred mode of communication: listening to the questions being read (mostly listening or both reading and listening) versus mostly reading (use, acceptability and communication mode, respectively).

Bivariate associations of these three outcomes with various sociodemographic characteristics (eligibility status, race/ethnicity, gestational age, and residency) and risk characteristics (smoking, depression, and intimate partner violence risks) were examined using Fisher's exact tests. Due to the potential for confounding among our demographic and risk characteristics, logistic regression was then used to obtain adjusted independent odds ratios for each characteristic. Separate regression models were created to include demographic characteristics and risk characteristics, given that only demographically eligible women continued to respond to the risk assessment questions.

Finally, in order to evaluate the effects of socioeconomic status (SES) on A-CASI enjoyment and experience, logistic models including risk and SES characteristics were run on a subset of the population. This subset of 878 women included only those who (1) responded to the A-CASI acceptability questions, and (2) completed the baseline interview (enrolled in the study), thereby providing information on educational attainment and income.

Because the income question had high levels of missing data, receipt of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) was used as a proxy for low income. These models were run only for two outcome variables, enjoyment of use and mode of communication. Difficulty of use was excluded because the small number of women (n=7) who found the computer difficult to use would not have permitted meaningful analyses.

RESULTS

A total of 2,403 women answered questions about their experiences using the computer to complete the screening questionnaire. Table 1 presents the demographic and risk characteristics of these women.

The respondents reported overwhelmingly that A-CASI was not difficult to use, with less than 3% finding it somewhat or very difficult to use. More than two-thirds of women reported liking using the computer a lot and less than 1% of women disliked it. Sixty-one percent of women both read and listened to the computer. Twenty-nine percent mostly read the questions and responses and the remaining 10% mostly listened (See Table 2).

There were no associations between demographic eligibility, race/ethnicity, or DC residency and in the perception of difficulty in using the computer (See Table 3). Women who did not know their gestational age were 4.2 times as likely to find the computer difficult as those 28 weeks of gestation or more (95% CI:1.6 – 10.9). However, the sample size for the "Don't Know" group who found the computer difficult to use is very small, leading to wide variability in this estimate. Among women who were demographically eligible, those with depression risk were 4.6 times as likely to report that the computer was somewhat or very difficult to use (95% CI:2.3 – 9.4). No significant differences were found among other risk groups.

Mothers who were demographically eligible for the study enjoyed using the computer more than did mothers who were demographically ineligible (see Table 4). Among those demographically eligible, women without intimate partner violence risk were twice as likely to enjoy using the computer as were those with this risk (95% CI: 0.4 – 0.7).

Respondents who were Black/African-American or Hispanic, or DC residents were more likely to listen to the questions being read than were their counterparts (see Table 5). In addition, women who did not know their gestational age were 4.0 times as likely to listen to the questions than those greater than 28 weeks (95% CI:1.8 – 8.9). Among women who were demographically eligible, those with smoking risk were 1.5 times as likely to listen to the questions being read as those without this risk (95% CI:1.2 – 2.0).

Among women for whom SES data were available from the baseline interview, logistic regression models predicting enjoyment using the computer and mode of communication were developed with education, WIC and the three risk factors as covariates. Educational attainment was a significant predictor of both computer enjoyment and mode of communication. Women with less than a high school education, or with a high school diploma or GED, were significantly more likely to enjoy using the computer and to listen to the questions being read than were those with some college education (see Table 6). Receipt of WIC was not significantly related to either. Regarding difficulty of use, no logistic model was developed because 98% of respondents had no difficulty using the computer to answer the screening questions.

Table 7 shows the average mean time for completion of the A-CASI screening by eligibility, site and communication mode. For the 2,913 women who completed the A-CASI screening,

the mean time for completion was 4.8 minutes. For demographically eligible women, the mean completion time was 5. 8 minutes, and those ineligible, the mean completion time was 2.3 minutes. Completion time by site ranged from 3.7 minutes to 5.4 minutes. Average completion time by site ranged from 5.2 minutes to 6.2 minutes for eligible women and from 2 minutes to 2.9 minutes for ineligible women. The site that had the highest percentage of women who were high school graduates or had some college education and working showed the shortest completion time among ineligible (2 minutes) and eligible (5.2 minutes) women.

Average completion time of A-CASI by communication mode increased from 3.8 minutes for women who read the questions on the screen to 5.0 for those who listened to the questions, and to 5.1 minutes for those who read and listened. The pattern of time spent (read only was the shortest, followed by listen only, with listen and read the longest) was similar for eligible and ineligible women and overall. Completion time for ineligible women was approximately 3 minutes shorter than that for eligible women because once a woman was determined to be ineligible, the A-CASI program skipped the rest of the screening questions. The multiple regression model predicting A-CASI completion time by site, eligibility, and communication mode was developed (not shown). The results showed that each of the three covariates was significant at $p<0.001$. The model fit was significant ($p<0.001$) and the three covariates explained 49.6% of the variation in the completion time, thus implying a large effect size of 0.984.

DISCUSSION

Women who consented and completed the A-CASI screener overwhelmingly reported enjoying using the computer and found it easy to use. The majority of women, regardless of background, reported that they liked using the computer a lot to answer the survey questions. Furthermore, women who were demographically eligible for the study, and therefore answered more questions, enjoyed using the computer more than did women who were demographically ineligible. Respondents who were Black/African-American or Hispanic or DC residents also enjoyed using the computer significantly more than their counterparts. This may be explained by the novelty of the experience, given the lack of computer access in such populations [32,33]. Those with intimate partner violence risk tended to feel less positive about using the computer than did women without this risk. Possibly, for these women, answering the intimate partner violence questions impacted their experience.

For population groups with limited reading skills, the only alternative to self-administered reporting is for an interviewer to read potentially stigmatizing questions and responses aloud. The ability to listen and read the question is a major benefit provided by the A-CASI methodology. This dual communication mode allows a respondent to choose the mode most effective for him or her. In our study, the majority of the respondents mostly or generally listened to the questions. As A-CASI is intended [23], within our respondent pool we found that women coming from the more underserved populations as well as those with lower education levels tended to listen to the questions more than did their counterparts. As might be predicted, those who mostly read the questions completed the A-CASI in less time than those who mostly listened or read and listened. However, for both of these groups, there was not a substantial difference in the mean completion time. It is reassuring that using the audio feature of A-CASI does not impact burden. As previously noted, A-CASI enhances the ability to screen for a broad range of risks and risk behaviors in a clinical setting [11–17]. Furthermore, it does this without interfering with the routine activities of the clinic.

The women in our study also reported sensitive information and risky behavior at a higher prevalence using A-CASI than in published studies using other reporting means. Twenty-

two percent of our pregnant respondents reported that they currently smoke cigarettes. In comparison, using interviewer-collected data, the National Institute on Drug Abuse and the Substance Abuse and Mental Health Agency reported tobacco use rates of 21% [34] and 20% [35], respectively, among pregnant women. Furthermore, data abstracted from birth certificates by the National Center for Health Statistics indicated that 12% of women giving birth reported that they smoked cigarettes [36]. Also, 14% of our pregnant respondents reported IPV during the past year, compared with 10% prevalence of abuse reported by a multiethnic population-based sample of women aged 18–64 during in-person, clinic-based interviews [37].

A-CASI administration for eligibility screening in similar RCT studies is recommended because of its ease of use and as a reliable and quick method for screening. On average, the completion time was less than five minutes. This means that the administration of A-CASI screening in the busy environment of prenatal clinic sites does not occupy a lot of time of the patients and can provide health professionals with needed and reliable information.

Study strengths include the novelty of exploring A-CASI communication mode, the large sample size, use within a population of pregnant minority women, verification of the ability to conduct A-CASI screening within a busy clinic setting as well as the touch screen interface. Our study reinforces the previous literature regarding the ability to screen for risk factors in public health settings. This is an important part of the mainstream of preventive medicine. The novelty of exploring communication mode (listen only, read only or listen and read) strengthens the A-CASI literature.

There are, however, limitations to our study. Our results may be applicable only to lower-income, urban, minority women who seek prenatal care and thus may not be more broadly generalizable. In our study, out of 4,213 women approached, 15% (n = 649) refused to complete the A-CASI screener. Because women were not queried about the reason(s) for their refusal, we can only speculate as to why they declined to participate. It is possible that some refused due to unfamiliarity with computers. We included only two socio-demographic variables (education level and WIC participation) as possible correlates for time spent in completing A-CASI and only for a subset of the sample. Data on other predictors that might be correlated with completion time were not examined.

Future research should determine the reasons for refusing to participate in A-CASI screening. Furthermore, for those who do participate, researchers should ask more probing questions about the A-CASI experience. For example, researchers might ask the reasons for choice of communication mode or additional socio-demographic questions. It would also be useful to determine whether our results are generalizable to other populations. Finally, it would be beneficial to identify women with risk(s) and explore the possibility of incorporating a brief intervention to address the risk(s) at the end of the screening.

CONCLUSION

The acceptance of A-CASI as a screening tool in this study opens the door for more uses of this technology in health-related fields. Its advantages are numerous. Implementation is standardized for all respondents and not subject to the variations that interviewers may impose when conducting an interview. Complex question ordering and skip patterns and mathematical calculations (e.g., scoring questionnaire scale items) can be programmed providing ease in navigating the questionnaire. Data are available immediately. The laptop computer and headphones provide privacy and mobility so the technology can be used to ask sensitive questions in almost any locale, including busy clinic settings. Knowledge of computers is not necessary with the touch-screen component. The audio recording of the

questions and answer choices provides an alternative to an interviewer reading potentially stigmatizing questions aloud to population groups with limited reading skills. We are encouraged that our respondents, especially those with less education and more likely to have limited reading skills, overwhelming reported listening to the questions, thus giving us greater reassurance in their question comprehension without jeopardizing privacy.

Acknowledgments

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Table 1

Characteristics of A-CASI respondents

Characteristic	n	%
Currently pregnant	2,391	99.7
28 weeks pregnant or less	1,804	75.5
18 years or older	2,387	99.3
DC resident	1,962	81.7
Black/AA or Hispanic	2,077	86.9
Demographically eligible from A-CASI	1,626	67.7
Smoking risk	1,130	70.0
Depression risk	420	26.0
Intimate partner violence (IPV) risk	231	14.3
Any risk factor	1,219	75.5
TOTAL RESPONDENTS	2,403	—

Table 2

Experience of using A-CASI

Question	n	%
(1) How difficult was it to use the computer to answer the survey questions?		
1. Not difficult	2,345	97.8
2. Somewhat difficult	47	2.0
3. Very difficult	7	0.3
(2) How much did you like answering the questionnaire using the computer?		
1. I liked it a lot	1,619	67.5
2. I liked it a little	316	13.2
3. I neither liked nor disliked it	445	18.5
4. I disliked it a little	11	0.5
5. I disliked it a lot	8	0.3
(3) When answering the survey questions, did you…		
1. Mostly listen but not always read the questions on the screen	230	9.6
2. Generally read the question on the screen and listen	1,469	61.3
3. Mostly read the questions on the screen, but not always listen	699	29.2

Table 3

Difficulty of computer use

Characteristic	Not difficult n (%)	Somewhat or very difficult n (%)	Unadjusted odds ratio (95% CI)*	Adjusted odds ratio (95% CI)*
DEMOGRAPHIC CHARACTERISTICS				
Demographically eligible from A-CASI				
Yes	1586 (97. 8%)	36 (2.2%)	1.0 (0.5, 1.8)	n/a
No	759 (97.7%)	18 (2.3%)		
Black/AA or Hispanic				
Yes	2026 (97.7%)	47 (2.3%)	1.4 (.6, 4.7)	1.5 (0.6, 3.8)
No	309 (98.4%)	5 (1.6%)		
28 weeks pregnant or less [†]				
Don't know	65 (90.3%)	33 (1.8%)	36.3 (14.9, 100.2)	4.2 (1.6, 10.9)
Yes	1767 (98.2%)	14 (2.7%)	0.6 (0.2, 1.7)	0.7 (0.4, 1.3)
No	501 (97.3%)	7 (9.7%)		
DC resident				
Yes	1915 (97.8%)	43 (2.2%)	0.9 (0.4, 1.9)	0.7 (0.4, 1.5)
No	430 (97.5%)	11 (2.5%)		
RISK CHARACTERISTICS*				
Any risk factor				
Yes	1187 (97.7%)	28 (2.3%)	1.1 (0.5, 2.9)	n/a
No	387 (98.0%)	8 (2.0%)		
Smoking risk				
Yes	1100 (97.7%)	26 (2.3%)	1.1 (0.5, 2.6)	0.8 (0.4, 1.7)
No	474 (97.9%)	10 (2.1%)		
Depression risk [†]				
Yes	395 (94.7%)	22 (5.3%)	4.7 (2.3, 10.0)	4.6 (2.3, 9.4)
No	1179 (98.8%)	14 (1.2%)		
Intimate partner violence risk				
Yes	221 (96.1%)	9 (3.9%)	2.0 (0.8, 4.5)	1.3 (0.6, 3.0)
No	1353 (98.0%)	27 (2.0%)		

Note: Risk characteristics are presented among demographically eligible women, $n = 1626$.

*Odds ratios are not presented for the reference cell. Modeling odds of finding the A-CASI somewhat or very difficult.

[†]Significant bivariate association, $p < 0.05$.

Table 4

Enjoyment of using computer

Characteristic	Liked a little or a lot n (%)	Neutral or disliked n (%)	Unadjusted odds ratio (95% CI)[*]	Adjusted odds ratio (95% CI)[*]
DEMOGRAPHIC CHARACTERISTICS				
Demographically eligible from A-CASI [†]				
Yes	1346 (83.0%)	276 (17.0%)	0.6 (0.5, 0.8)	n/a
No	589 (75.8%)	188 (24.2%)		
Black/AA or Hispanic [†]				
Yes	1736 (83.7%)	337 (16.3%)	0.3 (0.2, 0.4)	2.9 (2.2, 3.7)
No	193 (61.5%)	121 (38.5%)		
28 weeks pregnant or less [†]				
Don't know	64 (88.9%)	8 (11.1%)	0.6 (0.2, 1.3)	1.3 (0.6, 2.9)
Yes	1433 (79.6%)	367 (20.4%)	1.2 (1.0, 1.6)	0.8 (0.6, 1.0)
No	427 (82.9%)	88 (17.1%)		
DC resident [†]				
Yes	1618 (82.6%)	340 (17.4%)	0.5 (0.4, 0.7)	1.4 (1.1, 1.8)
No	317 (71.9%)	124 (28.1%)		
RISK CHARACTERISTICS[*]				
Any risk factor				
Yes	1019 (83.9%)	196 (16.1%)	0.8 (0.6, 1.2)	n/a
No	322 (81.5%)	73 (18.5%)		
Smoking risk				
Yes	947 (84.1%)	179 (15.9%)	0.8 (0.6, 1.1)	1.3 (1.0, 1.7)
No	394 (81.4%)	90 (18.6%)		
Depression risk				
Yes	353 (84.7%)	64 (15.4%)	0.9 (0.6, 1.2)	1.3 (0.9, 1.8)
No	988 (82.8%)	205 (17.2%)		
Intimate partner violence (IPV) risk [†]				
Yes	175 (76.1%)	55 (23.9%)	1.7 (1.2, 2.4)	0.5 (0.4, 0.7)
No	1166 (84.5%)	214 (15.5%)		

Note: Risk characteristics are presented among demographically eligible women, $n = 1626$

[*] Odds ratios are not presented for the reference cell. Modeling odds of liking the A-CASI a little or a lot.

[†] Significant bivariate association, $p < 0.05$

Table 5

Mode of communication

Characteristic	Listen at all n (%)	Mostly read n (%)	Unadjusted odds ratio (95% CI)[*]	Adjusted odds ratio (95% CI)[*]
DEMOGRAPHIC CHARACTERISTICS				
Demographically eligible from A-CASI [†]				
Yes	1228 (75.7%)	394 (24.3%)	0.5 (0.4, 0.6)	n/a
No	471 (60.7%)	305 (39.3%)		
Black/AA or Hispanic [†]				
Yes	1547 (74.6%)	526 (25.4%)	0.3 (0.2, 0.4)	3.0 (2.3, 3.9)
No	143 (45.7%)	170 (54.3%)		
28 weeks pregnant or less [†]				
Don't know	65 (90.3%)	7 (9.7%)	0.2 (0.1, 0.5)	4.0 (1.8, 8.9)
Yes	1280 (71.2%)	519 (28.9%)	0.8 (0.7, 1.0)	1.2 (1.0, 1.5)
No	346 (67.2%)	169 (32.8%)		
DC resident [†]				
Yes	1448 (74.0%)	510 (26.1%)	0.5 (0.4, 0.6)	1.6 (1.3, 2.0)
No	251 (57.1%)	189 (43.0%)		
RISK CHARACTERISTICS[*]				
Any risk factor [†]				
Yes	942 (77.5%)	273 (22.5%)	0.6 (0.5, 0.9)	n/a
No	277 (70.1%)	118 (29.9%)		
Smoking risk [†]				
Yes	880 (78.2%)	246 (21.9%)	0.6 (0.5, 0.8)	1.5 (1.2, 2.0)
No	339 (70.0%)	145 (30.0%)		
Depression risk				
Yes	323 (77.5%)	94 (22.5%)	0.9 (0.7, 1.2)	1.1 (0.8, 1.4)
No	896 (75.1%)	297 (24.9%)		
Intimate partner violence (IPV) risk				
Yes	175 (76.1%)	55 (23.9%)	1.0 (0.7, 1.4)	0.9 (0.6, 1.3)
No	1044 (75.7%)	336 (24.4%)		

Note: Risk characteristics are presented among demographically eligible women, $n = 1626$.

[*] Odds ratios are not presented for the reference cell. Modeling odds of listening to the questions being read.

[†] Significant bivariate association, $p < 0.05$.

Table 6

Adjusted Odds Ratios (AORs) for predicting computer enjoyment and communication mode

Characteristic	Question 2: Liked using the computer a little or a lot n (%)	Question 3: Mostly listened or both read and listened n (%)	Question 2: Liked using the computer a little or a lot AOR (95% CI)	Question 3: Mostly listened or both read and listened AOR (95% CI)
Receives WIC[*]				
Yes	306 (84.3%)	281 (77.4%)	0.9 (0.6, 1.4)	0.8 (0.6, 1.1)
No	434 (84.3%)	409 (79.7%)	Referent	Referent
Education[†]				
Less than HS	225 (86.5%)	219 (84.2%)	1.8 (1.1, 3.0)	2.2 (1.4, 3.5)
HS graduate/GED	347 (86.8%)	319 (79.8%)	1.8 (1.2, 2.9)	1.6 (1.1, 2.4)
Some college	168 (77.8%)	152 (70.4%)	Referent	Referent

Note: Population was subset for women with baseline data, $n = 878$. The logistic regression also accounted for smoking, depression, and intimate partner violence.

[*] 41.5% of the enrolled women were receiving WIC.

[†] 29.6% of the enrolled women had less than high school education, and 45.7% had a high school degree or GED.

Table 7

A-CASI total time (mean, minimum, maximum) by eligibility, site and communication mode

	Listen Only	**Read Only**	**Listen and Read**	**TOTAL**
ELIGIBILITY				
Eligible	5.68 (2.68 – 25.55)	5.11 (2.55 – 20.55)	6.18 (2.88 – 36.02)	5.78 (2.25 – 36.02)
Ineligible	2.58 (1.08 – 6.42)	2.05 (0.92 – 8.03)	2.60 (0.83 – 7.18)	2.34 (0.58 – 8.37)
SITE				
A	4.71 (2.20 – 7.33)	4.43 (1.50 – 9.38)	5.73 (0.83 – 36.02)	5.38 (0.83 – 36.02)
B	4.91 (1.65 – 7.23)	4.54 (1.72 – 10.35)	5.78 (1.60 – 11.37)	5.09 (0.58 – 22.62)
C	4.11 (1.08 – 13.97)	3.25 (0.92 – 11.88)	4.18 (0.85 – 12.60)	3.73 (0.68 – 13.97)
D	6.02 (2.25 – 13.57)	4.53 (1.50 – 20.55)	5.57 (1.20 – 11.33)	5.33 (1.20 – 20.55)
E	4.91 (1.10 – 10.33)	4.37 (1.08 – 13.00)	5.19 (1.33 – 15.60)	4.99 (1.08 – 15.60)
F	5.31 (1.87 – 25.55)	4.25 (1.07 – 8.27)	5.39 (1.42 – 20.47)	5.08 (1.07 – 25.55)
TOTAL	4.97 (1.08 – 25.55)	3.76 (0.92 – 20.55)	5.14 (0.83 – 36.02)	4.75 (0.58 – 36.02)