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Authors

Dehlendorf, Christine
Fitzpatrick, Judith
Steinauer, Jody
et al.

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Development and field testing of a decision support tool to facilitate shared decision making in contraceptive counseling

Christine Dehlendorf[a,b,c], **Judith Fitzpatrick**[a], **Jody Steinauer**[b], **Lawrence Swiader**[d], **Kevin Grumbach**[a], **Cara Hall**[e], and **Miriam Kuppermann**[b,c]

[a]Department of Family & Community Medicine, University of California, San Francisco, 1001 Potrero Avenue, San Francisco, CA, USA

[b]Department of Obstetrics, Gynecology & Reproductive Sciences, University of California, San Francisco, 1001 Potrero Avenue, San Francisco, CA, USA

[c]Department of Epidemiology & Biostatistics, University of California, 1001 Potrero Avenue, San Francisco, CA, USA

[d]The National Campaign to Prevent Teen and Unplanned Pregnancy, 1776 Massachusetts Ave NW, Washington, DC 20036

[e]University of Rochester School of Medicine and Dentistry (URSMD), 601 Elmwood Ave, Rochester, NY 14642

Abstract

Objective—We developed and formatively evaluated a tablet-based decision support tool for use by women prior to a contraceptive counseling visit to help them engage in shared decision making regarding method selection.

Methods—Drawing upon formative work around women's preferences for contraceptive counseling and conceptual understanding of health care decision making, we iteratively developed a storyboard and then digital prototypes, based on best practices for decision support tool development. Pilot testing using both quantitative and qualitative data and cognitive testing was conducted. We obtained feedback from patient and provider advisory groups throughout the development process.

Results—Ninety-six percent of women who used the tool in pilot testing reported that it helped them choose a method, and qualitative interviews indicated acceptability of the tool's content and presentation. Compared to the control group, women who used the tool demonstrated trends

Corresponding author: Judith Fitzpatrick; judith.fitzpatrick@ucsf.edu; postal address: 1001 Potrero Avenue, San Francisco, CA 94110.

Authors confirm that all patient/personal identifiers have been removed so the patient/person(s) described are not identifiable and cannot be identified through the details of the story.

Conflict of interest

None declared.

toward increased likelihood of complete satisfaction with their method. Participant responses to cognitive testing were used in tool refinement.

Conclusion—Our decision support tool appears acceptable to women in the family planning setting.

Practice implications—Formative evaluation of the tool supports its utility among patients making contraceptive decisions, which can be further evaluated in a randomized controlled trial.

Keywords

Decision making; decision support tool; contraception; contraceptive counseling; shared decision making

1. Introduction

With 45% of pregnancies in the United States being unintended, many women in this country are unable to achieve their reproductive goals, which can lead to negative outcomes for them and their families.(1) This burden is disproportionately experienced by women of color and women of lower socioeconomic status (SES), who experience higher rates of unintended pregnancy.(1) A key factor contributing to the high rates of unintended pregnancy is non-use and inconsistent use of contraception. As all non-barrier contraceptive methods require consultation with a health care provider, contraceptive counseling can help women use contraception consistently and correctly. Studies investigating the effect of counseling have found that over 50% of women who undergo it report that their provider influenced their choice of method,(2) and this influence may be particularly marked with respect to choice of newer methods.(2, 3) Other studies have found that women who experience higher quality interpersonal care have better contraceptive outcomes.(4–7) Quality contraceptive counseling can therefore have a powerful influence on women's abilities to achieve their reproductive goals. However, qualitative and quantitative studies have found that women are often dissatisfied with the contraceptive counseling they receive, reporting that they feel unable to discuss their concerns.(5, 8–11) In particular, many women report that their concerns about contraceptive attributes, such as side effects, were not sufficiently considered and that providers did not adapt their advice to meet these women's individual needs.(12)

A promising approach to improving contraceptive counseling is the use of a decision support tool designed to facilitate quality decision making, with the ultimate goal of helping women to select the best method for them. Decision aids offer a comprehensive framework for patients to evaluate their medical options and to select the option that is most consistent with their needs.(13) A decision tool can help women identify their contraceptive preferences and compare methods according to these preferences. This information can then be communicated to their providers, facilitating a shared decision making process designed to help each woman identify the contraceptive method she is most likely to continue to use — and to use correctly — and ultimately to achieve her reproductive goals.

The value of a contraceptive decision aid used to support shared decision making in family planning is supported by a previous cohort study, in which a shared decision making

approach to counseling was found to be associated with increased patient satisfaction with the decision making process when compared to primarily patient-driven or provider-driven approaches.(14) In addition, a qualitative study of women of diverse race/ethnicities found that while these women wanted autonomy over their ultimate contraceptive decision, most also desired decision support from their providers.(9) Beyond the facilitation of shared decision making, a decision support tool can address common challenges in contraceptive counseling, including the time-limited nature of counseling sessions and the prevalence of knowledge gaps and misconceptions about contraceptive methods among patients, which diminish patients' ability to make informed decisions.(15–21) The use of an interactive decision support tool has the potential to save time by providing individualized information to patients, including information that addresses misconceptions, and ensures that the provider is aware of the patient's preferences, ultimately facilitating a more efficient interaction.

In response to a systematic need for more patient-centered contraceptive counseling, we developed *My Birth Control*, a contraceptive decision support tool to promote a shared decision-making approach to counseling that is rooted in women's preferences. This interactive, tablet-based decision aid is meant to be used by women immediately prior to their contraceptive counseling visit. This paper presents our systematic approach to the development of *My Birth Control* and an evaluation of this tool for clarity and acceptability.

2. Methods

2.1 Conceptual framework

The conceptual basis for *My Birth Control* was informed by the preference-sensitive nature of contraceptive decision making, in which the best method is dependent on the individual woman's preferences. Most women are medically eligible for ten or more contraceptive method options, and their preferences for method characteristics are highly variable.(22–24) An understanding of these diverse preferences is essential for providers to be able to provide effective decision support. For example, while contraceptive effectiveness has been found to be an important feature to women in decision making, women also report other attributes such as side effects, safety, and mode of use to be important, and women differ in their preferences for and prioritization of these features.(23, 25–27) The results from one quantitative study indicate that providers' perceptions of the importance of method characteristics deviate from women's perceptions: while women selected heavy periods as the least desirable method characteristic, providers selected low effectiveness as the least desirable characteristic, suggesting providers' preferences and attitudes may not align with those of their patients.(27) Other qualitative work indicates that broad public health aims to increase use of highly effective methods and reduce unintended pregnancy may not be consistent with women's own attitudes around pregnancy, to which a planned behavior model may not apply.(28) These results further highlight the need for a patient-centered approach to contraceptive counseling that engages with women's highly individualized, contextual needs and preferences.

The development of *My Birth Control* also drew on available literature about the process of decision making in the health care context. In considering how to facilitate shared decision

making in the context of contraceptive counseling, we used the model described by Charles et al., who delineated three stages of treatment decision making: information sharing, deliberation, and the final decision.(29)*My Birth Control* was designed to assist with the information sharing and deliberation stages of this process by providing information to women about their options and initiating the process of thinking about how these options relate to their personal preferences. A printout of information regarding their reported preferences for method characteristics and the methods that they are most interested in is then given to the provider, with the goal of having patients and providers together continue the process of deliberation, and proceed to making the decision.

Two theories addressing the process of decision making influenced the design of *My Birth Control*. The first is the decision conflict theory, a prescriptive theory that has been previously used in the development of decision support tools.(30) This theory describes the process of "vigilant decision making", which includes canvassing all the available options, considering one's own preferences about the decision being made, and weighing the advantages and disadvantages of the available options. In accordance with this theory, we designed the tool to include information about all available options and to provide for explicit values clarification. In order to acknowledge the more intuitive aspect of decision making, we also drew on the concept of ecological rationality.(31) In contrast with models emphasizing the role of deliberation and logic in decision making, this model describes how humans often use heuristics to make successful decisions with limited information. Use of this model of decision making has been proposed as a useful approach for decision support tools, given the time-limited environments in which they are used and the relevance of affective reactions to information that are not considered if an individual relies exclusively on rational processes.(32) In accordance with literature emphasizing the value of integrating a rational approach to decision making with more intuitive approaches,(32, 33) we structured our tool to draw on both processes. Women first explicitly and rationally consider their contraceptive preferences, as described. Then, instead of using information about these preferences to determine a final recommendation for what method a woman should use, the tool instead presents women with a variety of recommendations corresponding to different aspects of their preferences. Women must then determine which methods they most want to discuss with their provider based on their sense of which aspect of their preferences is most important. This sequence of conscious deliberation, followed by more intuitive consideration, has been shown to be an effective means of optimizing decision making.(33)

2.2 Systematic development process (Figure 2)

In developing *My Birth Control*, we used a systematic, iterative process following the general structure recommended by Elwyn et al. for the development of web-based decision support interventions.(34) In this process, we drew on the available evidence regarding best practices for the design of the structure and content of decision support tools, including the International Patient Decision Aids Standards Collaboration (IPDAS) quality checklist(35) and its background document (see Table 1).(36) Feedback from patient and provider advisory groups was solicited throughout the development process in order to incorporate both perspectives in the final product, which contains both patient-facing (the tool itself) and a provider-facing (the printout) elements. The patient advisors for this project represented an

existing patient group assembled by a safety net reproductive health clinic in San Francisco that provides family planning care to the population of interest. The group consisted of 6–10 members, with 6 core members that advised the development of the decision support tool from its inception., The provider advisory group was assembled by the research team and consisted of 10 clinicians with experience delivering contraceptive counseling in safety net settings. Separate meetings were held with the patient and provider advisory groups, and decisions were made using a consensus process with the groups' feedback iteratively incorporated into the decision support tool by the research team, prioritizing patient feedback when there was discordance.

Initial development process (Stages 1–3)—Our needs assessment consisted of formative work regarding women's preferences for contraceptive counseling and review of relevant literature regarding contraceptive counseling. The formative qualitative work, consisting of semi-structured interviews analyzed using modified grounded theory including both inductive and deductive themes, has been previously published.(9) Relevant findings from this study including the need to explicitly address side effects, including concerns patients may have heard through social networks, and the value of a shared decision making approach to contraceptive counseling. This needs assessment informed the creation of a story board in collaboration with a scientific advisory group of family planning experts based at the University of California, San Francisco. This story board consisted of basic educational information about methods and preference elicitation, and ultimately generated a printout that includes a patient's preferences meant for use by the provider during the clinical visit (see Table 2). The story board was reviewed by patient and provider advisory groups, and their feedback was synthesized and incorporated into prototype planning. With design and development support from The National Campaign to Prevent Teen and Unplanned Pregnancy, we created an iPad-based prototype.

Pilot test of Prototype 1 (Stage 4)—Pilot testing of the original prototype, Prototype 1, was conducted at a safety net clinic in the San Francisco Bay Area among 41 patients who used the tool to obtain preliminary information about the impact and acceptability of the tool. Participants were recruited from the waiting room and screened for eligibility prior to their family planning visit. They were considered eligible if they were between the ages of 15–45, wished to discuss initiating a contraceptive method for the purpose of preventing pregnancy, and spoke English. They interacted with the tool prior to their visit, and the printout was shared with their provider. Pre- and post-visit surveys were used to collect quantitative data regarding impact and acceptability of the tool, pre- and post-visit knowledge about methods, and satisfaction with their method choice. Qualitative interviews were conducted of a sample of these patients, selected using a random number generator, until saturation was reached (10 interviews). In addition, a control group of 42 participants receiving usual care were recruited prior to introducing the tool into the clinic, who answered the same surveys as those using the tool with the exception of questions regarding the tool itself. We compared contraceptive knowledge and satisfaction between patients who used *My Birth Control* prior to their contraceptive counseling visit with those who received usual care, using chi squared testing. Qualitative analysis of interviews consisted of iterative thematic analysis using content analysis, in which reactions to the tool were analyzed using

a pre-specified template(37), focused on the perceived positive and negative aspects of the tool. Each interview was summarized with respect to these themes by the original interviewer using direct quotes from the interviews. These summaries were then discussed in group meetings, . developing consensus around overall themes and emerging sub-themes (e.g., the ease of navigation, impact on informed decision making). In the final step of the analysis, findings were then synthesized in memos.

Cognitive testing of Prototype 1, development of Prototype 2, and cognitive testing of Prototype 2 (Stages 5–7)—Cognitive testing of the tool was conducted in two phases at a different safety net clinic in San Francisco. Results from the first phase of cognitive testing using Prototype 1 were used to inform the development of Prototype 2, which contained refined content as well as several additional features. Cognitive testing was then conducted using Prototype 2. We again solicited feedback from our patient and provider advisory groups before combining their feedback with the results from the second round of cognitive testing to create a final version of *My Birth Control.*

In both phases of cognitive testing, female patients were recruited from the waiting room to review the tool and provide feedback following their clinical visit. Patients were screened for eligibility prior to their clinical visit and were considered eligible if they were between the ages of 15 and 45, spoke English, and were not pregnant or seeking pregnancy at the time.

In both phases, research staff asked patient participants directed questions about their thoughts regarding specific sections of the tool, and noted places where users had questions or difficulty navigating. Initial interviews were focused on areas of interest to the development team, based on feedback from both provider and patient stakeholder groups regarding their clarity, with iterative revision as described below. Specific feedback regarding their thoughts around the clarity of instructions included on the interactive pages of the tool and the acceptability of language included in our educational modules was also elicited. In the first phase of testing, we also asked patients about the perceived utility of adding more features to the Prototype 1, which informed the development of Prototype 2. Interview responses were transcribed in real time by the second author (JF) and reviewed by the first and second (CD) author in regular meetings. In these meetings, interview questions were iteratively revised according to responses given by previous participants, with attention given to tool components that were noted to be difficult to navigate or understand in order to explore potential modifications. At the end of each phase, recommendations for revisions were compiled by the second author and reviewed by the first author prior to being implemented through web design and development in the sequential prototypes.

All study procedures were approved by the University of California, San Francisco Institutional Review Board (UCSF IRB) and all participants completed informed consent.

3. Results

3.1 Results from pilot testing of Prototype 1

Quantitative data—Table 3 presents the characteristics of the 83 participants. Findings from the pilot study affirmed the acceptability of *My Birth Control* in clinical practice. Of

the 41 patients who used the tool, 96% reported that it had helped them to choose a method, with the same percentage indicating that they were satisfied with the information they received from the tool. While the study was not powered adequately to evaluate differences in outcomes between groups, results revealed trends toward better outcomes associated with use of tool. Specifically, women who used the tool had a trend towards being more likely to be completely satisfied with their choice of method compared with the control group (29% vs. 12%; p=0.06). In addition, among participants who had no prior knowledge about long-acting reversible contraception (LARC), those who used the tool had a trend towards being more likely to have any knowledge about LARC methods following their visit, compared to those who received usual care. Specifically, among participants who had no knowledge about the hormonal intrauterine device (IUD) (n=26), and the non-hormonal IUD (n=23) prior to their visit, there were trends towards participants who used the tool being more likely to have any knowledge about these methods after their visit than were control participants (100% vs. 72%, p=0.1 and 100% vs. 69%, p=0.054). With the implant, this difference in post-visit knowledge was significant (n=37, 95% vs. 81%, p=0.016).

Qualitative data—In qualitative interviews, patients shared that they found the tool to be acceptable, clear, and to have a positive influence on their experience of contraceptive counseling. One patient affirmed the acceptability of the intervention by stating “I thought it was really helpful and informative; I think it was enough information- not too much to be overwhelming.” Patients found the structure and content to be coherent and clear, with one user stating, “The tool was easy to navigate; there was no part where I didn’t know where to go next.” With respect to the influence on their counseling experience, one patient shared, “I was able to ask better questions and be more confident in that, not just going into it being like, ‘whatever, I don’t know.” Another participant shared “It made [my visit] go much, much faster. I had really direct questions. It made it really easy for [the clinician] because I was already informed on all of the stuff.”

3.2 Results from cognitive testing of Prototypes 1 and 2

Cognitive testing of Prototype 1—Participants in the first round of cognitive testing made suggestions related to language, bolding key words, and increasing font size. These findings led to changes to enhance the clarity and user-friendliness, which were incorporated into Prototype 2. For example, patients reported that it would be helpful to have added instructions and animations indicating what to do next on the main menu page and the final recommendations page. We also observed that some patients had difficulty advancing through these sections. These results led us to incorporate additional instructions and animations on both pages. For example, on the final recommendation page, we added a button stating “Click to see the recommended methods for you!” rather than automatically revealing the recommendations in order to more clearly prepare the user for the section. We also made changes to the language included in the educational modules as indicated by patient feedback. For example, we simplified the language of the describing method effectiveness from “x in 100 women will experience an unplanned pregnancy during the first year on this method” to “x in 100 women will get pregnant during the first year on this method” in response to user feedback. In addition, participants indicated the desirability of adding specific new features including a “side effects by method” feature in the educational

module covering contraceptive side effects that would allow the user to click on a picture of a method and see the associated side effects and a “method comparison” feature that would allow the user to compare two methods side by side (Figure 3).

Cognitive testing of Prototype 2—Cognitive tests using Prototype 2 overwhelmingly confirmed the acceptability of the new features added to the tool in response to feedback from the first phase of cognitive testing. Participants appreciated the “what’s on your mind?” feature that allowed them to type in questions throughout the educational session of the tool. One participant reported, “I think that it’s good because sometimes you have questions that aren’t on [the tool].” Patients confirmed the utility of the “side effects by method” feature in addition to the general side effects overview. A participant commented, “I think it’s easier to keep track of all of the side effects.” In addition, participants shared positive feedback regarding the “method comparison” feature. One user stated, “I kind of wish I would have had this when I was deciding which IUD I wanted…side-by-side, I like that.” Participants also provided further feedback on the user interface that informed additional modifications. For example, some participants expressed that they would not have noticed the button at the bottom of each page designed to elicit questions from the patient. In response to this feedback, we worked with our development team to add a descriptive icon to the button to make it more conspicuous. Changes made to Prototype 2 in response to patient feedback resulted in the final version of the tool.

3.3 Results from patient and provider advisory groups

The input collected during stakeholder meetings throughout the development process influenced all aspects of the tool, including the structure, content, and graphics. Feedback from the patient advisory groups led us to remove pictures of couples and to replace them with pictures of single women to maximize inclusiveness. In addition, the patient advisory group reinforced our decision to include educational pages devoted specifically to the IUD and emergency contraception (EC). While the educational portion of tool is almost entirely self-directed, with users able to decide for themselves the method-specific information they wish to obtain, patient advisors supported the appropriateness of incorporating IUD and EC-specific pages to which users would automatically be directed, as prevalent misinformation and knowledge gaps exist around these methods. Our provider advisory group contributed to our educational modules, drawing upon their knowledge of common concerns among their patient population. This included the suggestion from provider advisors that we address the safety of amenorrhea associated with hormonal contraceptive use, as it is a common patient concern. They suggested that we add language to the tool’s description of menstrual changes that assured the patient that “nothing was building up inside of them.” Patients strongly approved of this language when it was tested during subsequent cognitive interviews.

4. Discussion and conclusion

4.1 Discussion

We developed and formatively evaluated a tablet-based contraceptive decision aid designed to facilitate shared decision making between women and their providers, and to ultimately support women in selecting the contraceptive method that is most aligned with their personal

preferences. We utilized an iterative development process that was informed by patient and provider input throughout the storyboarding, prototyping, and finalization of *My Birth Control*. This patient-informed process is consistent with recommendations to include users in the development of decision aids to achieve a more patient-centered intervention.(38) The tool was enthusiastically received by patients and results from the pilot evaluation revealed trends towards better outcomes with use of the tool, including higher satisfaction with method choice and increased reports of any knowledge about LARC methods among women who had no previous knowledge. The increased knowledge about LARC methods among patients who used the tool was particularly encouraging given that we have designed the educational component of the intervention to be self-motivated, in that it does not automatically direct users to review all of the information provided for each method. These findings suggest that users interacted with the tool to obtain the information they needed to address their own knowledge gaps in order to consider the full range of method options in their decision making. Our multi-step cognitive interviewing process allowed us to refine the tool to better meet the needs of the target population.

Integration of *My Birth Control* into clinical practice provides an opportunity to facilitate patient-centeredness in contraceptive counseling in a manner that acknowledges the preference-sensitive nature of contraceptive decision making. The intentional design of the tool to be non-directive towards specific methods is in contrast to some interventions around contraception which focus on promoting the most effective methods.(39) By focusing on the women's preferences, we are acknowledging that, while efficacy is clearly an important consideration in decision making in method selection, whether it is the most important consideration for an individual woman will depend on her feelings about other characteristics of the available methods, such as side effects.

An additional feature of contraceptive decision making that influenced our development process is the complexity of this decision, in that for most women there are a range of available options that vary on multiple dimensions. This informed the three-step process facilitated by the intervention, in which the tool outlines the attributes around which contraceptive methods vary, then elicits informed preferences, and only then reviews the ways in which specific methods align or misalign with women's preferences around these attributes. This multiphase process allows women more space to consider their preferences and how they weigh relative to each other prior to engaging in the deliberation process about method choice. Further, our target audience of women of reproductive age in the US, a generally technology-savvy demographic, allowed us to create a modern, attractive tablet-based tool, without the need to specifically tailor our interventions to groups less comfortable with technology. This work highlights the need to consider the specific characteristics of the medical decision at hand and the target audience in designing a decision aid to be used in that context. More generally, the design of *My Birth Control*, which uses a printout as a bridge between the decision support that occurs before the visit through use of the tool and the in-person consultation with a provider, is an innovative contribution to the study of decision aids. Most decision aids are designed either to be used prior to the visit by the patient, who then is responsible for bringing the knowledge and insight gained into the visit, or to be used collaboratively between the patient and the provider during the visit(40–42). The use of the integrative strategy employed in our tool

makes an explicit connection between the use of the tool and the subsequent consultation with a provider through the printout, and maps this connection to the process of decision making. This provides the benefit of the patient receiving pre-visit education and support in a time-saving manner, while also facilitating the decision making process during the visit, and could be broadly applicable.

4.2 Conclusion

Formative evaluation of *My Birth Control* confirmed the acceptability of a contraceptive decision support tool designed to facilitate shared decision making around contraception. The stakeholder-driven development process ensured that the resulting decision aid was informed by patient preferences for contraceptive care and reflected the clinical realities faced by family planning providers. Further research to evaluate the effectiveness of the tool in improving contraceptive outcomes and patient experience with counseling can be assessed in a randomized controlled trial.

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References

1. Finer LB, Zolna MR. Declines in Unintended Pregnancy in the United States, 2008–2011. N Engl J Med. 2016; 374(9):843–52. [PubMed: 26962904]
2. Harper CC, Brown BA, Foster-Rosales A, Raine TR. Hormonal contraceptive method choice among young, low-income women: how important is the provider? Patient education and counseling. 2010; 81(3):349–54. [PubMed: 20837389]
3. Bitzer J, Cupanik V, Fait T, Gemzell-Danielsson K, Grob P, Oddens BJ, et al. Factors influencing women's selection of combined hormonal contraceptive methods after counselling in 11 countries: Results from a subanalysis of the CHOICE study. Eur J Contracept Reprod Health Care. 2013; 18(5):372–80. [PubMed: 23941311]
4. Rosenberg MJ, Waugh MS, Burnhill MS. Compliance, counseling and satisfaction with oral contraceptives: a prospective evaluation. Fam Plann Perspect. 1998; 30(2):89–92. 104. [PubMed: 9561874]
5. Forrest JD, Frost JJ. The family planning attitudes and experiences of low-income women. Fam Plann Perspect. 1996; 28(6):246–55. 77. [PubMed: 8959414]
6. Weisman CS, Maccannon DS, Henderson JT, Shortridge E, Orso CL. Contraceptive counseling in managed care: preventing unintended pregnancy in adults. Womens Health Issues. 2002; 12(2):79–95. [PubMed: 11879761]

7. Dehlendorf C, Henderson JT, Vittinghoff E, Grumbach K, Levy K, Schmittdiel J, et al. Association of the quality of interpersonal care during family planning counseling with contraceptive use. American journal of obstetrics and gynecology. 2016
8. Guendelman S, Denny C, Mauldon J, Chetkovich C. Perceptions of hormonal contraceptive safety and side effects among low-income Latina and non-Latina women. Matern Child Health J. 2000; 4(4):233–9. [PubMed: 11272343]
9. Dehlendorf C, Levy K, Kelley A, Grumbach K, Steinauer J. Women's preferences for contraceptive counseling and decision making. Contraception. 2013; 88(2):250–6. [PubMed: 23177265]
10. Becker D, Tsui AO. Reproductive health service preferences and perceptions of quality among low-income women: racial, ethnic and language group differences. Perspect Sex Reprod Health. 2008; 40(4):202–11. [PubMed: 19067933]
11. Radecki SE, Bernstein GS. Use of clinic versus private family planning care by low-income women: access, cost, and patient satisfaction. Am J Public Health. 1989; 79(6):692–7. [PubMed: 2729465]
12. Becker D, Koenig MA, Kim YM, Cardona K, Sonenstein FL. The quality of family planning services in the United States: findings from a literature review. Perspect Sex Reprod Health. 2007; 39(4):206–15. [PubMed: 18093037]
13. Estabrooks C, Goel V, Thiel E, Pinfold P, Sawka C, Williams I. Decision aids: are they worth it? A systematic review. Journal of health services research & policy. 2001; 6(3):170–82. [PubMed: 11467275]
14. Dehlendorf CSJ. Listening to patients and providers talk: An observational study of contraceptive counseling (abstract). Contraception. :293–4.
15. Akers AY, Gold MA, Borrero S, Santucci A, Schwarz EB. Providers' perspectives on challenges to contraceptive counseling in primary care settings. J Womens Health (Larchmt). 2010; 19(6):1163–70. [PubMed: 20420508]
16. Kavanaugh ML, Jones RK, Finer LB. Perceived and insurance-related barriers to the provision of contraceptive services in U.S. abortion care settings. Women's health issues: official publication of the Jacobs Institute of Women's Health. 2011; 21(3 Suppl):S26–31.
17. Kaye KSK, Sloup C. The fog zone: How misperceptions, magical thinking, and ambivalence put young adults at risk for unplanned pregnancy. 2009
18. Moos MK, Bartholomew NE, Lohr KN. Counseling in the clinical setting to prevent unintended pregnancy: an evidence-based research agenda. Contraception. 2003; 67(2):115–32. [PubMed: 12586322]
19. Rubin SE, Winrob I. Urban female family medicine patients' perceptions about intrauterine contraception. J Womens Health (Larchmt). 2010; 19(4):735–40. [PubMed: 20201700]
20. Stanwood NL, Bradley KA. Young pregnant women's knowledge of modern intrauterine devices. Obstet Gynecol. 2006; 108(6):1417–22. [PubMed: 17138775]
21. French RS, Wellings K, Cowan FM. How can we help people to choose a method of contraception? The case for contraceptive decision aids. The journal of family planning and reproductive health care/Faculty of Family Planning & Reproductive Health Care, Royal College of Obstetricians & Gynaecologists. 2009; 35(4):219–20.
22. Jackson AV, Karasek D, Dehlendorf C, Foster DG. Racial and ethnic differences in women's preferences for features of contraceptive methods. Contraception. 2016; 93(5):406–11. [PubMed: 26738619]
23. Lessard LN, Karasek D, Ma S, Darney P, Deardorff J, Lahiff M, et al. Contraceptive features preferred by women at high risk of unintended pregnancy. Perspect Sex Reprod Health. 2012; 44(3):194–200. [PubMed: 22958664]
24. Hatcher, RA. Contraceptive technology. 19th. New York, N.Y.: Ardent Media; 2007. p. xxxp. 874
25. Madden T, Secura GM, Nease RF, Politi MC, Peipert JF. The role of contraceptive attributes in women's contraceptive decision making. American journal of obstetrics and gynecology. 2015; 213(1):46e1–6. [PubMed: 25644443]
26. Melo J, Peters M, Teal S, Guiahi M. Adolescent and Young Women's Contraceptive Decision-Making Processes: Choosing "The Best Method for Her". Journal of pediatric and adolescent gynecology. 2015; 28(4):224–8. [PubMed: 26049939]

27. Weisberg E, Bateson D, Knox S, Haas M, Viney R, Street D, et al. Do women and providers value the same features of contraceptive products? Results of a best-worst stated preference experiment. The European journal of contraception & reproductive health care: the official journal of the European Society of Contraception. 2013; 18(3):181–90.
28. Borrero S, Nikolajski C, Steinberg JR, Freedman L, Akers AY, Ibrahim S, et al. "It just happens": a qualitative study exploring low-income women's perspectives on pregnancy intention and planning. Contraception. 2015; 91(2):150–6. [PubMed: 25477272]
29. Charles C, Gafni A, Whelan T. Decision-making in the physician-patient encounter: revisiting the shared treatment decision-making model. Soc Sci Med. 1999; 49(5):651–61. [PubMed: 10452420]
30. Janis, ILML. Decision-making: A psychological analysis of conflict, choice, and commitment. New York: Free Press; 1977.
31. Goldstein DG, Gigerenzer G. Models of ecological rationality: the recognition heuristic. Psychol Rev. 2002; 109(1):75–90. [PubMed: 11863042]
32. de Vries M, Fagerlin A, Witteman HO, Scherer LD. Combining deliberation and intuition in patient decision support. Patient education and counseling. 2013; 91(2):154–60. [PubMed: 23265430]
33. Nordgren LFBM, Dijsterhuis A. The best of both worlds: Integrating conscious and unconscious thought best solves complex decisions. J Exp Soc Psychol. 47:509–11.
34. Elwyn G, Kreuwel I, Durand MA, Sivell S, Joseph-Williams N, Evans R, et al. How to develop web-based decision support interventions for patients: a process map. Patient Educ Couns. 2011; 82(2):260–5. [PubMed: 20627644]
35. Elwyn G, O'Connor A, Stacey D, Volk R, Edwards A, Coulter A, et al. Developing a quality criteria framework for patient decision aids: online international Delphi consensus process. BMJ. 2006; 333(7565):417. [PubMed: 16908462]
36. Update of the IPDAS collaboration background document http://ipdas.ohri.ca/resources.html2012[
37. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. Qual Health Res. 2005; 15(9):1277–88. [PubMed: 16204405]
38. Wyatt KD, Anderson RT, Creedon D, Montori VM, Bachman J, Erwin P, et al. Women's values in contraceptive choice: a systematic review of relevant attributes included in decision aids. BMC women's health. 2014; 14(1):28. [PubMed: 24524562]
39. Garbers S, Meserve A, Kottke M, Hatcher R, Ventura A, Chiasson MA. Randomized controlled trial of a computer-based module to improve contraceptive method choice. Contraception. 2012; 86(4):383–90. [PubMed: 22402258]
40. Elwyn G, Frosch D, Volandes AE, Edwards A, Montori VM. Investing in deliberation: a definition and classification of decision support interventions for people facing difficult health decisions. Medical decision making: an international journal of the Society for Medical Decision Making. 2010; 30(6):701–11. [PubMed: 21088131]
41. Hostetter, MKS. Helping Patients Make Better Treatment Choices with Decision Aids. Quality Matters: Innovations in Health Care Quality Improvement. Oct-Nov. 2012. Issue ed. www.commonwealthfund.org:The Commonwealth Fund; 2012
42. Mann DM, Ponieman D, Montori VM, Arciniega J, McGinn T. The Statin Choice decision aid in primary care: a randomized trial. Patient education and counseling. 2010; 80(1):138–40. [PubMed: 19959322]
43. Eisenberg DL, Secura GM, Madden TE, Allsworth JE, Zhao Q, Peipert JF. Knowledge of contraceptive effectiveness. Am J Obstet Gynecol. 2012; 206(6):479 e1–9. [PubMed: 22521458]
44. Klein WM, Stefanek ME. Cancer risk elicitation and communication: lessons from the psychology of risk perception. CA Cancer J Clin. 2007; 57(3):147–67. [PubMed: 17507441]
45. Galesic M, Garcia-Retamero R, Gigerenzer G. Using icon arrays to communicate medical risks: overcoming low numeracy. Health Psychol. 2009; 28(2):210–6. [PubMed: 19290713]
46. Garcia-Retamero R, Galesic M, Gigerenzer G. Do icon arrays help reduce denominator neglect? Med Decis Making. 2010; 30(6):672–84. [PubMed: 20484088]
47. Hawley ST, Zikmund-Fisher B, Ubel P, Jancovic A, Lucas T, Fagerlin A. The impact of the format of graphical presentation on health-related knowledge and treatment choices. Patient Educ Couns. 2008; 73(3):448–55. [PubMed: 18755566]

48. Steiner MJ, Dalebout S, Condon S, Dominik R, Trussell J. Understanding risk: a randomized controlled trial of communicating contraceptive effectiveness. Obstetrics and gynecology. 2003; 102(4):709–17. [PubMed: 14551000]

49. Fagerlin A, Zikmund-Fisher BJ, Ubel PA. Helping patients decide: ten steps to better risk communication. J Natl Cancer Inst. 2011; 103(19):1436–43. [PubMed: 21931068]

50. Zikmund-Fisher BJ, Ubel PA, Smith DM, Derry HA, McClure JB, Stark A, et al. Communicating side effect risks in a tamoxifen prophylaxis decision aid: the debiasing influence of pictographs. Patient Educ Couns. 2008; 73(2):209–14. [PubMed: 18602242]

Highlights

- The choice of a contraceptive method is a preference-sensitive decision, and previous studies have suggested that shared decision making is an appropriate counseling approach for contraceptive care.
- We developed a tablet-based contraceptive decision support tool drawing on best practices for decision support tool development and intuitive and deliberative models of decision making, and utilizing intensive provider and patient engagement.
- The tool is designed to facilitate shared decision making between provider and patients by assisting in the first two phases of decision making (information sharing and deliberation), and then using a printout to facilitate ongoing deliberation and decision making between the patient and provider.
- Qualitative and quantitative data from pilot testing indicated that the tool was acceptable and appropriate for the target population.
- The systemic and theoretically-informed nature of tool development, the focus on stakeholder involvement, and the customization of the tool content and structure to the specific decision-making context, can serve as a model for development of decision support tools for a broad range of health care decisions.

Figure 1.
Main menu for the educational session *My Birth Control*.

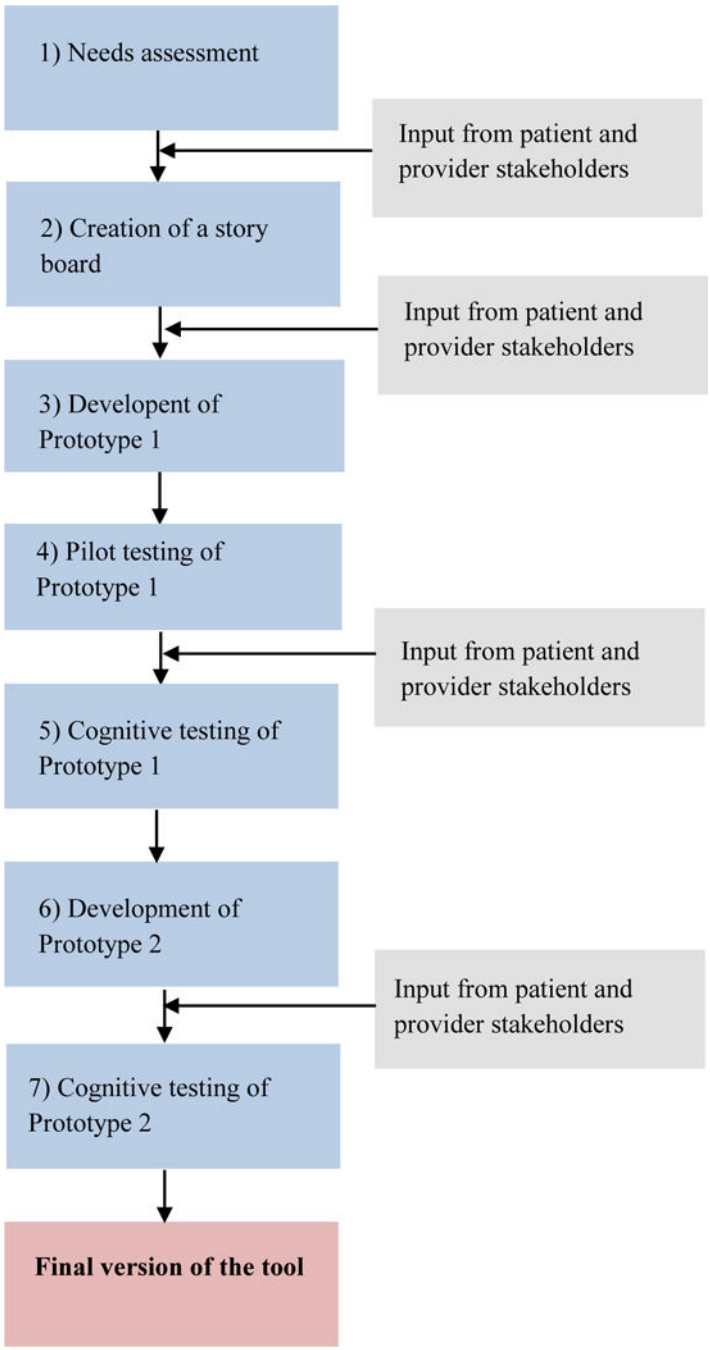

Figure 2.
Systematic development of *My Birth Control*.

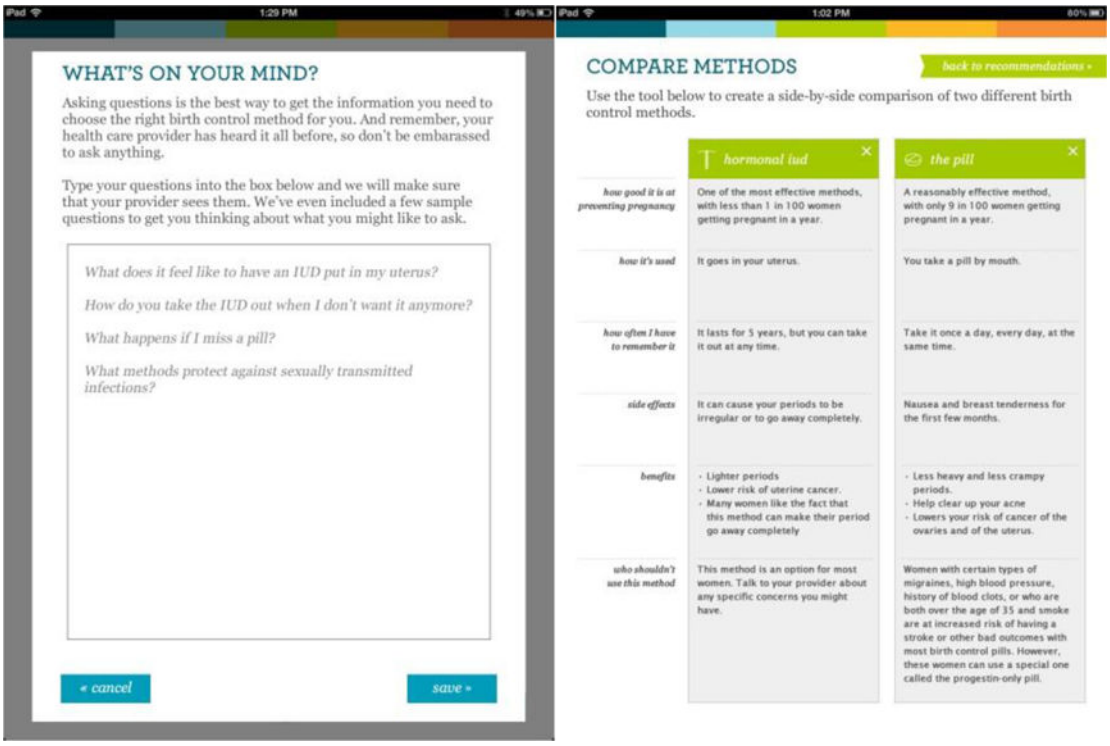

Figure 3.

Features added to Prototype 2 following pilot evaluation and first phase of cognitive testing: "what's on your mind?" feature and "method comparison" feature.

Table 1

Influence of the IPDAS quality checklist on the content and development process for *My Birth Control*

IPDAS Criterion I: Content	**Content for *My Birth Control***
IA. Provide information about options in sufficient detail for decision making.	The tool presents information about the core characteristics of contraceptive methods, and then provides an opportunity to explore the characteristics of these methods in more depth. Users can choose the level of information that they receive through the interactive nature of the interface, allowing for an individualized experience.
IB. Present probabilities in an unbiased and understandable way.	The vast majority of women report that the efficacy of their contraceptive method is important to them,(23) yet many women are poorly informed about issues related to the relative efficacy of specific contraceptive methods.(17, 43) Therefore, communicating risk of pregnancy and overcoming known biases to the interpretation of risk(44) is essential. We have utilized best practices for risk communication, including presenting information graphically using a pictograph,(45–47) in addition to using numbers,(36) grouping methods into categories of relative effectiveness,(48) and clearly presenting the relevant denominator for the information being presented.(36) In addition, our interactive interface, in which users can click between methods to compare their efficacy, allowing them to consider the incremental risk associated with different choices.(49, 50)
IC. Include methods for clarifying and expressing values.	Our values clarification exercise elicits women's preferences across a range of relevant method characteristics, including side effects, mode of administration, and frequency of administration.
ID. Incorporate structured guidance in deliberation and communication.	Users have the opportunity to explore their options after receiving recommendations based on her preferences for method characteristics, and are then provided a handout with information about their preferences, their preferred methods, and their questions, in order to facilitate deliberation with the provider.
IPDAS Criterion II: Development	**Development process for *My Birth Control***
IIA. Present information in a balanced manner.	Information about all methods was presented so that the positive and negative features of each option are shown with equal detail and can be compared. The tool also includes an interactive method comparison feature allowing users to compare methods along the characteristics covered in the educational modules.
IIB. Utilize a systematic development process.	See the description of the systematic development process in Section 2.2.
IIC. Use up-to-date scientific evidence that is cited in a reference section.	The most up-to-date scientific information was utilized in writing the content of the tool, including the U.S. Medical Eligibility Criteria for Contraceptive Use, 2010 and Contraceptive Technology, 2007, with references made available.
IID. Disclose conflicts of interest.	There are no conflicts to disclose.
IIE. Use plain language.	The tool includes simple illustrations, bulleted copy, and language adapted to be at a reading comprehension level no higher than eighth grade.
IIF. Meet usability and security criteria for an internet-based decision aid.	We have ensured that all information entered into the tool meets the highest standards for security. The use of the tool is guided by text and graphics, with opportunity to return to sections and to select the desired amount of detail.

Table 2

Structure of *My Birth Control*.

Sections
1) Educational session: This interactive module provides information about the five areas determined to be most relevant to the choice of a contraceptive method based on our formative work and consultation with patient and provider advisors and a review of the literature: effectiveness, side effects, return to fertility, and mode and frequency of administration (see Figure 1).
2) Values clarification exercise: Women indicate their preferences for the method characteristics described in #1.
3) Health history: A checklist assesses whether women have conditions that affect their medical eligibility for different contraceptive methods
4) An interactive “method chooser” screen: This module highlights specific methods most appropriate for each woman based on responses to items 2 and 3 above, and allows the woman to navigate through information about the different methods. On this screen, she can compare the methods that are appropriate for their based on her answers to different questions, allowing her to weigh the relative importance of, for example, side effects of a method and its efficacy on her method choice.
5) Question elicitation: This screen allows the woman to indicate what questions she has, with example questions provided.
6) Birth control profile: This final screen allows the woman to print out her method preferences (#2), relevant medical history (#3), questions she wishes to ask her health care provider (#5), and the methods that she is most interested in. This print-out is designed to be shared with the medical provider.

Table 3

Characteristics of the participants enrolled in pilot testing (N=83).

	Total (%)	Intervention group (N = 42)	Control group (N = 41)
Age			
15–24	33 (40)	18 (43%)	15 (37%)
25–34	45 (54)	21 (50%)	24 (58%)
35–45	5 (6)	3 (7%)	2 (5%)
Race			
African American/Black	3 (4)	1 (2%)	2 (5%)
Asian	20 (24)	11 (26%)	9 (22%)
Pacific Islander	1 (1)	0 (0%)	1 (2%)
White	54 (65)	27 (64%)	27 (66%)
Mixed race/multi-racial	5 (6)	3 (7%)	2 (5%)
Ethnicity			
Hispanic	19 (23)	13 (31%)	6 (15%)
Non-Hispanic	64 (77)	29 (69%)	35 (85%)
Education			
High school	5 (6)	3 (7%)	2 (5%)
Some college or 2-year degree	27 (48)	11 (26%)	16 (39%)
4-year college	40 (32)	22 (52%)	18 (44%)
More than 4-year college	11 (13)	6 (14%)	5 (12%)