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A Motivational Interviewing-Based Counseling Intervention to Increase Postabortion Uptake of Contraception: A Pilot Randomized Controlled Trial

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Abstract

Objective—To determine if a counseling intervention using the principles of motivational interviewing (MI) would impact uptake of long-acting reversible contraception (LARC) after abortion.

Methods—We conducted a pilot randomized controlled trial comparing an MI-based contraception counseling intervention to only non-standardized counseling. Sixty women 15-29 years-old were randomized. Primary outcome: uptake of LARC within four weeks of abortion. Secondary outcomes: uptake of any effective contraceptive, contraceptive use three months after abortion and satisfaction with counseling. Bivariate analysis was used to compare outcomes.

Results—In the intervention arm, 65.5% of participants received a long-acting method within four weeks compared to 32.3% in the control arm ($p=0.01$). Three months after the abortion, differences in LARC use endured (60.0% vs. 30.8%, $p=0.05$). Uptake and use of any effective method were not statistically different. More women in the intervention arm reported satisfaction with their counseling than women in the control arm (92.0% vs. 65.4%, $p=0.04$).

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Results of this trial were presented as a poster at the 2014 North American Forum on Family Planning, Miami, Florida, October 10-13, 2014.

Conclusion—Twice as many women in the MI-based contraception counseling intervention initiated and continued to use LARC compared to women who received only non-standardized counseling.

Practice Implications—A contraception counseling session using the principles and skills of motivational interviewing has the potential to impact LARC use after abortion.

Keywords

Abortion; Contraception; Counseling; Long Acting Reversible Contraception; Motivational Interviewing; Unintended Pregnancy

1. Introduction

In the United States, 21-27% of women experience a repeat pregnancy within 12 months after abortion, and 11-15% have a repeat abortion within one to three years after abortion [1, 2]. In the European Union, 20-60% of abortions are performed for women with a history of a prior abortion [3]. Immediate provision of long-acting reversible contraceptives (LARC), which include intrauterine devices (IUDs) and contraceptive implants, reduces rates of repeat pregnancy within one year after abortion [4-8]. Several trials have investigated contraception counseling at the time of abortion, but most have not shown an increase in contraceptive uptake [9, 10]. However, a recent cluster randomized controlled trial (RCT) demonstrated increased LARC uptake among women attending both family planning and abortion clinics in which multiple interventions to increase LARC uptake occurred including counselor training about LARC [11]. Thus, it appears that contraception counseling training can have an effect on LARC uptake at the abortion visit.

Motivational interviewing (MI) is a patient-centered counseling style that aims to create a collaborative relationship between counselor and patient. MI uses skills such as open-ended questioning, reflective listening, empathic statements, and exploration of ambivalence to elicit a patient's intrinsic motivation for behavior change. MI counselors support patients to build confidence and self-efficacy, encouraging patients to design their own plans to change. The spirit of MI recognizes that people are “the undisputed experts on themselves,” and counselors avoid arguing for change [12]. Studies of women's contraceptive decision-making preferences have found that women strongly value autonomy but appreciate provider input and expertise [13,14]. Thus, a collaborative and non-coercive style of counseling, such as MI, may represent an approach that aligns well with women's preferences for contraceptive decision-making.

The primary aim of this study was to determine the effect of an MI-based intervention on young women's use of LARC after abortion. We hypothesized that more women in the intervention group would start a LARC method within 4 weeks of the abortion procedure, including immediate same-day initiation, compared to a control group receiving non-standardized counseling.

2. Methods

2.1 Study procedures

This RCT was a 1:1 parallel group pilot trial of an MI-based contraception counseling intervention, conducted at an urban academic center. English speaking women aged 15-29 years presenting for abortion were eligible. Women requesting abortion for fetal or maternal medical indications, with pregnancy resulting from sexual assault, or with a desire for repeat pregnancy within 6 months were not eligible. We obtained written informed consent from all eligible and interested participants prior to initiating any study procedures. The Institutional Review Board of the Biologic Sciences Division of the University of Chicago approved all study procedures and granted a waiver of parental consent for minors.

Participants used a tablet device to complete a baseline survey designed for this study. The survey assessed demographic information, contraceptive and pregnancy history, and intended postabortion method of contraception. Upon completion of the baseline survey, participants were randomized to one of the two study arms: intervention or control. Women in the intervention arm completed an MI-based counseling session with a counselor who had training in the principles and skills of MI prior to returning to routine clinic flow, which included non-standardized contraception counseling delivered by a clinic physician: a gynecology resident, a Fellow in Family Planning, or a faculty member (usual care). Women in the control arm immediately returned to usual care and received only the non-standardized counseling. In both groups, arrangements for starting a contraceptive method, if the participant chose to start one, were performed during usual care. Study personnel determined randomization allocation via sequentially numbered, sealed, opaque envelopes. Counselors for the study (AW and SQM) did not participate in recruitment into the trial nor determination of group allocation. A research assistant who was not involved with other aspects of study conduct prepared the envelopes using a computer-generated blocked randomization scheme with permuted block sizes of four and six. Clinic staff and physicians were not informed of a participant's allocation. A research assistant blinded to group allocation surveyed participants by telephone one and three months postabortion. Subjects were compensated a total of \$30 for participation.

2.2 Intervention

We designed the MI-based counseling session for the purpose of this study. Details of the intervention, its development and counselor training are previously published, including a table describing the steps of the intervention [15]. Briefly, we created a seven-step contraception counseling session, incorporating principles and skills of MI, including: reflective listening; collaborative discussion of benefits and drawbacks of contraceptive methods; and avoidance of confrontation. A two-page outline of the intervention was provided to each counselor for use during the sessions (Appendix). The seven steps of the intervention were not designed to be a static outline, and counselors were free to move between the steps in a fluid manner but were instructed to include all seven steps: (1) establish rapport, (2) set the agenda, (3) discuss prior contraception use, (4) ask permission to give educational information about contraceptive methods, (5) assess importance, confidence and readiness to use contraception, (6) continued discussion of very effective

contraception, and (7) wrap up. The educational component of the intervention used a pictorial guide adapted from the US Agency for International Development (USAID) and World Health Organization (WHO), which depicts contraceptive methods in tiers organized by effectiveness [16]. Although counselors emphasized the top two tiers, they elicited participant preferences for contraceptive attributes other than effectiveness and incorporated these preferences into the session. Counselor training included six hours of didactic instruction with skill practice and feedback, followed by five hours of practice counseling sessions with professional standardized patients that were videotaped for grading and feedback [15]. For this trial, there were two counselors. One physician (AW, the principal investigator [PI]) was trained and evaluated during the intervention development phase, prior to a 20-subject feasibility study [15] and did not undergo additional training or evaluation prior to this RCT. One Licensed Clinical Social Worker (LCSW) (SQM) completed training after the development phase and was not involved in the feasibility study. Both counselors underwent the same training protocol and were evaluated for competency and fidelity to the principles of MI using the Motivational Interviewing Treatment Integrity (MITI) Scale [17] by an expert in MI training and evaluation (MQ). However, one counselor (SQM) left the institution prior to the end of recruitment, and it was not feasible to train another counselor. The remaining trained counselor (AW) performed all interventions after that point. No further training or assessments took place, and individual sessions were not monitored for quality of MI.

2.3 Trial outcomes

Our primary outcome was uptake of a LARC method of contraception within four weeks of the abortion visit, including same-day uptake, as determined from the electronic medical record by an investigator not involved in training or counseling (EM). Secondary outcomes included effective contraceptive method uptake within four weeks of the abortion, method use and satisfaction at the one and three month telephone contacts, and satisfaction with the contraception counseling received. We defined effective contraception to include IUDs and hormonal methods of contraception. Contraceptive method uptake within four weeks of the abortion visit was determined by review of the electronic medical record. For LARC and for DMPA, we were able to verify actual method start, i.e. insertion or injection. The clinic offered these methods free of charge for immediate use regardless of insurance status. For combined hormonal contraception (CHC) and progestin-only pills, we considered prescription for the medication as indication of method uptake. Method use and method satisfaction at one- and three-months postabortion as well as satisfaction with contraception counseling were assessed during follow-up telephone contacts. Satisfaction with contraceptive method was assessed using an 11-point scale (0 = “least satisfied” and 10 = “most satisfied”), and in analyses, high satisfaction was defined as a rating of 8-10. Satisfaction with counseling was assessed using a 5-point Likert-type scale (1 = “strongly disagree” and 5 = “strongly agree”) to rate agreement with five positive statements about the counseling they received. We defined satisfaction with the counseling as rating all five statements as 4 “agree” or 5 “strongly agree.” We also assessed feasibility outcomes: ability to approach and recruit patients, length of the intervention, ability to complete the full MI-based intervention, and follow-up rates.

2.4 Data management and analysis

Study data were collected and managed using REDCap software tools (Research Electronic Data Capture, version 5.8.2, Vanderbilt University, Nashville, TN) hosted at The University of Chicago [18]. We used STATA, version 11.2 for Windows (StataCorp LP, College Station, TX) to analyze the data. For comparison between the two arms of the study, we used intention-to-treat analysis, using the chi-square or Fisher's exact test for categorical variables and the independent-samples t-test for continuous variables. Statistical significance was determined at $p < 0.05$. We also calculated unadjusted relative risks for contraceptive use outcomes. We performed a post-hoc sub-analysis restricted to women who had not intended to use LARC at baseline, because significantly more of these women were randomly allocated into the control arm. We also performed a stratified analysis to compare outcomes between the two counselors. Statistical analyses for all RCT outcomes were performed by the PI (AW), and all analyses were re-calculated for accuracy by a statistician who was not otherwise involved in the trial.

As a pilot trial, we did not perform a formal sample size calculation. We chose a total sample size of 60 in order to estimate LARC uptake in each group in a feasible time frame. We also viewed this sample size as sufficient to allow informed sample size estimates for a future larger trial. While there is a lack of formal guidance on sample size estimation for pilot trials, 30 per arm is within standard practice [19].

3. Results

The study was conducted from June to November 2013 (Figure 1). The majority of participants was non-Hispanic Black and single with annual household income of less than \$30,000. Participants presented to clinic with a median gestational age of 58 days. At baseline, participants in the control arm were more likely to have an annual income of less than \$10,000. Participants in the control group were less likely to identify a LARC method as their intended postabortion method of contraception. The two groups did not differ on other baseline variables (Table 1).

Contraceptive and satisfaction outcomes

Participants in the intervention arm were significantly more likely to have a LARC device placed immediately or within four weeks after the abortion (65.5% vs. 32.3%, $p=0.01$) (Table 2 and Figure 2). Uptake of any effective method immediately or within four weeks of the abortion was not statistically different between the groups (86.2% vs. 74.2%, $p=0.34$).

At three months post-enrollment, 51 women were contacted for follow-up. LARC use was more common among women in the intervention arm (60.0% vs. 30.8%, $p=0.05$) (Table 2). The difference in effective contraception use had increased by the three-month contact but still did not reach statistical significance (84.0% vs. 61.5%, $p=0.12$). Among those women using any effective contraceptive method three months after the abortion ($n=40$), there was a larger proportion of women in the intervention arm reporting high satisfaction with that method although the comparison was not statistically significant. (90.5% vs. 68.4%, $p=0.12$). The same pattern was present among women using a LARC method ($n=23$) (93.3%

vs. 62.5%, $p=0.10$). At the three-month contact, women in the intervention arm were also significantly more likely to report satisfaction with their contraception counseling than women in the control arm (92.0% vs. 65.4%, $p=0.04$).

In the post-hoc sub-analysis of only women who had not intended to use LARC at baseline, more women in the intervention arm had a LARC method placed immediately or within four weeks of the abortion: 7/15 (46.7%) vs. 4/25 (16.0%), $p=0.07$, but this comparison did not reach statistical significance. At three-months after the abortion, 35 of the 40 women in this post-hoc analysis had a follow-up contact. More women in the intervention arm were using LARC at this contact compared to women in the control group: 7/14 (50.0%) vs. 3/21 (14.3%), $p=0.053$.

Feasibility outcomes

During the trial period, 152 women aged 15-29 years presented to clinic. Thirty-six met one of the exclusion criteria, leaving 116 eligible patients (Figure 1). Of the 56 eligible patients who did not participate in the trial, 32 were approached but declined to participate, and 24 were not approached: 23 because one of the trained counselors was not available in clinic, and one due to clinician concern that the trial procedures would interrupt clinic flow. The MI-based intervention lasted a median of 24 minutes (range 14-39 minutes). No sessions were terminated early. Participant retention for the one- and three-month follow-up contacts was 92% and 85%, respectively. There were no statistically significant differences in contraceptive or feasibility outcomes between the two counselors.

4. Discussion and Conclusion

4.1 Discussion

This pilot randomized controlled trial found a large and significant increase in LARC uptake among women who were randomized to receive the MI-based contraception counseling intervention compared to non-standardized counseling. Use of LARC three months after the abortion was also significantly higher in the intervention group. Results of this study also suggest that MI-based contraception counseling may positively impact satisfaction with contraceptive methods. Additionally, almost all participants who received MI-based counseling reported satisfaction with their counseling, statistically significantly more than their counterparts who received only non-standardized counseling.

Our positive results are consistent with a series of studies that examined using MI with feedback to decrease the incidence of alcohol-exposed pregnancies (AEP) [20-22]. Primary outcomes for these studies included measures of effective contraception use as well as alcohol exposure. The CHOICES study compared information-only (brochures and referral sheets) to a five-session MI intervention among 830 women at risk for AEP and found a 2-fold increase in use of effective contraception among women randomized to the intervention group [20]. Similarly, in the BALANCE study of 228 college women who were binge drinkers, a single-session MI intervention plus feedback showed favorable results compared to brochures-only. Four months after the intervention, 69% of women in the intervention group reported use of effective contraception compared to 55% of women in the control

group, $p < 0.06$ [21]. Finally, the EARLY study, an RCT of 232 community women at risk for AEP, tested a shortened single-session MI plus feedback intervention and found positive but less dramatic results than in earlier studies [22].

Our results are also consistent with Harper et al.'s cluster RCT showing that within the context of multiple interventions to decrease barriers to uptake, counselors can impact LARC uptake in family planning and abortion clinics [11]. By using the MI framework to discuss contraceptive options, establishing a collaborative relationship, and emphasizing participant autonomy, MI-based counseling allows women to weigh benefits and drawbacks of contraceptive use in a non-coercive environment [12, 15, 23]. In our trial, this framework plus education using a tier-based chart [16], resulted in more women choosing a LARC method and a trend toward more satisfaction with that method 3 months after abortion.

In contrast, Langston et al. found no increase in very effective contraception uptake at the time of abortion among women randomized to structured educational counseling, also using WHO educational tools: 50% vs. 58%, $p = 0.27$ [9]. In a systematic review of RCTs, Stewart et al. identified six trials examining peri-abortion contraception counseling. No trials found substantial effects, and the pooled odds ratios for subsequent unplanned pregnancy, uptake of LARC, and method continuation at 3 months were non-significant. None of trials reported a solid theoretical foundation in their intervention development [24]. In one of the few studies to report a theoretical framework for intervention development, Davidson et al. used a video intervention designed specifically to increase immediate LARC uptake after abortion. There was no in-person counseling component. That RCT of 192 women found no difference in post-abortion LARC initiation [25].

Our results demonstrate that it is feasible to administer an MI-based intervention in an urban academic clinic. We were able to approach and enroll over half of all eligible patients who presented to the clinic during the trial period. However, there were some obstacles to integration of the trial and the counseling into the clinic. Twenty-three patients were not approached for recruitment into the study due to lack of counselor availability on that clinic day. This limitation underscores the resource-intensive nature of the training we performed for this feasibility trial, which did not allow for the training of a new counselor after one of our two counselors left the institution. We also did not have resources for periodic re-training or evaluation for MI fidelity nor for evaluation of individual counseling sessions. Some studies have shown success with MI using less intensive training of counselors, and our trial had significant findings despite these deficiencies in training and evaluation [26, 27]. Future study of this intervention may benefit from creative training approaches that allow for more rapid and less resource-intensive methods. More efficient training may be especially important for high volume abortion clinics that have high staff turnover and many different staff members who perform contraception counseling.

The intervention lasted a median of 24 minutes, but some sessions lasted as long as 39 minutes. Nonetheless, we were able to complete all MI-based counseling sessions without early termination which may indicate that any disruption to clinic flow caused by the intervention was well-tolerated by clinic staff. However, future research may benefit from

attention to techniques and processes that can shorten the length of counseling and are therefore less likely to interfere with clinic flow.

Despite the relatively small sample size of this trial, comparison of our primary contraceptive outcome did reach statistical significance. However, this was a pilot study with a small sample size and no formal sample size calculation, thus definitive conclusions cannot be made. In small studies of this nature, randomization can fail to equally distribute confounders across groups. This randomization failure occurred in our trial, as more women who at baseline intended to use a LARC method after the abortion were allocated into the intervention arm of the trial. Although our post-hoc sub-analysis of the 40 women who did not intend to use a LARC method was not statistically significant, the difference between groups was similar in direction and magnitude to that of the full study analysis. This finding is reassuring that this failure of randomization did not substantially influence our findings. Nonetheless, this unequal distribution remains an important study weakness, one that can be addressed with a larger sample size. The small sample size also precludes sub-group analysis to determine if there are identifiable populations of women for whom this intervention is more likely to be helpful. Additionally, the relatively short follow-up time did not allow for meaningful assessment of repeat pregnancy, an important outcome in this setting.

Our trial was implemented in an academic clinic, which limits generalizability. The non-standardized contraception counseling was often performed by Family Planning Fellows and faculty who may be highly invested in promoting uptake of effective contraception. Similarly, our counselors for the intervention arm were professionally trained (a physician and an LCSW), one of whom (AW) was the PI for the project and was dedicated to providing high-level contraception counseling adherent to the spirit of MI. Higher volume abortion clinics often employ non-professionally trained counseling staff for patient education about contraception. Use of lay counselors has shown success in other research and would increase the generalizability of this MI-based intervention in future research [26, 27]. The involvement of the PI in the design of the study, counseling, and data analyses also introduces the risk of bias in interpretation of results. While this is not ideal in a large definitive RCT, it was inherent in the nature of this small pilot study in which the PI was involved in many aspects of the study. In future investigation of the intervention, the PI will not participate in the direct counseling portion of the study. In this pilot RCT, we mitigated bias by assignment of primary training and evaluating to a second investigator, MQ, as well as having a statistician who did not participate in other aspects of the trial re-check all statistical analyses. The PI and second counselor were not directly involved in recruitment or group allocation for the trial as well. Additionally, our primary outcome was assessed via objective source, the electronic medical record, by a third investigator, EM. And finally, we confirmed that there were no statistically significant differences between outcomes after counseling performed by either the PI or the other counselor in the study.

4.2 Conclusion

While there is evidence that patient-centered collaborative counseling and MI can promote healthy behavior changes and the use of contraception in certain contexts, this is one of the first studies to examine the effectiveness of a theory-based contraception counseling

intervention in the setting of abortion [28, 29]. In this pilot trial using trained professionals, twice as many women who participated in the MI-based contraception counseling intervention initiated and continued to use LARC compared to women who received only non-standardized counseling. Further research is needed to determine if MI-based counseling can be scalable for use in high-volume clinics, by decreasing the time and intensity of training and using lay counselors.

4.3 Practice Implications

Women who undergo abortion may desire and benefit from contraception counseling, and the use of patient-centered collaborative counseling in this milieu is essential. Because MI is both patient-centered and collaborative, it represents a potentially appropriate and effective strategy to increase uptake of contraception after abortion. In turn, contraceptive uptake may decrease the rate of repeat unintended pregnancy. This trial demonstrates that an MI-based counseling intervention can be integrated into an abortion clinic and provides pilot data that women who participate in the intervention are more likely to begin use of long-acting reversible contraceptives.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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References

1. Goodman S, Hendlish SK, Reeves MF, Foster-Rosales A. Impact of immediate postabortal insertion of intrauterine contraception on repeat abortion. *Contraception*. 2008; 78:143–8. [PubMed: 18672116]
2. Madden T, Westhoff C. Rates of follow-up and repeat pregnancy in the 12 months after first-trimester induced abortion. *Obstet Gynecol*. 2009; 113:663–8. [PubMed: 19300332]
3. Gissler M, Fronteira I, Jahn A, Karro H, Moreau C, Oliveira da Silva M, Olsen J, Savona-Ventura C, Temmerman M, Hemminki E, the REPROSTAT group. Terminations of pregnancy in the European Union. *BJOG*. 2012; 119:324–332. [PubMed: 22129480]
4. Reeves MF, Smith KJ, Creinin MD. Contraceptive effectiveness of immediate compared with delayed insertion of intrauterine devices after abortion: a decision analysis. *Obstet Gynecol*. 2007; 109:1286–94. [PubMed: 17540799]
5. Langston AM, Joslin-Roher SL, Westhoff CL. Immediate postabortion access to IUDs, implants and DMPA reduces repeat pregnancy within 1 year in a New York City practice. *Contraception*. 2014; 89:103–8. [PubMed: 24309218]

6. Peipert JF, Madden T, Allsworth JE, Secura GM. Preventing unintended pregnancies by providing no-cost contraception. *Obstet Gynecol.* 2012; 120:1291–7. [PubMed: 23168752]
7. Roberts H, Silva M, Xu S. Post abortion contraception and its effect on repeat abortions in Auckland, New Zealand. *Contraception.* 2010; 82:260–5. [PubMed: 20705155]
8. Pohjoranta E, Mentula M, Gissler M, Suhonen S, Heikinheimo O. Provision of intrauterine contraception in association with first trimester induced abortion reduces the need of repeat abortion: first-year results of a randomized controlled trial. *Hum Reprod.* 2015; 30:2539–46. [PubMed: 26370664]
9. Langston AM, Rosario L, Westhoff CL. Structured contraceptive counseling--a randomized controlled trial. *Patient Educ Couns.* 2010; 81:362–7. [PubMed: 20869187]
10. Ferreira AL, Lemos A, Figueiroa JN, de Souza AI. Effectiveness of contraceptive counselling of women following an abortion: a systematic review and meta-analysis. *Eur J Contracept Reprod Health Care.* 2009; 14:1–9. [PubMed: 19241296]
11. Harper CC, Rocca CH, Thompson KM, Morfesis J, Goodman S, Darney PD, Westhoff CL, Speidel JJ. Reductions in pregnancy rates in the USA with long-acting reversible contraception: a cluster randomised trial. *Lancet.* 2015; 386:562–8. [PubMed: 26091743]
12. Miller, WR.; Rollnick, S. *Motivational interviewing: Helping people change.* 3rd ed. Guilford press; 2013.
13. Dehlendorf C, Diedrich J, Drey E, Postone A, Steinauer J. Preferences for decision-making about contraception and general health care among reproductive age women at an abortion clinic. *Patient Educ Couns.* 2010; 81:343–8. [PubMed: 20650593]
14. Dehlendorf C, Levy K, Kelley A, Grumbach K, Steinauer J. Women's preferences for contraceptive counseling and decision making. *Contraception.* 2013; 88:250–6. [PubMed: 23177265]
15. Whitaker AK, Quinn MT, Martins SL, Tomlinson AN, Woodhams EJ, Gilliam M. Motivational interviewing to improve postabortion contraceptive uptake by young women: development and feasibility of a counseling intervention. *Contraception.* 2015; 92:323–9. [PubMed: 26093191]
16. Comparing Effectiveness of Family Planning Methods. US Agency for International Development and World Health Organization; 2007. Available from: http://pdf.usaid.gov/pdf_docs/pnadi061.pdf [February 6, 2015]
17. Moyers, T.; Martin, T.; Manuel, J.; Miller, W.; Ernst, D. [February 6, 2015] Revised global scales: motivational interviewing treatment integrity 3.1.1 (MITI 3.1.1). Revised January 22, 2010. Available from: http://www.motivationalinterview.org/Documents/miti3_1.pdf
18. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)--a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform.* 2009; 42:377–81. [PubMed: 18929686]
19. Billingham SA, Whitehead AL, Julious SA. An audit of sample sizes for pilot and feasibility trials being undertaken in the United Kingdom registered in the United Kingdom Clinical Research Network database. *BMC Med Res Methodol.* 2013; 13:104. [PubMed: 23961782]
20. Floyd RL, Sobell M, Velasquez MM, Ingersoll K, Nettleman M, Sobell L, Mullen PD, Ceperich S, von Sternberg K, Bolton B, Johnson K, Skarpness B, Nagaraja J. Preventing alcohol-exposed pregnancies: a randomized controlled trial. *Am J Prev Med.* 2007; 32:1–10. [PubMed: 17218187]
21. Ceperich SD, Ingersoll KS. Motivational interviewing + feedback intervention to reduce alcohol-exposed pregnancy risk among college binge drinkers: determinants and patterns of response. *J Behav Med.* 2011; 34:381–95. [PubMed: 21318412]
22. Ingersoll KS, Ceperich SD, Hettema JE, Farrell-Carnahan L, Penberthy JK. Preconceptional motivational interviewing interventions to reduce alcohol-exposed pregnancy risk. *J Subst Abuse Treat.* 2013; 44:407–16. [PubMed: 23192220]
23. ACOG Committee Opinion No. 423. Motivational interviewing: a tool for behavioral change. *Obstet Gynecol.* 2009; 113:243–6. [PubMed: 19104391]
24. Stewart H, McCall SJ, McPherson C, Towers LC, Lloyd B, Fletcher J, Bhattacharya S. Effectiveness of peri-abortion counselling in preventing subsequent unplanned pregnancy: a systematic review of randomised controlled trials. *J Fam Plann Reprod Health Care.* 2016; 42:59–67. [PubMed: 26346972]

25. Davidson AS, Whitaker AK, Martins SL, Hill B, Kuhn C, Hagbom-Ma C, Gilliam M. Impact of a theory-based video on initiation of long-acting reversible contraception after abortion. *Am J Obstet Gynecol*. 2015; 212:310, e1–7. [PubMed: 25265403]
26. Dewing S, Mathews C, Cloete A, Schaay N, Simbayi L, Louw J. Lay counselors' ability to deliver counseling for behavior change. *J Consult Clin Psychol*. 2014; 82:19–29. [PubMed: 24099433]
27. Evangeli M, Engelbrecht SK, Swartz L, Turner K, Forsberg L, Soka N. An evaluation of a brief motivational interviewing training course for HIV/AIDS counsellors in Western Cape Province, South Africa. *AIDS Care*. 2009; 21:189–96. [PubMed: 19229688]
28. Lopez LM, Tolley EE, Grimes DA, Chen-Mok M. Theory-based strategies for improving contraceptive use: a systematic review. *Contraception*. 2009; 79:411–7. [PubMed: 19442774]
29. Nobili MP, Piergrossi S, Brusati V, Moja EA. The effect of patient-centered contraceptive counseling in women who undergo a voluntary termination of pregnancy. *Patient Educ Couns*. 2007; 65:361–8. [PubMed: 17125957]

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Highlights

- Motivational interviewing may be a suitable approach for contraception counseling.
- MI-based counseling led to higher uptake of long-acting reversible contraception.
- MI-based counseling led to more use of LARC three months after abortion.
- Women were more satisfied with MI-based vs. non-standardized counseling.

Figure 1.
Trial Flowchart

Figure 2.

Method of effective contraception initiated or prescribed immediately or within four weeks after abortion, as determined from the medical record

None = no effective method (i.e. no method or barrier method only)

DMPA = depot medroxyprogesterone acetate

CHC = combined hormonal contraception

LARC = long-acting reversible contraception

LNG-IUD = levonorgestrel-releasing intrauterine device

Cu-IUD = copper intrauterine device

Table 1

Participant baseline characteristics and abortion-related variables

Variable	Total N=60	Intervention N=29	Control N=31
Age (years) [mean $\pm$ SD]	22.8 $\pm$ 3.8	23.5 $\pm$ 3.9	22.2 $\pm$ 3.8
Race			
Black, non-Hispanic	47 (78.3)	24 (82.8)	23 (74.2)
White, non-Hispanic	4 (6.7)	2 (6.9)	2 (6.5)
Hispanic	6 (10.0)	2 (6.9)	4 (12.9)
Other	3 (5.0)	1 (3.5)	2 (6.5)
Marital Status			
Single, not cohabitating	47 (78.3)	23 (79.3)	24 (77.4)
Single, cohabitating	9 (15.0)	4 (13.8)	5 (16.1)
Ever Married	4 (6.7)	2 (6.9)	2 (6.5)
Annual income			
<\$10,000	24 (42.1)	7 (25.0)	17 (58.6)
\$10,000 – \$30,000	21 (36.8)	15 (53.6)	6 (20.7)
>\$30,000	12 (21.1)	6 (21.4)	6 (20.7)
Education			
High school or less	22 (37.3)	9 (32.1)	13 (41.9)
Some college	27 (45.8)	12 (42.9)	15 (48.4)
College graduate	10 (17.0)	7 (25.0)	3 (9.7)
Insurance coverage			
Medicaid	29 (48.3)	15 (51.7)	14 (45.2)
Private	20 (33.3)	10 (34.5)	10 (32.3)
None	9 (15.0)	3 (10.3)	6 (19.4)
Not specified / unknown	2 (3.3)	1 (3.5)	1 (3.2)
Gestational age (days) [median (range)]	58 (34-158)	50 (34-151)	61 (37-158)
Procedure type			
Surgical	37 (61.7)	17 (58.6)	20 (64.5)
Medical	23 (38.3)	12 (41.4)	11 (35.5)
Parity			
Nulliparous	28 (46.7)	11 (37.9)	17 (54.8)
Parous	32 (53.3)	18 (62.1)	14 (45.2)
Prior abortion	24 (40.0)	15 (51.7)	9 (29.0)
Considering LARC at baseline (prior to any contraception counseling)	20 (33.3)	14 (48.3)	6 (19.4)
Had ever used any method of contraception	59 (98.3)	29 (100)	30 (96.8)
Using a method of contraception at time of conception	19 (31.7)	9 (31.0)	10 (32.3)

All data are n (%) unless otherwise noted.

SD, standard deviation; LARC, long-acting reversible contraception

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Table 2

Contraceptive outcomes

Outcome	Intervention	Control	p-value ^a	RR (95% CI)
Uptake within four weeks of abortion ^b				
	N=29	N=31		
LARC method	19 (65.5)	10 (32.3)	0.01	2.03 (1.14 – 3.61)
Any effective method	25 (86.2)	23 (74.2)	0.34	1.16 (0.90 – 1.50)
Use one month after abortion ^c				
	N=26	N=29		
LARC method	15 (57.7)	10 (34.5)	0.08	1.67 (0.92 – 3.05)
Any effective method	21 (80.8)	20 (69.0)	0.37	1.17 (0.86 – 1.59)
Use three months after abortion ^c				
	N=25	N=26		
LARC method	15 (60.0)	8 (30.8)	0.05	1.95 (1.01 – 3.77)
Any effective method	21 (84.0)	16 (61.5)	0.12	1.37 (0.96 – 1.93)

All data are n (%) unless otherwise noted. LARC, long-acting reversible contraceptive

^aP-values calculated using chi-square or Fisher's exact test

^bAscertained from the electronic medical record

^cAscertained from self-report at time of telephone contact