
Shared Decision Making for Routine Infant Circumcision: A Pilot Study

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ABSTRACT

It is important that expectant parents receive accurate information about the benefits and risks of circumcision as well as the benefits and risks of having an intact foreskin when making a decision about routine infant circumcision (RIC). A pilot study was conducted using the shared decision making (SDM) conceptual model to guide expectant parents through a 3-phase decision-making program about RIC as part of their childbirth education class. The participants showed a high level of preparedness following each of the 3 phases. Preparedness scores were highest for those who decided to keep their expected sons' penises natural. This SDM program was an effective way of guiding expectant parents through the decision-making process for RIC.

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Routine infant circumcision (RIC), which is the nonreligious elective removal of the prepuce of the penis in the days following birth, is the most common surgery performed in the United States (Wang, Macklin, Tracy, Nadel, & Catlin, 2010). The rate of RIC among American newborn males has decreased by 10.0% over the last three decades and is currently estimated to be 58.3% (Owings, Uddin, & Williams, 2013). There are large regional variations in the United States, with the highest rate in the midwest (71%) and the lowest in the west (40.2%; Owings et al., 2013). Worldwide, approximately 30% of adult men are circumcised and approximately 70% have a natural penis (World Health Organization [WHO], 2007). Two-thirds of the circumcised men in the

world are of Muslim faith. Elective nonreligious circumcision at any age is uncommon throughout Europe, Central and South America, and in most of Asia (WHO, 2007).

Historically, the reasons for choosing RIC were varied and dependent on the cultural group and the beliefs of the time (Gollaher, 1994). At first, circumcision was primarily a religious ritual to establish a covenant with the creator among individuals of the Muslim and Jewish faiths but RIC became a recommended medical practice in the United States during the second half of the 19th century (Gollaher, 1994). Various conditions or lifestyles, including paralysis, insomnia, promiscuity, and homosexuality, were believed to be cured by circumcision

(Gollaher, 1994). Today, parents choose circumcision for their newborn sons for the child to have the same appearance as his father, to reduce his risk for infection, and because of beliefs about hygiene (Binner, Mastrobattista, Day, Swaim, & Monga, 2002; Chantry, Byrd, Sage, & Calvert, 2010; Turini, Reinert, McQuiston, & Caldamone, 2006). There is considerable controversy regarding the necessity of RIC, the rights of the child to make an informed decision at a later age, the legality of parental assent, and the role of the physician in counseling and performing an elective surgery on a newborn (Pinto, 2012).

Circumcision is not recommended as a routine procedure for all newborns (American Academy of Pediatrics [AAP], 2012; British Medical Association, 2006; Canadian Paediatric Society, 1996; Royal Australasian College of Physicians, 2010; Royal Dutch Medical Society, 2010). The AAP (2012) issued a statement that the potential benefits of RIC, such as a reduced risk of certain sexually transmitted infections in adulthood, may outweigh the risks, such as heavy bleeding. It is the position of the AAP that the decision should ultimately be made by the child's parents. The AAP made the following recommendations about parental decision making:

Parents are entitled to factually correct, nonbiased information about circumcision that should be provided before conception and early in pregnancy, when parents are most likely to be weighing the option of circumcision of a male child. Physicians counseling families about elective male circumcision should assist parents by explaining, in a nonbiased manner, the potential benefits and risks, and by ensuring that they understand the elective nature of the procedure. Parents should weigh the health benefits and risks in light of their own religious, cultural, and personal preferences, as the medical benefits alone may not outweigh these or other considerations for individual families. (AAP, 2012, p. e762)

There is evidence that today's expectant parents are not receiving standardized, unbiased, and evidence-based information about RIC (Binner et al., 2002; Carbery et al., 2012; Chantry et al., 2010; Muller, 2010; Turini et al., 2006; Wang et al., 2010). New parents are asked soon after the birth if they would like their son to be circumcised, but comprehensive education on the benefits and risks of the procedure often is not provided to them either prenatally or in the postpartum period. There is

evidence that counseling about circumcision is based on preference of the provider (Muller, 2010). In addition, Okino and Yamamoto (2004) found considerable inconsistencies among websites providing information on RIC, including contradictory information on the benefits and risks of the procedure. This is of concern because expectant parents frequently turn to the easily accessible Internet when gathering information about RIC (Okino & Yamamoto, 2004).

The AAP (2012) suggested that information on RIC be included in the curriculum of childbirth preparation classes. Childbirth classes are an ideal venue because the body of evidence examining parental decision making about RIC demonstrates that parents make this decision during pregnancy (Binner et al., 2002; Bisono et al., 2012; Chantry et al., 2010). Bisono et al. (2012) reported that difficulties related to making a decision about RIC in the postpartum period was the predominate reason for not circumcising among Hispanics. The purpose of this pilot study was to implement a three-phase shared decision-making (SDM) program to prepare expectant parents attending childbirth classes to make a decision about RIC. The pilot was conducted to assess the feasibility of the SDM program, determine if refinements to the program or data collection instruments were needed, and generate data for study outcomes that can be used for sample size determination in subsequent studies (Grove, Burns, & Gray, 2013).

REVIEW OF THE LITERATURE

The literature was reviewed to examine what is known about methods to provide information about RIC to new/expectant parents and factors that influence the decision for and against RIC. Academic Search Complete, Cumulative Index to Nursing and Allied Health Literature (CINAHL), MEDLINE, and PsycINFO databases were used to search the terms *informed consent*, *circumcision*, *decision aid*, *shared decision*, *parental*, and *decision making*. Limits placed on the search included English language and publication dates from 2002 to January 2013. Articles with titles related to testing an education intervention, informed consent procedures, RIC information dissemination, or attitudes about RIC were obtained, and the abstracts were reviewed. The inclusion criteria consisted of (a) male circumcision, (b) neonatal circumcision, (c) related to decision making, (d) related to informed consent,

(e) quantitative research design, and (f) published since 2002. The exclusion criteria consisted of (a) female circumcision and (b) opinion or commentary. Six articles were identified that specifically addressed the way in which information is provided that may impact parental decision making about RIC.

Two studies evaluated the effect of written information (Binner et al., 2002; Wang et al., 2010), one study evaluated the effect of an informational video (Chantry et al., 2010), one addressed factors relating to physician recommendation for or against RIC (Muller, 2010), one study evaluated physicians' perception about their own ability to adequately counsel expectant parents (Carbery et al., 2012), and four articles addressed reasons for choosing or not choosing RIC (Binner et al., 2002; Chantry et al., 2010; Turini et al., 2006; Wang et al., 2010). All of the studies were conducted within the United States, with the exception of the Muller (2010) study, which evaluated the personal influences of Canadian physicians' recommendations about RIC.

Educational Material and Informed Consent Methods

Neither an informational brochure nor a video had an effect on parental decision making about RIC. Binner et al. (2002) pretested 190 women on their decision about RIC, provided them with the AAP brochure, and then conducted a posttest to evaluate the influence of the brochure on their decision. None of the women in the study changed their decision after reading the AAP brochure (Binner et al., 2002). Chantry et al. (2010) compared traditional physician counseling versus an informational video plus traditional physician counseling method, among a sample of 306 women. There were no statistically significant differences found between the groups in terms of knowledge ($p = .78$), perception of bias ($p = .31$), satisfaction ($p = .13$), or decision for or against RIC ($p = .30$; Chantry et al., 2010). Both studies were limited by providing the information during the postpartum period, when this decision had already been made (Binner et al., 2002; Chantry et al., 2010). The Binner et al. (2002) study was further limited by lack of a comparison group.

Wang et al. (2010) assessed support for RIC at baseline and then after providing a summary of the AAP's 1999 statement on RIC and information stating that RIC would decrease human papillomavirus (HPV) and HIV. The sample consisted of 280 expectant parents and 60 parents with newly born sons. The authors found no statistically significant

change in baseline support after providing this set of information ($p = .91$).

Physician Knowledge

Carbery et al. (2012) found that of 1,500 U.S. physicians sampled, 22% reported that they did not know the benefits and risks of RIC enough to counsel expectant parents. Muller (2010) conducted a study with 572 Canadian physicians and found that respondents were influenced by their own circumcision status ($p < .001$) and that of their sons ($p < .001$) when providing parents with recommendation about RIC.

Factors Which Influence Decision Making About Routine Infant Circumcision

Among 1,197 participants in four studies that evaluated reasons for the parental RIC decision, a desire to match the other males in the family and concerns about infection or hygiene were the most influential factors in choosing RIC (Binner et al., 2002; Chantry et al., 2010; Turini et al., 2006; Wang et al., 2010). After receiving information on HPV and HIV reduction, respondents who already had a son who was circumcised or who cited "family reasons" (Wang et al., 2010, p. 132) were significantly more likely to choose RIC as compared to those who did not already have a son who was circumcised ($p < .001$). Binner et al. (2002) and Chantry et al. (2010) cited a desire for the same surgical outcome as the other males in the family as the most influential factor in the RIC decision. Turini et al. (2006) found that a desire to match the other males in the family ranked second at 23.49% among the 361 parents of newly born males in their reasons for choosing RIC.

Turini et al. (2006) reported that 53% of respondents who chose RIC cited medical benefits and hygiene (which the study authors categorized together) as the most influential factor in their study. Binner et al. (2002) did not evaluate the influence of concerns about hygiene or infection in the decision, but Chantry et al. (2010) noted that concerns about infection also played a role in the decision. Among parents who chose to keep their son's penis natural, 71.74% were most influenced by their belief that RIC was an unnecessary medical procedure (Turini et al., 2006).

Conclusion

The literature on RIC suggests that strong traditional values influence parents' decisions about RIC. However, among both parents who chose RIC and

those who kept their son's penis natural, the circumcision status of other males in the family was influential in the decision. Providing informational brochures, videos, physician counseling, and information on HIV and HPV risk reduction had little influence among families who had a tradition of RIC. Beliefs about hygiene and concerns about reducing the risk for infections were also factors in the decision (Binner et al., 2002; Chantry et al., 2010; Turini et al., 2006; Wang et al., 2010). Some physicians felt unprepared to adequately discuss RIC with expectant parents (Carbery et al., 2012) and were influenced by the circumcision status within their own family (Muller, 2010).

CONCEPTUAL MODEL AND TRANSLATIONAL FRAMEWORK

SDM is a conceptual model used to guide individuals through a decision-making process about health-related topics. The model consists of providing evidence-based information in a way that allows an individual to weigh the evidence in terms of his or her own personal values (O'Connor, 2006). SDM is particularly geared for topics that are preference-sensitive and have no clear best choice based on available scientific evidence (O'Connor, 2006). Preference-sensitive topics are ones in which each person must decide based on his or her own values if the benefits of a procedure or a course of action are an acceptable tradeoff for the risks (Stacey et al., 2011). SDM has been used to successfully guide other decision-making processes including end-of-life decisions (Murray, Miller, Fiset, O'Connor, & Jacobsen, 2004), decision support among family physicians (Légaré et al., 2006), natural products to treat menopausal symptoms (Légaré et al., 2007), and treatment of depression (Stacey et al., 2008). A meta-analysis by Dugas et al. (2012) found that SDM effectively increased knowledge while decreasing anxiety and decisional conflict among the obstetric population making obstetric decisions. SDM is well suited to assist parents deciding on RIC because previous research indicates that the decision of whether or not to have an infant son circumcised is a values-based decision for which there is no clear choice based on known risks and benefits (AAP, 2012).

The Ottawa decision support framework (ODSF) was created to guide the implementation of the SDM model of clinician/client collaborative health decision making (O'Connor, Stacey, Tugwell, & Guyatt, 2005).

The ODSF is appropriate for health decisions that (a) are stimulated by a new circumstance, diagnosis, or developmental transition; (b) require careful deliberation because of uncertain and/or value-sensitive nature of the benefits and risks; and (c) need relatively more effort during the deliberation phase than the implementation phase (O'Connor et al., 1998a, p. 268). The ODSF has three categories: decisional needs, decision quality, and decision support (O'Connor, Stacey, & Jacobsen, 2011). This is a fluid framework without distinct linear functionality. The decisional needs of individuals may evolve throughout the decision-making process, thereby affecting the decision quality and decision support interventions. Figure 1 shows the components of the ODSF as it was applied to this study.

STUDY DESIGN AND METHODS

Setting and Sample Recruitment

The SDM program was implemented at a free-standing birth center in a large state in the mid-western United States. The inclusion criteria for participation in the pilot study were (a) 18 years old or older, (b) pregnant woman, (c) support person of pregnant woman, (d) expecting a male child, and (e) unaware of the expected child's sex. A convenience sample was recruited in August and September of 2013 at three separate childbirth education classes held at the birthing center. The classes used the Bradley Method of childbirth education. These particular childbirth classes were selected because of the availability of the classes to the project director (PD) and because RIC was an existing topic on the class curriculum. After receiving permission from the educators, the PD explained the purpose of the study and what participation would entail. Potential participants were told that participation in the study was voluntary and that their obstetric care would not be affected by the decision to participate or to not participate. Written informed consent was obtained from all participants after explanation of the study and before implementation began. The study was approved by the Baylor University institutional review board.

Intervention

Prior to the pilot study, an advertisement was placed in the birthing center's August 2013 newsletter to recruit participants for a preliminary test of the program to ensure that the measurement instruments were easy to fill out, instructions were clear, the SDM

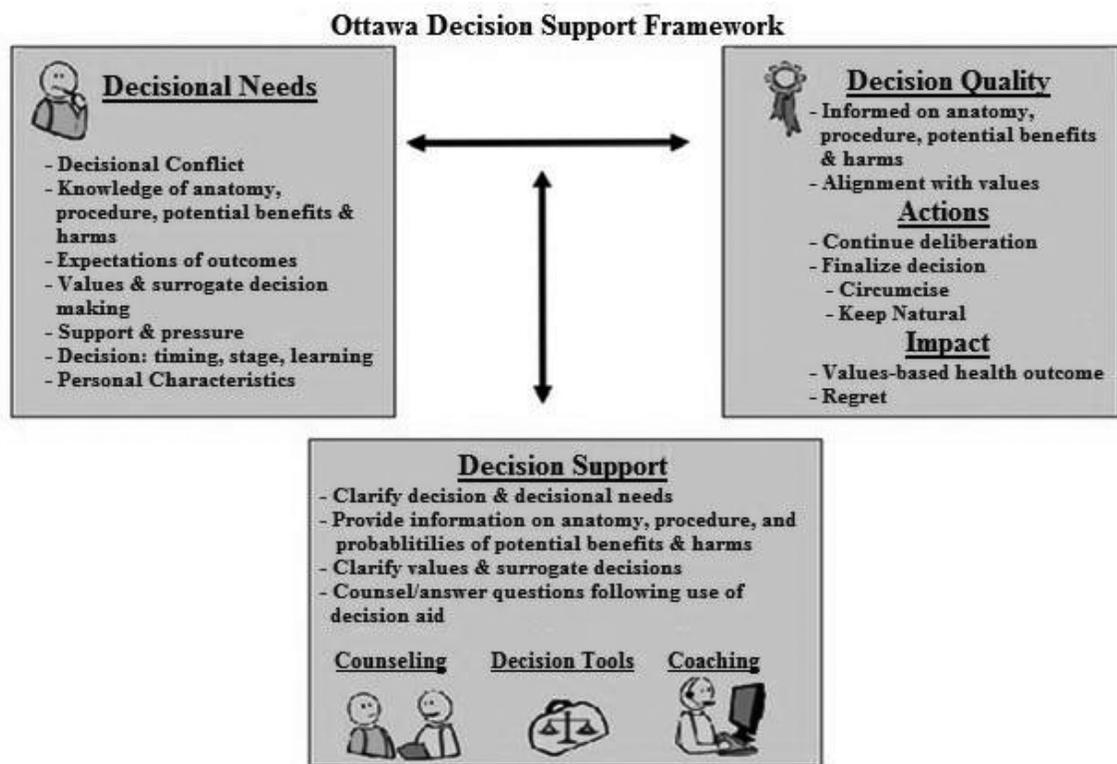


Figure 1. Ottawa decision support framework. Adapted from O'Connor, A. M. (2006). *Ottawa decision support framework to address decisional conflict*. Retrieved from Ottawa Hospital Research Institute website: <http://decisionaid.ohri.ca/docs/develop/ODSF.pdf>

online decision aid worked without technological difficulties, and to identify any problems with procedures. Three expectant parents participated. No alterations to project procedures or materials were made.

The SDM program consisted of three phases. Phase 1 consisted of in-class instruction by the PD about RIC to the participants during their childbirth education class. Educational content included information on male anatomy, care of the natural and the circumcised penis, explanation of the circumcision procedure, and answering frequently asked questions. Participants were encouraged to consider the information in light of their personal values. The first author (TM) may be contacted for a copy of the in-class curricula.

Phase 2 of the study used an SDM online decision aid. Within 1 week of the in-class instruction, participants completed the Healthwise (2012) decision aid entitled *Circumcision: Should I keep my son's penis natural?* The decision aid covered the benefits and risks of RIC and the application of personal values when making the RIC decision.

Phase 3 of the study consists of decision support counseling. Each woman and her support person (if participating) met as a couple with the PD for the

decision support counseling within 30 days of completion of the decision aid. Counseling was nondirective and aimed to facilitate decision making by answering questions that arose during use of the decision aid, clarifying personal values, and supporting the participants' decisions (O'Connor et al., 2011). The counseling was facilitated by asking questions such as (a) how are you coming along with your decision about circumcision for your baby; (b) do you understand each of the options; (c) do you feel like you understand the benefits and risks of each choice; (d) after using the decision aid, were you able to determine which factors were most important to you; (e) are you experiencing pressure or support from others about which choice to make; (f) do you feel like you have all of the information you need to make this decision; (g) have you made a decision; and (h) are you comfortable with the decision that you have made (O'Connor et al., 2011). The counseling took place immediately before or after a regularly scheduled childbirth preparation class.

Measures

All of the measurement instruments are available in the implementation toolkit by Ottawa Hospital

TABLE 1
Timing of Tool Collection

	Leaning Tool	PrepDM	Decision Tool	Enacted Decision
Before Phase 1	X			
After Phase 1	X	X		
After Phase 2	X	X		
After Phase 3		X	X	
4 months later				X

PrepDM = Preparation for Decision Making Scale.

Research Institute ([OHRI]; <https://decisionaid.ohri.ca/implement.html>). The OHRI measurement tools are available for use free of charge and without need of permission. The measurement tools were customized for use by inserting the name of the health condition in question into the title, instruction, and question items (where appropriate). Before Phase 1 began, participants were asked to complete a background information form to gather demographic data. The timing of tool collection in relationship to the study design is outlined in Table 1.

Choice Predisposition (Leaning) Tool. The participants were asked to select a box on a 15-point horizontal scale to declare if they were leaning toward RIC (on the far left), keeping their son’s penis natural (on the far right), or if they were unsure (in the middle). This tool was completed three times: before the class instruction (Phase 1), after class instruction (Phase 1), and after completing the decision aid (Phase 2). The test–retest reliability coefficient for the *Measures*

of *Decision/Choice Predisposition* Tool (which also includes the Decision Tool and the Enacted Decision Tool discussed later) exceeds 0.90 (O’Connor et al., 1998b). The Leaning Tool is in Figure 2.

Preparation for Decision Making Scale. This tool aims to ascertain each participant’s level of preparedness for decision making. The first five questions from the Preparation for Decision Making Scale (PrepDM) asked participants to rate their level of agreement among five response categories (*not at all, a little, somewhat, quite a bit, and a great deal*). An example of an item is, “Did this educational material help you think about the pros and cons of each of the options.” The range of scores is 1 to 5. A higher score indicated higher preparation for decision making (Graham & O’Connor, 2010). This tool was collected three times: after class instruction (Phase 1), after completing the decision aid (Phase 2), and after provider counseling (Phase 3). Bennett et al. (2010) reported Cronbach’s alpha ranges from .92 to .96 and test–retest reliability of .944. The PrepDM is in Figure 3.

Decision Tool. When completing this tool, participants disclosed their decision to proceed with RIC, to keep their son’s penis natural, or if they were still deciding. This tool was collected once, following completion of provider counseling (Phase 3). The Decision Tool is in Figure 4.

Enacted Decision Tool. The Enacted Decision Tool ascertained if the decision made during the final phase

Shared Decision Making for Routine Infant Circumcision
Leaning Tool

My opinion of routine infant circumcision

If you were to have a son and were asked to make a choice right now about having your son circumcised, please show where you would be on the scale below, by placing a check in the box

If you would want your son circumcised, place an on the far left.

If you would want your son to stay natural, place a on the far right.

If you are unsure, place a in the middle.

Circumcise Unsure Keep natural

Figure 2. Leaning Tool. Adapted from O’Connor, A. M. (2003). *User manual—Measures of decision/choice predisposition*. Retrieved from Ottawa Hospital Research Institute website: http://decisionaid.ohri.ca/docs/develop/user_manuals/um_choice_predisposition_decision.pdf

Please show your opinion of [this phase of the project] by circling the number to show how much you agree with each statement.

Did this educational material . . .	Not at all	A little	Some what	Quite a bit	A great deal
1. Prepare you to make a decision?	1	2	3	4	5
2. Help you think about the pros and cons of each option?	1	2	3	4	5
3. Help you think about which pros and cons are most important to you?	1	2	3	4	5
4. Help you know that the decision depends on what matters most to you?	1	2	3	4	5
5. Help you organize your own thoughts about the decision?	1	2	3	4	5

Figure 3. Preparation for Decision Making Scale. Adapted from Graham, I. D., & O'Connor, A. M. (2010). *User manual—Preparation for Decision Making Scale*. Retrieved from Ottawa Hospital Research Institute website: http://decisionaid.ohri.ca/docs/development_manuals/UM_prepdm.pdf

of the program was the same decision that was implemented. Four months after completion of the program, the participants were invited to complete the Enacted Decision Tool. The Enacted Decision Tool is in Figure 5.

Analysis

Participant demographics collected in the background information form were analyzed using descriptive statistics (percentages and means) to describe the group of participants. The participants' decisional leanings were analyzed using descriptive statistics (percentages and means) to gather how participants' leaning about the RIC decision varied throughout the decision-making process. Each of the five items in the scale was analyzed separately to examine if a phase of the program was more helpful in preparing parents in a particular way. The Decision Tool yielded nominal-level data categorized as *Decided* (choosing either to circumcise or to remain

natural) or *Undecided* (unsure). The percentages of participants who made each choice were described. The decision also was described based on the participants leaning before the study began.

RESULTS

Within the three childbirth classes where recruitment took place, 19 participants met the inclusion criteria. Everyone who met inclusion criteria agreed to participate in the study. The participants consisted of nine male–female couples and one woman whose male spouse was not able to attend. All of the participants ($N = 19$) were married to the parent of the expected child.

Most identified as non-Hispanic White (84.2%, $n = 16$), Christian (68.4%, $n = 13$), and held a college degree (78.9%, $n = 15$). The mean age of the participants was 30.53 years old. The pregnant women in the study averaged 31.26 weeks' gestation.

**Shared Decision Making for Routine Infant Circumcision
Decision Tool**

My thoughts on the best choice if I were to have a son

Now that you have learned about circumcision, which choice looks best if you were to have a son?

Keeping his penis natural

Having his penis circumcised

I'm not sure.

Figure 4. Decision Tool. Adapted from O'Connor, A. M. (2003). *User manual—Measures of decision/choice predisposition*. Retrieved from Ottawa Hospital Research Institute website: http://decisionaid.ohri.ca/docs/development_manuals/um_choicepredisposition_decision.pdf

**Shared Decision Making for Routine Infant Circumcision
Enacted Decision Tool**

Did you have a son or a daughter?

Son

Daughter (*You may stop here if you had a daughter.*)

My decision about circumcision:

Now that you have had the time to think more on your decision and your baby has been born, which choice did you make for your son?

I kept his penis natural.

Is this a change from when we last spoke? → Yes
 No

I requested for his penis to be circumcised.

Is this a change from when we last spoke? → Yes
 No

I haven't decided yet.

Figure 5. Enacted Decision Tool. Adapted from O'Connor, A. M. (2003). *User manual—Measures of decision/choice predisposition*. Retrieved from Ottawa Hospital Research Institute website: http://decisionaid.ohri.ca/docs/develop/user_manuals/um_choice_predisposition_decision.pdf

The circumcision statuses of the male family members (expectant fathers and sons/stepsons of participants) were almost exclusively circumcised. One of the expectant fathers had a natural penis, the other nine were circumcised. Of the three couples who already had a son/stepson, all of the boys were circumcised in the neonatal period. The background information and demographics are presented in Table 2.

Decision-Making Preparedness

Overall, the participants indicated high levels of preparedness following all phases of the program. The mean scores for Phases 1, 2, and 3 were 4.3, 4.2, and 4.4, respectively. The mean PrepDM scores for each question are in Table 3.

Participants who indicated they were *Decided* and *Undecided* on the Decision Tool after Phase 3 all had mean levels of preparedness scores of 4 or greater. The participants who decided on RIC had the lowest mean PrepDM scores across all phases with a mean score of 4.2. Those who were *Undecided* on the Decision Tool had only slightly higher mean PrepDM score of 4.3. Participants who decided on keeping their expectant son's penis natural had the highest mean PrepDM score of 4.5.

Leaning

At the baseline measure, most (84.2%, $n = 16$) participants indicated that they were leaning toward

TABLE 2
Background Information and Demographics

Age	<i>M</i>	Range
Participants (years)	30.53	23–43
Fetal gestational age (weeks)	31.26	27–38
	<i>N</i>	%
Race		
White, non-Hispanic	16	84.2
White, Hispanic	1	5.3
Asian	2	10.5
Religion		
Christian	13	68.4
Hindu	2	10.5
No religion	4	21.0
Education		
High school/GED	1	5.3
Some college	3	15.8
Associate's degree	2	10.5
Bachelor's degree	11	57.9
Master's degree	1	5.3
Doctorate degree	1	5.3
Children		
First child	12	63.2
1 other	5	26.3
2 others	1	5.3
3 others	1	5.3
Circumcision status		
Father, circumcised	9	90
Father, natural	1	10
Brother(s), circumcised	3 ^a	100
Brother(s), natural	0	0

Note. GED = general educational development.

^aThree of the expected children will have brother(s) who are circumcised.

TABLE 3
Preparation for Decision Making Question-by-Question Mean Scores

	Phase 1 <i>M (SD)</i>	Phase 2 <i>M (SD)</i>	Phase 3 <i>M (SD)</i>	All Phases <i>M</i>
Prepare you to make a decision?	4.3 (0.9)	4.0 (1.0)	4.2 (0.9)	4.2
Help you think about the pros and cons of each option?	4.5 (0.8)	4.3 (0.9)	4.6 (0.6)	4.5
Help you think about which pros and cons are most important to you?	4.4 (0.8)	4.3 (0.9)	4.4 (0.8)	4.36
Help you know that the decision depends on what matters most to you?	4.2 (1.1)	4.1 (0.9)	4.5 (0.6)	4.3
Help you organize your own thoughts about the decision?	4.2 (0.8)	4.3 (0.9)	4.3 (0.8)	4.26
All items: <i>M</i>	4.3	4.2	4.4	4.3

circumcision for their expected son, and three participants (15.8%) indicated that they were leaning toward keeping their expected son's penis natural. None of the participants indicated that they were unsure before implementation of the program began. The only male who indicated that he was leaning toward *Keep Natural* at baseline was the male with a natural penis. His wife also indicated that she was leaning toward *Keep Natural*. The participants who indicated that they were leaning toward keeping their sons' penis natural at baseline did not vary their leaning or decision at any point throughout the entire program.

Following completion of the class instruction (Phase 1), the leanings of some of the participants differed from the baseline measure. Ten participants continued their leaning toward RIC (52.6%), 5 became unsure (26.3%), and 4 were leaning toward keeping their son's penis natural (21.1%). Six of the nine couples had unmatched leanings at this point in the study. After Phase 2, which consisted of the online decision aid to clarify values, fewer participants indicated that they were unsure of their decision (10.5%, $n = 2$). Eleven were leaning toward RIC (57.9%), and 6 were leaning toward keeping natural (31.6%) after Phase 2.

Decision

After Phase 3 (provider counseling), the participants were asked to indicate their decision about RIC. Most participants were *Decided* on completion of the SDM program (84.2%, $n = 16$), and three (15.8%) were *Undecided*. Of the participants who indicated they were decided, 10 participants decided on RIC for their expected son (52.6%) and 6 decided to keep their expected son's penis natural (31.6%). One expectant father indicated that he was *Undecided*, whereas his wife indicated that she had decided to keep their son's penis natural.

Enacted Decision

Six couples and the one woman who participated without her husband completed the Enacted Decision Tool, representing seven children. Three couples were lost to follow-up. One couple who responded gave birth to a girl and was excluded from further data calculations. The couple who had an unmatched decision following Phase 3 indicated that they ultimately kept their son's penis natural. One couple was *Undecided* on completion of the intervention and indicated on the Enacted Decision Tool that they chose RIC for their son. All of the remaining participants who responded to the Enacted Decision Tool carried through with the same choice that they had indicated on the Decision Tool.

The couples who were lost to follow up had decided on RIC on the Decision Tool after Phase 3. Based on the returned Enacted Decision Tool, the circumcision rate was 33.3%. Two newborns were circumcised (33.3%), and four newborns kept their natural penis (66.7%). Table 4 outlines the results of the participants' leanings and decisions.

TABLE 4
Leaning and Decision

	Circumcise		Unsure		Keep Natural	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Baseline (Leaning)	16	84.2	—	—	3	15.8
After Phase 1 (Leaning)	10	52.6	5	26.3	4	21.1
After Phase 2 (Leaning)	11	57.9	2	10.5	6	31.6
After Phase 3 (Decision)	10	52.6	3	15.8	6	31.6
Follow Up (Enacted Decision)	4	36.4	—	—	7	63.6

DISCUSSION

Previously published interventions on parental decision making for RIC showed that physician counseling, videos, and informational brochures have not been shown to influence parental decision making about RIC, particularly in the postpartum period (Binner et al., 2002; Chantry et al., 2010; Wang et al., 2010). One strength of this SDM program was that the decision-making support was provided during pregnancy when parents are most likely to make their decision about RIC rather than after the birth of their son (AAP, 2012; Binner et al., 2002; Bisono et al., 2012; Chantry et al., 2010).

There are indications that this SDM program had an effect on the decision-making process. As the study progressed, participants moved in and out of decision categories. Once participants began to learn about their choices, some of them moved from leaning toward RIC at baseline to being unsure following the in-class instruction in Phase 1. One reason for the change in leanings may be that this was the first time they had encountered information on natural male anatomy, care of the natural and circumcised penis, the circumcision procedure, and accurate information about the risks and benefits of RIC. Some of the participants volunteered to the PD that they had never thought about RIC before, thought that it was just what everyone did, or had assumed that they would choose RIC because other men in their families were circumcised. Fewer participants were unsure after the second phase, which may indicate the participants' application of their own values and previously held beliefs about RIC to the information they received in Phase 1. In addition, although 16 participants were leaning toward RIC at baseline, this number decreased to 10 participants after Phase 3, a 37.5% reduction.

A second strength of the SDM program was that it occurred over a period of time, ranging from 1 to 3 weeks. Previous studies on parental decision making for RIC often collected decision data immediately following the intervention (Binner et al., 2002; Chantry et al., 2010; Wang et al., 2010). An advantage of a multicomponent SDM program is that such a program allows for the passage of time, thereby providing expectant parents with contemplative opportunity. Decision making using the SDM model does not occur in a single encounter but only after the individual has had time to consider his or her options and the input of significant others (Stiggelbout et al., 2012).

A third strength of this study was that the PD was dedicated to providing unbiased and evidence-based information during the class instruction and in the online decision aid. Previous research indicates that bias has been present in the way that information about RIC has been presented (Muller, 2010). The PD was very careful in her word choices, presentation, and provider counseling not to influence the decisions of the participants or to convey her own opinions about RIC.

The SDM conceptual model of decision support is superior to solely providing written information because previous research has found providing written information to be ineffective (Binner et al., 2002; Wang et al., 2010) and because SDM discloses probability of risks and application of personal values (O'Connor, 2006). Failure to disclose probabilities may be a form of bias because without disclosing probabilities, the risks and benefits of RIC may be over- or underestimated. For example, simply informing parents that RIC may decrease the risk of a urinary tract infection (UTI) is biased in favor of RIC. Whereas informing parents that one or two UTIs will be prevented for approximately every 100 to 111 circumcisions performed (AAP, 2012; Singh-Grewal, Macdessi, & Craig, 2005) may help the parents to comprehend the true incidence of UTI and aid decision making in an evidence-based manner.

No previous studies have been published on the application of SDM and the use of decision aids for parents deciding about RIC for their sons. The results of this pilot study suggest that SDM effectively prepared the participants to make their decisions about RIC based on health-related factors and their own personal values. It is possible that the RIC decision was influenced by the participants' discussions with their health-care providers and their cultural values, as suggested by Bisono et al. (2012). Future studies, with larger sample sizes and diverse participants, are needed to test the efficacy of the intervention.

Merging the evidence and individual personal values is the primary objective of using the SDM conceptual model (O'Connor, 2006). This is important for RIC because this is a values-based decision (AAP, 2012). The PrepDM Tool investigated the participants' preparedness based on their personal values rather than their factual knowledge about RIC. Considering that the mean scores of the values items of the PrepDM were consistently more than 4 throughout the study, it appears that SDM effectively

supported the participants in making a decision that was consistent with their personal values.

The actual rate of RIC in this study may be different than the Enacted Decision Tool revealed because not all of the participants responded to that questionnaire. If the participants who were lost to follow up gave birth to sons and carried through with their decision to circumcise, the rate of circumcision would have been 55.6% ($n = 5$) versus 44.4% ($n = 4$) of the newborns who kept their natural penis. This speculated rate is similar to the current estimated rate of RIC in the U.S. southern region (58.4%) and the rate throughout the entire United States (58.3%; Owings et al., 2013).

Interestingly, every participant who chose to keep his or her son's penis natural responded to the Enacted Decision Tool. In contrast, only two of the five couples who had decided on RIC responded to the Enacted Decision Tool. One of the two couples who responded had a daughter and therefore no longer had a decision to enact. All six participants who were lost to follow up indicated that they were leaning toward RIC every time the Leaning Tool was collected, with the exception of one expectant father who was *unsure* following in-class instruction (Phase 1) only. It is unknown why most couples who decided on RIC did not respond to the Enacted Decision Tool. It is possible that it was by chance that those who decided on RIC did not reply. In addition, it is possible that they experienced regret about their decision, gave birth to daughters, or that they changed their mind and decided not to carry out their decision to have their sons circumcised. It is also possible that they were concerned about the perception of the PD regarding the decision that they enacted. Future research on SDM for RIC should include use of the Decision Regret Scale from OHRI (https://decisionaid.ohri.ca/eval_regret.html).

LIMITATIONS

There were several limitations to this pilot study. Although there were only 19 participants, 10–20 participants may be adequate in pilot work to obtain estimates of variance (Grove et al., 2013). The expectant parents were predominately well educated, White, and married. Expectant parents who possess different characteristics may have responded differently to the program. Furthermore, the participants were motivated to enroll in a childbirth education class that focuses on natural birth and informed decision making. Some of the participants planned

to birth in an out-of-hospital birthing center or have a birth doula present. These participants may be more willing to accept information that is new and critically analyze the information before making a decision. Future research on SDM for RIC should strive to have a more diverse group of participants and a comparison group to compare the effectiveness of SDM to usual parental education about RIC.

This study did not collect data from the participants to determine their level of satisfaction or their level of regret with the decision that they made about RIC. Many of the participants who responded to the Enacted Decision Tool volunteered that they were pleased with their decision to keep their sons' penises natural. It is unknown if participants who elected for RIC felt satisfaction or regret. Satisfaction or regret with the enacted decision should be evaluated in future studies.

IMPLICATIONS FOR PRACTICE

Childbirth educators are exceptionally important in the dissemination of accurate information about RIC and high-quality decision support because parents make this decision before or during pregnancy (AAP, 2012). Providers and childbirth educators who are interested in providing SDM decision support should learn how to provide such support in a way that leads the parents to make their own decisions without the provider placing their own values into the discussion. Training is available from OHRI (<https://decisionaid.ohri.ca/ODST/>). Although implementing SDM in practice may be more labor intensive than traditional informed consent, it may be worth the extra effort if it leads to high-quality decisions.

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