By Ashley Jensen and Jane Wrede

Fertility Awareness–Based Methods
FOR Family Planning: A LITERATURE REVIEW

ABSTRACT: *A review of 23 research articles to examine fertility awareness-based methods revealed biologic indicators and tracking methods to identify the fertile window in reproductive-aged women. This literature review indicated that a woman's cycle regularity is a major determinant of which method is best. Additionally, the woman's desire to achieve a pregnancy and her preference regarding the intensity of training are factors in method choice. Some evidence suggests that use of at least two biologic indicators is most effective for determining the fertility window. Recommended web and mobile applications also are discussed.*
KEY WORDS: *contraception, fertile period, fertility, natural family planning methods, nursing*

A wide spectrum of beliefs exists among women about using birth control. Women may choose natural family planning (NFP) or a fertility awareness–based (FAB) method based on religious convictions, beliefs, or physical reasons. Neither FAB methods nor NFP is popular in the United States (Jennings, 2018). Midwives and other nurses often perceive they lack knowledge about these methods, preventing them from educating patients. This article presents a critical appraisal of the literature about FAB methods and clinical implications for nursing practice.

Many Christians believe that life begins at fertilization. Often referenced is Psalm 139:13: "For you created my inmost being; you knit me together in my mother's womb" (NIV). Some feel the use of mechanical or hormonal methods for birth control are unacceptable given they would interfere with the creation of a human life. For example, the Roman Catholic Church posits all forms of contraception as immoral. Varying views of contraception exist among the branches of Judaism: Ultraconservatives may prohibit contraceptive use entirely, more moderate Jews may prohibit only specific methods, and liberal Jews likely will have no objection.

In addition to religious or moral reasons, some women may avoid mechanical or hormonal methods of birth control because they want to avoid undesirable side effects such as nausea, vomiting, headache, vertigo, breast tenderness, weight gain, venous thrombosis, irregular bleeding, or spotting (Stöppler, 2019). It is also possible that some Christian women opt not to use such methods of birth control because they want to be a "temple of the Holy Spirit" (1 Corinthians 6:19, NIV) that is unencumbered by such effects. A perceived knowledge deficit on the part of the nurse or midwife may be another reason that FAB methods and NFP are not widely used. Fehring et al. (2001) surveyed 370 midwives about their knowledge and promotion of NFP. These researchers found that 11% would not mention NFP to their patients, 64% would mention it only to select patients, and 22% would mention it to all or most of their patients. Nearly 50% reported that they felt unprepared to give NFP instruction to patients.

The purpose of this article is to present a critical appraisal of the literature about FAB methods. Clinical implications will be discussed and a decision tree is provided to guide nurses who are consulted regarding family planning.

FERTILITY AWARENESS-BASED FAMILY PLANNING

Central to FAB family planning is the identification of a woman's "fertile window" or the time frame each month during which she can become pregnant from sexual intercourse (Jennings, 2018). As sperm can live for 5 days and an egg's lifespan is only 24 hours once released after ovulation, the fertile window exists for the 5 days prior to ovulation and 1 day after. A clear mucous vaginal discharge typically occurs 1 to 2 days (or even 5 to 8 days) prior to ovulation and

occurs when a woman is most vulnerable to pregnancy (Ecochard et al., 2015; Hilgers, 2002).

In addition to noting vaginal mucus, other biological changes indicate the

Ashley Jensen, RN, CNM, CrMSNM, focuses her practice on restorative reproductive medicine for infertility, miscarriage, and treatment of women's health conditions without using artificial hormones. She is a trained Creighton Model System nurse-midwife through the AAFCP.

Jane Wrede, PhD, APRN, CNM, is a full-scope certified nurse-midwife and program director for the Nurse-Midwifery program at Bethel University, St. Paul, MN. She is dedicated to empowering the mind, body, and spirit of the women she cares for and the nurse-midwifery students she instructs.

SDC **Supplemental digital content** is available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of the article at journalofchristiannursing.com.

fertile window exists. These include changes in basal body temperature (BBT), saliva, and hormone levels excreted in the urine (which can be indirectly observed with test strips; Hilgers, 2002). Additionally, an estimate of the fertile window can be determined by monitoring the menstrual cycle with calendars or web and mobile phone-based applications ("apps"; Scherwitzl et al., 2015; Setton et al., 2016). Collectively, these are known as FAB methods of family planning, or NFP. Various FAB methods, along with their protocols for identifying the fertile window, are discussed in Table 1. (See a Review of FAB Methods in Supplemental Digital Content at http://links.lww.com/NCF-JCN/A74.)

CRITICAL APPRAISAL OF THE LITERATURE

This critical appraisal of the literature revealed which biologic indicators and tracking methods are the most accurate in identifying the

fertility window for reproductive-aged women. An initial search of peer-reviewed articles written in English was completed utilizing CINAHL and PubMed; the search terms "ovulation detection" or "ovulation prediction" or "fertile window" or "fertile phase" were used for the search. This initial search limited studies to those written within the previous 10 years.

Data mining (i.e., looking for new sources by checking the reference lists in the initially identified studies) was then performed to ensure a thorough search of current and past research. This yielded additional studies, some of which were outside the 10-year search criteria, as many of the foundational NFP methods emerged as early as the mid-1900s. Research on these methods occurred in the 1980s and into the early 2000s. The research from these early articles has not been replicated; therefore, these reports were essential to the current aim of identifying the fertile window in reproductive-aged women.

Inclusion and exclusion criteria

The following inclusion criteria guided what literature was included in this review: 1) females of childbearing age; 2) FAB methods of NFP; 3) techniques of monitoring fertility; 4) achieving pregnancy; or 5) avoiding pregnancy. Exclusion criteria included 1) nonresearch studies; 2) studies on nonhumans; 3) systematic reviews; 4) literature reviews; 5) studies on infertility; 6) studies on artificial reproductive technologies; 7) studies regarding women who were currently pregnant; 8) studies on pregnancy loss; 9) studies on ovulation induction techniques; 10) studies of breastfeeding women; 11) studies of women with medical conditions (i.e., polycystic ovary syndrome, endometriosis, or ovarian cancer); and 12) studies on women in perimenopause.

Number and types of studies selected

Twenty-one articles met the inclusion criteria. The authors of these articles represented numerous countries including the United States (9), Germany (4), Philippines (4), Belgium (2), France (2), Italy (2), Peru (3), Switzerland (2), Sweden (3), Bolivia (2), England (1), India (2), New Zealand (1), Benin (1), Ecuador (1), El Salvador (1), Guatemala (1), Honduras (1), Ireland (1), and Spain (1). Two additional articles stated participants were from unspecified European countries.

SYNTHESIS OF EVIDENCE

Findings from the literature about the most accurate methods for identifying the fertile window are presented as they pertain to the following topics: regular cycles, irregular cycles, mobile applications, achievement of a pregnancy, use of biologic indicators, and client training. Table 2 provides a summary of evidence.

Regular cycles

Many NFP methods are not effective in preventing or achieving pregnancy among women with irregular menstrual cycles. Studies of use of the Standard Days Method[R] (SDM), a calendar method, had a high initial dropout rate (41%) for women with irregular cycles (Arévalo et al., 2002; Sinai et al., 2012). Sinai et al. (2012) found that with the women who remained in the study, the effectiveness of this method for avoiding pregnancy was 86% to 88% in the first year, and 94% to 97% in the second year. In this study, women who had irregular cycles were not good candidates and were dropped from the study or became pregnant; thus, those who remained were good candidates to continue using the method to prevent pregnancy.

Irregular cycles

Although some methods cannot effectively be used by women who have irregularly long or short menstrual cycles, both the Creighton Model FertilityCare System™ (CrMS, a cervical mucus-only method) and the Marquette Method (MM, a symptohormonal method) have been studied in a population of women of all cycle lengths. A prospective cohort study by Doud (1985) looked at the effectiveness of the CrMS among 378 women in the United States of all reproductive categories (i.e., those who were breastfeeding; those experiencing perimenopause, long cycles, short cycles, or regular cycles). Method-use pregnancy rates, or the rates when the method is used completely correctly, were found to be about 1% for women after 12 months of use, and typical-use pregnancies (i.e., those that reflect the reality of some error, such as incorrect use based on incorrect teaching, or failure to correctly implement) were nearly 4% (Doud, 1985). The researchers studying MM excluded women who were breastfeeding or postpill, so it is unknown whether this method is beneficial under these circumstances. The CrMS, however, is known to be effective in any life situation including postpill, breastfeeding, or perimenopause (Doud, 1985; Fehring et al., 1994; Fehring & Schneider, 2017; Fehring et al., 2008; Fehring et al., 2009; Howard & Stanford, 1999).

Mobile and web-based applications

Mobile and web-based applications can be a helpful means of fertility tracking. Not all applications, however, are effective. Some require training from the organization that created the app if the app is to be an effective method of family planning (Duane et al., 2016; Scherwitzl et al., 2016).

Two descriptive comparative studies critiqued numerous web and mobile fertility applications on their ability to identify the fertile window (Duane et al., 2016; Setton et al., 2016). Whereas Setton et al. (2016) evaluated 55 websites and mobile apps, Duane et al. (2016) critiqued 39. Both observed that most of these resources were not completely accurate at predicting fertility windows. For example, Duane et al. found that 29 of 39 apps were able to predict the fertile window, but only six received a perfect score on accuracy or had no false negatives when fertile days were identified as infertile. The six applications that scored perfectly (using established criteria) included Ovulation Mentor, Sympto.org, iCycleBeads™, LilyPro, Lady Cycle, and myNFP.net. According to Duane and colleagues' study findings, applications that did not correctly identify the fertile days were NFP Charting Ovulation, Symptopro™, Fertility Pinpoint™, Kindara, Groove Fertility Pro, FEMM, NFP Project Caruso, Charting App, Lady Time, and Knowhen[R]. NaturalCycles, another mobile application, has been found to accurately identify the fertile window and is an effective aid for pregnancy prevention (Scherwitzl et al., 2016; Scherwitzl et al., 2015). Both Scherwitzl et al. studies reiterated that though effective, a woman needs to remember to implement abstinence or protection on fertile days.

Achieving pregnancy

Identifying the fertile window through methods such as cervical mucus monitoring (CMM) or saliva microscope observations can be relevant and effective for couples wanting to achieve a pregnancy, as well

as for those wanting to avoid pregnancy (Ecochard et al., 2015; Evans-Hoeker et al., 2013; Günther et al., 2015). These methods allow a woman to measure the rise in estrogen that occurs before ovulation. Such equipment is available for public purchase at online retailers. Evans-Hoeker et al. (2013) conducted a time-to-pregnancy cohort study of women without known infertility from the United States (N = 331) trying to conceive and observed that the use of CMM significantly increased the likelihood of pregnancy (p = 0.02). As the CMM frequency increased, so did the chance of pregnancy (p = 0.01).

Comparing biologic indicators

FAB methods that use more than one biologic indicator of fertility include the MM, which observes hormone level and mucus quality, and Symptothermal Methods (STM), which observes body temperature and other symptoms. Fehring et al. (2013) found that the typical-use pregnancy rate (which accounts for error like lack of knowledge about how to use a method) among those using an electronic hormonal fertility monitor was 7%, compared with 18.5% among those who only used the quality of their cervical mucus. Frank-Herrmann et al. (2007) studied how monitoring CMM, BBT, and using a calendar algorithm together affected pregnancy rates. These researchers calculated pregnancy rates after 13 cycles. A typical-use pregnancy rate of 1.6% was observed when women were sexually abstinent during the fertile window, compared with 2% when a barrier method was used during that time. The perfect-use pregnancy rate was 0.4, and significantly differed from a 7.5% unintended pregnancy rate when there was unprotected intercourse during the fertile window (p < 0.00001). This evidence supports what one could easily assume, that watching at least two biologic indicators results in lower pregnancy rates than utilizing just one (Fehring & Schneider, 2017; Fehring et al., 2008; Fehring et al., 2009; Fehring et al., 2013; Frank-Herrmann et al., 2007; Wade et al., 1981).

Central to fertility awareness-based (FAB) method family planning is the identification of a woman's "fertile window."

Client training

Client training for the FAB methods varies from intense training over a year to something that can be quickly completed during a standard office visit. The CrMS, MM, Billings Ovulation Method® (OM), and STM have varying follow-up structures for clients; however, most cite individual training of at least a year in duration (Doud, 1985; Fehring et al., 1994; Fehring et al., 2008; Fehring et al., 2009; Howard & Stanford, 1999; World Health Organization, 1981). Such training typically involves multiple in-person sessions (sometimes individual, sometimes in groups) that deliver information to ensure couples understand the system and are using it correctly. For example, when the CrMS is used to avoid pregnancy, instructions are given for when couples should have intercourse; these instructions for avoiding pregnancy start out with restrictiveness and become less restrictive as the couple learns the system and becomes more confident in their skills. Conversely, the SDM, TwoDay Method®, and NaturalCycles applications require little-to-no

training for users (Arévalo et al., 2004; Arévalo et al., 2002; Scherwitzl et al., 2016; Scherwitzl et al., 2015; Sinai et al., 2012). This brief training for SDM usually includes an office visit where the woman is simply told to avoid intercourse or use protection on every cycle day 8 to 19. For NaturalCycles, the woman is only directed to download the app and monitor her temperature and put it in the app; the app performs the calculation. The amount of training involved for a method may impact a woman's decision about which method to use.

PRACTICE RECOMMENDATIONS

Different methodologies are used to calculate pregnancy rates (e.g., life table analysis, Kaplan-Meier survival analysis, Pearl Index). Given this, findings from studies using different methodologies cannot be compared. Even among studies that used the same analytical method, the way pregnancy is defined varies, further complicating synthesis of these findings. Even if a conclusion could be made, it is vital to recognize the uniqueness of each woman. She should be informed about each

Table 2. Evidence Summary Table

Author	Study Design	Sample Size	Study Location	Study Considerations	
Arévalo (2002)	Prospective cohort study	478	Bolivia, Peru, and the Philippines	28% removed due to having two cycles outside of 26 to 32-day range	
Arévalo (2004)	Prospective nonrandom-ized multicenter study	450	Guatemala, Peru, and the Philippines		
Bigelow (2004)	Prospective cohort study	782	Italy, Switzerland, Germany, France, England, and Belgium		
Doud (1985)	Prospective cohort study	378	United States	No exclusions	
Duane (2016)	Descriptive comparative study	39 web and mobile fertility applications			
Ecochard (2015)	Observational cohort study	107	France, Italy, Germany, Belgium, and Spain	Excluded women with cycles outside of a 24- to 34-day range	
Evans-Hoeker (2013)	Time-to-pregnancy cohort study	331	United States	CMM was more likely to occur among women who were younger ($p = 0.01$) and nulligravid ($p = 0.002$)	
Fehring (1994)	Prospective descriptive cohort study	242	United States	No exclusions	
Fehring (2008)	Retrospective evaluation	204	United States	Excluded breastfeeding woman	
Fehring (2009)	Retrospective cohort comparison	626	United States	Excluded woman who were postpill	
Fehring (2013)	Prospective randomized clinical trial	667		Women with menstrual cycles outside of a 21- to 42-day range were excluded	
Fehring (2017)	Prospective cohort study	572	United States and Europe	Excluded women who were breastfeeding	
Frank-Herrmann (2007)	Prospective observantional longitudinal cohort study	900	Germany	Excluded women with cycles outside of a 22- to 35-day range	
Günther (2015)	Prospective comparative study	74	Germany	Excluded women with cycles outside of a 25- to 35-day range	
Howard (1999)	Observational cohort study	701	United States	No exclusions	
Scherwitzl (2015)	Retrospective investiga-tional pilot study	317	Switzerland and Sweden		
Scherwitzl (2016)	Retrospective observational study	4,054	Sweden		
Setton (2016)	Descriptive comparative study	20 websites; 33 applications			
Sinai (2012)	Long-term prospective cohort study	1,659	Bolivia, Peru, Philippines, Benin, Ecuador, Honduras, and India.	40.8% removed in first year due to having two cycles outside of 26- to 32-day range. 8.3% in the following 2 years	
Wade (1981)	Randomized prospective comparative study	430	United States	Excluded women with cycles outside of a 24- to 36-day range	
World Health Organization (1981)	Prospective cohort study with women	725	New Zealand, India, Ireland, Philippines, and El Salvador	Excluded women with cycles outside of a 25- to 35-day range	

Note. LTA = life table analysis; CMM = cervical mucus method; KMSA = Kaplan–Meier survival analysis; EHFM = electronic hormonal fertility monitor; BBT = basal body
FBA = fertility awareness–based; SDM = Standard Days method.

FAB Method	Outcomes: PI, LTA, or KMSA
SDM	LTA for correct-use pregnancy rates: 4.8%.
TwoDay Method[R]	LTA for TwoDay Method[R] pregnancy rate: 3.5%.
	All vaginal mucus was ranked (i.e., clear, stretchy and lubricative mucus ranked highest, and mucus with other qualities were given lesser rankings). Highest ranking mucus was observed 2 days before ovulation. Intercourse on a day of the highest ranked mucus is much more likely to result in a pregnancy without regard to its relation to ovulation.
CrMS	CrMS method-use pregnancy rates: 0.9%. Typical-use pregnancy rate: 3.8%.
Web and mobile-based apps	Ovulation Mentor, Sympto.org, iCycleBeads™, LilyPro, Lady Cycle, and myNFP.net received a perfect score on accuracy or had no false negatives when fertile days were identified as infertile.
	All signs of ovulation (i.e., BBT, LH, CMM) were compared with ultrasound testing to confirm when ovulation actually happened. Cervical mucus correlated the closest; authors concluded it can be used as a clinical proxy for ovulation.
Cervical mucus only	Using CMM significantly increases the chances of achieving pregnancy; this effect increases cumulatively.
CrMS	LTA method-use pregnancy rates: 1.2%. Typical-use pregnancy rate: 2%.
MM	KMSA typical-use pregnancy rate: 9.2% for those who used EHFM alone or in combination with BBT and CMM and 12.2% for those who did not use the EHFM at all.
MM	KMSA typical-use unintended pregnancy rates:12.3% for the group that utilized EHFM and CMM and 22.8% for the CMM group.
MM	KMSA typical-use pregnancy rate: 7% pregnancies for the EHFM group and 18.5% for the CMM group.
MM	KMSA typical-use pregnancy rate: 6% for the group that used EHFM alone, 19% for the CMM only, and 18% for the combined EHFM and CMM. MM in person, individualized in-depth training, with 5 sessions over the course of 1 year. It also can be taught fully online.
STM	KMSA perfect-use pregnancy rate: 0.4%. Unintended pregnancy rate: 7.5%. Typical-use pregnancy rates: 1.6%.
	Saliva will become positive for "ferning" on a slide 24 hours before LH. Ferning occurs when estrogen level becomes high.
CrMS	LTA total pregnancy rate: 17% (couples planning pregnancy not excluded). Method-related pregnancy rate: 0.14%. Intended/planned pregnancy rate: 13%. CrMS has individualized in-depth training with 8 sessions over the course of 1 year.
Natural Cycles	Only one unintended pregnancy occurred among all participants. Only 0.05% of the fertile days were falsely attributed to the fertile window.
Natural Cycles	PI pregnancy rate: 0.5% pregnancies per woman-years. Typical-use PI: 7%.
Web and mobile-based apps	Only one website and three applications were able to exactly predict the precise fertile window based on a standardized data set. 74% websites and 75% of applications predicted fertile days that were within the actual fertile window.
SDM	LTA typical-use pregnancy rate of 12% to 14% after year one, 3.7% to 5.2% after year two, 3.4% to 5.9% after year three.
STM	PI pregnancy rates: 35% per 100 women-years for the OM and 16.6% for the STM.
Billings OM	PI method-related pregnancy rates: 2.2% per women-years. User-related PI pregnancy rate: 19.6%.

temperature; MM = Marquette Method; LH = lutenizing hormone; CrMS = Creighton Model System; PI = Pearl Index; STM = Symptothermal Method; OM = Ovulation Method;

method, and she should be counseled in depth about the FAB method that suits her preference.

A decision tree can assist nurses and midwives to guide women in making an appropriate decision with regard to what FAB or NFP method to use (Figure 1). When helping a woman decide which method may be most suitable, four questions need to be answered: Does she have regular cycles? Does she want to achieve or avoid pregnancy? What kind of training does she need or want? And, are instructors available to teach the preferred or chosen method?

If the woman has regular cycles, the provider should ascertain the woman's intention for identifying her fertile window. If it is to achieve pregnancy, she should be directed toward a prospective method that utilizes CMM (Ecochard et al., 2015; Evans–Hoeker et al., 2013). Monitoring saliva could also be used as a valid prospective method, although only one study was identified that tested this method (Günther et al., 2015).

If she does not have regular cycles, her two options include the CrMS and MM. CrMS demonstrated high effectiveness rates. If CrMS local instructors are not available, MM would be a good alternative. The MM studies were inconsistent regarding participants they kept in their study from different reproductive categories including postpill, breastfeeding, and perimenopausal status. Therefore, caution should be used when advising women about MM (Fehring & Schneider, 2017; Fehring et al., 2008; Fehring et al., 2009). If neither CrMS nor MM instructors are locally available, the MM can be learned entirely online.

For the woman whose goal is to avoid pregnancy, a provider should determine if she prefers a simple method to be used immediately or one that can be taught to her individually. Providers should also use clinical judgment in helping a woman choose a method that is congruent with her religious and spiritual belief system. Also, consider whether the patient can consistently adhere to an intense regimen that requires daily action and whether she can financially afford individual training or the cost of some devices, such as an electronic hormonal fertility monitor. Although a

Figure 1. FAB Method Decision-Making Tool
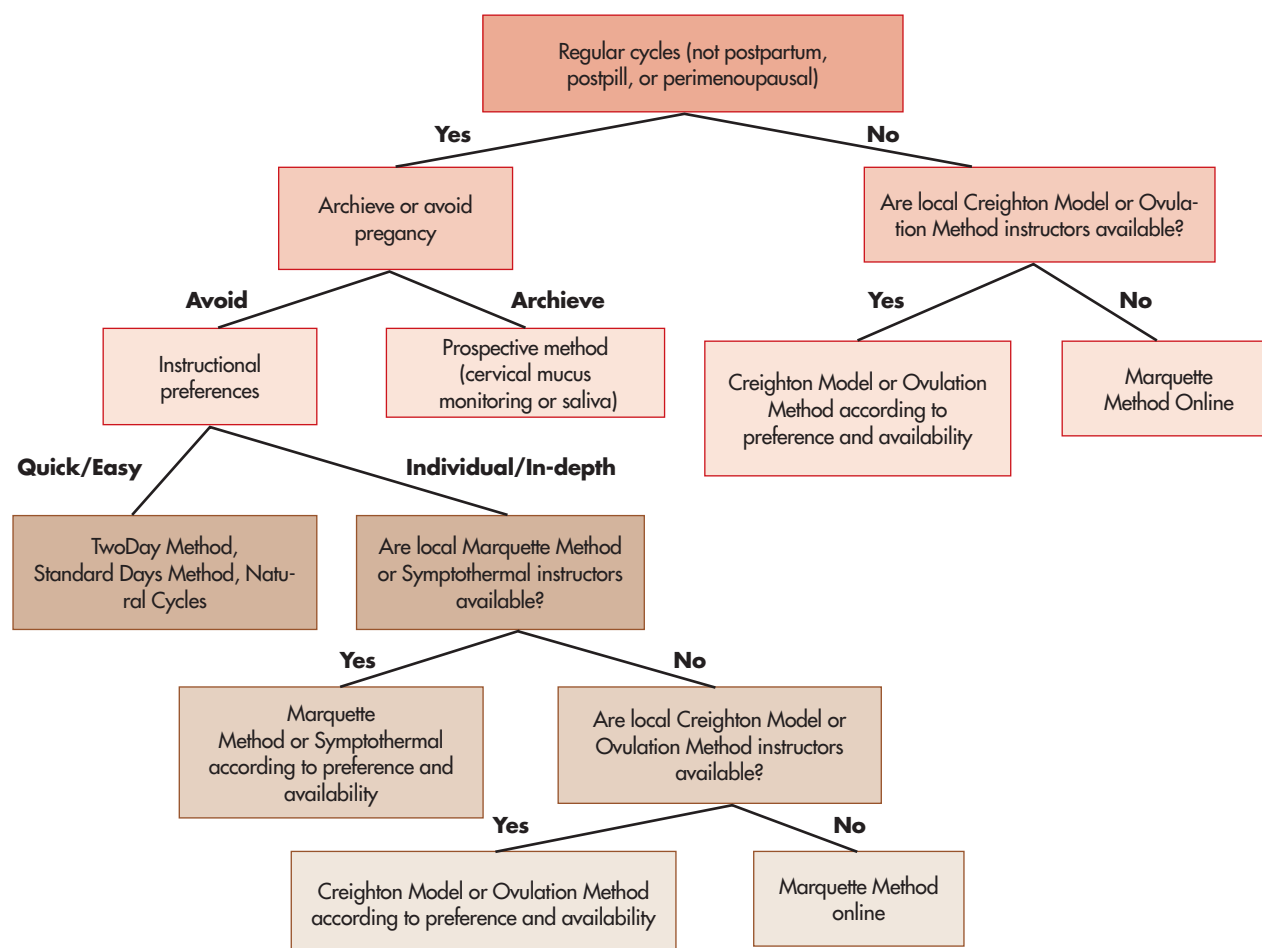
Note. NFP—Decision tree. Creighton Model = Creighton Model FertilityCare System; Ovulation Method = Billings Ovulation Method.

method may be highly effective, it can only reach its effectiveness rate if it is used correctly nearly all of the time. Therefore, it is the duty of the provider to guide a woman in choosing the most appropriate method that she can implement.

Six articles from this literature review revealed that the MM and STM, which use two biologic indicators of fertility for identifying the fertile window, are more effective than methods that use a single indicator of fertility. Thus, these methods should be viewed as the first line among the four methods that have individual and in-depth client training as is shown in Figure 1 (Fehring & Schneider, 2017; Fehring et al., 2013; Frank-Herrmann et al., 2007). Furthermore, women who are 3 to 6 months postpill, breastfeeding, or perimenopausal status should likewise observe caution and notice multiple biologic indicators for the fertility window (Fehring & Schneider, 2017).

Several effective methods can be taught quickly during an office visit. The TwoDay Method[R] relies on a nurse or midwife to educate the user during an office visit as it does not have a mobile application (Manhart et al., 2013). NaturalCycles is available on iOS and Android. Similarly, the SDM can be utilized through the iOS and Android application iCycleBeads™. Other highly effective web and mobile applications for the STM include Sympto.org and myNFP, which are both available on iOS, Android, and the web (Duane et al., 2016). Lady Cycle, which is only available on Android, and LilyPro, which is only available on iOS, are other quickly learned and implemented apps.

In-depth, personalized training is required for several methods, including CrMS, MM, and OM. STM individualized training can be obtained through the Couple to Couple League International (https://ccli.org/) and Northwest Family Services (https://www.nwfs.org/natural-family-planning). Individuals also can learn about the STM through books, websites, and mobile applications, though it should

be noted that the two studies that evaluated STM involved professionals teaching the participants about use of the method (Frank-Herrmann et al., 2007; Wade et al., 1981). The websites for finding local instructors for the CrMS, MM, OM, and STM can be found in Table 3. If there are no local instructors for CrMS, MM, OM, or STM, the MM can be utilized through their online platform.

CONCLUSION

Family planning intentions can be potentially discussed with patients in many different contexts of care. Any nurse who has contact with women of childbearing age should have awareness of these FAB method options. The decision tree in Figure 1 can be used by any nurse engaging in a discussion with a patient who is interested in family planning options. Although risk of pregnancy for those using some methods of FAB may be higher than those using "the pill" (i.e., 24 vs. 9 unintended pregnancies per 100 women), some types of FAB are without the risks from using contraceptives (Centers for Disease Control and Prevention, n.d.). Indeed, some FAB methods are comparable with other contraceptive methods such as the sponge or spermicide. Given their benefits, FAB methods are important options about which nurses ought to inform patients. 🌺

Table 3. Resources for Learning About FAB Methods

- *The Complete Guide to Fertility Awareness,* Jane Knight, 2017, Routledge.
- FAB method online book chapter—https://www.glowm.com/resourcesglowm/cd/pages/v6/v6c016.html
- Fertility Appreciation Collaborative to Teach the Science (FACTS)—https://www.factsaboutfertility.org/what-is-charting/
- Creighton Model FertilityCare System™—https://www.fertilitycare.org/
- Marquette Method—www.marquettemethod.com/
- Billings Ovulation Method[R]—https://www.boma-usa.org/find-a-boma-usa-teacher.html
- Couple to Couple League—https://ccli.org
- SymptoPro™—https://www.symptopro.org/about-us/find-an-instructor.html

Arévalo, M., Jennings, V., Nikula, M., & Sinai, I. (2004). Efficacy of the new TwoDay Method of family planning. *Fertility and Sterility, 82*(4), 885–892. https://doi.org/10.1016/j.fertnstert.2004.03.040

Arévalo, M., Jennings, V., & Sinai, I. (2002). Efficacy of a new method of family planning: The Standard Days Method. *Contraception, 65*(5), 333–338. https://doi.org/10.1016/S0010-7824(02)00288-3

Bigelow, J. L., Dunson, D. B., Stanford, J. B., Ecochard, R., Gnoth, C., & Colombo, B. (2004). Mucus observations in the fertile window: A better predictor of conception than timing of intercourse. *Human Reproduction, 19*(4), 889–892. https://doi.org/10.1093/humrep/deh173

Centers for Disease Control and Prevention. (n.d.). *Effectiveness of family planning methods.* https://cdc.gov/reproductivehealth/UnintendedPregnancy/PDF/Contraceptive_methods_508.pdf

Doud, J. (1985). Use-effectiveness of the Creighton model of NFP. *International Review of Natural Family Planning, 9,* 54–72.

Duane, M., Contreras, A., Jensen, E. T., & White, A. (2016). The performance of fertility awareness-based method apps marketed to avoid pregnancy. *Journal of the American Board of Family Medicine, 29*(4), 508–511. https://doi.org/10.3122/jabfm.2016.04.160022

Ecochard, R., Duterque, O., Leiva, R., Bouchard, T., & Vigil, P. (2015). Self-identification of the clinical fertile window and the ovulation period. *Fertility & Sterility, 103*(5), 1319.e3–1325.e3. https://doi.org/10.1016/j.fertnstert.2015.01.031

Evans-Hoeker, E., Pritchard, D. A., Long, D. L., Herring, A. H., Stanford, J. B., & Steiner, A. Z. (2013). Cervical mucus monitoring prevalence and associated fecundability in women trying to conceive. *Fertility & Sterility, 100*(4), 1033.e1–1038.e1. https://doi.org/10.1016/j.fertnstert.2013.06.002

Fehring, R. J., Hanson, L., & Stanford, J. B. (2001). Nurse-midwives' knowledge and promotion of lactational amenorrhea and other natural family-planning methods for child spacing. *Journal of Midwifery & Women's Health, 46*(2), 68–73. https://doi.org/10.1016/S1526-9523(01)00094-0

Fehring, R. J., Lawrence, D., & Philpot, C. (1994). Use effectiveness of the Creighton Model ovulation method of natural family planning. *Journal of Obstetric, Gynecologic, and Neonatal Nursing, 23*(4), 303–309. https://doi.org/10.1111/j.1552-6909.1994.tb01881.x

Fehring, R. J., & Schneider, M. (2017). Effectiveness of a natural family planning service program. *MCN. The American Journal of Maternal Child Nursing, 42*(1), 43–49. https://doi.org/10.1097/NMC.0000000000000296

Fehring, R. J., Schneider, M., & Barron, M. L. (2008). Efficacy of the Marquette Method of natural family

planning. *MCN. The American Journal of Maternal Child Nursing, 33*(6), 348–354. https://doi.org/10.1097/01. NMC.0000341254.80426.32

Fehring, R. J., Schneider, M., Barron, M. L., & Raviele, K. (2009). Cohort comparison of two fertility awareness methods of family planning. *The Journal of Reproductive Medicine, 54*(3), 165–170. https://www.ncbi.nlm.nih. gov/pubmed/19370902

Fehring, R. J., Schneider, M., Raviele, K., Rodriguez, D., & Pruszynski, J. (2013). Randomized comparison of two Internet-supported fertility-awareness-based methods of family planning. *Contraception, 88*(1), 24–30. https://doi. org/10.1016/j.contraception.2012.10.010

Frank-Herrmann, P., Heil, J., Gnoth, C., Toledo, E., Baur, S., Pyper, C., Jenetzky, E., Strowitzki, T., & Freundl, G. (2007). The effectiveness of a fertility awareness based method to avoid pregnancy in relation to a couple's sexual behaviour during the fertile time: A prospective longitudinal study. *Human Reproduction, 22*(5), 1310–1319. https://doi.org/10.1093/humrep/dem003

Günther, V., Bauer, I., Hedderich, J., Mettler, L., Schubert, M., van Mackelenbergh, M. T., Maass, N., & Alkatout, I. (2015). Changes of salivary estrogen levels for detecting the fertile period. *European Journal of Obstetrics, Gynecology, and Reproductive Biology, 194*, 38–42. https://doi.org/10.1016/j.ejogrb.2015.08.007

Hilgers, T. W. (2002). *Reproductive anatomy & physiology: A primer for FertilityCare professionals* (2nd ed.). Pope Paul VI Institute Press.

Howard, M. P., & Stanford, J. B. (1999). Pregnancy probabilities during use of the Creighton Model Fertility Care System. *Archives of Family Medicine, 8*(5), 391–402. https://doi.org/10.1001/archfami.8.5.391

Jennings, V. (2018). Fertility awareness-based methods of pregnancy prevention. *UpToDate.* https://www. uptodate.com/contents/fertility-awareness-based-methods-of-pregnancy-prevention?search=fertility%20 awareness&source=search_result&selectedTitle=1~150 &usage_type=default&display_rank=1

Manhart, M. D., Duane, M., Lind, A., Sinai, I., & Golden-Tevald, J. (2013). Fertility awareness-based methods of family planning: A review of effectiveness for avoiding pregnancy using SORT. *Osteopathic Family Physician, 5*(1), 2–8. https://doi.org/10.1016/j. osfp.2012.09.002

Scherwitzl, E. B., Danielsson, K. G., Sellberg J. A., & Scherwitzl, R. (2016). Fertility awareness-based mobile application for contraception. *The European Journal of Contraception & Reproductive Health Care, 21*(3), 234–241. https://doi.org/10.3109/13625187.2016.1154143

Scherwitzl, E. B., Hirschberg, A. L., & Scherwitzl, R. (2015). Identification and prediction of the fertile window using NaturalCycles. *The European Journal of*

Contraception & Reproductive Health Care, 20(5), 403–408. https://doi.org/10.3109/13625187.2014.988210

Setton, R., Tierney, C., & Tsai, T. (2016). The accuracy of web sites and cellular phone applications in predicting the fertile window. *Obstetrics and Gynecology, 128*(1), 58–63. https://doi.org/10.1097/ AOG.0000000000001341

Sinai, I., Lundgren, R. I., & Gribble, J. N. (2012). Continued use of the Standard Days method. *The Journal of Family Planning & Reproductive Health Care, 38*(3), 150–156. https://doi.org/10.1136/jf-prhc-2011-100097

Stöppler, M. C. (2019). 15 birth control options (types and side effects). *MedicineNet.* https://www.medicinenet. com/birth_control_methods/article.htm

Wade, M. E., McCarthy, P., Braunstein, G. D., Abernathy, J. R., Suchindran, C. M., Harris, G. S., Danzer, H. C., & Uricchio, W. A. (1981). A randomized prospective study of the use-effectiveness of two methods of natural family planning. *American Journal of Obstetrics and Gynecology, 141*(4), 368–376. https://doi.org/10.1016/0002-9378(81)90597-4

World Health Organization. (1981). A prospective multicentre trial of the ovulation method of natural family planning. II. The effectiveness phase. *Fertility & Sterility, 36*(5), 591–598. https://doi.org/10.1016/ s0015-0282(16)45856-5

Instructions for Taking the CE Test Online

- Read the article. The test for this CE activity can be taken online at www.NursingCenter.com/CE/CNJ. Find the test under the article title. Tests can no longer be mailed or faxed. You will need to create a username and password and log in to your free personal CE Planner account before taking online tests. Your planner will keep track of all your Lippincott Professional Development online CE activities for you.

- There is only one correct answer for each question. A passing score for this test is 13 correct answers. If you pass, you can print your certificate of earned contact hours and access the answer key. If you fail, you have the option of taking the test again at no additional cost.

- This CE test also is available for viewing at www.journalofchristiannursing.com in the table of contents for this issue under   CE Test Preview

- Visit www.nursingcenter.com for other CE activities and your personalized CE planner tool.

- For questions, contact Lippincott Professional Development: 1-800-787-8985.

Registration Deadline: December 2, 2022.

Disclosure Statement: The authors and planners have disclosed that they have no financial relationships related to this article.

Provider Accreditation:

Lippincott Professional Development will award 2.5 contact hours for this continuing nursing education activity.

Lippincott Professional Development is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.

This activity is also provider-approved by the California Board of Registered Nursing, Provider Number CEP 11749 for 2.5 contact hours. Lippincott Professional Development is also an approved provider of continuing nursing education by the District of Columbia, Georgia, and Florida, CE Broker #50-1223.

Payment and Discounts:

- The registration fee for this test is $24.95 for nonmembers, $17.95 for NCF members.

CE For 43 additional continuing education articles related to women's health, go to NursingCenter.com.