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Educating Providers: A Pilot Study on the Impact of Standard Days Method Education in

Northern Haiti

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Northern Haiti

Preventing unintended pregnancy is a topic of global and domestic importance. In 2013, almost 290,000 maternal deaths occurred due to complications of pregnancy or child-birth; 99% of these deaths were in developing countries (World Health Organizations, 2014). Additionally, more than 4 million infants died before reaching their first birthday, a large number being attributed to multiple factors related to unhealthy timing of pregnancy (World Health Organization, 2012). The World Health Organization (2012) asserts the ability of women to adequately control the timing and spacing of pregnancy can dramatically decrease maternal mortality due to pregnancy complications and unsafe abortions, decrease infant mortality, prevent the spread of HIV to infant populations, and reduce adolescent pregnancy. Reducing unintended pregnancy by healthy timing and spacing of pregnancies constitute two of the eight aims of the United Nations Millennium Development Goals for 2015 (United Nations, 2014).

The ability to time and space pregnancies is most urgent in economically vulnerable populations for whom unplanned pregnancy is devastating, such as for Haitian families. Haiti is among the poorest countries in the world with 80% of its population living below the poverty line. Haiti ranks 31<sup>st</sup> in the world for maternal mortality related to child birth, 40<sup>th</sup> for infant mortality, and the prevalence of contraceptive use is only 34%. (Central Intelligence Agency [CIA], 2015; Haiti 2012, 2014). More than 55% of the population is under 24 years of age, with the majority being under 14 years of age (CIA, 2015). Audu, Yahya, and Bassi (2006) suggest that the lack of individualized options and ineffective education in developing countries can curtail the use of modern natural or artificial contraceptives. Providing options and cultivating informed decisions for healthy timing and spacing of pregnancies are imperative initiatives for

both the health of developing countries and for meeting the Millennium Development Goals for 2015.

### **Background**

Fertility awareness methods of family planning, otherwise known as natural family planning (NFP) are an effective and economically efficient way to space and time pregnancies. The past 40 years have seen major scientific advancements in NFP. Specific markers of fertility have been discovered that, when observed, allow a woman to effectively recognize her time of fertility (Bo, Dunson, & Stanford, 2010). Studies by Alliende, Cabezón, Figueroa, and Kottmann (2005), Fehring (2002), and Hilgers, Abraham, & Cavanagh (1978) determined that detectable cervical fluid changes and basal temperature spikes correlate with exact days of ovulation in 95-98% of cycles as determined by comparison with empirical and laboratory identification of ovulatory phases, such as ultrasound and hormonal detection either through urine samples or blood testing. Research and development associated with these markers has sparked development of several methods, including the Billings Ovulation Method, the Creighton Model, basal body temperature (BBT), and the symptothermal method. The Billings Ovulation Method and the Creighton Model rely on observable cervical mucus changes to detect fertility, whereas BBT relies upon the spike of body temperature that occurs with ovulation. The symptothermal method uses a combination of both of these approaches. Each of these methods has been shown to have evidence-based use-efficacy of preventing pregnancy of 98.8-99.4% (Fehring, Lawrence, & Philpot, 1994; Frank-Herman et al., 2007).

A newer addition to modern methods of NFP especially in developing countries, is the Standard Days Method<sup>®</sup> (SDM), a method developed from the calendar, or rhythm method that involves more specific calculation of ovulation days, but does not use observational markers

(Arévalo, Yeager, Sinai, Panfichi, & Jennings, 2010). Developed by Georgetown University's Institute for Reproductive Health (IRH), SDM emerged from multidisciplinary research. It provides a natural, simple, effective means for women without resources to identify the fertile period of the menstrual cycle in order to successfully space pregnancies (Arévalo, Jennings, & Sinai, 2002). About 85% of women have menstrual cycles between 26 and 32 days, and the IRH determined a 12-day fertile window, between days 8-19 of the cycle in which a woman is most likely to become pregnant if she engages in unprotected intercourse (Arévalo, Jennings, & Sinai, 2002). The method utilizes a visual tool called CycleBeads in order to help a woman track her fertile and non-fertile days (Figure 1). This tool is a string of 32 color-coded beads, each representing a day in the menstrual cycle (Arévalo, Jennings, & Sinai, 2002).

Approved by The World Health Organization and tested through numerous studies, SDM is determined to be 95% effective at preventing pregnancy when utilized correctly. It has proven to be economical and well received among providers and clients in developing countries of Africa, Latin America, and Asia (Arévalo, Jennings, & Sinai, 2002; Germano & Jennings, 2006; Gribble, Lundgren, Velasquez, & Anastasi, 2008; Igras et al., 2014; León et al., 2006; Lundgren, Karra, & Yam, 2012; Lundgren, Sinai, et al., 2012; Naik, Suchi, & Lundgren, 2010; Ujuju et al., 2011), yet efforts to promote the utilization of SDM in Haiti have produced equivocal results. The IRH (2008) coordinated efforts with the United States Agency for International Development (USAID) to integrate SDM into Haitian healthcare policy in 2005. However, due to multiple threats including a natural disaster, lack of funding, lack of coordination with stakeholders, ineffective communication between governing officials and clinics, and civil unrest at the time of the intervention, the program was unable to continue (IRH, 2008).

A way to ensure women in Haiti have access to fertility education is to properly train health care providers. Gribble et al. (2008) demonstrated that educating health care providers in modern NFP methods significantly improved attitudes and increased presentation of NFP in contraceptive consultations as a viable method to prevent pregnancy. Gribble et al. (2008) also reported an increase in informed decisions and client selection of NFP when providers were more educated and comfortable with teaching NFP. The IRH (2008) determined from the attempt to integrate SDM in Haitian health care policy in 2005 that the need is urgent and could be well supported at the clinic level. Addressing systematic challenges to use of NFP at the clinic level and educating others about SDM may contribute to healthier timing and spacing of pregnancies.

### **Purpose**

The purpose of this pilot study is to use the Information - Motivation - Behavioral skills (IMB) model as framework for a SDM education intervention for health care providers in Northern Haiti to assess: 1) the impact of the training on core knowledge and skills required to offer SDM, and 2) the intention of health care providers to implement SDM in their clinical practice post-training.

### **Theoretical Framework**

The IMB model was developed by Fisher & Fisher (1992) as a behavioral modification theory for HIV/AIDS risk prevention. Through a literature review of AIDS risk-prevention studies, they hypothesized that three essential elements, information, motivation, and behavioral skills interact to promote a change in behavior (Fisher & Fisher, 1992). In more detail, the information construct must contain valuable and relevant knowledge in order to have an effect on change of behavior; motivation refers to the attitudes, perception of susceptibility, and intention to apply information and skill; and behavioral skills are the learned or acquired skills that if

applied can result in change (Fisher, Fisher, Misovich, Kimble, & Malloy, 1996). Finally, while information and motivation are separate constructs in this model, they both influence each other and together work through the behavioral skills component to produce behavior change.

No studies have applied the IMB model in the health care provider population or in the application of a natural family planning method intervention. However, many studies have successfully used this model in health education interventions. Fisher and Fisher (1992) and Fisher et al. (1996) used this model to assess an education intervention of AIDS risk-prevention in university students. Hong, Fongkaew, Senaratana, & Tonmukayakul (2010) and Kudo (2013) used the IMB model to design, implement, and evaluate education interventions in sexual and reproductive health and condom use in Asian adolescents. The model has also been successfully applied in diabetes education, post coronary artery bypass graft (CABG) rehabilitation adherence, and to examine teachers' behavior associated with fruit and vegetable consumption by preschoolers (Junling, Jingli, Yaocheng, & Jinming, 2013; Mita, Li, & Goodell, 2013; Zarani, Besharat, Sadeghian, & Sarami, 2010).

When SDM was first introduced in Haiti, no systematic theory or model was used to integrate education into the infrastructure, likely contributing to the project's failure (IRH, 2008). The IRH continues to advocate for the urgent need for SDM in Haiti, and the importance of a continued focus on quality provider education. Fleury & Sidani (2012) state that using theory to guide the development and implementation of a research study can enhance accuracy, specificity, and measurable processes of the problem and intervention. Applying the IMB model can enhance the probability of a successful intervention outcome by providing guidance and purpose. In addition, the IMB model provides better understanding of the applied learning components

and can highlight potential project weaknesses. A depiction of the IMB model adapted to fit this pilot study can be seen in Figure 2.

## **Methods**

### **Participants**

Participants were recruited from a convenience sample of available providers at four Ministry of Health, North Department clinics. A power analysis for sample size was not conducted. Recruitment took place one week prior to the start of the intervention by placement of recruitment flyers in each participating clinic. A \$10 US incentive was given to each participant for travel expenses and compensation for time. Inclusion criteria included health care providers (community health worker, nurse, or physician) who: (1) care for women of childbearing age, (2) read and write Haitian Creole or English, and (3) were able to attend the full intervention implementation. A total of 31 health care providers (5 physicians, 12 nurses, 2 nursing students, and 12 non-licensed health workers) volunteered to receive the educational intervention. The participant demographic included a mean age of 35.8; mean time in health care was 9.8 years; 22 females and 9 males; 19 from rural Haiti, 10 from urban Haiti, and 2 from the United States of America; and most saw patients of all age ranges from birth until death (Table 1). Of the 31 providers that participated in the study, two neglected to fill out the pretest and two others were not present for the posttest; therefore, these participants' results are not included in the final analysis.

### **Design**

The pilot study used a quasi-experimental, one-group pretest-posttest design to assess impact of the intervention on each participant's knowledge of fertility, family planning, and SDM, as well as intention to implement the method in practice, and skills demonstration. The



independent variable comprised the IRH's curriculum for SDM training of health care providers, and the dependent variables were knowledge, skills, intention to use SDM in practice, and change in practice regarding implementation of SDM.

### **Materials**

The intervention comprised administration of the IRH Toolkit for Training Community Health Workers in SDM (see Appendix 1) (IRH, 2015a). The Toolkit encompasses seven topics necessary for knowledge and skills acquisition in order to teach SDM effectively. The topics included: Family planning and informed choice – what are CycleBeads, how do you use CycleBeads, who can use CycleBeads, when can you start using CycleBeads, asking about breastfeeding and family planning, helping the couple use CycleBeads successfully, and offering CycleBeads practice counseling.

Educating the providers on the basics of fertility, SDM, and CycleBeads use occurs in the initial four topics. The first topic, family planning and informed choice, explains the importance of pregnancy spacing, including basic information on the menstrual cycle, fertility, methods of contraception, SDM, and CycleBeads. The CycleBeads material describes how the tool helps women track fertility, support informed decisions about postponing pregnancy and correctly track menstrual cycles. Specific standards and screening methods to successful use of SDM includes strategies to determine appropriate application for particular women. The concluding section of education delivers the providers details for initiation of SDM and tips for the woman's success.

The concluding three topics address counseling and provider specific aspects of offering CycleBeads to patients. The curriculum teaches specifics about breastfeeding and family planning that could potentially cause issue with SDM being used successfully, such as recent

pregnancy or use of hormonal methods of contraception. This section equips providers with knowledge regarding the length of time a patient should wait prior to starting SDM after those events. The course instills effective communication techniques about successful use of SDM and CycleBeads, including how to manage fertile days, when to notify the provider, and that SDM does not protect against sexually transmitted infections. The final topic offers patient counseling advice with demonstration of a complete counseling session, recapping the previously covered material.

To facilitate effective learning, the CycleBeads tool with instructional insert was used during the education intervention (Appendix 2). The insert is printed in English, French, and Spanish and provides step-by-step directions for use of CycleBeads. An instructional insert translated in Haitian Creole was also provided for those who could not read any of those languages. A professional translator, fluent in the terminology of the intervention as well as Haitian Creole, translated for the trainer.

Since no control group was assigned, specific questions were addressed in the pretest to correspond with the posttest questions to evaluate changes in information and motivation. Eight knowledge evaluation questions from the SDM online training course were administered pre and post-intervention, and five case study questions from the same course were administered post-intervention to address outcomes in knowledge improvement and application (IRH, 2012). These questions are used as the standard evaluation of SDM training, and have been tested as an effective form of measurement in studies that demonstrate proper training of providers as evidenced by high efficacy of the method (Arévalo, Jennings, Sinai, 2002). IRH (2012) suggests an 85% minimum pass rate on these tests to indicate understanding and ability to teach the method effectively.

Two questions regarding intention to implement the method and recommendation to other providers were asked pre and post intervention to assess change in motivation to implement the method. Also, a follow-up email to each clinic four months post intervention was sent. One question was asked to determine whether or not the clinic was offering SDM post intervention, along with an open-ended description of any successes and/or barriers in implementation.

The IRH's (2015b) knowledge improvement tool (KIT) was modified for one-time assessment and administered post-intervention to assess correct demonstration of core SDM skills concepts. The tool corresponds to topics in the intervention, and assesses correct demonstration during a practice counseling session of the following areas: correct use of CycleBeads, criteria for use of CycleBeads, the appropriate time to start using CycleBeads, importance of applying the rules correctly, when the patient should contact the provider, and the effectiveness of SDM. This supervision tool was developed and tested to be an effective tool to measure refresher training and observe correct demonstration of the skills required to implement SDM in practice, with minimum passing rate of 60% (Naik, Suchi, & Lundgren, 2010). Pre/posttest evaluations can be seen in detail in Appendix 3.

### **Procedure**

Approval for recruitment, materials, and procedures was obtained from the Belmont University Institution Review Board. The study fieldwork was conducted over approximately three weeks, from May 25<sup>th</sup> to June 12<sup>th</sup>, 2015 and consisted of participant recruitment, intervention implementation, and data collection. After volunteer participants signed the informed consent, each completed a pretest, which also included demographic questions. The intervention was delivered in two 4-hour sessions on consecutive days to account for time constraints, translation, and proper instruction in each of the participating clinics. The first

session consisted of the first four topics: Family planning and informed choices; how to use CycleBeads; who can use CycleBeads; and when a patient can start using CycleBeads. Each topic was covered in 30 – 50 minutes, and consisted of instruction employing visual aids, observation, demonstration, question/answer, and group discussion. The second session the following day consisted of the final three topics: asking patients about breastfeeding and other methods of family planning; helping a couple use CycleBeads successfully; and practicing CycleBeads counseling. Each topic was covered in 35-50 minutes, and consisted of instruction employing visual aids, demonstration, case studies, role-playing, and question/answer discussions. Immediately after the completion of the intervention on the second consecutive day, the participants completed a posttest. The posttest was both in written form to assess information and intention to apply the method in practice, as well as a check-off for evaluation of skill acquisition using case studies. Each participant also received 10 CycleBeads tools to aid with initial application of the SDM in his/her practice, as well as information on how to order or make more as needed.

Data were manually entered and analyzed using SPSS. Descriptive statistics were used to reflect sample demographics and results for application of knowledge and correct demonstration of skills required for standard care delivery of SDM. Wilcoxon matched-pairs testing was used to determine differences of the pretest/posttest scores on knowledge and intention to implement SDM in practice. McNemar's test was used to determine significance of differences between individual pretest and posttest questions. Finally, the Kruskal-Wallis test was used to determine differences in scores related to professional designation, previous experience with SDM, and previous training in fertility-awareness based methods of family planning. An alpha level of 0.05 was used for all statistical tests.

The Hope Through Healing Hands Foundation provided funding for this pilot study.

## **Results and Data Analysis**

### **Knowledge**

The mean score for participants' (n=27) core concept knowledge was 43.4%. The mean knowledge posttest score was 75.5%, increasing on average by 32%, indicating a significant difference with a  $p = .000$  using the Wilcoxon matched pairs test (Table 2). The participants increased correct responses for all eight questions, five of which were statistically significant based on the McNemar's test with increases over 20% ( $p < 0.05$ ). One question could not be calculated because all answers were correct (Table 3).

Application of core knowledge in the case studies revealed three key findings, that participants could: 1) correctly determine the length of a woman's cycle in 60% of cases, 2) correctly identify whether or not the woman meets the criteria to use SDM 60% of the time, and 3) correctly determine the appropriate time to start the woman on the method 40% of the time (Table 4).

No significant differences were found in scores on knowledge when moderating for profession, previous experience offering SDM, or previous training in fertility awareness-based methods of family planning (FAM) at either the pretest or posttest points as determined by a Kruskal-Wallis test. Also, using the same test, no significant differences were revealed in scores by these three categories in the three questions pertaining to application of knowledge. Specific results of these tests can be seen in Table 5.

### **Intention to Implement**

The pretest and posttest scores showed no statistically significant differences according to the Wilcoxon matched pairs test in provider's intention to implement the method after the

intervention ( $p=0.084$ ) (Table 6). On the pretest, 89% ( $n=26$ ) of providers specified that they planned to implement the method in practice and 100% ( $n=29$ ) indicated they plan to recommend the method to other providers to implement. The same questions on the posttest revealed 100% ( $n=29$ ) still would recommend the method to peers for implementation; however, the provider's intention to implement the method slightly decreased to 86% ( $n=25$ ).

Two of the four clinics responded to follow-up efforts to assess whether or not implementation of the method had occurred after training. Out of those two, both indicated that each provider had completed teaching and provided all of the acquired CycleBeads to patients. However, once the providers had depleted the allotted CycleBeads, the clinics had no funds to replenish the supply and training of patients ceased at that time.

Again, no differences were found between professions, previous experience offering SDM, or previous training received in FAM in intention to implement the method (Table 5).

### **Skills Acquisition**

Using the KIT skills checklist via case studies, participants ( $n=29$ ) demonstrated competence in SDM core concepts for administration with a mean score of 98.6% ( $SD=3.29$ ). All participants were able to demonstrate the 14 core concepts on how to use SDM and the three concepts related to importance of adherence to the rules; 97% ( $n=28$ ) of the participants correctly demonstrated the two criteria related to who can use SDM, the four concepts on when to start SDM, and the correct percent of effectiveness of SDM; and 86% ( $n=25$ ) of participants were able to demonstrate the five counseling criteria in which patients are to notify providers. These results are displayed in Table 7.

Finally, no differences were found between professions, previous experience offering SDM, or previous training received in FAM in regards to the scores on the KIT skills checklist (Table 5).

### Discussion

The results show the education intervention impacted Haitian health care providers by increasing knowledge and identification of core concepts of fertility and use of SDM, and effectively generating skills required to offer SDM in practice. Since intention to use and to recommend this method to other providers were both high on the pretest, the non-significant, pre/posttest result is attributed to the lack of opportunity for improvement related to the intervention.

The impact of the intervention on knowledge of fertility and SDM as demonstrated by the pretest and posttest scores showed a positive change, with nearly every score increasing by an average of 32%. While all participants either increased or maintained scores post intervention, Table 2 demonstrates that 40% of participants obtained a score of 85% or above on the posttest. The IRH has determined that participants who can correctly answer at least 85% of the knowledge questions demonstrate acceptable understanding of the method (Arévalo, Jennings, & Sinai, 2002). Not being understood correctly by the providers impacts how the method is taught in the clinic setting, potentially decreasing efficacy of preventing pregnancy when used by patients. Since SDM, like all other information-based family planning methods, is most effective when the provider teaching it is proficient and understands it correctly, future studies should focus attention on strategies to improve provider proficiency with the model.

Application of knowledge as demonstrated through the KIT skills checklist with case studies revealed less than satisfactory results. Although the providers increased knowledge in the subject matter, and demonstrated greater than 90% competencies on the KIT skills checklist, the established case studies proved difficult for the providers in this study to apply the knowledge in a written scenario. According to the criteria in the established study by Naik et al. (2010), all of

the providers in this pilot study demonstrated competence in core concepts and skills required to offer SDM in practice. The overwhelming number of correctly demonstrated skills as opposed to the insufficient application in written form shows that demonstration may be a better way for these providers to show understanding of core concepts. The conflicting scores of these two competencies would need to be revisited to ensure proper education in the method, potentially by following up with actual client simulations, or revisiting the providers to observe teaching. Furthermore, the results of the KIT skills checklist demonstrated that more emphasis should be applied to counseling patients. More specifically, when patients are to notify providers, which was the lowest scoring section with only 86% of providers correctly demonstrating these criteria.

Following up with clinics to determine actual implementation was difficult. Only two of the four locations responded, making it difficult to determine barriers or successes of implementing the method in different settings in Haiti. The positive findings that occurred in the two clinics who responded were that the patients, when introduced to the method, were eager to learn ways to prevent and time pregnancy and providers were ready and willing to teach this method. The providers held classes, and offered individual coaching sessions to clients who fit the criteria using the CycleBeads tools that were given for participation in the study. However, although information was provided as to how and where to purchase the tools for continued distribution, funding in these clinics prevented acquisition of additional CycleBeads and the providers are at the present time unable to continue with further outreach to clients. For clinics that already have the funds for contraceptives, it was anticipated that the beads could be added to the budget and to the methods provided by the clinic. However, this cannot be determined, as those clinics did not respond to the follow up efforts. Sustainability efforts for this study should address the lack of funding for tools required to offer this method to clients.



When moderating for demographic variables such as profession, previous experience, or previous training in SDM or other methods of NFP, no differences were found in knowledge, intention to implement, or skills acquired. This suggests the training curriculum can be effectively applied to varying levels of professionals, as well as those with experience or training in other methods of family planning to produce similar effects.

### **Impact**

Providers' ability to effectively learn and teach SDM can impact the quality of healthcare in northern Haiti by preventing unwarranted maternal and infant death due to unhealthy timing and spacing of pregnancies. Providing effective training in family planning methods, such as the IRH's curriculum in SDM not only increases effective education in methods for NFP, but also allows for individualized options to patients, in turn impacting the prevalence of contraception use and increasing family planning methods in under-resourced environments such as Haiti. In countries such as India and El Salvador, educating providers and introducing SDM into the contraceptive curriculum increased the use of contraception from 24% and 45% to 41% and 58% respectively (Johri, Panwar, & Lundgren, 2005; Lundgren, Gribble, Greene, Emrick, & de Monroy, 2005). This small, provider-focused study was successful in gaining the attention of providers and patients and increasing provider education in SDM. Future studies should be conducted to replicate these findings in a larger, randomized sample of providers, to demonstrate further impact on the ability to reach more of the population by increasing effective education and adding individualized options in family planning. Also, future studies should seek to explore strategies to improve case study-based knowledge application scores, and barriers to implementing the method in practice.

**Sustainability**

Patients and providers show considerable interest in teaching and utilizing this method as evidenced by the responses to the intention to implement responses and follow up efforts with the clinics. The cost of supplies and education in SDM is considerably less than other forms of contraception, such as continued 3-month injectable contraception, oral contraception, and condoms, and the time spent for educating patients is similar, rendering SDM sustainable and cost efficient for clinics to implement (Rosen, Winfrey & Adesina, 2013). However, as shown by the feedback from the participating clinics in this study, funding sources to supply clinics without resources for any form of contraception with the needed materials, including CycleBeads is essential for sustainability and continued use of the method in practice.

**Limitations**

A number of limitations potentially impacted this study. Language challenges and translation errors could have contributed to lower scores. Although this was mediated by teaching the translator the method and assuring comprehension, it not clear that terms and required competencies were properly translated from English to Haitian Creole. Adding to the language limitation, the providers are educated in health care in the French language, which can aid in difficulty translating from French written language to spoken Haitian Creole. Materials available in both of these languages prior to implementing the project would be instrumental in eliminating this limitation and aid in implementing SDM in this setting. Another limitation included the lack of proper follow up by participating clinics to determine actual implementation of the method. One clinic had a change in director, which could contribute to the lack of follow up. Other reasons for this barrier could include infrastructure and technology restraints.

### **Conclusion**

This small pilot study used the IMB model to frame an education intervention in an effective and cost-efficient method of NFP for health care providers in northern Haiti to determine the impact on core knowledge and skills required to offer the method, as well as the intention to implement the method in their clinical practice post-training. Findings of this pilot study suggested that the Georgetown University, Institute for Reproductive Health's Toolkit for Training Community Health Workers may be acceptable and effective for increasing knowledge and identification of core concepts of fertility and SDM among health care providers in northern Haiti, as well as equipping providers with the skills necessary to offer the method in practice. The findings also suggested that Haitian health care providers were interested in implementing the method in practice; however, sustainability efforts should further address the barrier of limited resources. Increasing effective provider education facilitates expansion in contraceptive prevalence by introducing individualized options in methods of family planning, which aids in healthy timing and spacing of pregnancies. Such efforts are essential to meeting the UN's Millennium Development Goals to reduce maternal and infant mortality and improve global health.

## References

- Alliende, M. E., Cabezón, C., Figueroa, H., & Kottmann, C. (2005). Cervicovaginal fluid changes to detect ovulation accurately. *American Journal of Obstetrics & Gynecology*, *193*(1), 71-75.
- Arévalo, M., Jennings, V., & Sinai, I. (2002). Efficacy of a new method of family planning: the Standard days method. *Contraception*, *65*, 333-338.
- Arévalo, M., Yeager, B., Sinai, I., Panfichi, R., & Jennings, V. (2010). Adding the Standard Days Method® to the contraceptive method mix in a high-prevalence setting in Peru. *Rev Panam Salud Publica*, *28*(2), 80-85.
- Audu, B. M., Yahya, S. J., & Bassi, A. (2006). Knowledge, attitude and practice of natural family planning methods in a population with poor utilisation of modern contraceptives. *Journal of Obstetrics And Gynaecology: The Journal of the Institute of Obstetrics and Gynaecology*, *26*(6), 555-560.
- Bo, C., Dunson, D. B., & Stanford, J. B. (2010). Dynamic model for multivariate markers of fecundability. *Biometrics*, *66*(3), 905-913. doi:10.1111/j.1541-0420.2009.01327.x
- Central Intelligence Agency [CIA]. (2015). The world factbook: Haiti. Retrieved from <https://www.cia.gov/library/publications/the-world-factbook/geos/ha.html>
- Fehring, R. J. (2002). Accuracy of the peak day of cervical mucus as a biological marker of fertility. *Contraception*, *66*(4), 231-235. doi:10.1016/S0010-7824(02)00355-4
- Fehring, R. J., Lawrence, D., & Philpot, C. (1994). Use effectiveness of the Creighton model ovulation method of natural family planning. *JOGNN: Journal of Obstetric, Gynecologic & Neonatal Nursing* *23*(4), 303-309.

- Fisher, J. D., & Fisher, W. A. (1992). Changing AIDS-risk behavior. *Psychological Bulletin*, *111*(3), 455.
- Fisher, J. D., Fisher, W. A., Misovich, S. J., Kimble, D. L., & Malloy, T. E. (1996). Changing AIDS risk behavior: Effects of an intervention emphasizing AIDS risk reduction information, motivation, and behavioral skills in a college student population. *Health Psychology*, *15*(2), 114-123. doi: 10.1037/0278-6133.15.2.114
- Fleury, J., & Sidani, S. (2012) Using theory to guide intervention research. In B. M. Melnyk & D. Morrison-Beedy (Eds.) *Intervention research: Designing, conducting, analyzing, and funding* (pp.11-36). New York: Springer Publishing Company
- Frank-Herrmann, P., Heil, J., Gnoth, C., Toledo, E., Baur, S., Pyper, C., . . . 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 (Oxford, England)*, *22*(5), 1310-1319.  
doi:doi:10.1093/humrep/dem003
- Germano, E., & Jennings, V. (2006). New approaches to fertility awareness-based methods: incorporating the Standard Days and TwoDay Methods into practice. *Journal of Midwifery & Women's Health*, *51*(6), 471.
- Gribble, J. N., Lundgren, R. I., Velasquez, C., & Anastasi, E. E. (2008). Being strategic about contraceptive introduction: the experience of the Standard Days Method®. *Contraception*, *77*(3), 147-154. doi: 10.1016/j.contraception.2007.11.001
- Haiti 2012. (2014). *Studies In Family Planning*, *45*(1), 95-104. doi:10.1111/j.1728-4465.2014.00379.x

Hilgers, T. W., Abraham, G. E., & Cavanagh, D. (1978). Natural family planning. I. The peak symptom and estimated time of ovulation. *Obstetrics and Gynecology*, 52(5), 575-582.

Hong, J., Fongkaew, W., Senaratana, W., & Tonmukayakul, O. (2010). Development of a theory-based sexual and reproductive health promotion and HIV prevention program for Chinese early adolescents. *Nursing & Health Sciences*, 12(3), 360-368. doi: 10.1111/j.1442-2018.2010.00538.x

Igras, S., Sinai, I., Mukabatsinda, M., Ngabo, F., Jennings, V., & Lundgren, R. (2014). Systems approach to monitoring and evaluation guides scale up of the Standard Days Method of family planning in Rwanda. *Global Health, Science and Practice*, 2(2), 234-244. doi: 10.9745/GHSP-D-13-00165

Institute for Reproductive Health, Georgetown University (IRH). (2008). AWARENESS project Haiti country report 2005-2007. Washington, DC: Author.

Institute for Reproductive Health, Georgetown University (IRH). (2012). Standard days method updated training course. Retrieved from <http://www.globalhealthlearning.org/course/standard-days-method-updated>

Institute for Reproductive Health, Georgetown University (IRH). (2015a). Standard days method toolkit. Retrieved from <https://www.k4health.org/toolkits/sdm>

Institute for Reproductive Health, Georgetown University (IRH). (2015b). Standard days method toolkit: Knowledge improvement tool. Retrieved from [https://www.k4health.org/sites/default/files/SDM%20KIT%20ENG%20JUN09\\_0.pdf](https://www.k4health.org/sites/default/files/SDM%20KIT%20ENG%20JUN09_0.pdf)

Johri, L., Panwar, D. S., & Lundgren, R. (2005). Introduction of the Standard Days Method in CARE-India's community-based reproductive health programs. Retrieved from <http://irh.org/wp-content/uploads/2013/05/PNADG769.pdf>

- Junling, G., Jingli, W., Yaocheng, Z., & Jinming, Y. (2013). Validation of an information-motivation-behavioral skills model of self-care among Chinese adults with type 2 diabetes. *BMC Public Health, 13*(1), 1-6. doi: 10.1186/1471-2458-13-100
- Kudo, Y. (2013). Effectiveness of a condom use educational program developed on the basis of the Information-Motivation-Behavioral Skills model. *Japan Journal of Nursing Science, 10*(1), 24-40. doi: 10.1111/j.1742-7924.2012.00207.x
- León, F. R., Blair, C., Huapaya, A., Lundgren, R., Mukabatsinda, M., Muramutsa, F., & Jennings, V. (2006). Quality of delivery of the Standard Days Method as compared with contraceptive pills in Rwanda. *The Journal of Family Planning and Reproductive Health Care / Faculty of Family Planning & Reproductive Health Care, Royal College of Obstetricians & Gynaecologists, 32*(4), 231-233.
- Lundgren, R. I., Gribble, J. N., Greene, M. E., Emrick, G. E., & de Monroy, M. (2005). Cultivating men's interest in family planning in rural El Salvador. *Studies In Family Planning, 36*(3), 173-188.
- Lundgren, R., Karra, M. V., & Yam, E. A. (2012). The role of the Standard Days Method in modern family planning services in developing countries. *European Journal of Contraception & Reproductive Health Care, 17*(4), 254-259. doi: 10.3109/13625187.2012.677077
- Lundgren, R., Sinai, I., Priya, J., Mukabatsinda, M., Sacieta, L., & León, F. R. (2012). Assessing the effect of introducing a new method into family planning programs in India, Peru, and Rwanda. *Reproductive Health, 9*(1), 17-24. doi: 10.1186/1742-4755-9-17
- Mita, S. C., Li, E., & Goodell, L. S. (2013). A qualitative investigation of teachers' information, motivation, and behavioral skills for increasing fruit and vegetable consumption in

- preschoolers. *Journal of Nutrition Education and Behavior*, 45(6), 793-799. doi:  
<http://dx.doi.org/10.1016/j.jneb.2013.05.001>
- Naik, S., Suchi, T., & Lundgren, R. (2010). Options for maintaining quality family planning counseling: Strategies for refresher training. *International Journal for Quality in Health Care*, 22(2), 145-150. doi: 10.1093/intqhc/mzp062
- Rosen, J. E., Winfrey, B., & Adesina, A. (2013). *Costing the Standard Days Method: The Cost of integrating the Standard Days Method (SDM) into family planning programs at scale and of providing the SDM in routine service delivery in Guatemala, India, and Rwanda* (DHS Occasional Paper No. 6). Calverton, Maryland: ICF International.
- Ujuju, C., Anyanti, J., Adebayo, S. B., Muhammad, F., Oluigbo, O., & Gofwan, A. (2011). Religion, culture and male involvement in the use of the Standard Days Method: evidence from Enugu and Katsina states of Nigeria. *International Nursing Review*, 58(4), 484-490. doi: 10.1111/j.1466-7657.2011.00900.x
- United Nations. (2014). Millennium development goals and beyond 2015. Retrieved from <http://www.un.org/millenniumgoals/bkgd.shtml>
- World Health Organization. (2012). Family planning: Fact sheet N°351 Retrieved from <http://www.who.int/mediacentre/factsheets/fs351/en/>
- World Health Organization. (2014). Maternal mortality: Fact sheet N°348. Retrieved from <http://www.who.int/mediacentre/factsheets/fs348/en/>
- Zarani, F., Besharat, M. A., Sadeghian, S., & Sarami, G. (2010). The effectiveness of the Information-Motivation-Behavioral skills model in promoting adherence in CABG patients. *Journal of Health Psychology*, 15(6), 828-837. doi: 10.1177/1359105309357092



Figure 1. CycleBeads Illustration with Instructions

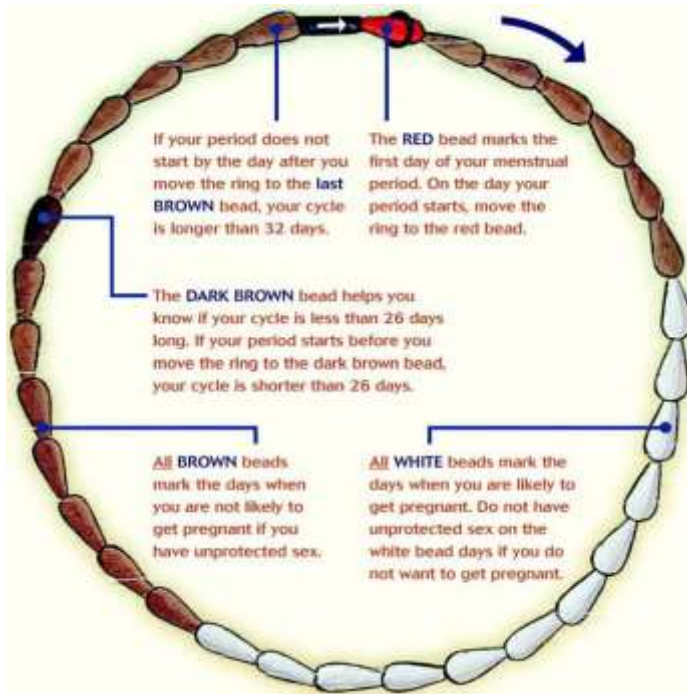


Image from Gribble, Lundgren, and Valasquez. (2008).

Figure 2. IMB model. Adapted from Fisher & Fisher (1992).

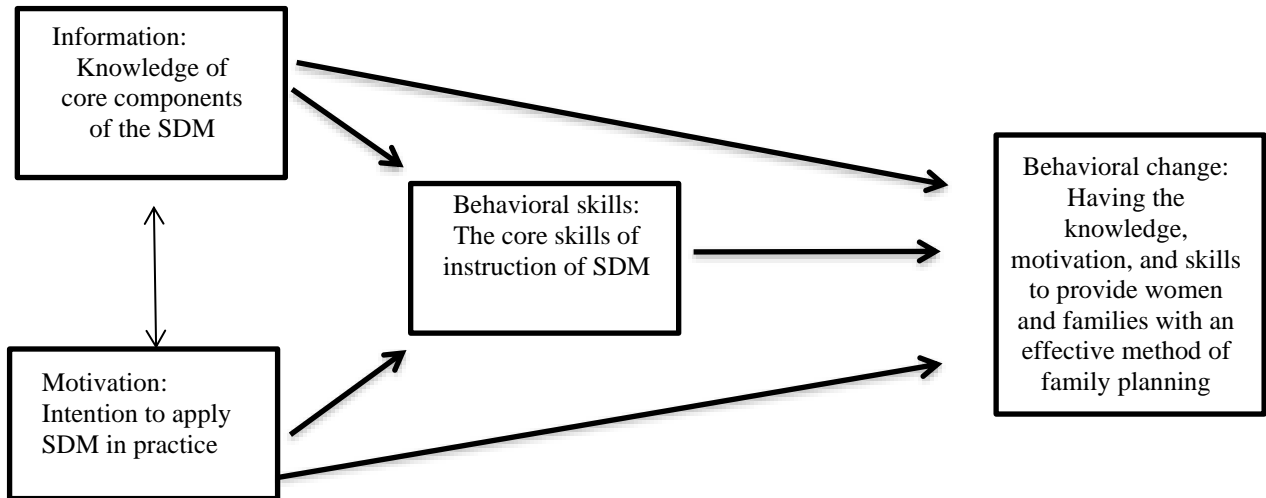


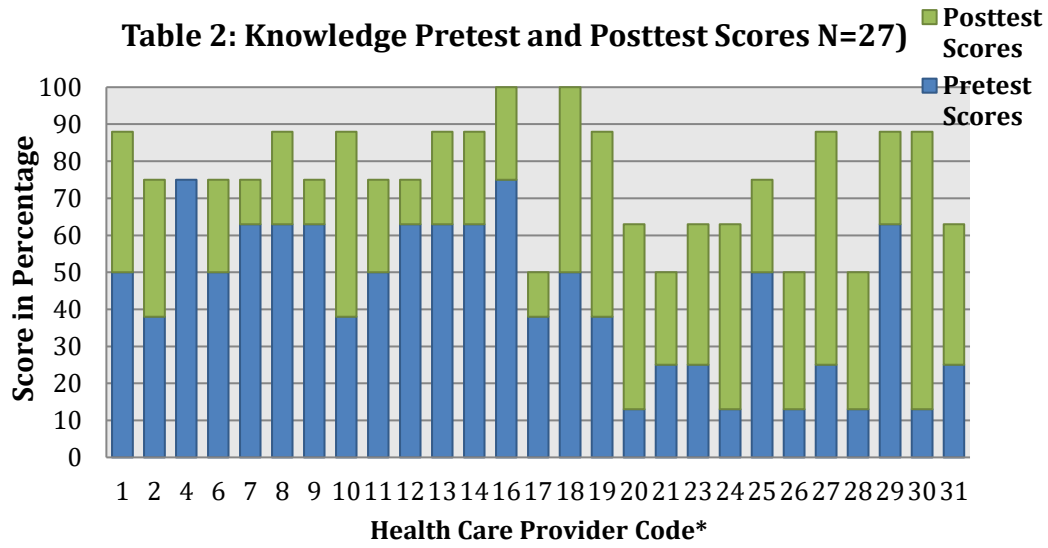
Table 1. Demographic Characteristics of Study Participants (N=31)

Characteristic	Total N=31	% of Total 100%
<b>Age – years</b>		
20-27	5	16.1%
28-35	14	45.2%
36-43	5	16.1%
44-51	3	9.7%
52-59	4	12.9%
<b>Gender</b>		
Male	9	29%
Female	22	71%
<b>Place of origin</b>		
Rural Haiti	19	61.3%
Urban Haiti	10	32.3%
America	2	6.5%
<b>Length of time in healthcare- years</b>		
1-9	18	58.1%
10-19	9	29%
20-29	3	9.7%
30-39	1	3.2%
<b>Profession</b>		
Physician	5	16.1%
Nurse	12	38.7%
Student	2	6.5%
Non-clinical/Community Health Worker	12	38.7%
<b>Provide patient care/ patient counseling</b>		
Patient care, but no counseling	1	3.2%
Patient counseling, no care	3	9.7%
Patient care and counseling	27	87.1%
<b>Provide family planning counseling</b>		
Yes	30	96.8%
No	1	3.2%
<b>Lower age of patients seen - years</b>		
Birth - 9	15	48.4%
10-19	14	45.2%
20-29	2	6.4%
<b>Upper age of patients seen - years</b>		
30-39	2	6.5%

Characteristic	Total	% of Total
40-49	7	22.5%
50-59	2	6.5%
60-69	1	3.2%
70-79	1	3.2%
>80	18	58%
<b>Type of Birth Control Patient Population Identifies*</b>		
Natural	9	29%
Oral contraceptive pill	10	32.3%
Depo-Prevera injection	18	58%
Condoms	12	38.7%
Long acting reversible contraception	3	9.7%
<b>Aware of Types of FAM *</b>		
Standard Days Method	7	22.6%
Lactational Amenorrhea Method	0	-
Withdrawal (coitus interrupt)	2	6.5%
Periodic abstinence (calendar)	22	71%
Cervical mucus methods	7	22.6%
<b>Experience in Offering FAM*</b>		
Standard Days Method	2	6.5%
Lactational Amenorrhea Method	0	-
Withdrawal (coitus interrupt)	1	3.2%
Periodic abstinence (calendar)	18	58.1%
Cervical mucus methods	2	6.5%
<b>Currently Offer FAM in Clinic*</b>		
Standard Days Method	2	6.5%
Lactational Amenorrhea Method	0	-
Withdrawal (Coitus interrupt)	1	3.2%
Periodic abstinence (calendar)	17	54.5%
Cervical mucus methods	2	6.5%
<b>Prior Training in FAM</b>		
Formal Medical or Nursing Education	3	9.7%
Workshop	7	22.6
Unspecified	3	9.7%
<b>Feelings of Offering FAM Methods</b>		
Positive	27	87.1%
Negative	2	6.5%
Indecisive	2	6.5%

Note. FAM = Fertility-Awareness Based Methods of family planning

\*Percentages may amount to over 100% due to multiple answers given



Note. \*Providers 3, 5, 15, and 22 were excluded from this data for failure to participate in either pretest or posttest

Table 3. Knowledge of Core Concepts in Fertility and SDM (N=27)

Information		Posttest			P value
		Correct (%)	Wrong (%)	Total (%)	
1. When are women most likely to get pregnant?					
<b>Pretest</b>	<b>Correct</b>	4 (14.8%)	2 (7.4%)	6 (22.2%)	.289
	<b>Wrong</b>	6 (22.2%)	15 (55.6%)	21 (77.8%)	
	<b>Total</b>	10 (37%)	17 (63%)	27 (100%)	
2. Women who use the Standard Days Method (SDM) must have cycles between what length?					
<b>Pretest</b>	<b>Correct</b>	10 (37%)	0 (0%)	10 (37%)	.000**
	<b>Wrong</b>	14 (51.9%)	3 (11.1%)	17 (63%)	
	<b>Total</b>	24 (88.9%)	3 (11.1%)	27 (100%)	
3. As soon as she starts her period, a woman who uses SDM should do what?					
<b>Pretest</b>	<b>Correct</b>	17 (63%)	0 (0%)	17 (63%)	-***
	<b>Wrong</b>	10 (37%)	0 (0%)	10(37%)	
	<b>Total</b>	27 (100%)	0 (0%)	27 (100%)	
4. What does this mean if a woman starts her period before she reaches the dark brown bead?					
<b>Pretest</b>	<b>Correct</b>	10 (37%)	1 (3.7%)	11 (40.7%)	.006*
	<b>Wrong</b>	11 (40.7%)	5 (18.5%)	16 (59.3%)	
	<b>Total</b>	21 (77.8%)	6 (22.2%)	27 (100%)	
5. When used correctly, what is SDM effectiveness?					
<b>Pretest</b>	<b>Correct</b>	11 (40.7%)	0 (0%)	11 (40.7%)	.000**
	<b>Wrong</b>	15 (55.6%)	1 (3.7%)	16 (59.3%)	
	<b>Total</b>	26 (26.3%)	1 (3.7%)	27 (100%)	
6. To prevent pregnancy, when do all women using SDM avoid unprotected sex?					
<b>Pretest</b>	<b>Correct</b>	11 (40.7%)	1 (3.7%)	12 (44.4%)	.125
	<b>Wrong</b>	6 (40%)	9 (60%)	15 (55.6%)	
	<b>Total</b>	17 (63%)	10 (37%)	27 (100%)	
7. What does is mean if a woman gets her period several days after placing the ring on the last brown bead?					
<b>Pretest</b>	<b>Correct</b>	6 (22.2%)	0 (0%)	6 (22.2%)	.031*

	<b>Wrong</b>	6 (22.2%)	15 (55.6%)	21 (77.8%)	
	<b>Total</b>	12 (44.4%)	15 (55.6%)	27 (100%)	
8. Couples who use SDM have different ways of managing the fertile days. Many users abstain from intercourse, while others use condoms.					
<b>Pretest</b>	<b>Correct</b>	18 (66.7%)	1 (3.7%)	19 (70.4%)	
	<b>Wrong</b>	8 (29.6%)	0 (0%)	8 (29.6%)	.039*
	<b>Total</b>	26 (96.3%)	1 (3.7%)	27 (100%)	

Note. \*  $p < 0.05$ ; \*\*  $p < 0.001$  \*\*\* No measures of association are computed for the crosstabulation of Question 3. At least one variable in each 2-way table upon which measures of association are computed is a constant.

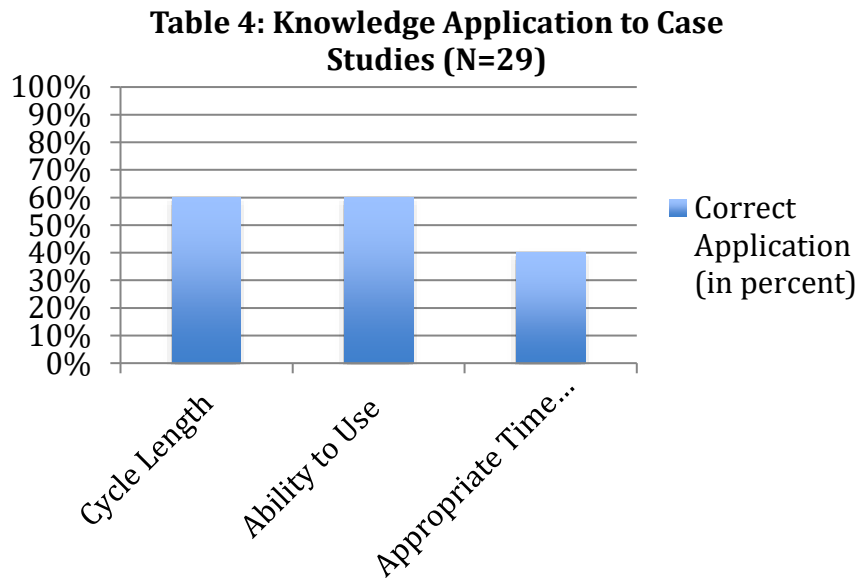
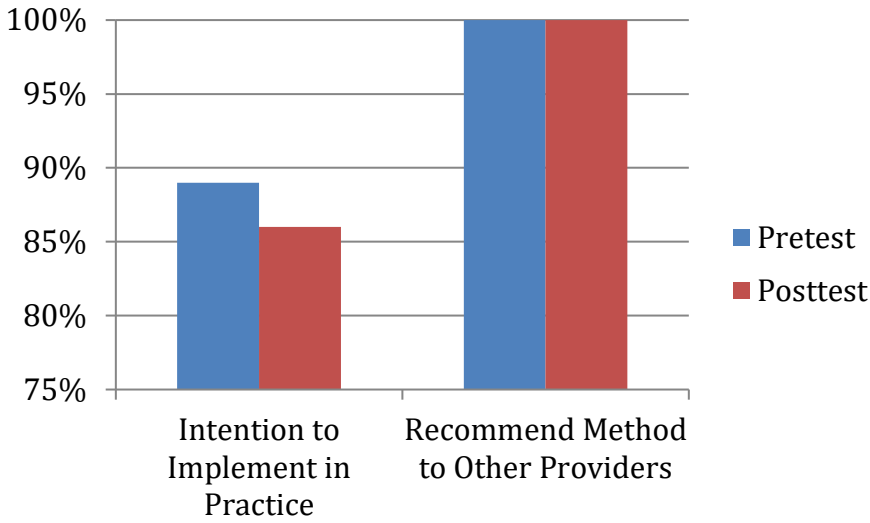


Table 5. Differences of Scores by Designation (N=29)

IMB Criteria	<i>P</i> value
<b>Knowledge</b>	
Profession	
Pretest score	0.158
Posttest score	0.079
Application of identifying length of cycle	0.273
Application of a woman's ability to use SDM	0.464
Application of knowing when to start SDM	0.419
Previous Experience with SDM	
Pretest score	0.144
Posttest score	0.69
Application of identifying length of cycle	0.857
Application of a woman's ability to use SDM	0.446
Application of knowing when to start SDM	0.48
Previous Training in FAM	
Pretest	0.752
Posttest	0.391
Application of identifying length of cycle	0.242
Application of a woman's ability to use SDM	0.522
Application of knowing when to start SDM	0.251
<b>Intention To Implement</b>	
Profession	
Pretest	0.779
Posttest	0.702
Previous Experience with SDM	
Pretest	0.558
Posttest	0.212
Previous Training in FAM	
Pretest	0.48
Posttest	0.156
<b>Skills</b>	
Profession	0.88
Previous Experience with SDM	0.465
Previous Training in FAM	0.1

Note. SDM = Standard Days Method; FAM = Fertility-Awareness Based Methods of family planning

**Table 6: Provider's Intention to Implement SDM in Practice (N=29)**



Note.  $p = 0.084$

Table 7. Demonstration of Core SDM Skills Concepts (N=29)

KIT Core Skill Competency	Yes* (%)	No** (%)
How to use Cycle Beads	29 (100%)	0
Who can use the SDM	28 (96.6%)	1 (3.4%)
When a woman can start using the method	28 (96.6%)	1 (3.4%)
Importance of rule adherence	29 (100%)	0
When the client should contact the provider	25 (86.2%)	4 (13.8%)
Effectiveness of SDM	28 (96.6%)	1 (3.4%)

Note. \*Amount of providers who covered all subcompetencies in core competency area

\*\* Amount of providers who missed one or more subcompetencies in core competency area