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Influence of Motivation on the Efficacy of Natural Family Planning

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The proposed MCN paper uses the same participants from a previous study but involves another purpose (i.e., the influence of motivation) that was not addressed in that study. The motivation data is all new.

Call outs and key words:

Call Out 1: A key component in the use of any behavioral focused method of family planning is the motivation of both partners in using the method and avoiding pregnancy.

Call Out 2: If only one of the partners is committed to the method it will be difficult to use and the efficacy will most likely be lower.

Call Out 3: This study involves measuring the motivation levels of the couple (i.e., the woman and her male partner) before each menstrual cycle of use.

Call Out 4: We found that high motivation for both the woman and her male partner has a big impact on the pregnancy outcomes of behavioral focused family planning methods.

Call Out 5: Assessing the motivation of both the woman and her partner before recommending behavioral focused family planning methods (and especially natural family planning methods) is recommended.

Key words: motivation; natural family planning method; pregnancy rates;rhythm.

Abstract

Purpose: Mutual motivation is recognized as essential for effective behavioral methods of family planning. Few studies have studied this factor in family planning efficacy. The purpose of this study was to determine the influence of mutual motivation on unintended pregnancy rates of couples who used natural family planning (NFP) methods to avoid pregnancy.

Study Design and Methods: Using an online taught NFP method, 358 women and (their male partners) indicated “how much” and “how hard” they wished to avoid pregnancy on a scale of 0-10 before each menstrual cycle charted over 12 month of use. This motivation scale is used in the National Survey of Family Growth as a measure of motivation. All pregnancies were verified with an online pregnancy evaluation and urine based pregnancy test. A combined motivation score was used in analysis.

Results: There were 28 pregnancies among the low motivation participants (N=60) and 16 among the high motivation participants (N=298). At 12 months of use, there were 75 pregnancies per 100 users for the low motivation group and only 8 for the high motivation group. There was an 80% greater likelihood of a pregnancy with the low motivation group ($\chi^2 = 25.5, p < .001$) OR = 1.80; 95% CI = 1.61-1.90).

Clinical Implications: High motivation to avoid pregnancy by both the female user of a behavioral method of family planning and her male partner is required for high efficacy.

Assessing motivation of both the woman and her male partner before prescribing NFP methods is recommended.

Influence of Motivation on the Efficacy of Natural Family Planning

A key component in the use of natural family planning (NFP) methods or any type of behavioral focused method of family planning is the motivation of both partners to avoid pregnancy (Sinai, Lundgren, Arévalo, & Jennings, 2006; Smoley & Robinson, 2012). If only one of the partners is committed to the method it will be difficult to use and the efficacy will most likely be lower. Mutual motivation has been recognized in the family planning and in particular the NFP community as essential for NFP efficacy for many years (Barnet, 1996). However, there have been few and no recent studies that have investigated this component for the use of NFP methods.

Recent efforts in the development of new NFP methods have been to simplify instructions and to use more accurate and objective measures to estimate the fertile phase of the menstrual cycle (Fehring, 2004). We (researchers and professional nurses at Marquette University) have developed a method of NFP that includes an electronic hormonal fertility monitor (EHFM) that measures metabolites of estrogen and luteinizing hormone (LH) in the urine and provides an estimate of the fertile window (Fehring, Schneider, Raviele, & Barron, 2007). Subsequently, we conducted a number of efficacy and effectiveness studies on this new method called the Marquette Method (MM), developed a Web site and automatic online menstrual cycle charting system, and tested the efficacy of a unique method of monitoring fertility during the breastfeeding transition (Fehring, Schneider, & Barron, 2008; Fehring, Schneider, & Barron, 2009; Fehring, Schneider, & Raviele, 2011; Bouchard, Fehring, & Schneider, 2012). Efficacy of the MM for couples wishing to avoid pregnancy ranges from 0-3 unintended pregnancies per 100 users over 12 months of use with correct use and 8-13 with typical use. We now are interested in determining the influence of couple motivation in the use of the MM on pregnancy rates.

Background Studies and Conceptual Model of Couple Motivation

Spiezer and colleagues (2006) explored the strength of motivation and ambivalent fertility desires among women in Sub-Sahara Africa to suggest strategies to meet unmet family planning needs. The authors concluded that it was important to assess the strength of fertility motivation when determining which women have unmet family planning needs and suggested a systematic screening algorithm to identify these women. Researchers from the Georgetown University Institute of Reproductive Health (IRH) recently conducted a study to determine characteristics that might predict incorrect use of a NFP method (Sinai, Lundgren, Arévalo, & Jennings, 2006). The participants were 928 women from 10 different sites in four countries (i.e., Bolivia, Guatemala, Peru, and the Philippines). Of these 928 women, 212 (23%) reported at least one act of intercourse during the estimated fertile phase in at least one menstrual cycle, i.e., they practiced incorrect use of these methods. Most (39) said they had intercourse on fertile days because their husbands insisted. The IRH researchers also recently reported case studies on the importance of involving men in family planning programs and addressing sensitive issues like partner violence and partner communication (Lundgren, Cachan, & Jennings, 2012).

A classic study on the efficacy of NFP methods defined motivation by whether the couple had limited their family size or are currently delaying pregnancy (Rice, Lanctôt, & Garcia-Devesa, 1981). The limiters had a pregnancy rate of 4.5% and the delayers 15%. There are no studies that have directly investigated motivation on unintended pregnancy outcomes with couples using NFP methods and in particular the motivation of the man and woman.

For this study the Model of Mutual Fertility Motivation (MMFM) was used as the conceptual psychological base for this study (Miller, Severy, & Pasta, 2004). The MMFM combines the individual level of fertility motivation with the couple level of fertility motivation

and realize that these differ and change over time. Furthermore, this model takes into consideration the incremental behaviors that are designed to promote or prevent childbirth. This model also stipulates that motivation entails communication, influence, and disagreement on fertility desires between partners and that these dynamics will influence motivation to use or not use a method of family planning. Little research has been conducted with NFP methods to determine the effect of mutual partner motivation on NFP efficacy. When there is concurrence in motivation and when there is high motivation to avoid pregnancy by both partners, then behavioral methods of family planning, and in particular NFP will be more effective. Other factors such as ease of use, satisfaction, and efficacy of the method of NFP are important as well. See mapping of model in Figure 1.

Purpose of Study

The purpose of this study was to determine the influence of mutual motivation on unintended pregnancy rates of couples who used natural family planning (NFP) methods to avoid pregnancy. We hypothesized that there will be fewer unintended pregnancies among couples who have high mutual motivation to avoid pregnancy compared to those couples with low mutual motivation. We also proposed to determine if there were differences in motivation levels between couples who used an electronic hormonal monitor compared with couples who used the self-observation of cervical mucus to estimate the fertile phase of the menstrual cycles. An overall concern is that only 2-3% of reproductive age women in the United States (US) have ever used NFP methods (Mosher, 2012). Couple motivations and intentions are thought to be a key concern in the use and efficacy of these behavioral family planning methods by US women and couples (Santelli, Lindberg, Orr, Finer, & Speizer, 2009).

Methods

This was a secondary purpose of a 12-month (13 cycles) prospective clinical comparison efficacy trial of two online methods of NFP, i.e., the use of an electronic hormonal fertility monitor (EHFM) or the use of self-observed cervical mucus monitoring (CMM) plus fertility algorithm methods of NFP (Fehring, Schneider, Raviele, and Pruszynski 2012). Any pregnancies that occurred among the participants over a 12 month period were recorded and evaluated as to whether they were intended, not intended user failure, not intended system failure, or unknown. Pregnancies were confirmed by a positive urine pregnancy test and a luteal phase longer than 18 days. All couple participants were assessed as to their perceived “satisfaction” and “ease of use” with an online measurement tool at 1, 3, and 6 months of use. Mutual motivation for avoiding pregnancy was assessed before each menstrual cycle.

Sample

In order to reach a significant level of analysis for a comparison of pregnancy rates between two groups, i.e., EHFM and CMM, a minimum of 600 women/couple participants were sought for completion of the study. To achieve 80% power that detected a difference of 10% in pregnancy rates between the two groups at least 300 couples were needed per group. This power analysis was based on a total unintended pregnancy rate of 10% for the EHFM group and a 20% pregnancy rate for the CMM group. Couples who sought online NFP services (from April 2008 through December 2010) and met the criteria for the study had the opportunity to participate in the study. After signing an online consent, participants were assigned to either the EHFM or CMM group as indicated by an automatic online randomization process. All couples received a free EHFM but those in the CMM group received the monitor after completing the study. All couples received \$10 for each menstrual cycle chart completed. This study received Internal Review Board approval from the Marquette University Office of Research Compliance

on November 5, 2008 and has received continuous yearly renewals.

The female partner of the couple volunteers were between the age of 18 and 42; had a menstrual cycle range of 21-42 days; had not used depo medroxyprogesterone acetate (DMPA) over the past 6 months; had no history of oral, patch or sub-dermal hormonal contraceptives for the past 3 months; if post breast-feeding, had experienced at least 3 cycles past weaning; had no known fertility problems; did not use medications that interfere with ovulatory function; did not smoke cigarettes; and were not pregnant. The potential participant indicated openness to a possible pregnancy and was able to read and understand written English or Spanish at the 9th grade level. Male participants had no known fertility problem and were between the ages of 18 and 50. They were asked to participate in the online training of fertility monitoring and asked to complete the satisfaction, ease of use, and motivation surveys.

The online electronic charting system has designated sections for recording the results of CMM and the EHF_M – as either L = low, H = high, or P = peak. The charting system provides a pop-up window for the user that illustrates the three levels of cervical mucus and the three levels provided by the fertility monitor. The charting system also has a place to record menses on a scale of 1-3 with 1 = light; 2= moderate; and 3=heavy menstrual flow and a row for recording acts of intercourse (= I). The top of the chart has room for recording intention of use (to achieve or avoid pregnancy) for each cycle and level of motivation to avoid pregnancy (See Figure 2). The charting automatically indicates (in light blue) the fertile phase (based on the algorithm) as the user charts. There is no guessing as to whether the day is either fertile or not.

Mutual Motivation

We had a need for a rapid measure of motivation, since we assessed this concept in the online menstrual cycle charting system for each cycle charted (i.e., monthly) for both the woman and her male partner. We selected a motivation measure that was developed by the experts of

measurement for the 2002 (cycle 6) National Survey for Family Growth (Peterson & Mosher, 1999). The unintended pregnancy group was determining the multidimensional measures of pregnancy intention and felt that motivation was a key factor (Santelli, Lindberg, & Or et al., 2009). There were two questions asked of participants (the woman and man) in the NSFG and in our current study, i.e., 1) how hard they are currently avoiding pregnancy on a scale of 0 – 10, 0 as trying hard to get pregnant and 10 as trying hard not to get pregnant, and 2) how much they want to avoid pregnancy at this time, with 0 as wanting to get pregnant and 10 as wanting to avoid pregnancy. In order to be rated as a “High” motivated couple they (i.e., the woman and her partner) need to have a score of 9 or better on the two motivation questions. Both the woman user and her partner were asked to rate their motivation levels before each menstrual cycle of use.

Each couple (male and female) participant who entered the study completed a 21 item demographic registration form developed by Gray and Kambic (1984). The registration form asked demographic information (e.g., ethnicity, religious status), number of children, cycle history, family planning history, and intention for using NFP. The form automatically pops up on the NFP Web site when the couple registered.

Classification of pregnancy

The electronic charting system automatically notifies the user of the possibility of a pregnancy when the luteal phase goes beyond 19 days. The charting system then prompts the user to take a pregnancy test and complete an online pregnancy evaluation. The online charting system also cues the woman user to a link that launches a pregnancy evaluation form on each menstrual cycle that is charted. All pregnancies were evaluated by three advanced practice nurses specially trained in NFP.

We (the professional nurse NFP teachers involved with this research study) reviewed the charting system for the days of fertility, the days of recorded intercourse, and the information on the pregnancy evaluation form. Each couple that achieved a pregnancy was asked to confirm the pregnancy with a pregnancy test kit (i.e., the Aim Strip Pregnancy Test). Each couple participant was asked to record on their fertility chart, before each new cycle, their level of motivation for avoiding a pregnancy. A determination was made if intercourse occurred during the fertile time as designated by the monitor and fertility algorithm.

Survival analysis and Kaplan-Meier estimates were calculated for both the high and low groups and a chi square analysis (and Odds Ratios) was used to determine if there was any significant difference in pregnancy rates (and the probability of a pregnancy) based on motivation level. Mean scores of motivation were analyzed using a mixed model with repeated measures to determine if there were significant changes in motivation levels across time and between the EHFMM and the CMM group. If there was an indication of significant differences in certain fixed effects, Tukey's multiple comparison procedure was used to find where the differences lie.

Results

Six hundred sixty-seven couples (seeking to avoid pregnancy with a NFP method) were registered for the study. Of these 667 participants, 358 contributed 2,621 cycles of use. Of the final number of participants (N = 358); 198 were in the EHFMM group and 160 were in the CMM group. Participants came from all but four states in the United States, with Wisconsin, Ohio, Georgia, California and Texas as the states with the most participants.

Demographic information, i.e., mean age, years married, number of living children, basal metabolic index, and age of husband/partner in the high (N=298) and low (N=60) motivation

groups are presented in Table 1 and show that the two groups were similar (see Table 1). Both groups have a high majority of Caucasian and Catholics. However, the low motivation group had statistically fewer living children ($t=2.55, p < .05$).

Motivation across time

In the repeated measures analysis, there was no significant difference in couple motivation between the EHF and CMM groups. However, there was a significant change in motivation over time. In addition, the interaction between the two factors was significant, implying that the motivation scores have different rates of change in the two groups. Since the factors are significant, we investigate further using the Tukey post hoc test. We first consider the time variable. There was a significant difference between time 3 and time 12 as well as between time 6 and time 12.

For the interaction variable, we looked at the combinations of the two factors. We found that most of the difference came from the EHF group. There is a significant difference in motivation for those in the EHF group between time 3 and time 6 ($p = 0.0126$), time 3 and time 12 ($p < 0.001$), and time 6 and time 12 ($p < 0.001$).

Influence of Motivation

There were 28 pregnancies among the low motivation participants ($N=60$) and 16 among the high motivation participants ($N=298$). The 12 month pregnancy rate for the high motivation group was 8 per 100 women over 12 months of use and for the low motivation group 75 per 100 women over 12 months of use. The Hazard Function curves for the two groups are shown in Figure 3. We found a significantly higher proportion of pregnancies among the low motivation couples ($\chi^2 = 95.1, p < .001$) and 20 times a greater likelihood of an unintended pregnancy with this group ($OR = 20.3; 95\% CI = 9.70-42.41$).

Discussion

Our study provides evidence that high motivation to avoid pregnancy is necessary by both partners in a relationship when using NFP methods to avoid pregnancy. We found that the likelihood for an unintended pregnancy was almost double for the low motivation group. There are no NFP studies that provided evidence for a direct measure of motivation, however, the Rice, Lanctôt, and Garcia-Devesa (1981) study showed a difference of pregnancy rates between couples who have completed their family size (4.5 pregnancies per 100 over 12 months) versus those who were spacing children (14.5 unintended pregnancies). Our study had a greater contrast in pregnancy rates between high motivation (i.e., 8 unintended pregnancies per 100) versus 75 per 100 over 12 months of use for the low motivation group. The strength of our study was that we measured motivation for each menstrual cycle in the analysis.

Our results also support the mutual motivation model, in that there is often a cycle to cycle change in motivation with a significant decrease over 12 months of use. We also show that once motivation decreases, the likelihood of an unintended and intended pregnancy increases. Severy, Robinson, Findley-Klein, and McNulty (2006) found that there is an increase in satisfaction in use of the fertility monitor in avoiding pregnancy over time and with the use of the monitor to achieve a pregnancy. We did not find any influence of ease of use and acceptability of the method to avoid pregnancy in our earlier comparison study (Fehring, et al, 2012). However, we did find that motivation has to be very high (i.e., 9-10 out of 0-10) for acceptable efficacy.

Of interest, is that the participants in the CMM group have greater motivation (at 3 and 6 months of use) to avoid pregnancy than the EHFMM group. This is likely due to the number of participants who enter the study intending to receive a free fertility monitor who are assigned to

the EHF_M group, and then use the monitor to achieve a pregnancy, i.e., they intended all along to achieve a pregnancy. The participants in the CMM group have more at stake in avoiding a pregnancy and have to work hard to receive a free monitor at the end of the study. This is the first study that has prospectively measured mutual motivation in the use of NFP methods. In a previous study on the use of an EHF_M to achieve pregnancy some of the participants had a tendency to use the monitor to avoid pregnancy (Janssen & Lunsen, 2000).

Limitations of this study could contribute to the results. Although the participants were from all geographic areas of the country the participants were rather homogenous in being middle class educated Caucasian Catholic couples. Finding similar results might be actually more attenuated with more diverse participants that are financially poorer, and with less stable relationships. Another limitation is the discontinuation and loss to follow-up with the methods. However, if there is loss to use of the method due to satisfaction, we assume that the motivation in use would decrease. We also had a large number of couples who signed up for the study wishing to receive the fertility monitor for use in achieving pregnancy. Although the participants consented to avoid pregnancy for one year, that was not the case. We had over 100 participants who were provided monitors and did not provide any cycle information. This loss of participants could have affected our power to detect differences, which might explain why we did not find a greater difference in motivation between the monitor and mucus groups across time.

As suggested by Speizer (2006) we recommend that users and professional teachers of NFP methods (and other behavioral family planning methods) periodically assess motivation of both members of a couple in regards to their intention of use and level of motivation. A simple two question assessment of the woman and her partner could be used: 1) how much were they trying to avoid pregnancy and how hard were they trying to avoid pregnancy on a scale of 0-10,

as we used in our study. When motivation decreases and they have a strong intention to avoid (or achieve) then a reminder to the couple (in-person or in an online format) or with a built in automatic monitoring system could be helpful to users when their motivation level decreases. This could be a part of the programming of fertility monitoring applications for smart phone type devices.

Although we attempted to have a more diverse participant profile by having the web site in the Spanish language, by seeking participants with Spanish language advertising, and with an available professional nurse NFP teacher who is fluent in Spanish we did not achieve this goal. Future studies need to reach out to a more diverse population, possibly through Title X Family planning clinics and family planning health professionals. Investigating other factors that contribute to motivation, such as whether the family size has been met or not (i.e., limiting or spacing), including intention of use and strength of intention, age of participants, ease of use, and length of required abstinence would also be recommend as factors to include in investigating this concept. Since NFP methods involve both the woman and her male partner, the libido and relational power between the spouses, are other factors that need to be assessed and included in a motivational model. Our anecdotal experiences with thousands of couples in our online NFP site attest to the problem of not having libidos in sync and pressure from one partner to have intercourse. A final recommendation is to test the effects of simple interventions to assess, monitor and to encourage mutual motivation with NFP and other behavioral family methods such as a fertility monitoring app that cautions users when motivation decreases.

As hypothesized and based on clinical evidence and conceptual thinking, we concluded that high motivation and in particular high mutual motivation is necessary for effective use of NFP to avoid pregnancy if couples wish to meet their stated intentions. Motivation also has to be

very high for couples to behaviorally meet their family planning intentions. Strategies to assess and strengthen a couple's motivation to use NFP methods to avoid or achieve a pregnancy were provided.

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Table 1. Comparison of demographics between the High and Low Motivation groups by mean, standard deviation, and range of scores.

	<u>High Motivation (N= 298)</u>	<u>Low Motivation (N= 60)</u>
Mean age female	30.1 (SD=5.4; 21-42)	29.9 (SD=5.5; 19-42)
Mean age male	32.1 (SD=6.2; 22-47)	31.7 (SD=5.9; 20-42)
Mean years married	6.2 (SD=5.0; 0-20)	5.1 (SD=4.8; 0-18)
Mean # living children	2.1 (SD=1.9; 0-8)	1.4 (SD=1.7; 0-8)*
Mean BMI female	25.0 (SD=5.5; 16.5-49.9)	23.8 (SD=5.9; 16.3-38.9)
% Ethnicity female	81% White/6%Hispanic	77% White/6%Hispanic
% Religion female	79% Catholic/17% Protestant	77% Catholic/13% Protestant

* There was a significant difference between the two study groups on number of living children ($p < .05$).

Figure 1: Mutual Motivation Model of Family Planning (FP)

Mutual Motivation Fertility Model

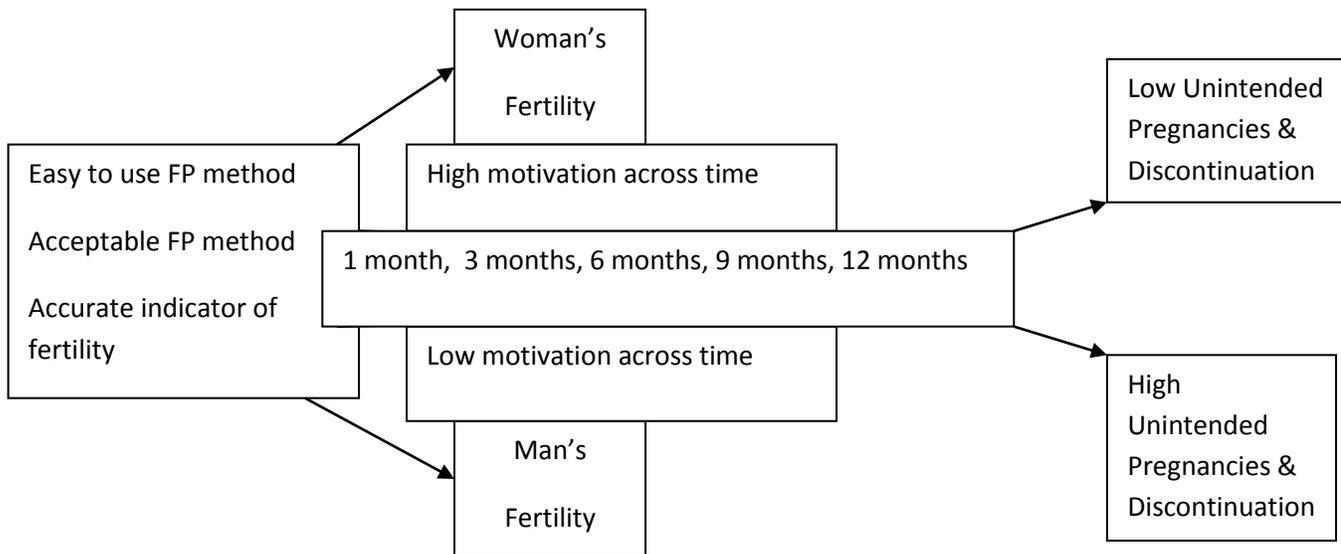


Figure 2: Example Motivation Rating and Online Menstrual Cycle NFP Chart

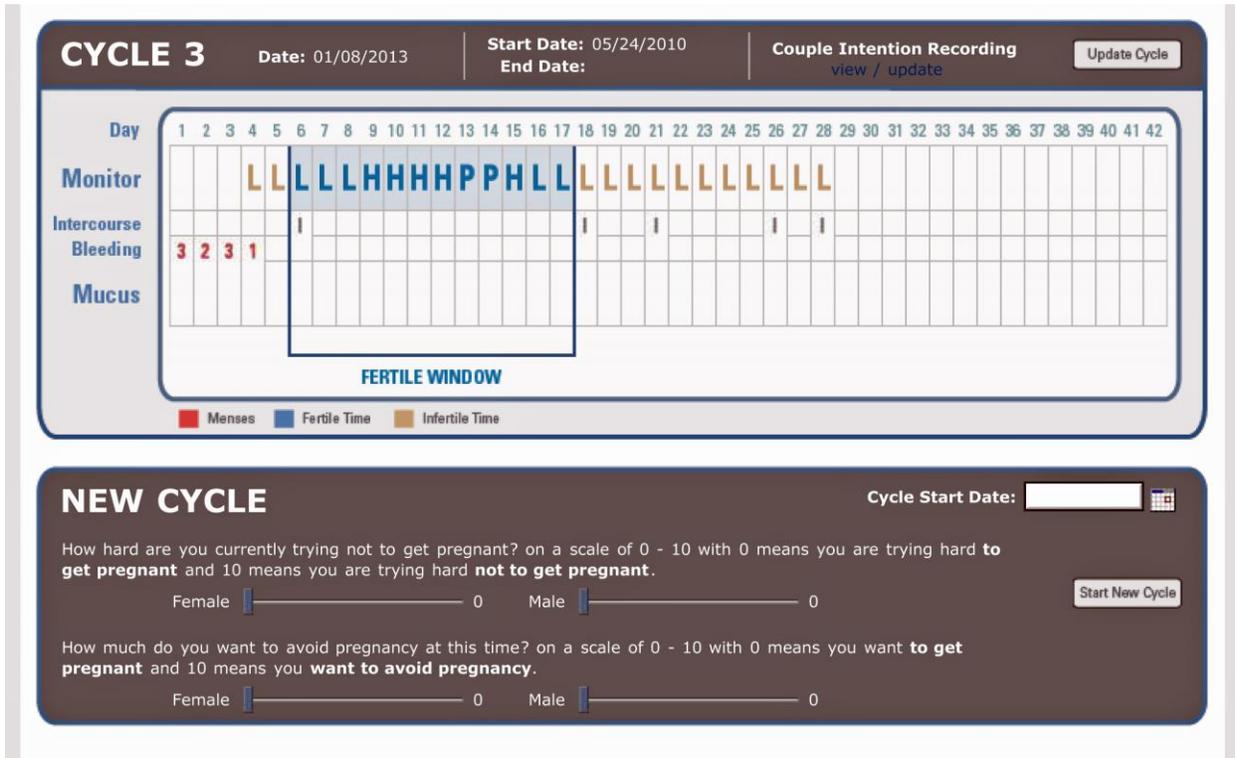
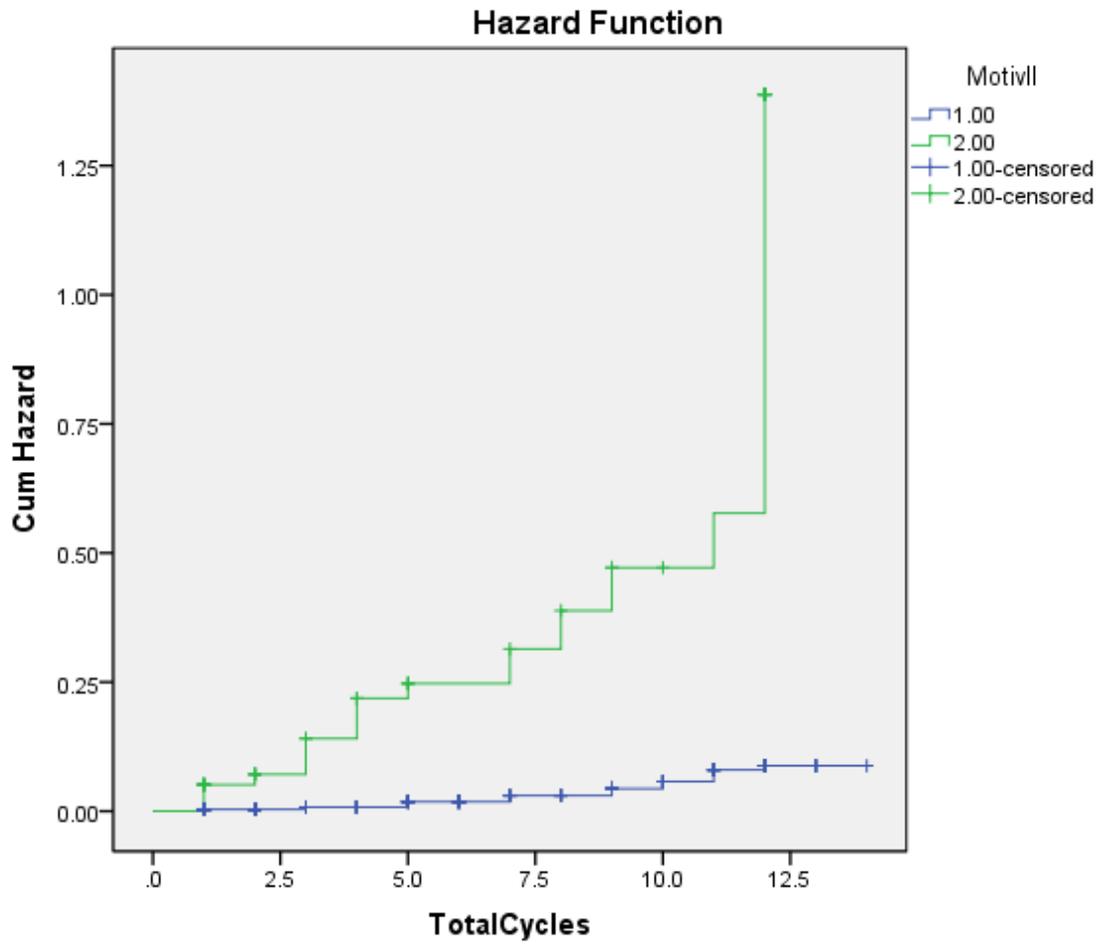


Figure 3: Hazard Function Curve with 1.00 = High Motivation Group and 2.00 = Low Motivation Group



Months of use

Clinical Implications

Mutual Motivation is KEY!

- **High motivation to avoid pregnancy is required for BOTH partners for high efficacy.**
- **Assessing motivation prior to prescribing NFP (or other behavioral method) with a simple 2 question tool is recommended.**
- **When motivation decreases the likelihood of pregnancy increases (intended or not).**
- **Assessing motivation periodically in couples who are using NFP is recommended.**
- **Strategies to encourage motivation of the couple should be applied.**