

WINDOW-BASED MENSTRUAL CALCULATOR SOFTWARE FOR DEVELOPING NATIONS

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ABSTRACT

Some married women are looking for pregnancy, that is, desirous to be pregnant while some young ladies are getting unwanted pregnancy that thwarts their future. In our society today, the Internet has exposed the women to different social networks as well as movies and all kind of pictures. Also the advancement of new computing power has enabled continuous growth in several applications of technologies such as menstrual calculator. Most menstrual calculator tools are web-based and thus, the user must be connected online to use such tool. This paper elicits information about this software, how it is used, and its importance. The findings were used to design and implement a menstrual calculator that is window-based and will enable ladies or women to be able to accurately calculate the actual date of their menstrual period, ovulation and fertility period.

Keywords: Menstrual calculator, menstrual period, ovulation, fertility period, window-based design

INTRODUCTION

Some young married women are looking for pregnancy, that is, desirous to be pregnant while some young ladies are getting unwanted pregnancy that thwarts their future. Thus, developing this menstrual calculator will help mitigate these problems.

Often times, the menstrual cycle is not the same for every woman. On average, menstrual flow occurs every 28 days (with most women having cycles between 25 and 35 days. When we talk of menstruation, we refer to a monthly bleeding in a young woman's life where she can become pregnant (DIY, 2012; Mache, 2010, 2011). During a woman's menstruation, her body is shedding the lining of the uterus (womb). During such period, menstrual fluid flows from the uterus through the small opening in the cervix, and passes out of the body. Most menstrual periods last from three to five days and a menstrual cycle is counted from the first day of one's menstrual period to the first day of the next period (Althoff, 2011; Nico, 2012).

Also, ovulation, which is the release of a mature egg (ovum) from the ovarian follicle, oc-

curs 14 days before one's period is due (Robin, 2012; Winder, 2011). According to Geirsson (1991), the time from last menstrual period (LMP) until ovulation is, on average, 14.6 days, but with substantial variation both between people and between cycles in any single person, there is an overall 95% prediction interval of 8.2 to 20.5 days. Thus, if one is trying to get pregnant or avoid pregnancy, a woman has to understand the period of ovulation in her menstrual cycle. This understanding is better achieved with the application of menstrual calculator. Furthermore, the use of menstrual calculator will help young and married women to understand time to avoid sex as well as time to get pregnant.

Most menstrual calculator tools are web-based (Robin, 2012a; Tampax, 2012). Tampax (2012) enumerated the questions to be considered when charting a cycle. In the design of such a chat, the days of the period should be marked down on a calendar and the first day of the period should be taken as Day1 of the menstrual cycle.

Often times, a normal cycle is between 25 to 35 days but in some cases, it could be shorter or longer (Carlsson *et al.*, 2004). The menstru-

al flow pattern should be tracked as there is need to keep track of light or heavy bleeding; changes in color and texture of blood clots; unusual length of the period and amount of flow; unusual vaginal secretions that occur during the month; and a clear or white secretion at mid-cycle (ovulation).

In other words, the following symptoms or changes should be noted when charting the cycle: Variations in length of the period; Timing or amount of menstrual fluid; Any change in vaginal secretions that is associated with itching or odor; Vaginal lubrication problems; Any pelvic pain, whether or not it is related to menstruation; Depression, mood swings, and irritability that may be related to your menstrual cycle (Cornforth, 2010; Robin, 2012). In the eventuality of a problem, these exact dates and pattern are useful helps in ensuring speedy and satisfactory treatment. In a study by Kepczyk *et al* (1999), premenopausal women who exhibited symptoms of iron deficiency were given endoscopies. Eighty six percent of them actually had gastrointestinal disease and were at risk of being misdiagnosed because they were menstruating. Such scenario can be prevented by keeping track of one's menstrual experience. It has been stated that the amount of iron lost via menstrual fluid is relatively insignificant for most women (Clancy, 2011). However, it is noteworthy that normal menstrual bleeding lasts about four to five days (Cornforth, 2010), and although it may seem like losing a lot of more blood, the amount of blood lost during the period is only about two to eight tablespoons. There are some women who have periods more often than every 21 days or less often than every 35 days as a result of abnormal bleeding. Some abnormal bleeding includes: Bleeding or spotting between periods; Bleeding after sex; Bleeding more heavily (passing large clots, needing to change protection during the night, soaking through a sanitary pad or tampon every hour for two to three hours in a row); Bleeding for more than seven days; when the menstrual cycle is most times less than 28 days or more than 35 days apart; and Bleeding after you have gone through menopause (Cornforth, 2010). The cause of most abnormal menstrual bleeding is called dysfunctional uterine bleeding - a change in hor-

mone levels. Other causes includes: thickening/build-up of the lining of the uterus; Cancer of the uterus; Uterine fibroids; Small noncancerous growths in the lining of the uterus; adenomyosis; Medical conditions such as thyroid and pituitary disorders, diabetes, and cirrhosis of the liver; Pregnancy complications -- such as miscarriage or ectopic pregnancy; Changes in birth control pills; Use of certain drugs such as steroids or blood thinners; Use of an intrauterine device (IUD) for birth control; Recent trauma, surgery, or other uterine procedure; Infection in the uterus (pelvic inflammatory disease); Polycystic ovary syndrome; and Stress, change in diet or exercise routine, recent weight loss or weight gain, travel, or illness (Cornforth, 2010). There is need to consult a doctor when the above symptoms are experienced. The reasons are not far fetch. However, the proposed software does not solve such problems rather the software usage begins with regular menstrual period.

MATERIALS AND METHODS

The fact-finding techniques used in information gathering were document review, observation of the existing systems, as well as research and site visit which entailed exploring the Internet to search for information. The accessed information was used in the design and implementation of menstrual calculator software. Most menstrual calculator tools are web-based (Robin, 2012a; Tampax, 2012) and thus, the user must be connected online to use such tool. This paper elicits information about this proposed software, how it is used, and its importance. The findings were used to design and implement a menstrual calculator that is window-based and will enable ladies or women to be able to accurately calculate the actual date of their menstrual period and ovulation.

MENSTRUAL CALCULATOR

A menstrual calculator is application software that computes menstrual period and ovulation period. In other words, a menstrual calculator contains two major phases which are:

- Menstrual period
- Ovulation period

How to calculate the next menstrual cycle

period:

The average menstrual cycle period is 28 days long. Menstrual cycles can range from 21 to 35 days in adults and from 21 to 45 days in young teenagers (Mache, 2011). An estimated menstrual cycle period can be calculated by setting up the menstrual cycle parameter by following these steps:

1. Determine the first day of the last menstrual period.
 2. The length of one's menstrual cycle should be understood. This is the number of days from the first day of the period until the last day before the next period.
 3. Enter the length of your menstrual period.
- These steps are shown in Figure1:

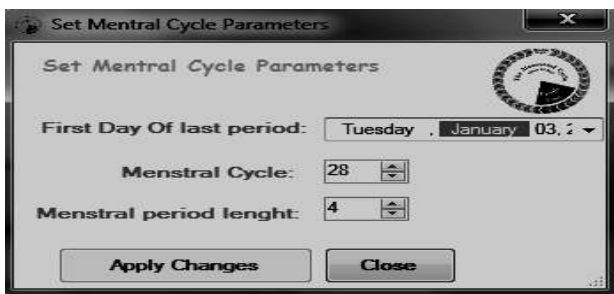


Fig 1: Setting menstrual cycle parameter

When the menstrual cycle parameters are fixed, the next menstrual Start date will be calculated as follows:

$$\text{Start} = \text{GetValue}(\text{"StartDate"})$$

$$\text{Next_start1} = \text{start}$$

$$\text{Next_start2} = \text{Next_start1} + (\text{cycle})$$

How to calculate ovulation date:

Most women experience ovulation mid-cycle and this is usually on the 14th day of the 28 day cycle (My Monthly Cycle, 2010; Procter and Gamble, 2012; Timer, 2012; Articlesbase, 2011; fwhc, 2012; Miller, 2011; Buzzle, 2012). Ovulation can occur before or after the 14th day due to irregular cycle or for many other reasons. An estimated ovulation date can be calculated as follows:

If cycle is less than or equal to 28 Then
Ovulation = menstrual date + (cycle / 2))

Else If cycle greater than 28 Then
Ovulation = menstrual date + Round(Cycle * 0.85 * (2 / 3))

THE USE OF MENSTRAL CALCULATOR

The following steps are employed in the use of menstrual calculator

Open the set menstrual cycle parameter of Figure 1

Complete the necessary information which are: first day of last menstrual period, menstrual cycle, and length of menstrual period.

Then, Click on “apply changes” and

Click on ok

Click on close

Then My dashboard appears as shown in Figure2



Figure 2: MY Dashboard

When MY Dashboard view is displayed, the following details are inputted.

1. The number of months to view is entered
2. Then click on view my calendar
3. Then click on the radio button on menstruation or ovulation or fertility period as the case maybe.
4. Then click on view my calendar.

When we set the menstrual cycle to be twenty-eight days and length of menstrual flow to be four days, the menstrual cycle, ovulation period, and fertility period calendar for the next four months is shown in Figure3, Figure4, and Figure5 respectively.

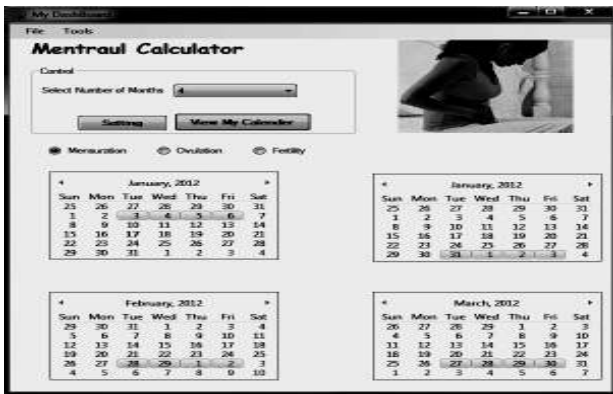


Figure 3: Menstrual Periods.

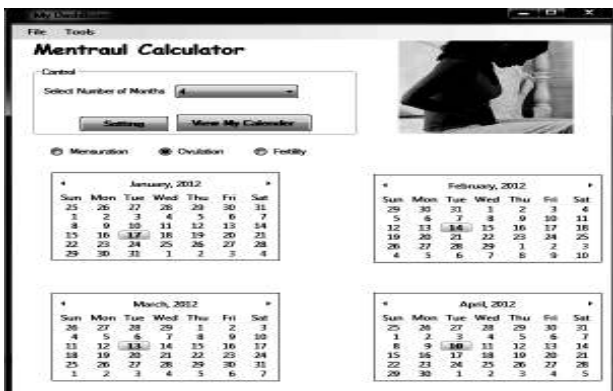


Figure 4: Ovulation Days

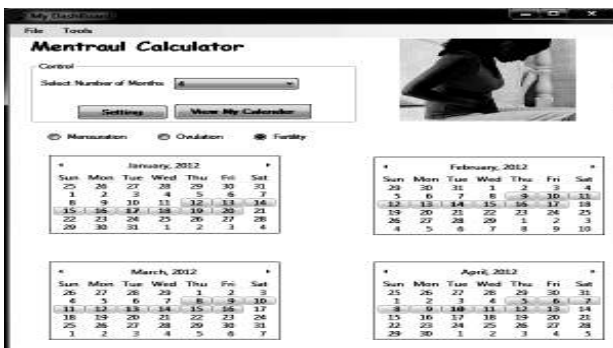


Figure 5: Fertility Period

RESULTS AND DISCUSSION

One interesting thing about this menstrual calculator application software is the simplicity of the application. It does not make use of da-

```
SaveSetting("MenstrualCal", "Settings", "StartDate", txtStartDate.Value.Date)
SaveSetting("MenstrualCal", "Settings", "Lenght", txtLenght.Text)
SaveSetting("MenstrualCal", "Settings", "Cycle", txtCycle.Text)
```

Figure 6: Use of System Registry to save info

The use of a window-based menstrual calculator is of immense benefit to our Nigeria environment and other developing countries. The reason is because most people do not have internet facility and most times, these internet facilities are epileptic. The ability to predict the date of one's menstruation, understand the fertility period, and know the ovulation date will mitigate barrenness, unwanted pregnancy and abortion.

As always, if anything abnormal appears, it is best to call your doctor right away. Another good reason to chart your cycle is that you generally don't want to visit the gynecologist when you are menstruating. Certain tests, like Pap smears, must be done when you're not bleeding, so it's important to know where you are in your cycle (Knight, 1991; Sharma *et al.*, 2008; Dean *et al.*, 2006).

The result obtained in Figure 3, 4 and 5 showed that a menstrual period of 28 days with 4 days menstrual fluid will have results shown in Figure 7, 8 and 9 below. The menstrual fluid period is fixed but the menstrual fluid date varies for each menstrual month and each menstrual fluid dates occurs at first or last week of the month as shown in Figure 7. The ovulation dates varies as the menstrual cycle occurs. In other words, when first and second ovulation date is known, the third, fourth and fifth ovulation dates cannot be accurately predicted without a menstrual calculator (Figure 8). The variation in fertility dates varies for each new month according to Figure 9. The only trend in fertility dates is that the fertility period is consistent (that is 9 days) for each menstrual cycle. Also, from menstrual fluid date, after four days, the fertility period commences and this last for about nine days. The peak, which is termed as the ovulation date, occurs on the sixth of these nine days.

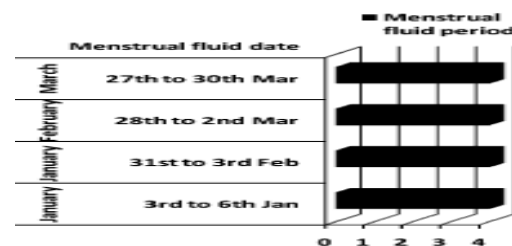


Figure 7: The menstrual fluid dates and period for the next four months

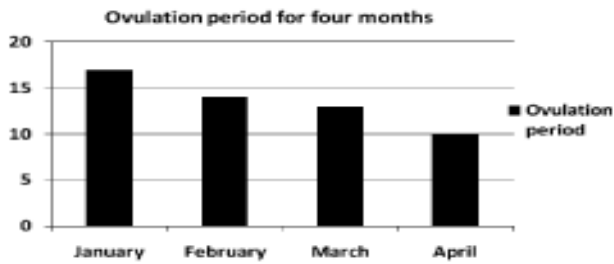


Figure 8: The ovulation period for the next four months

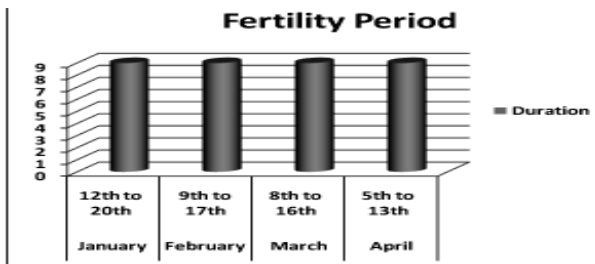


Figure 9: The fertility period for the next four months

With the information at hand, married women can have time to avoid sex as well as time to get pregnant.

CONCLUSION

There have always been the human desire to make situation easy and accurate. The computer system can be applied to every aspect of our life (Miller, 2011; kam, 2011; Strassmann, 1994; Womenshealth, 2002)

This window-based application software will give a better prediction of menstrual date and ovulation. The software will also generate accurate results when compared to manual way of menstrual cycle calculation.

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