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# Billings Ovulation Method: between efficacy and lack of knowledge

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## Abstract

Despite large investments, artificial family planning methods still have limitations. Since the 1950s, scientists have worked to develop a reliable natural method. This article reviews the literature on the Billings Ovulation Method, pointing out its logic, efficacy, benefits, challenges, and rules. It is a natural method, based on more than fifty years of research. Its reading key is the cervical mucus, a reliable indicator of fertility, and its efficacy is between 97 and 99%, comparable to most effective methods. Billings is also suitable for all types of cycles, as it is not based on calculations, but on the observation of the mucus. In conclusion, Brazil needs to strengthen programs that offer more global sexual education to the population, also training health professionals on natural family planning methods.

**Keywords:** Family planning. Natural family planning methods. Ovulation detection.

## Resumo

### Método de Ovulação Billings: entre eficácia e desconhecimento

Apesar dos grandes investimentos, os métodos artificiais de planejamento familiar ainda apresentam limitações. Desde a década de 1950, cientistas trabalham para desenvolver um método natural confiável. Este artigo revisa a literatura sobre o Método de Ovulação Billings, apontando sua lógica, sua eficácia, seus benefícios, seus desafios e suas regras. Trata-se de método natural, embasado em mais de cinquenta anos de pesquisas. Sua chave de leitura é o muco cervical, confiável indicador da fertilidade, e sua eficácia está entre 97% e 99%, comparável aos métodos mais eficazes. O método também é indicado para todo tipo de ciclo, pois não se baseia em cálculos, e sim na observação do muco. Conclui-se que no Brasil é preciso fortalecer programas que ofereçam educação sexual mais global à população, capacitando ainda profissionais da saúde a respeito dos métodos naturais de planejamento familiar.

**Palavras-chave:** Planejamento familiar. Métodos naturais de planejamento familiar. Detecção da ovulação.

## Resumen

### Método de Ovulación Billings: entre la eficacia y el desconocimiento

A pesar de las grandes inversiones, los métodos artificiales de planificación familiar todavía tienen limitaciones. Desde la década de 1950, los científicos vienen trabajando para desarrollar un método natural confiable. Este artículo revisa la literatura sobre el Método de Ovulación Billings, presentando su lógica, efectividad, beneficios, desafíos y reglas. Se trata de un método natural, basado en más de cincuenta años de investigación. Su clave es el moco cervical, un indicador confiable de fertilidad, y su efectividad está entre el 97% y el 99%, comparable a los métodos más efectivos. El Método de Ovulación Billings también es adecuado para todo tipo de ciclos, ya que no se fundamenta en cálculos, sino en la observación de mocos. Se concluye que en Brasil es necesario fortalecer programas que ofrezcan una educación sexual más global a la población, además de capacitar a los profesionales de la salud sobre métodos naturales de planificación familiar.

**Palabras clave:** Planificación familiar. Métodos naturales de planificación familiar. Detección de la ovulación.

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Family planning methods have been used in human history since before the great scientific advancements of the last centuries and, despite the large investments in the last decades, they continue to have limitations. This is the case, for example, of the side effects caused by artificial methods such as birth control pills, but also of natural methods such as rhythm and basal temperature, which has failed to meet needs due to uncertainties and excessive restrictions on sexual intercourse<sup>1,2</sup>.

For some couples the problem also involves moral teachings of religion, particularly those for which sacredness of sexual union is inseparable from openness to children. The faithful, desirous of following such teachings, seek methods that do not separate these two dimensions of human sexuality and, at the same time, are effective in family planning. This is the official position of the Catholic Church, which since Pope Pius XII (1876-1958), through Paul VI (1897-1978), with the encyclical *Humanae Vitae*<sup>3</sup>, John Paul II (1920-2005) and, recently, Pope Francis (1936), with *Amoris Laetitia*<sup>4</sup>, encourages the observation of fertility rhythms in the exercise of responsible sexuality.

In bioethics, the issue of overpopulation worried one of the pioneers in the field, Van Rensselaer Potter<sup>5</sup>, in the 1970s. The biochemist, considered until recently the first to use the term “bioethics”, defended demographic control as a measure for humanity’s survival and disliked the religious discourse that opposed *any attempt to limit fertility*<sup>6</sup>. Additionally, in the previous decades, the advancement of artificial contraceptive methods and the possibility of almost completely dissociating reproductive and sexual issues already increased the distrust on natural methods available at the time.

Based on this problem and at the request of Catholic priest Maurice Catarinich, in the 1950s John Billings and later his wife Evelyn Billings, from Melbourne, Australia, worked on a simple discovery: the presence and characteristics of the mucus in the vaginal orifice would indicate the periods of fertility. James Brown, in the 1960s, and Erik Odeblad, in the late 1970s, from Umea University, Sweden, scientifically validated this finding. From the beginning, John Billings helped develop the “ovulation method for family

planning,” which since the 1970s has been called the “Billings Ovulation Method” (BOM) in recognition of his scientific discovery. It is, therefore, a natural family planning method, with scientific guidance and proven efficacy<sup>2,7</sup>.

On January 27, 1977, World Organisation Ovulation Method Billings (WOOMB) was founded to disseminate information already known<sup>1</sup>. In Brazil, BOM began to be promoted by the religious sister Martha Silva Bhering, nurse midwife, in 1975. A year later, another nun, Sister Maria José Torres, a physician who studied BOM in Rome with Anna Capella, joined Bhering’s work. The sisters, in partnership with the Archdiocese of São Paulo and the National Conference of Bishops of Brazil, started what is now the National Confederation of Natural Family Planning (Cenplafam Woomb)<sup>8,9</sup>.

Despite the initial connection with Catholicism, Cenplafam Woomb’s work is not restricted to Catholic believers. However, after more than four decades of dissemination in Brazil, research indicates that most of the population<sup>10</sup> and even health professionals<sup>11</sup> are unaware of the method. Even Catholics seem to ignore it, as shown by a recent survey in a Brazilian parish<sup>12</sup>. Of 47 respondents, 17 (36.2%) self-rated zero regarding knowledge about BOM. In all, 31 (67.4%) respondents rated themselves from 0 to 5, against 15 (32.6%) who rated themselves from 6 to 10<sup>12</sup>.

Inside and outside the Church, we observe a certain prejudice due to ignorance of the BOM, sometimes mistakenly associated with the “calendar” method (rhythmic method). Brazilian scientific research on the topic is still scarce – a simple search on the Capes Journal Portal and on the Pubmed and Lilacs indexers, using the terms “Billings method” and “Billings Ovulation Method” in the title of publications, results in only four articles in Portuguese.

However, offering effective natural methods, for whatever reason the patient (or the couple) seeks them, is in line with the international consensus established, for example, by the Cairo Conference (1994), which recognizes the human right to family planning<sup>13</sup>. In Brazil, Law 9.263/1996<sup>14</sup> regulates family planning and declares it a right of every citizen<sup>15</sup>.

This right is supported by the bioethical principles of beneficence, non-maleficence, autonomy, and justice, proposed by Beauchamp and Childress<sup>16</sup>. Above all, respect for autonomy stands out, whose principle establishes the health professional's duty to inform patients so that their decisions are not controlled or limited. In other words, in the context that interests us here, the choice of employing the family planning method concerns only the patient (or the couple).

Considering this panorama, the aim, via literature review, is to describe the logic of BOM and distinguish the phases of the menstrual cycle in relation to family planning, pointing out the efficacy, benefits, and challenges of the method, to finally list the rules for its proper functioning.

## Mucus, reading key for the method

Natural family planning methods (also called "behavioral," "fertility diagnosis" or "natural fertility regulation")<sup>17</sup> consider the physiological changes in women during the menstrual cycle and the lifespan of the sperm. They are thus based on the periodicity of human fertility and infertility, on the fact that women ovulate only once in each cycle, the limited ability of the egg to be fertilized (only 12 to 24 hours after ovulation), the reduced lifespan of the sperm (three to five days after ejaculation) and the possibility for women to monitor their cycle<sup>18</sup>.

The chances of intercourse resulting in pregnancy vary according to the woman's ovulation: 4% chance if intercourse occurs five days before ovulation; 25% to 28% if it occurs in the two days before ovulation; 8% to 10% in the 24 hours after ovulation; and virtually nil on the other days of the menstrual cycle<sup>18</sup>.

BOM is based on the meaning of cervical mucus – *secretion containing water, inorganic mineral salts, epithelial cells, leukocytes, and a mixture of glycoproteins (mucin) (...) produced by the cells lining the cervix*<sup>19</sup>. This mucus was only understood by the scientific world in the 20th century (although African societies have interpreted it for generations)<sup>2</sup>. It makes the vagina less acidic and creates a kind of duct for sperm to pass into the uterus. Studies such as the one by

Odeblad<sup>20</sup> have shown that the presence of mucus is indispensable for conception.

In fact, during the fertile days, women produce mucous secretion from the glands of the cervix, announcing the proximity of ovulation. Therefore, if guided, the woman can recognize this sign of fertility and, in agreement with her partner, decide to have sex or abstain from it, according to the desire to conceive or not<sup>1</sup>.

A study conducted with 22 women to determine if they could predict and symptomatically identify their ovulation showed – based on laboratory analysis of plasma luteinizing hormone, urinary estrogens and pregnanediol – that ovulation happened on average 0.9 days after the occurrence of the peak symptom (peak day) of the mucus noted by the users, with first mucous symptoms starting to appear on average six to two days before ovulation. Thus, the research proved that mucus observations provide a reliable basis for a family planning method<sup>21</sup>.

The World Health Organization (WHO)<sup>7</sup> conducted a prospective multicenter clinical evaluation of BOM in India, the Philippines, New Zealand, Ireland, and El Salvador, noting that 93% of women found a recognizable mucus pattern already in the first observed cycle.

From this knowledge, one can deduce, in general lines, the principle to avoid pregnancy: the presence of mucus is a sign of possible fertility, so sexual intercourse, whether complete or incomplete, should be avoided<sup>22</sup>. Even with personal variation of the cycle, the fertile period is not so long as to require unattainable levels of sexual abstinence. The inverse principle, in turn, is largely beneficial for those who desire pregnancy, as sexual intercourse on days with the presence of mucus increases the likelihood of fertilization.

## Mucus characteristics

Initially, the mucus is characterized as sticky and filamentous. Another sign is the presence of a clot of dark mucus (a type of cervical plug that detaches at the beginning of the fertile period and opens the passage to the uterus). Besides eye observation, this fluid can be perceived by the sensation of moisture in the vaginal canal<sup>2</sup>.

During fertile days, the mucus becomes *less thick and lighter, filamentous and abundant (...)* like strands of raw, smooth, or slippery egg white<sup>23</sup>. It may appear slightly pink, coffee-colored, red, or yellow, with a characteristic odor, accompanied by swelling and increased volume of the vulva tissues and sexual desire<sup>1</sup>.

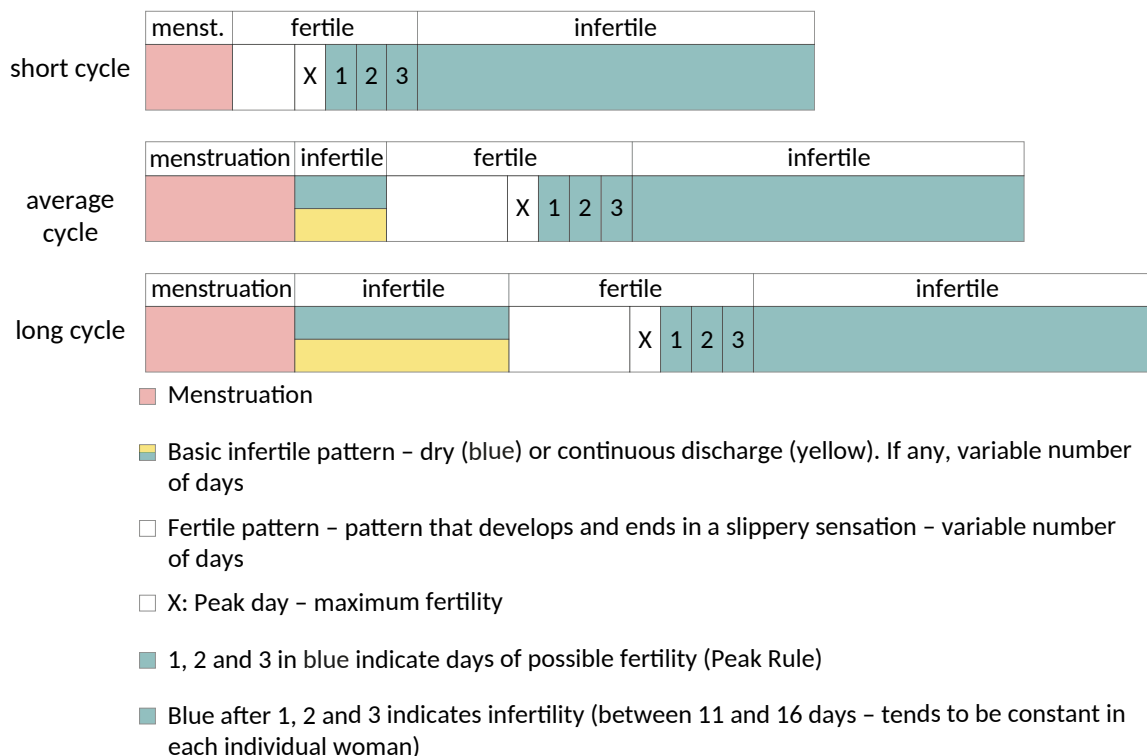
This evolution of the fertile mucus occurs as ovulation approaches. It starts in a small quantity, thick, whitish in color, viscous and with the quality of holding its shape (without elasticity); as it progresses, transitional mucus is present in greater quantity, which begins to thin and becomes more translucent, slightly elastic; at the height of fertility, the mucus is profuse, thin, transparent, and elastic<sup>2</sup>. Despite this description, women do not need to touch the mucus, as, for daily observations, it is enough to pay attention to the sensation of lubrication in the vaginal canal and/or identify the presence of mucus in the underwear or during personal hygiene. Importantly, not all women may have

visible mucus, and therefore are trained to observe its evolution by vulvar sensation<sup>1,2</sup>.

## Menstrual cycle

To understand BOM, one must know the female menstrual cycle well, which can basically be divided into four periods<sup>24</sup>: menstrual, infertile, fertile, and infertile (Figure 1). The menstrual period lasts an average of five days, with variable flow. The infertile period is marked by a basic infertile pattern (BIP), if any, as not every woman has this period; its duration can fluctuate, even for the same woman, due to external factors, such as stress. The fertile period, in turn, presents a pattern marked by the presence of fertile mucus. During this period, ovulation is identified by the peak day, which is followed by three days of possible fertility. Finally, the infertile period refers to the post-ovulatory phase, which usually lasts from 11 to 16 days (invariable for the same woman).

**Figure 1.** Development of female fertility during the menstrual cycle and the Billings Ovulation Method



Source: Adapted from Billings<sup>25</sup>.

## Menstrual period

In adolescence or pre-menopause, at weaning or going of the pill, women can have irregular cycles and be normally fertile. But even in these cases BOM can be used, such as in so-called “regular” cycles<sup>1</sup>.

Vaginal bleeding marks the beginning of the menstrual cycle, which persists for about four to five days (with possible variations). During this phase, the ovaries are not highly active and, consequently, there is a low quantity of female hormones (estrogen and progesterone) circulating in the blood<sup>2</sup>. However, in noticeably short menstrual cycles, menstruation and fertile period can occur simultaneously. Abstinence is thus recommended on days of increased blood flow, which can camouflage signs of fertility (appearance and progression of mucus characteristics)<sup>1,2</sup>.

## Possible first infertile period: basic infertile pattern

The first sign of infertility can occur after the menstrual period, certainly identifiable in the first month of observation by the sensation of dryness in the vaginal canal, which characterizes dry BIP. If instead of dryness one notices thick mucus in small quantities, sometimes sticky and continuous, without any change, it is a sticky BIP. In the latter, it may take more than one cycle to distinguish the change from infertile to fertile mucus<sup>2</sup>.

In typical 28-day cycles, both patterns, dry or sticky BIP, persist, on average, for two to three days after menstruation. On the other hand, *in some long cycles (...) there may be mucus daily or succession of 3 or 4 or even more days when mucus is present, separated by days when there is no mucus. When there is mucus every day, that mucus that remains the same, day after day, is a basic infertile pattern (...). When dry days and mucus days occur intermittently, and mucus is the same whenever it is present, along 2 weeks of observations, (...) there is a basic combined infertile pattern of dry days and mucus days*<sup>26</sup>.

## Fertile period

The end of the dry or sticky BIP and the beginning of the fertile period are identifiable by the appearance of fertile mucus in the

region of the vulva. At the right time, still in the pre-ovulatory phase, the hypothalamus communicates with the pituitary gland, responsible for producing hormones that act on the ovaries. The follicles, present in the ovaries and carrying a primitive egg, develop and produce another estrogen-like hormone, estradiol, which will activate the cervix to produce mucus<sup>2</sup>.

It is during this period that the increase in hormones leads to the production of the most fertile mucus, indispensable for conception because it helps the sperms, keeping them capable of fertilizing, facilitating their movement and forming protective and nutritious channels for them to climb up the fallopian tubes. Additionally, mucus blocks defective sperm.

The other ovulation processes significantly alter the characteristics of the mucus and raise the body temperature, with both changes being observable<sup>24</sup>. According to McKay, *the characteristics of cervical mucus change visibly, with changes to the levels of estrogen and progesterone in the cycle, and this helps the woman to understand when she may be fertile and when she may not be*<sup>27</sup>.

This progression of the mucus is observable until there is an abrupt change in the characteristics that define it as fertile. This change is significant because it signals that ovulation happened the day before, called “peak day” or “peak fertility”<sup>28</sup>. Odeblad adds that *in 80% of cycles this is the day of ovulation*<sup>29</sup>.

Bhering and Kajiyama comment on other studies that discuss ovulation: *assuming that a woman is fertile only one or two days in her cycle, the day of ovulation, the properly applied ovulation method makes conscious, free and responsible family planning possible. This is because the egg is viable for one to two days and the sperm has fertilizing power for two to three days (...), while for Langman, the egg is viable for only 24 hours (...). For Hume, the peak of the mucous symptom either coincides with ovulation or precedes it by one day*<sup>30</sup>. Physician James Brown, however, confirmed through hormonal dosages that *the fertile phase of the cycle (“the fertility window”) begins when one can recognize the first change in flow characteristics from a BIP*<sup>31</sup>. This shows that fertility cannot consider only the egg or

sperm lifespan; it needs first to consider the environment, the cervical mucus.

It is worth noting that women do not necessarily ovulate on the day of greatest amount of mucus, and therefore it is important to observe the characteristics of this mucus, especially the sensation of lubrication. In cycles lasting between 23 and 35 days, the fertile phase persists for about five days. Even in cases of longer or shorter cycles, this same average is maintained<sup>2</sup>.

In a cycle, normally only one follicle reaches maturity for possible conception. But ovulation, in any cycle, occurs only in one day, that is, when the egg leaves the ovary and is ready to be fertilized<sup>1</sup>. Therefore, for fertilization, it is necessary for a sperm to pierce the egg barrier in less than one day after ovulation; otherwise, the egg cell dies and disintegrates.

### Infertile period: post-ovulatory phase

If fertilization does not occur within the egg's viability period and a three-day interval ("peak rule") of sexual abstinence is respected after the peak of fertility, the chance of pregnancy is reduced to zero and the couple may have unrestricted sexual intercourse for a period of 11 to 16 days of infertility<sup>1</sup>.

After these days, the endometrium peels off and a new cycle begins, with a new menstruation. But not all bleeding indicates that there was ovulation (anovulatory cycle), since a smaller quantity of hormones can form the endometrium and not be enough to cause ovulation (common while there is exclusive breastfeeding on demand)<sup>2</sup>.

### Efficacy

According to Hansche<sup>32</sup>, studies – such as the WHO survey<sup>7</sup>, which found a BOM efficacy of approximately 98.5% – point out that, if followed correctly, a natural family planning method such as BOM can be as effective as the most common artificial methods. Regarding this WHO study<sup>7</sup>, Malagodi and Braga state that *the importance of this research should not be minimized, as it was not commissioned by the Church, nor promoted by companies interested in selling some product,*

*nor was it restricted to a small and limited study. This was a multinational and multicultural survey, coordinated by the WHO and lasting four years*<sup>33</sup>.

Another survey, this time in the United States, showed that BOM is 97% effective in the first year, against 96% and 95% for the two-day and calendar methods, respectively<sup>34</sup>. In Brazil, when visiting Cenplafam's family planning center, Ricci<sup>35</sup> found that among 200 couples using the method, there were no unwanted pregnancies.

Worthy of mention is the pilot study by Klaus and collaborators<sup>36</sup>, which strictly followed Tietze and Lewit<sup>37</sup> methods for data collection and presentation. They monitored 135 women trained in BOM, who were asked, whenever a pregnancy occurred, if they were following the rules correctly. According to the answers, failures were classified as "biological" (method failure) or "personal" (user failure). The biological failure rates, at 12 and 24 months, were 0.072% and 0.517%, respectively. Personal failures reached 1.23% and 1.38%, in 12 and 24 months, respectively.

To obtain the total accidental pregnancy rate, biological and personal failures are usually added. Even so, the values remain low – 1.30% at 12 months and 1.896% at 24 months – compared to the lowest rates of other methods (remembering that the use of conventional methods is also susceptible to personal failures). Thus, we consider that BOM could be included in the "most effective" category of Tietze<sup>38</sup>.

Still based on data from other studies, Bhering and Kajiyama<sup>8</sup> state that the BOM failure rate is low, and its main variable is sexual behavior. Thus, according to Uchimura and collaborators, *when the Billings method is used correctly, the chance of unintended pregnancy varies between 1 and 3% in 12 months, and corroborating these data, a prospective longitudinal study revealed that the probability of conception from intercourse occurring outside the period defined as fertile by the method was 0.4%*<sup>39</sup>.

As in other methods, BOM is conditioned to the human factor, that is, its efficacy will depend on correct observation of the mucus and fidelity to the rules. From these and other studies, we conclude that the BOM has similar – and

sometimes even greater – efficacy as other family planning methods considered highly effective.

## Benefits

Besides the efficacy factor, BOM stands out for being easily learned – the WHO survey<sup>7</sup> included even illiterate people. The method also does not involve expensive costs in the short or long term, as is the case with other methods<sup>24</sup>.

Under normal physiological conditions, BOM does not need medications or devices, as simply observing and interpreting the mucus signals is enough<sup>2</sup>. And, *unlike other more traditional methods of this type, the ovulation method does not require calendar calculations or basal temperature readings. It is based only on the way in which the cervical mucus – which most women recognize as their normal vaginal discharge – varies at different stages of the menstrual cycle*<sup>27</sup>. We can thus infer that, for women without reproductive disorders, and focusing on the contraceptive issue, without considering aspects related to sexually transmitted diseases, for example, BOM does without the combined use of other methods.

Regarding the participation of men in family planning, a research showed the importance of the partner in the BOM experience: *the union of the couple in implementing the method was observed as a motivating and determining factor for use. Interviewees reported partner support in the daily notes of perceived sensations, promoting dialogue, making him a protagonist and co-responsible in family planning*<sup>40</sup>.

BOM is also reported to help establish the couple's physical and mental harmony<sup>41</sup> and has important social benefits in promoting marital fidelity and harmony and in encouraging monogamous relationships among sexually active couples, which is the essential education required to reduce the acquired immunodeficiency syndrome (AIDS) epidemic<sup>39</sup>.

Added to this are advantages such as: recognition of normal and abnormal gynecological problems; adequacy to Christian morals and values; and no need for doctors or other scarce resources in developing countries<sup>8</sup>. For followers of Catholic moral teachings (and other similar

doctrines), BOM ensures the two dimensions of the sexual act: unitive and procreative, understood as a true “life project for two”<sup>42</sup>.

Other advantages of the method are: low cost; no side effects; adaptation to all stages of a woman's reproductive life, from adolescence to menopause, when going of the pill or breastfeeding, whether in “regular” or irregular cycles; preservation of sensitivity (which does not occur with condoms); absence of complications such as those caused by diaphragms and intrauterine devices<sup>8</sup>; and feeling of satisfaction for women – by being attuned to their body rhythms – and, consequently, for their spouse. All these aspects make BOM very suitable for the Brazilian reality<sup>43</sup>.

According to Ricci, Cenplafam Woomb's monitors disclose, in addition to family planning, other highly beneficial topics, such as *sexual education and guidance, alternative medicine, guidance for natural childbirth (considering cesarean delivery as an extraordinary means), breastfeeding, exercises for a more peaceful and healthy pregnancy, prenatal care, etc.*<sup>42</sup> Thus, the method meets the expectations of authors who advocate the importance of including reproductive health in family planning. Pessini and Barchifontaine point out that, *in the words of the Cairo Action Plan, this means the right to information and access to safe, inexpensive and harmless methods for regulating fertility*<sup>44</sup>.

Finally, for being natural, and therefore favorable to women's health and self-knowledge, it can be said that BOM contributes to female empowerment, overcoming a controlling policy, in which the woman plays a role much more of an object than a subject of her sexual and reproductive history<sup>43</sup>. BOM finds support and presents itself to some patients (or rather, to couples) as the family planning method most in line with the bioethical principles of non-maleficence and beneficence.

## Challenges

No method offers only benefits. Likewise, BOM has its challenges, including the quality of teaching for its good understanding and use (experienced instructors are needed), the couple's motivation

and cooperation (a more important factor in BOM than in other methods) and the certainty of what one wants (because if a couple has sexual intercourse on fertile days, or practice other deviations, they will hardly be successful)<sup>2</sup>. In this respect, one must already be capable of fully exercising sexuality. This capacity consists of the attitude to enjoy mutual love exchange, but also to abstain from it, when necessary, without dramas, since it is a free choice<sup>45</sup>.

Another possible disadvantage would be interference with sexual spontaneity, requiring periodic abstinence and modification of sexual behavior<sup>46</sup> (reason why more stable couples welcome and follow the method more easily). However, a research showed that 318 of 371 (86%) of the participants did not find the required abstinence too difficult or excessive in marriage<sup>47</sup>. Another recent survey obtained a more significant result: none of the 113 women interviewed considered abstinence an obstacle to accept the method<sup>11</sup>. Yet another qualitative study observed that, for the women interviewed, periodic abstinence was not considered a problem: *On the contrary, it can bring more freedom to the couple, by showing that the couple's union is not just based on sex; thus, together, they can decide the most appropriate time to have sexual intercourse*<sup>48</sup>.

The need for true sex education, especially among young people, must not be ruled out<sup>13</sup>. In fact, *sex education, in the context of family planning, can provide adequate means for those who do not want to have children but wish to maintain an active sex life*<sup>49</sup>.

Finally, lack of knowledge by gynecologists trained in a culture that ignores natural methods and encourages medicalization, constitutes a real obstacle to the dissemination and use of BOM<sup>24</sup>. Although the Ministry of Health<sup>50</sup> determines that health professionals inform patients about all viable options for conception and contraception, the survey by Uchimura and collaborators<sup>11</sup> revealed that only 5.1% of the interviewees declared that their physician had already offered them natural family planning methods.

From these data, the authors conclude that few physicians offer their patients natural family planning, and most underestimate the efficacy of such methods<sup>11</sup>. However, if health

professionals had more knowledge about the real efficacy of the method and offered it to their patients, the discrepancy found between acceptance/interest in the method and its actual use would be mitigated. Despite the family planning policies mentioned, negligence occurs in primary care services, where there is no definition of the roles of the professionals who make up the team, with a noticeable gap between what is proposed by the Ministry of Health and what is practiced in the Family Health Program<sup>43</sup>. Thus, the rights to information and choice, advocated by the biomedical principle of respect for patient autonomy, are ignored.

## General rules

To mitigate the lack of knowledge previously mentioned, it should be noted that BOM recommends general rules to avoid or achieve pregnancies. The first rule to prevent conception, of fundamental importance, is to avoid not only coitus, but all genital contact on the days of abstinence (which does not include avoiding other expressions of love, essential to maintain a healthy relationship)<sup>2</sup>. This is because *a man's sexual arousal – even if he does not ejaculate – can produce secretions that may contain sperm, which can be carried by the fertile mucus outside the vagina, thus conception can occur*<sup>51</sup>.

In summary, there are four general rules for avoiding pregnancy. They are very simple and can be didactically divided into two blocks (“first days rule” and “peak rule”):

### First Days Rule

*Rule 1: Avoid intercourse on days of heavy bleeding during menstruation.*

*Rule 2: Alternate nights are available for intercourse when these days are recognized as infertile (basic infertile pattern).*

*Rule 3: Avoid intercourse on any day of mucus or bleeding that disrupts the basic infertile pattern. Allow three days of BIP afterwards, before resuming intercourse on the evening of the 4th day.*

*Rule 2 continues.*

### Peak Rule

*When the peak is identified, following a BIP change, the Peak Rule is applied. From the beginning of*

*the fourth day after the peak, until the end of the cycle, sexual intercourse is available every day, at any time*<sup>52</sup>.

During menstruation, therefore, intercourse should be avoided. The goal is that signs of fertility are not hidden by bleeding, because in some short cycles ovulation can happen during menstruation or immediately after. The same guideline is valid for any bleeding day even before menstruation starts (plus three more days without intercourse)<sup>1,2</sup>.

After menstruation, dry or sticky BIP may appear. In these few days without variations, the first days rule applies. During this period, sexual intercourse is allowed only at night and, for added security, on alternate nights, to facilitate observation of the mucus during the day. Changes can indicate fertility, so when one notices them, one should avoid intercourse for three days, in which it will be possible to observe the beginning of the fertile period or the continuity of BIP<sup>2</sup>.

The beginning of fertile days is marked by changes in the *quantity, color, viscosity, filaments, or wetness of the mucus*<sup>53</sup>. On these days, until the third day after the peak, one must abstain from sex: *BOM adds three days after the peak day to be 100% sure that the post-ovulatory infertile days have been reached*<sup>31</sup>.

After the fourth peak day a new infertile period begins, which will continue until the next menstruation. Since the egg is already dead, the possibility of pregnancy is zero, and therefore sexual intercourse is allowed every day and at any time<sup>2</sup>.

Based on the knowledge of the most fertile days, BOM is also used to get pregnant, especially when the couple has infertility problems. The rule is simple: watch for signs of fertility and have sex on fertile mucus days<sup>1,2</sup>.

## Final considerations

This article traced the origins of BOM and highlighted its development after more than fifty years of research. Its reading key is cervical mucus, which works as a reliable indicator of fertility, helping in the easy, free, and safe

identification of ovulation. The method uses this meaning of mucus to help couples recognize their fertile cycles and thus exercise sexuality responsibly, planning for parenthood.

The main benefit of BOM – and the most expected from any method – is its high efficacy between 97% and 99%, comparable to most conventional methods<sup>36,54</sup>. This result is contrary to any common sense that mistakenly identifies the method with the calendar method (rhythmic method), judging it suspect.

With proper guidance, it is easy to learn the method and quickly identify the mucus pattern. No rest (as in the basal temperature and symptothermal methods) and no handling of the cervical mucus is required; one only needs to feel the lubrication progress. BOM is indicated for all women, as it does not depend on the number of days in a menstrual cycle (long or short) or its regularity from one month to the next. This is because the method is not based on calculations and predictions, but on daily observation of mucus.

The method also does not require the aid of drugs and other devices, favoring female self-knowledge and, consequently, reproductive health. Ultimately, BOM provides means to empower women and benefits dialogue between the couple, with more effective participation of men in family planning. Finally, it is a method accepted by several religious traditions, including Catholicism.

But BOM still has some challenges, which can be relevant depending on the couple. Among these challenges are the quality of teaching about the method, poor sex education (in many families, sex education, if any, is limited to recommending condom use), the couple's motivation for periodic exercise of sexual abstinence, lack of knowledge of the method by health professionals and, finally, the prevailing mentality of medicalization (after all, isn't it easier to take a pill?).

In conclusion, although the benefits of BOM seem to outweigh the challenges, for this and other natural family planning methods to be better known and adopted, it is urgent in Brazil to create and promote programs, in health and other areas that offer more comprehensive sex education to the population. There is an urgent

need to train health professionals to provide safe and accurate information on all methods of contraception available (including modern natural family planning methods), impartially and without prejudice, as required by the bioethical principle of justice. Once the patient (or the couple) has made their choice, the professional must respect it, as stated in the principle of autonomy.

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