



A cross-sectional study on Polish Medical Students' knowledge of Fertility Awareness-based Methods

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Abstract: Fertility Awareness-based Methods (FAMs) observe physiological signs to determine fertile and infertile phases in a women's cycle. WHO recommends to use both natural family planning (NFP) or FAM as a synonym. They may serve as methods for family planning as well as a procreation health monitor in restorative medicine and as a useful biomarker in management of reproductive-health disorders. Unfortunately, this knowledge is marginalized during medical education. A cross-sectional study was performed among 542 Polish medical students to assess their skills in NFP. The most common NFP method indicated by 84.9% students was the Calendar Method, the one with historical value. The Billings Method and Creighton Model System were known by 42% and 14% participants respectively, while Multi Index Methods were known by 26.4%. A total of 6% of the respondents use NFP themselves. The largest group of students (42%) assessed the effectiveness of NFP in avoiding pregnancy at about 50%. The results show little interest and incomplete knowledge in up to date NFP among future medical professionals. It seems there is an urgent need to introduce this subject into medical education as a valuable tool to understand and monitor procreation health as well as family planning method.

Keywords: Natural Family Planning (NFP); Fertility Awareness-based Methods (FAM); restorative medicine; procreative health; fertility

Introduction

Reproductive health literacy seems to become an increasingly important issue especially due to falling fertility indicators and growing infertility rate (Chawłowska et al.2020). The question arises as to whether healthcare professionals and medical students are sufficiently educated and prepared to promote fertility care among their patients and use it in their own lives.

In the late seventies, the WHO began to take an interest in Fertility Awareness-based Methods (FAMs) and promoted them as a part of public

awareness with respect for the environment and nature in all aspects (Ohme-Peters, S., & Fedra work Group (2019) . In 1988, the WHO defined Natural Family Planning (NFP) as methods for achieving or preventing pregnancies. Modern FAMs are a useful part of NFP based on self-observation of natural signs and symptoms of the cycle as well as on new-technology monitors which help to distinguish whether the woman's cycle phase is fertile or not (Smoley, Robinson, 2012). The classic biomarkers include basal body temperature fluctuations, characteristics

of cervical mucus and modification of the cervix. When applying FAMs, the use of drugs, devices or any surgical procedures which lead to fertility impairment is not needed. The couple only agrees on abstinence during the fertile phase of the cycle if they are not planning to conceive (Natural family planning: A guide to provision of services.1988) . The routine of observing and recording fertility signs allows women to be active participants in monitoring their gynecologic health from adolescence to menopause (Fehring & Mu, 2014) . Moreover, usage of FAM has a strong influence on relationships, since it helps to create a better communication between spouses and more openness for each other's needs (Unsel et al.2017). FAMs are applied in restorative reproductive medicine that seeks to cooperate with or restore the normal physiology and anatomy of human procreation. Many health problems can be addressed through it, for instance infertility, miscarriage, polycystic ovarian syndrome and more (Tham et al. 2012). The classic methods of NFP can be divided into single index methods, like the Billings Ovulation Method and Creighton Model Fertility Care System (CrMS) (both focusing on observation of cervical mucus changes), as well as multi-index methods like symptothermal methods, considering basal body temperature fluctuations in addition to other symptoms. The Lactation Amenorrhea Method (LAM) is a natural family planning method for women who breastfeed and are amenorrheic; it can be used up to six months postpartum (Van der Wijden, et al. 2015). The examples of NFP methods which are enriched with some advanced techniques can be so called new technologies as Persona, Lady comp and the Marquette Method that introduces the use of an electronic hormonal fertility monitor to estimate the fertile phase of the cycle in combination with traditional natural markers in the postpartum period (Ślizień-Kuczapska, 2007)

1. Materials and Methods

Since FAMs are significant in the context of family planning, fertility awareness and reproductive health, a survey was conducted to check the knowl-

edge of medical students in Poland about NFP methods and their effectiveness in both achieving or avoiding pregnancy.

The scientific method used in the study was a diagnostic survey, using the online authors' own questionnaire compiled for the particular research containing closed-ended questions of single or multiple choice. From March to May 2020, the total of 542 medical students participated in the survey. The group of respondents consisted of 445 women (82.1%) and 97 men (17.9%). The mean age of the participants was 22.3 years \pm 2.11 SD with the range of 19-39 years. Among the respondents, 181 (33.3%) came from the rural areas and 361 (66.7%) from the urban areas. The majority of the participants were unmarried (518; 95.4%) and sexually active (331; 61.0%). The respondents were medical students studying at universities in 13 Polish cities: Lublin (221), Wrocław (91), Łódź (60), Warszawa (55), Białystok (37), Poznań (19), Kraków (18), Zabrze (14), Olsztyn (12), Katowice (9), Rzeszów (2), Szczecin (1) and Gdańsk (1). Two students did not declare the city of their studies. One person replied that he or she is not a student, so the questionnaire was rejected in the further analysis of the study and this person was not included to our statistics. Students were asked to complete an online questionnaire that was widespread through the online student groups. The questionnaire was divided into three parts:

1. Physiology of the Menstrual Cycle and Fertility,
2. Reproductive Health
3. Fertility Awareness-based Methods and Family Planning which is presented in this publication.

The participants' characteristics underwent a descriptive analysis. Continuous variables were presented as means \pm standard deviations (SD), and categorical variables were shown as the numbers and percentages of individuals. A two proportion Z-test was used to compare the answers of the groups of students. Differences with a p-value less than 0.05 were considered significant. The data was explored and analyzed using the RStudio ver. 1.1.463 software (Boston, MA, USA).

2. Results

The medical students' knowledge of NFP methods is presented in Table 1. Considering the best known methods, the Calendar Method and phone applications were indicated by 84.9% and 71.4% of the medical students, respectively. In the case of phone applications, females are more familiar with them than males 74.4% vs. 57.7% respectively. Ovulatory testing, the third most recognized method among the medical students (61.8%), is also significantly better known by women. In the study population, 42.4% of the participants were aware of the Billings Method and 26.4% of the Multi-index methods. The least known methods were LAM and Creighton Model System, indicated by 14.9% and 14.6% of the respondents respectively.

The main source of information about reproductive health and FAMs for medical students is the Internet, indicated by 83.0% of the respondents (Table 2). Considering other common answers, medical textbooks, consultation with medical staff and gynecology lectures were chosen by the respondents (73.4%, 48.3% and 36.0%, respectively). Female respondents more often marked consultations with medical staff than male ones, while men more frequently get the knowledge from gynecology lectures than women. In the study population, 13.3% of the participants used the friends' advice and 11.8% a talk with their parents. The least common sources of information were the NFP lectures and consultations with NFP teachers indicated by 4.8% and 2.6% of the respondents respectively. There was no significant correlation between sexual activity or respondents' year of studies and the replies to this question.

Table 1. Medical Students' Knowledge of NFP Methods

Method	Total n = 542	Males n = 97	Females n = 445	P value
Calendar Method	84.9%	86.6%	84.5%	0.7132
Phone application	71.4%	57.7%	74.4%	0.0016
Ovulatory tests	61.8%	37.1%	67.2%	<0.0001
Billings Method	42.4%	35.1%	44.0%	0.1309
Multi-index methods	26.4%	28.9%	25.8%	0.6276
LAM	14.9%	17.5%	14.4%	0.5289
Creighton Model System	14.6%	12.4%	15.1%	0.6029

Table 2. Percentage of respondents' sources of information

Information source	Total n = 542	Males n = 97	Females n = 445	P value
Internet	83.0%	83.5%	82.7%	0.9659
Medical Textbooks	73.4%	73.2%	73.5%	1.000
Consultation with medical staff	48.3%	41.2%	50.0%	0.1519
Gynaecology lectures	36.0%	40.2%	35.1%	0.4004
Friend's advice	13.3%	13.4%	13.3%	1.000
Parent's advice	11.8%	11.3%	11.9%	1.000
NFP lectures	4.8%	7.2%	4.3%	0.3328*
Consultations with NFP teachers	2.6%	3.1%	2.5%	1.000

Table 3. Percentage of respondents using different family planning methods

Type of family planning methods	Contraception	Not using a method	Natural Family Planning (NFP)	Other
Number of respondents	273	229	34	6
Percentage	50.3%	42.2%	6.3%	1.1%

The perception of the effectiveness of FAMs is presented in Figure 1. The largest group of medical students (42.3%) believe that these methods ensure efficacy at the level of approximately 50%. 22.9% of the respondents indicated the efficacy of FAM at the level of nearly 100%.

The number and percentage of the respondents using different types of family planning are presented in Table 3.

Half of the students use contraceptive methods, while 42% do not apply any methods. 6.3% of the students surveyed use NFP.

81.0% of all respondents considered FAMs helpful in planning the conception of a child.

3. Discussion

Our research focused on medical students' FAM skills and NFP knowledge; namely, its types, effectiveness in avoiding or achieving pregnancy and their own experience. There was also an attempt to assess their sources of information about fertility care.

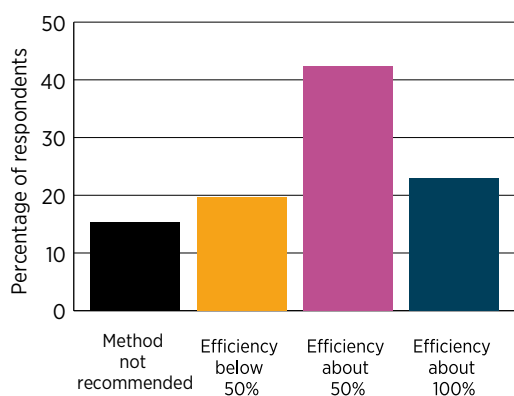


Figure 1. Medical students' attitude towards efficacy of FAM.

In the opinion of Muzyczka et al. (2012), who conducted a study among students of medicine and medical fields in Lublin, the total of 34% of the students do not use any method at all to avoid pregnancy. If they do, hormonal contraception (12%) are most commonly used, then condoms and other mechanical devices (8% each). A symptothermal method is only used by 1% of the students (Muzyczka et al. 2012). According to a study by Dębska et al. (2017) on medical students from Warsaw, as many as 64% of the respondents use or will use a condom. More than half of them (51%) uses or will use contraceptive pills, 39% use or will use NFP (Dębska et al. 2017). As far as our study is concerned, about half of the respondents declared to apply contraception and 42% are not using any method to avoid pregnancy. Only 6% of the respondents use FAMs. The low interest in NFP methods might indicate that they never gained wide use and physicians acceptance as efficient and valuable methods. This way spreading NFP widely is inhibited (Pallone et al. 2009).

Moreover, Dębska et al. (2017) highlighted the medical students' opinion on the main advantages of NFP. Detection of various gynecological diseases through NFP is believed to be helpful. NFP is also thought to involve a spouse in the observations of the female cycle. High efficacy is noticed as the benefit reported by only few respondents. Asked directly about the efficacy of NFP in avoiding pregnancy at a five-level Likert scale, the assessment of three is the most common (27%). The highest score of five was given only by 8% of the respondents. Moreover, another Polish study on Tricity students (in Gdańsk, Gdynia, Sopot in Poland) revealed that 75% of the respondents have an opinion that "the effectiveness of NFP is lower than that of condoms and oral contraceptives" and this opinion was shared by a significantly larger group of medical students than non-medical ones. Similar opinions are expressed by

doctors (Targan et al. 2018). 3-6% of family doctors, gynecologists and residents participating in the study by Choi et al., 2010) had correct knowledge about the efficacy of NFP. The underestimation of NFP translates into relatively rare inclusion of NFP in counseling on the choice of a contraceptive method (Choi, et al. 2010). FAMs efficacy is scientifically proven to be close to 100%, if it is appropriately applied (Manhart et al. 2015). However, there may be some differences between typical and correct use especially among unmarried young couples. Successful use can be determined by social attitude, sexuality, relation with partner and need of his support as well as religion and ecological aspects.

In our research, the efficacy of NFP was assessed at a medium level, about 50% by most students. The low efficacy marked by the students might be due to fact that NFP cannot be effective in avoiding pregnancy in fertile periods what make them more difficult to use for these who are not ready to observe their body language and prefer an incidental sex relation instead of a stable partnership what was already mentioned above (Simmons et.al 2020) The respondents of our research indicated some important advantages of NFP. On the question whether NFP is helpful in achieving pregnancy 81% (n = 439) of the students agreed with the value of NFP in distinguishing the fertile and infertile phases as well as its use in monitoring procreative health. The answer denying the use of NFP or the answer declaring partial helpfulness of NFP was chosen only by 8% (n = 47) of the students respectively. These results show that the knowledge of the relationship between FAM and health care is no longer taboo (Vigil et al. 2012).

Our study showed that the largest group of students (85%) selected the Calendar Method as a known NFP method, while it is based on calculation only and nowadays only has historical importance. The Calendar Method does not observe any signs of fertility which are directly connected to the cycle and thus cannot be used to determine infertile periods reliably. Using the calendar method is more guessing than knowing the fertile periods. (Johnson et al. 2018). This method has a low Pearl Index (PI), around 20, which means that 20 women in 100 who use it get pregnant per year. Moreover, in our research 71%

of the medical students marked phone applications as a known NFP method, while the majority of apps implement a mobile version of the Calendar Method (Fehring 2005). The Billings Method is quite well known (42 %), but other NFP methods like multi-index methods, the Creighton Model are known by only 26%, and 14% of the students, respectively. This means that medical students have heard about NFP methods but probably know little about them and are unlikely to use them in practice. Meanwhile, it is known that modern NFP methods may have a high success rate in avoiding conception; for example: The Billings Method in correct use has a PI of 1.1 and in typical use a PI of 10.5 (Duane et al. 2022), the Creighton Model System has a PI of 0.5 (Hilgers, Stanford, 1998), and multi-iIndex – symptothermal methods have a PI of 0.4 with correct use and a PI of 1.8 with typical use (Frank-Herrmann, et al. 2007). The female respondents tend to be slightly more familiar with NFP methods than the men, for example the Billings Method was known by 44% of the women and by 35% of the men. Interestingly, no significant correlation was found between the years of studies and answers about known NFP methods chosen in our research in contrast to the study by Chawłowska, 2020 where the increasing age of students corresponded with overall greater knowledge about fertility awareness. This might indicate that careful explanation of NFP is neglected during medical studies. Moreover, in the study of Tricity, there was a significant increase in positive responses regarding high efficacy of NFP, which correlated with older non-medical participants. It is compelling, however, there was no such correlation found among medical students. Therefore, again, it can be concluded that studying at medical universities does not always provide the students with reliable and up-to-date knowledge of NFP efficacy (Targan et al. 2018).

Furthermore, in our research, the correlation was not found in the case of students' sexual activity and their knowledge of NFP methods. This might indicate that progress in students' sexual activity might not correlate with more interest in NFP. This could be explained by the fact highlighted by Meston, 2007, that people's most frequent motives

of sexual acts are connected to physical pleasure and emotional sphere (Meston, 2007). Planning a family can be deduced to stand in a further place in these motivations, so people are not interested in deepening their knowledge on NFP. Another possible reason for lack of knowledge or insufficient eagerness to use NFP is due to some difficulties of the application like regularity and accuracy of the observation of symptoms (Dębska et al. 2017). This can be partially confirmed by our study because NFP was assessed as too difficult to use daily, especially in women with irregular cycles or that it disturbs the spontaneity of intercourse (8% and 2%, respectively). NFP are sometimes perceived as methods reserved only for women with a normalized lifestyle and regular menstruation. That was confirmed by 74.3% of the respondents stated in the study in Tricity (Targan et al. 2018). This might be the reason for considering NFP as irrelevant to them; therefore, they neither gather information on it, nor use it. Moreover, according to the study by Pedro et al., higher levels of fertility awareness is presented by the groups of women and educated individuals but more importantly by people having difficulty in conceiving and those that had planned their pregnancies. This might mean that people without the need for the use of NFP are not well informed about it and its efficacy (Pedro et al. 2018).

In the study of Muzyczka, 40 % of the medical students assess their knowledge about fertility as poor, while 45% of them admitted ignorance. Only 2% of the medical students were noted to have a good knowledge about fertility awareness. The study in Melbourne on students of various fields (Prior et al. 2019) discovered that at least two-thirds of the respondents rated their knowledge about the physiology of reproduction, prevention of sexually transmitted infections and avoiding pregnancy as 'good'. However, proportions rating their knowledge about fertility care and the influence of various factors on fertility as 'good' were much lower. This might indicate a lack of coherence between fertility knowledge and fertility care among students.

The sources from which students learn about reproductive health, including NFP, might to some extent show the quality of knowledge they

achieve. In the study by Muzyczka et al. (2012), the most preferred sources of information for medical students were books (65%) and the internet (61%). About 29% draw knowledge from medical consultations and 21% learn from the journals. About 14% gain the knowledge from a friend or from the media [10]. According to the study in Melbourne (Prior et al. 2019), the internet as well as general practitioners were the most preferred sources of information on fertility by 55% and 33%, respectively. Few students rated friends or family as their top source of information (6%). In our research, the most common source of information was also the internet (83%), medical textbooks and consultation with medical staff (73% and 48%, respectively). However, in the study on medical staff in Warsaw, most of the respondents (64%) claimed that the issue of NFP is rarely discussed in media, handbooks and medical journals (Bączek et al. 2017).

Danis et al. conducted a study on 3rd-year medical students at one institution in the USA, where students were given a quiz containing the same questions before and after two lectures about FAMs included in their OB-GYN rotation. The examination showed that students' knowledge improved from the initial test score of 39% to the final test score of 54%. Furthermore, students have acquired more confidence in sharing information about NFP with patients, as well as in using NFP to diagnose and treat gynecological and reproductive problems (Danis et al. 2017). This shows a possibility of effective refinement of the students' knowledge by the provision of extra lectures.

Conclusions

The knowledge of modern FAMs among medical students from selected Polish universities can be considered as medium. Most of them confirm its value in planning the conception and in expressing woman's health status. Unfortunately, our research did not reveal the actual scale of their use for this purpose in practice. Among the well-known NFP methods are the ones of historical importance, like

the Calendar Method, or their modern equivalents for instance phone applications. Modern NFP methods are less known and used by only very few students on the contrary to contraceptive methods' popularity. It seems that students' interest could increase only if they were given the opportunity to learn more about the physiology underlying FAM and its importance in reproductive health care. Knowing FAM can provide them to choose NFP as a life style. This decision needs partnership acceptance, joint commitment and shared responsibility for the creation of new human life. The knowledge of NFP methods seems to be higher among females but not correlated with the

year of studies or sexual activity. The main source of information about reproductive health is the internet, medical textbooks and university lectures.

Medical university curricula and textbooks contain only residual information about FAMs. Therefore, the introduction of modern knowledge about fertility-based awareness and its application in procreative health care is of great significance and urgent necessity to the future medical staff. It might be helpful to underline unique advantages of FAM, for example allowing women to be active participants in monitoring their gynecologic health as well as in building strong relationships with their partners.

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