

NOWAK, Aleksandra, NOWAK, Alicja and KIELBOWICZ, Magdalena. Foreign bodies inside us - Trends and knowledge regarding long-acting reversible contraceptives (LARCs) use, factors influencing of contraceptives choice-making process, and the dual-method use among Polish college-aged women. Journal of Education, Health and Sport. 2023;15(1):90-105. eISSN 2391-8306. DOI <http://dx.doi.org/10.12775/JEHS.2023.15.01.011>
<https://apcz.umk.pl/JEHS/article/view/44446>
<https://zenodo.org/record/8125156>

The journal has had 40 points in Ministry of Education and Science of Poland parametric evaluation. Annex to the announcement of the Minister of Education and Science of December 21, 2021. No. 32343. Has a Journal's Unique Identifier: 201159. Scientific disciplines assigned: Physical Culture Sciences (Field of Medical sciences and health sciences); Health Sciences (Field of Medical Sciences and Health Sciences). Punkty Ministerialne z 2019 - aktualny rok 40 punktów. Załącznik do komunikatu Ministra Edukacji i Nauki z dnia 21 grudnia 2021 r. Lp. 32343. Posiada Unikatowy Identyfikator Czasopisma: 201159. Przynależność dyscypliny naukowej: Nauki o kulturze fizycznej (Dziedzina nauk medycznych i nauk o zdrowiu); Nauki o zdrowiu (Dziedzina nauk medycznych i nauk o zdrowiu).
© The Authors 2023;
This article is published with open access at License Open Journal Systems of Nicolaus Copernicus University in Torun, Poland
Open Access. This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author (s) and source are credited. This is an open access article licensed under the terms of the Creative Commons Attribution Non commercial license Share alike. (<http://creativecommons.org/licenses/by-nc-sa/4.0/>) which permits unrestricted, non commercial use, distribution and reproduction in any medium, provided the work is properly cited.
The authors declare that there is no conflict of interests regarding the publication of this paper.
Received: 09.06.2023. Revised: 24.06.2023. Accepted: 25.06.2023. Published: 12.07.2023.

Foreign bodies inside us - Trends and knowledge regarding long-acting reversible contraceptives (LARCs) use, factors influencing of contraceptives choice-making process, and the dual-method use among Polish college-aged women

Aleksandra Nowak

Sz. Starkiewicz Specialist Hospital in Dąbrowa Górnicza, Szpitalna 13, 41-300 Dabrowa Gornicza, Silesia, Poland
amm.nowak97@gmail.com
ORCID: 0009-0006-8572-8798

Alicja Nowak

7th Navy Hospital in Gdańsk, Polanki 117, 80-305 Gdansk, Pomerania, Poland
alicja.nowak.97@gmail.com
ORCID: 0009-0000-4684-2877

Magdalena Kielbowicz

Medical University of Silesia, Katowice, Silesia, Poland
magdalena.kielbowicz1506@gmail.com
ORCID: 0009-0002-0152-2305

Abstract:

Introduction: The choice-making process of the contraceptive method seems complex and influenced by many factors. Long-acting reversible contraceptives require mechanical interference with the woman's body. For some, it will be an insurmountable barrier whilst for others a chance to enjoy a successful sex life without fear of pregnancy. Recognizing the factors influencing their use will allow us to identify target groups, increase awareness, and spread knowledge about them.

Purpose: This study aimed to assess contraceptive use trends and knowledge, focusing on long-acting reversible contraceptives (LARCs) and vaginal rings, also to identify predictors associated with their use and analyze the decision-making process for dual-method use (hormonal plus barrier method) among female college students in Poland.

Materials and methods: A self-administered questionnaire including 44 questions in the form of a web-based survey distributed among peers in social media platforms and forums.

Results: In the survey a total of 700 female students aged 19±25 took part. All the questions about LARC and vaginal rings were answered correctly by only 19 participants (2.71%). The most knowledgeable were medical students ($p < 0.0001$). Out of 55 LARC and vaginal ring users (7.86%), 47 female students (76.4%) stated the improvement of their life. Of the methods interfering with the body, the study group most frequently chose the vaginal ring (38.1%) and least frequently the hormone injection (0.1%).

Conclusions: Participants' knowledge of LARC methods and vaginal rings is insufficient and its main influencing factors are faculty type and frequency of intercourse. LARC and vaginal disc are not the first contraception choice. Fear of pregnancy is the most common factor for dual method use.

Keywords: LARCs; dual-method; college students; contraception; reproductive health.

Introduction:

Choosing a contraceptive method is a complex process in which personal circumstances, access to and also the type of information, and other factors such as a partner's participation in the decision-making play an important role. Despite the widespread availability, efficacy, and convenience of long-acting reversible contraceptive methods, they are not the most common contraceptive choice in the college-aged female population. Analyzing data from the

report “The State of Health of the Polish Population in 2019” carried out by the GUS - Polish Central Statistical Office, we can conclude that in the population of Polish women between the ages of 15 and 49 years in urban areas of age, only 54,1% of them are using contraceptives whereas in rural areas - 49,7%, which in the group of 20-29 aged woman in urban areas - 55,6%, and 43,2% in rural areas [1]. Also based on the data and article of the program “ZDROWA ONA” initiated by Gedeon Richter there is a statement that more than 50% of the Polish female population does not use any contraception, it is reported that the reasons may be a lack of sex education and fear of complications of contraceptive use [2]. Contraceptive use by Polish female populations varies according to their education, marital status, and marriage or informal relationship in a shared household. It is reported that of the various types of contraception among women aged 15-49, the most popular methods are the following 44,8% condoms, 29,8% - a contraceptive pill or other hormonal agents (i.e, patches, injections), 12,2% - calendar-based contraceptive method, 11,5% - coitus interruptus, 8,2% - intrauterine device, 3% - measuring the temperature and/or observation of cervical mucus, 2,5% - others methods and 1,9% - chemicals and other mechanical contraceptives. In the group of 20-29 aged women - the most common are 49,2% - condoms, 38,8% - contraceptive pills or other hormonal agents (i.e, patches, injections), and 11,4% - calendar-based contraceptive methods, the use of IUD is reported to be at the level of 1,8%, what’s interesting in the group of 15-19 aged woman IUD use is at the 12,3%, which is the third common method among this group [1]. In comparison to other reports - data collected in 2004 and 2009 women are increasingly turning to methods of contraception such as condoms and the birth control pill and other hormonal agents (i.e, patches, injections), while they are moving away from natural methods (such as calendar-based contraceptive method and measuring the temperature and/or observation of cervical mucus) and intermittent intercourse, this trend is strengthening over the years, especially when it comes to women living in urban areas [3]. There are differences in the chosen method of contraception depending on the area inhabited, the level of education, and age, for example, the trend of using natural methods and intermittent courses is strengthening in the countryside and among those with lower education, which may increase health inequalities. Unfortunately, a comparison of this data with the 2019 data is not elaborated, looking at the data included in the tables - this trend could be maintained. Also noteworthy is a report that reports that Poland's position in a ranking that assesses access to contraception and knowledge about it relative to Europe has declined [2]. Based on the data collected it is important to recognize the factors influencing the use of contraceptive methods, it will allow us to identify target groups to increase

awareness and spread knowledge about them. In this study, we mainly focused on LARCs because they have one of the highest efficacy rates compared to oral contraceptives and condoms, where the annual pregnancy rate was 1%, 9%, and 18% for LARCs, oral contraceptives, and condoms, respectively [From awareness to the usage of long-acting reversible contraceptives: Results of a large European survey - PMC], mostly since LARCs are independent of user compliance. But let's take a step back and define what LARCs are. Long-acting reversible contraception (LARC for short) includes hormonal and copper IUDs (intrauterine devices), subdermal implants, and injections [5,6]. Also in our study, we included vaginal ring/disc, which is a hormonal method that requires monthly disc replacement. The above methods involve mechanical interference in the woman's body, which for many may be an insurmountable barrier. All of the above methods of preventing pregnancy have in common high effectiveness, convenience of use, and reversibility. Also what caught our attention was the use of barrier methods while the first contraceptive method of choice was a non-barrier method. Using dual-method protection is important because of the reduction of the spread of sexually transmitted infections (STIs). As there is also a high teenage birth rate with 11 births per 1000 adolescents and 2.59 abortions per 1000 live births [4], it is relevant to understand the underlying cause and factors influencing contraceptive use among Polish females. In this study we mainly focused on college-aged females as it was the most interesting to us what is the state of knowledge and what motivates the choice of different methods of contraception of our peers by having access to different groups as students, we had an easier task in collecting the data needed for the study.

The aim of the work:

The main objective of this study was to assess the state of knowledge about LARCs and disc use. In addition, the study was aimed at finding target groups that require increased awareness and knowledge of contraception. Equally important was to understand and find factors influencing the decision-making process regarding contraceptive choice and dual-method use.

Materials and methods:

The study included 700 sexually active female students between the ages of 19 and 25 who filled out the author's questionnaire. The data was collected in February 2022. Exclusion criteria involved incomplete data regarding the volume of contrast media and the serum

creatinine level. Inclusion criteria involved - being a female student from Polish universities and exclusion criteria involved the abstinence from sex in the last 6 months before completing the survey. The self-administered questionnaire consisted of 44 questions. We collected the following variables:

- sociodemographic data,
- sexual activity
- pregnancy plans
- methods of contraception
- dual-method use

The questionnaire also included questions testing the respondents' knowledge of LARCs and vaginal rings - 3 questions for each of 4 methods regarding the duration of effectiveness, the basic mechanism of action, and the possibility of use by a nulliparous woman (a female of reproductive age who has never had a live delivery). The questionnaire was distributed on online forums, student groups, and on social media platforms. This study did not require the opinion of the Bioethics Committee. The data were statistically processed using TIBCO Statistica 13. Analysis of variance was carried out using the Kruskal-Wallis test. Correlation analysis was carried out using Spearman's rank correlation. The level of significance adopted was 0.05. The strength of the correlation was expressed according to Guilford's classification.

Results and analysis:

Characteristics of the studied group.

The study involved 700 female students. The majority of respondents were 23 years old (19,3%) and were 5th-year students (28,3%). The most likely to participate in our study were medical faculties students (which corresponds to 42% of all participants), followed by students of humanities (38%) and technology (20,3%). Approximately 31% of respondents live in cities with a population of over five hundred thousand. Most of the students were in informal relationships - as many as 73.7%, at the time of the study their relationships lasted from 2 to 5 years (43,9%), and only 36.4% lived with a partner. The highest number of students in our study were sexually active several times a week (39%), 399 women (57%) declared the will to have children, and 18 students already had children (2,5%).

The detailed characteristics of the study group in terms of basic sociodemographic data and faculty, year of study are presented in Table 1. Table number 2 presents detailed characteristics of the study group in terms of the type of relationship, duration of relationship

(RS), living with a partner, frequency of sex, and pregnancy plans. For qualitative variables, the frequency (N) and percentage (%) of occurrence of each category of results are provided.

Table 1. Characteristics of the studied group. Age, faculty, year of study, and residence of participants.

Age (n/%)	<19	19	20	21	22	23	24	25	>25
All participants n=700	0 (0)	34 (4.9)	70 (10)	100 (14.3)	101 (14.4)	135 (19.3)	124 (17.7)	82 (11.7)	52 (7.4)

Faculty (n/%)	Medical	Humanities	Technical
All participants n=700	292 (41.7)	266 (38)	142 (20.3)

Year of the studies (n/%)	I	II	III	IV	V	VI
All participants n=700	130 (18.6)	74 (10.6)	131 (18.7)	108 (15.4)	198 (28.3)	59 (8.4)

Acommodation (n/%)	Rural	City
All participants n=700	125 (17.8)	574 (82.2)

Source: Own study

Table 2. Characteristics of the studied group. Type of relationship, duration of relationship (RS), living with a partner, frequency of sex, and pregnancy plans.

Type of relationship (n/%)	Formal	Informal	Single	Divorced	Widow
All participants n=700	84 (12)	516 (73.7)	98 (14)	0 (0)	2 (0.3)

Duration of RS (n/%)	Single	<3 months	3-6 months	Year	2-5 years	>5 years
All participants n=700	97 (13.9)	25 (3.6)	52 (7.4)	84 (12)	307 (43.9)	135 (19.3)

Living with partner (n/%)	Yes	No
All participants n=700	255 (36.4)	445 (63.6)

Sexual activity (n/%)	Every day	A few times a week	A few times a month	Once every few weeks	Several times a year
All participants n=700	23 (3.3)	273 (39)	267 (38.1)	50 (7.1)	87 (12.4)

Pregnancy plans (n/%)	Yes	No	I don't know	I already have kids and want more	I already have kids and don't want more
All participants n=700	399 (57)	102 (14.6)	181 (25.9)	10 (1.4)	8 (1.1)

Source: Own study

LARCs and vaginal rings use

Indication of IUD, implant, vaginal ring, or injection as a contraceptive method was an inclusion criterion for the LARC and vaginal ring group, which was redirected to an additional question pool. 7.9% (N=55) of female students met the criteria and were included

in the LARC and vaginal ring group, with the vaginal ring being the most common choice 47%, N= 26, followed by the IUD(38%, 21), then the implant (13%, 7), and the injection (2%,1) was the least common. Among LARC and vaginal ring users, most of them had been using the method for 1 to 3 years (29%); quite interestingly, most of them started using this method when they were younger than 19 (27%, N=15). Only 18% of this group used this method for the first time in their lives. The others declared that they had used male condoms as well as one- and two-component contraceptive pills earlier. The detailed characteristics were presented in Table 3.

Table 3. The duration of LARCs and vaginal ring use, Age of onset of LARCs or vaginal ring use, “Is this the first contraceptive method in Your life?” - question regarding LARCs or vaginal ring.

The duration of use (n/%)	<3 months	3-6 months	6-12 months	1-3 years	>3 years
n=55	9 (16.4)	13 (23.6)	7 (12.7)	16 (29.1)	10 (18.2)

Age of onset of LARCs or vaginal ring use (n/%)	<19	19	20	21	22	23	24	25	>25
n=55	15 (27,2)	8 (14,5)	10 (18,2)	7 (12,7)	2 (3,6)	5 (9,0)	2 (3,6)	2 (3,6)	4 (7,2)

Is this the first contraceptive method in your life? (n/%)	Yes	No
n=55	10 (18)	45 (82)

Source: own study

The most common source of knowledge about LARC and vaginal rings was the internet (38%), followed by the gynecologist (35%). The role of schools and parents in the information process was still small, 3.6%, and 5.5% respectively. Female students had not heard about such methods from doctors of other specialties.

Convenience (47.3%) and high effectiveness (45.5%) were the most frequently mentioned reasons for starting to use methods requiring interference with a woman's body. About 76% of the female students declared an improvement in their quality of life and about 91% planned to continue the method. About 71% of the respondents included their partners in the

decision-making process about the method of contraception. 60% of the respondents experienced side effects, most frequently abnormal bleeding, mood swings, and weight gain.

The dual-method

The dual-method use (meaning LARC or vaginal disc use plus barrier method use) was declared by only 20% of women using LARC. The most common reason was fear of pregnancy (45%). Other frequently cited reasons were doubts about the method and lack of protection against sexually transmitted diseases.

Other contraceptive methods

Among the other methods, the use of the two-component pill (Combination birth control pill) was dominant, followed by the male condom. Unfortunately, as many as 52 female students (7.4%) did not use contraception and 15 (2.1%) mentioned intermittent intercourse as a form of contraception. The majority of the female students were satisfied with the current method, about 63% of the respondents have never considered using LARCs/vaginal rings. Among the reasons for this, as many as 146 (20%) women admitted that they did not know about the existence of such methods at all. Fear of later problems with getting pregnant and feeling unwell, as well as price were also frequently cited, 10%, 7.2%, and 4.4%, respectively. Other reasons mentioned by the respondents included: getting used to the current method, lack of suggestions from gynecologists, health problems for which they already take hormonal contraception in the form of pills, and fear of application, among others.

Assessment of the knowledge about the LARCs and vaginal ring

The study showed that 59.1% of female students thought that LARC and vaginal ring methods are not popular in Poland, and 84% of female students declared that Polish people do not have wide knowledge about them. In the below analysis, a Score% was used to describe the level of knowledge. The knowledge score% was obtained in the following way: each wrong answer was marked - (-1), the answer "don't know" - (0), and each good answer - (1), so it can be deduced that 0% is all wrong answers - terrible level of knowledge, the participant was mistaken, 50% is the lack of knowledge, 100% is all correct answers - completely good level of knowledge.

knowledge vs. field of study

In the Kruskal-Wallis ANOVA test, it was observed that the levels of knowledge differed significantly depending on the subjects' field of study. Female medical students had the highest level of knowledge with 79.2 (70.8-87.5) %, lower technical students with 70.8 (58.3-79.2) %, and humanities students with 70.8 (58.3-79.2) % ($p < 0.0001$).

Figure 1: Box and whisker plot of the level of knowledge according to the respondents' field of study.

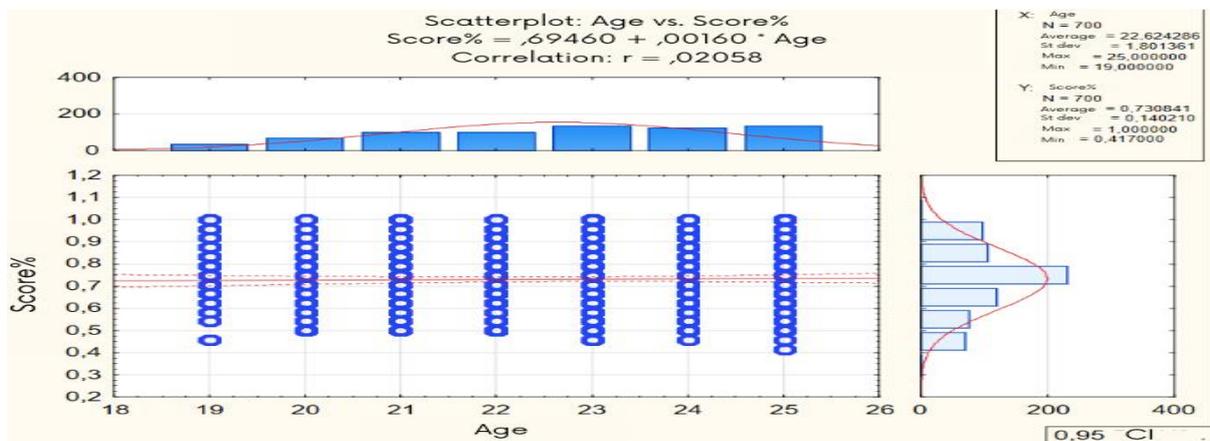


Source: own study

knowledge vs age

In the rho-Spearman correlation test, no relationship was observed between the age of the subjects and their level of knowledge about LARCs ($\rho = 0.02$; $p = 0.55$).

Figure 2. Scatterplot of age and knowledge level of respondents

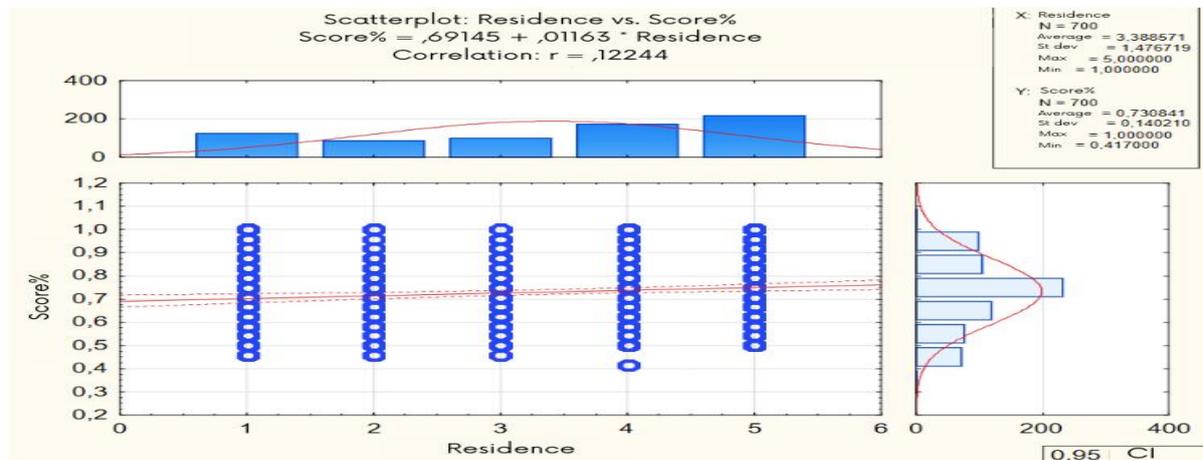


Source: own study

knowledge vs place of residence

In the rho-Spearman correlation test, a weak positive correlation was observed between the size of the respondent's place of residence and their level of knowledge about LARCs (rho=0.12; p=0.002).

Figure 3. Scatter plot of residence and knowledge level of respondents

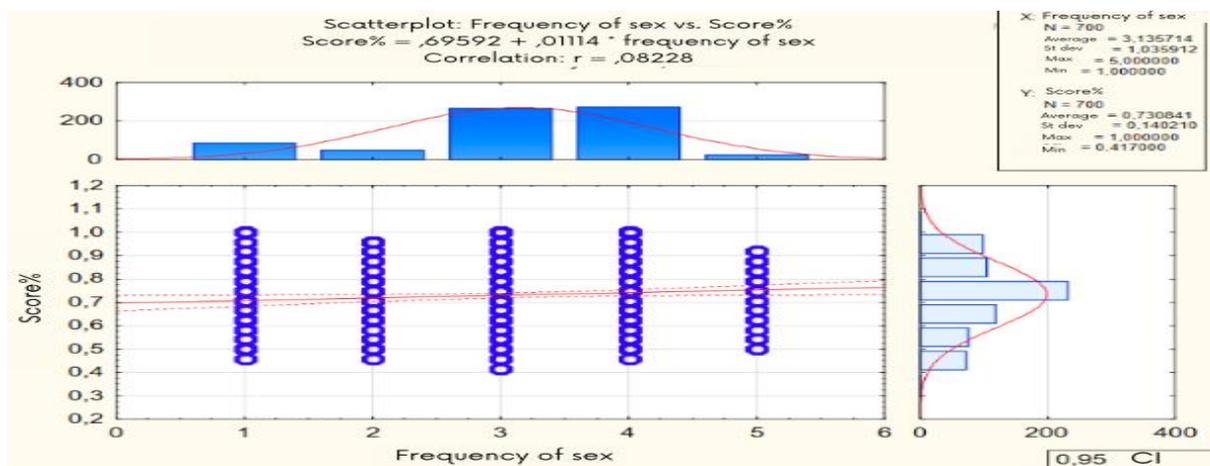


Source: own study

knowledge vs frequency of sex

In the rho-Spearman correlation test, a weak positive correlation was observed between the subjects' frequency of sex and their level of knowledge about LARCs (rho=0.08; p=0.03).

Figure 4. Scatter plot of the frequency of sex and level of knowledge of respondents



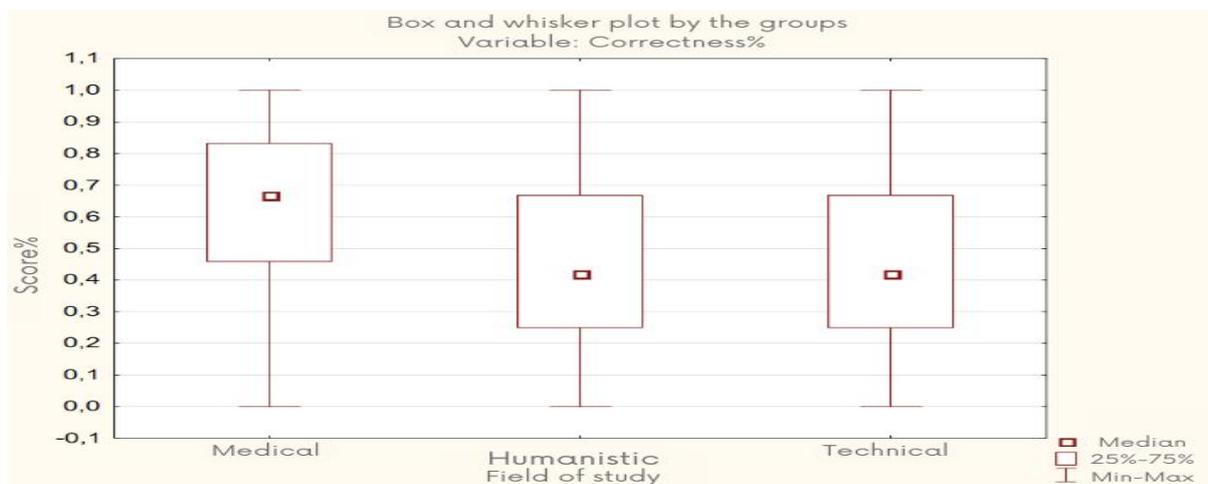
Source: own study

In the below analysis, a correctness% was used to describe the level of knowledge. The correctness% was obtained in the following way: each wrong answer or “don’t know” answer was marked - (0), and each good answer - (1), so it can be deduced that 0% is the terrible level of knowledge, the participant was mistaken or did not know, 100% is all correct answers - completely good level of knowledge.

knowledge vs. field of study

In the Kruskal-Wallis ANOVA test, it was observed that the levels of knowledge differed significantly depending on the subjects' field of study. Female medical students had the highest level of knowledge with 66.7 (45.9-83.3) %, lower technical students with 41.7 (25.0-66.7) %, and humanities students with 41.7 (25.0-66.7) % ($p < 0.0001$).

Figure 5. Box and whisker plot of the level of knowledge according to the respondents' field of study.

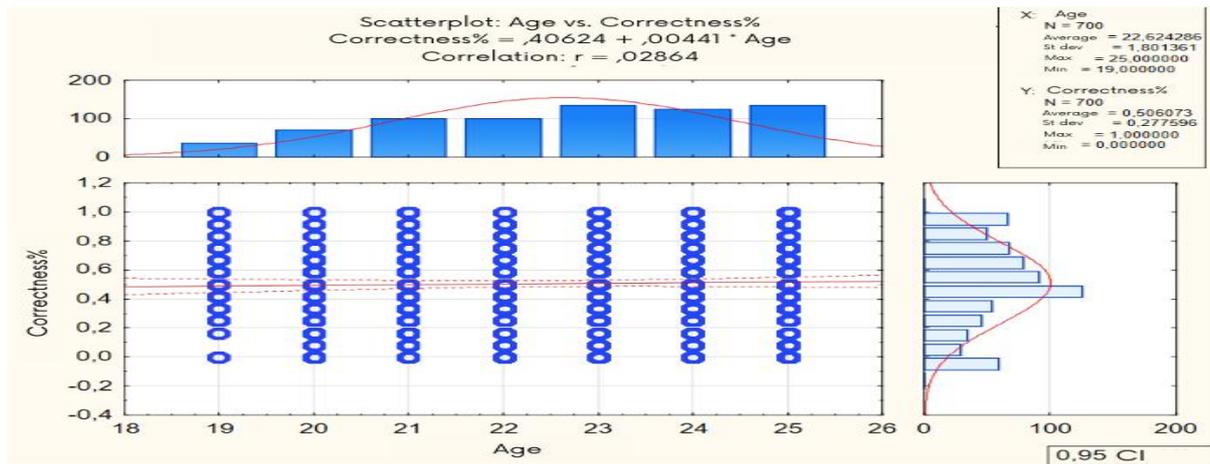


Source: own study

knowledge vs age

In the rho-Spearman correlation test, no relationship was observed between the age of the subjects and their level of knowledge about LARCs ($\rho = 0.04$; $p = 0.30$).

Figure 6. Scatterplot of age and knowledge level of respondents

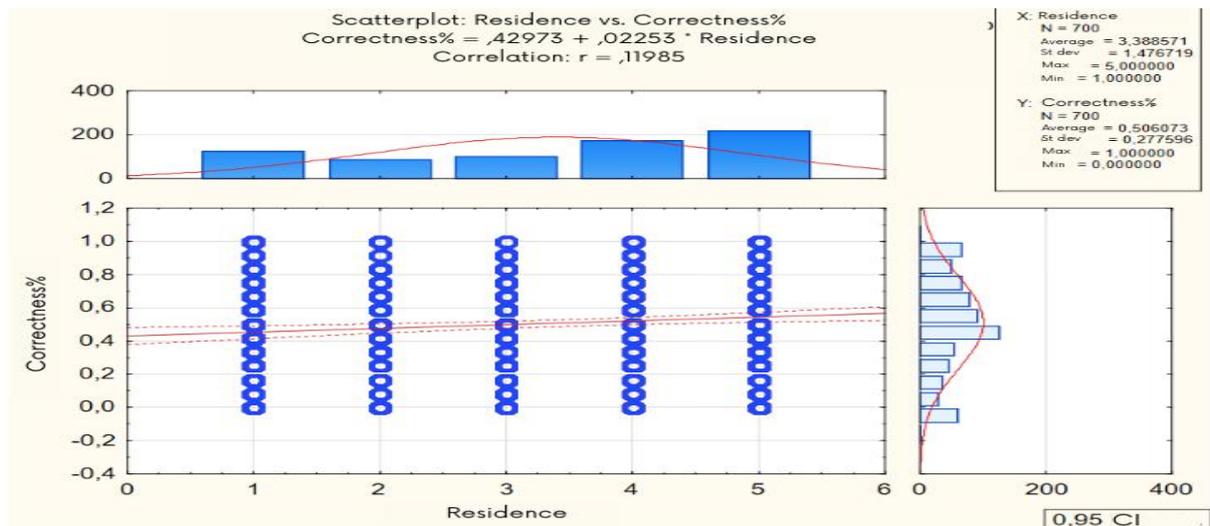


Source: own study

knowledge vs residence

In the rho-Spearman correlation test, a weak positive correlation was observed between the size of the respondent's place of residence and their level of knowledge about LARCs ($\rho=0.12$; $p=0.002$).

Figure 7. Scatterplot of residence size and knowledge level of respondents

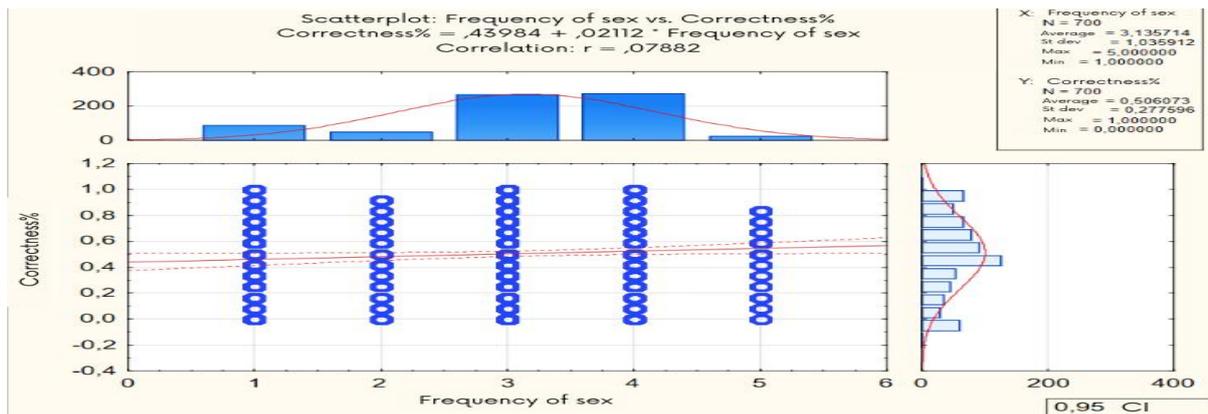


Source: own study

knowledge vs. frequency of sex

In the rho-Spearman correlation test, a weak positive correlation was observed between respondents' frequency of sex and their level of knowledge about LARCs ($\rho=0.08$; $p=0.03$).

Figure 8: Scatterplot of frequency of sex and level of knowledge of respondents



Source: own study

Discussion:

The Kruskal Wallis ANOVA test showed that the level of knowledge differed significantly depending on the field of study, data presented in Figure 1. The highest level of knowledge was represented by medical faculties students, then technical and humanities ($p < 0,0001$).

Spearman's rank correlation:

- No correlation was observed between the level of knowledge and the age of the respondents ($\rho = 0,02$; $p = 0,55$), Figures 2. and 6.
- There is a weak positive correlation between the size of the residence and the level of knowledge ($\rho = 0,12$; $p = 0,002$), Figures 3. and 7.
- A weak positive correlation exists between the frequency of intercourse and the level of knowledge ($\rho = 0,08$; $p = 0,03$), Figures 4. and 8.

The main conclusion that we can take from our study is that the knowledge of female students on LARC methods is insufficient. The factors that affect the most the level of knowledge are the residence and frequency of intercourse. What's interesting is that despite the widespread availability, efficacy, and convenience of long-acting reversible contraceptive methods, they are not the methods of choice among the population of Polish, college-aged women. Nowadays LARCs are recommended for unintended pregnancy prevention among nulliparous women [7]. In our study among the reasons not to choose methods that require mechanical interference with the woman's body were firstly the lack of awareness of the possibility of such a choice, fear of later problems with getting pregnant and feeling unwell, as well as price. Our results underscore the importance of providing sufficient contraceptive information and counseling on the safety, efficacy, and appropriateness of long-acting

reversible contraceptives. Similar conclusions are provided by Bostick, 2020 [8]. Most female college students using LARC or the disc do not use barrier methods at the same time, whereas it is important that using a dual method protects against STIs and awareness of that should be raised. Dual method use is most often due to fear of pregnancy.

Conclusions

The conducted study has expanded our knowledge about the factors that may influence LARCs and vaginal ring use. However, further research would be warranted to better understand the mechanisms of this correlation. In our study, we identified target groups where education and awareness about contraceptive methods should be increased and the importance of using barrier methods raised.

Key points:

1. Female students' knowledge of LARC methods is unsatisfactory.
2. Female medical students have the highest level of knowledge.
3. There is a correlation between the size of the place of residence and the level of knowledge, and also between the frequency of intercourse and the level of knowledge.
4. LARC or vaginal ring methods are not the most frequently chosen methods in the population of Polish college-aged women.
5. The most popular method is the vaginal ring, and the least popular is the injection.
6. Most female college students using LARC or the disc do not use barrier methods at the same time
7. Dual method use is most often due to fear of pregnancy.

Declarations

Author's contribution: Conceptualization, A. N. (Aleksandra Nowak) and A. N. (Alicja Nowak) ; methodology, M. K. ; software, M. K.; check, A. N. (Alicja Nowak) ; formal analysis, A.N. (Aleksandra Nowak); investigation, A. N. (Alicja Nowak) ; resources, M. K. ; data curation, A. N. (Alicja Nowak) ; writing - rough preparation, A. N. (Alicja Nowak) and A. N. (Aleksandra Nowak); writing - review and editing, M. K., A. N. (Alicja Nowak) and A. N. (Aleksandra Nowak); visualization, A. N. (Aleksandra Nowak); supervision, A. N. (Aleksandra Nowak); project administration, A. N. (Alicja Nowak) ; All authors have read and agreed with the published version of the manuscript.

Funding

This research received no external funding.

Institutional Review Board Statement

Not applicable.

Informed Consent Statement

Not applicable.

Data Availability Statement

Not applicable.

Conflicts of Interest

The author declares no conflict of interest.

References

1. “Stan zdrowia ludności Polski w 2019 r.” Główny Urząd Statystyczny, 31 August 2021, <https://stat.gov.pl/obszary-tematyczne/zdrowie/zdrowie/stan-zdrowia-ludnosci-polski-w-2019-r-6,7.html>.
2. „Zdrowa ONA – co pobudza i obniża kobiece libido?”, raport badawczy agencji SW Research w ramach programu „Zdrowa ONA”, https://zdrowa-ona.pl/ginekologia/antykoncepcja/co-warto-wiedziec-o-antykoncepcji/ponad-50-polek-nie-stosuje-zadnego-rodzaju-antykoncepcji-powodem-moze-byc-brak-edukacji-seksualnej-oraz-czesto-bezpodstawna-obawa-przed-powiklaniami/#_ftn1
3. “Stan zdrowia ludności Polski w 2009r.” Główny Urząd Statystyczny, 7 August 2011, <https://stat.gov.pl/obszary-tematyczne/zdrowie/zdrowie/stan-zdrowia-ludnosci-polski-w-2009-r-6,5.html>

4. "European Contraception Policy Atlas - Poland | EPF." European Parliamentary Forum for Sexual and Reproductive Rights (EPF), <https://www.epfweb.org/node/745>.
5. Hillard, Paula J. Adams. "What is LARC? And why does it matter for adolescents and young adults?." *Journal of Adolescent Health* 52.4 (2013): S1-S5, [10.1016/j.jadohealth.2013.02.001](https://doi.org/10.1016/j.jadohealth.2013.02.001)
6. „Intraurine contraception”; Natalie S Whaley, Anne E Burke; *Women’s Health*, Volume: 11 issue: 6, <https://doi.org/10.2217/whe.15.77>
7. „Foreign objects in college bodies: young women’s feelings about long-acting reversible contraception (LARC)”; Emily S Mann, Ashley L White, Cynthia Beavin, Gabrielle Dys; *Women Health*, 2020 Jul; 60(6), DOI: [10.1080/03630242.2019.1710891](https://doi.org/10.1080/03630242.2019.1710891)
8. „Adolescent Self-Reported Use of Highly Effective Contraception: Does Provider Counseling Matter?; Erica A. Bostick MD, Katherine B. Greenberg MD, Maria Fagnano MPH, Constance D. Baldwin Ph.D., Jill S. Halterman MD, MPH, Susan M. Yussman Md, MPH; *Journal of Pediatric and Adolescent Gynecology* Volume 33, Issue 5 October 2020, <https://doi.org/10.1016/j.jpag.2020.06.005>