Motivators for emergency contraception: Previous pregnancy and condom rupture

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A B S T R A C T

Objectives: Little is known about the motivations to apply for emergency contraception (EC). Our first aim was to explore the motivating circumstances to use EC as fast as possible. Our second aim was to explore the contraceptive method of the population seeking EC.
Study design: This present retrospective observational study between July 2021 and September 2021 is embedded in the MEEC (Motivation and Epidemiology of Emergency Contraceptive Pill) based on the study cohort of a Hungarian data bank containing follow-up data of 455 women applied for EC telemedicine consultation. Variables assessed were: age, gynecological history (pregnancies, abortions, miscarriages), data of the intercourse (elapsed time, contraceptive method), and data of the menstrual cycle, and relationship status.
Results: Of all patients, 59.3 % reported condom rupture, 29.5 % no protection, and 11.2 % other. Patients using condom applied for EC significantly sooner than those using no protection and using other protective methods. A significantly shorter elapsed time was observed in patients with a history of a previous pregnancy. No significant relationship was seen between the way of protection, previous pregnancies, and surprisingly the time of ovulation despite the obvious intention of avoiding pregnancy.
Conclusions: This is the first study to examine the potential role of epidemiologic factors as motivators for EC on the basis of a large patient cohort. Our study demonstrates the significant role of condom rupture/use and the history of previous pregnancies to be the strongest motivators for EC.

1. Introduction

Unintended pregnancy is a major global issue. 44 % of all pregnancies were unintended in the United States in 2008–2011 [1]. On a global scale, an estimated 121 million unintended pregnancies occur annually, constituting 48 % of all pregnancies, as per data

compiled from 2015 to 2019. Over this five-year timeframe, approximately 61 % of these undesired pregnancies were resolved through abortion [2]. Unwanted pregnancies have higher maternal health risks such as increased occurrence of vaginal bleeding, urinary tract infections, as well as gestational diabetes [3]. In the realm of unintended pregnancies, women may opt for abortion, drawing from a multitude of motivations, each rooted in their distinctive and intimately woven life circumstances. In Hungary, there were about 33 abortions per 100 live births, which means an induced abortion for every three births in 2016 [4]. Therefore, it is important that women have access to a full range of contraceptive methods, including especially EC (emergency contraception). Two EC pills are available in Hungary, containing levonorgestrel (LNG) 1.5 mg or ulipristal acetate (UPA) 30 mg, both are available only on pre-scription after consulting a practitioner. Levonorgestrel and ulipristal acetate can be used within 72 and 120 h after unprotected intercourse, respectively. The working method of these pills is that they delay ovulation by interfering with the preovulatory lutei-nizing hormone (LH) surge, thickening the cervical mucus and also blocking the transfer of the sperms; thus, the time window plays an important role in their effectiveness [5,6].

Several epidemiological factors may influence the use of emergency contraceptives. The urgent need for emergency contraception may depend on trust in the partner and the status of the relationship. Other influencing factors could be the time elapsed since the sexual intercourse, the contraceptive method being used, the time of the menstrual cycle, patient age and the history of pregnancy or abortion.

There is incomplete information on the association of personal factors and sexual behaviors with the use of EC. Most studies that assessed the relationship between EC use and personal factors were focusing on special population types or age groups with mostly anonymous retrospective surveys [7–9]. Little is known about the epidemiological influencing factors of women choosing emergency contraception.

Our first aim was to describe and understand factors that motivate women to use EC, placing particular emphasis on scrutinizing the temporal aspects, especially the time elapsed since the intercourse. **Our second aim** was to explore the methods of contraception in this special population seeking emergency contraception.

2. Materials and methods

2.1. Patients

This present retrospective observational study is embedded in the MEEC (Motivation and Epidemiology of Emergency Contra-ceptive Pill) based on the study cohort of a Hungarian data bank containing follow-up data of 455 women. Between July 2021 and September 2021 455 patients registered on the telemedicine consultation platform 'esemenyutan.hu', where patients regardless of social security (tax-funded social health insurance) could be prescribed an emergency contraceptive after consulting a gynecologist. As a part of the service, a consultation was provided, and the medicine was prescribed within an hour after the consultation. During consultation, each patient was asked to answer a set of standardized questions to explore their sexual behaviors and lifestyle.

2.2. Characteristics

This analysis used the chart review of all these patients, which included the following variables: **sociodemographic character-istics**: age (calculated by subtracting the date of birth from the date of consulting) and relationship status (married/in a relationship/ no relationship).

The questionnaire also included the following **gynecological characteristics**: description of the intercourse (the exact day and hour of the intercourse, the time elapsed between the registration and the intercourse, and the method of contraception); the first day of the last menstrual period and the number of days since the last menstrual period; past pregnancies (number of pregnancies, abortions, and miscarriages); and the year of the last Pap smear.

The study was ethically approved by the Institutional Review Board of Semmelweis University (Semmelweis Universitiy Reginal and Institutional Committee of Science and Research Ethics) (SE RKEB: 125/2022).

2.3. Data management

The data were quality controlled for repeat consulting (two repeats) (only first visits were kept), and data entry errors.

A binary age variable was created as aged above vs. below 30 years. Patients were divided into groups based on the day of the intercourse being near the ovulation or later in the cycle. The proximity to ovulation was defined as being between days 12–16 in the cycle, considering that the cycle was regular and about 28 days long. The method of contraception was divided into the following groups: using condoms, not using any contraception, and other (including but not limited to any oral contraceptive [OAC] with days missed, or a contraceptive ring that had been out for too long, or failed interruption of the intercourse).

2.4. Statistical analysis

The Shapiro-Wilk test was used to test the normality of continuous variables. Continuous data were described as medians and interquartile ranges given that all variables were non-normally distributed. The Mann-Whitney test was used to analyze the rela-tionship between time since last intercourse, and age, relationship status, history of pregnancies, history of abortions, and proximity to ovulation. The chi-square analysis was performed to assess the correlation of the method of contraception and age, relationship status,

history of pregnancies, history of abortions, and proximity to ovulation. Multivariate logistic regression analysis was used to predict the relationships between dependent (time) and independent variables (protection (yes/no), time of ovulation, history of pregnancies (yes/no), being in a relationship (yes/no) and age. The dependent variable (time) received a value of 1 if the patients registered on the website within 24 h, and a value of 0 if it was over 24 h.

Statistical significance was set at $p < 0.05$. Prism9 GraphPad (ver. 8. GraphPad Software, Inc., San Diego, CA, USA) and SPSS Sigma Stat software were used for data management and analysis, and for creating figures.

3. Results

3.1. Description of the sample

Participant characteristics are presented in Table 1. The median age of the 455 patients was 30 years (interquartile range: 25–37). The median time elapsed since the intercourse was 14 h (interquartile range: 5–32). The median days since the first day of the last menstrual period was 14 (interquartile range: 10.75–19.92).

Altogether 59.3 % (n = 270) of patients reported condom rupture, 29.5 % (n = 134) no protection and 11.2 % (n = 51) other contraception (birth control pill, spermicide gel, vaginal ring); 74.1 % (n = 337) of all patients had no history of pregnancy, 25.9 % (n = 118) had been previously pregnant, and 5.5 % (n = 25) of them had at least one abortion. Overall, 70.1 % (n = 319) indicated being in a relationship, and 29.9 % (n = 136) reported a one-night stand.

3.2. Relationship between time since intercourse and patient characteristics

Those patients who had history of a previous pregnancy registered significantly shorter time (p = 0.004) (Fig. 2). In addition, a significantly shorter elapsed time was observed in patients who used condoms than those who used no protection (p = 0.032) or those using another type of protection (p = 0.048, Fig. 1). There were no statistically significant associations between age, relationship status and proximity to ovulation in the menstrual cycle, and time since last intercourse (**Table 2**).

3.3. Relationship between methods of contraception and patient characteristics

No correlation was found between the methods of contraception and age, relationship status, proximity to ovulation in the cycle, and history of prior pregnancies.

3.4. Factors influencing EC request – multivariable logistic regression model

To calculate to probability of EC request, a multivariate logistic regression analysis was used. A dependent variable was time (the dependent variable (time) received a value of 1 if the patients registered on the website within 24 h, and a value of 0 if it was over 24 h). The independent variables were condom use (yes/no), time of ovulation, history of pregnancies (yes/no), being in a relationship (yes/no) and age. Of the independent factors, only condom use (yes/no) and history of pregnancy (yes/no) were significant (Table 3). The logistic model analysis showed that the use of any protection methods such as condom, withdrawal or other contraception significantly increased the risk of EC request (odds ratio = 1.757, 95 % confidence interval: 1.137–2.715; p = 0.011); furthermore, a previous pregnancy also significantly increased the risk of EC request (odds ratio = 1.858, 95 % confidence interval: 1.063–3.248; p =

Table 1
Characteristics of the sample.

Characteristics	N (range or %)
Total	455 (100 %)
Median age (years)	30 (25–37)
Relationship status	
In relationship	319 (68.6 %)
No relationship	136 (31.4 %)
History of prior pregnancies	
Pregnancy (n)	118 (25.9 %)
Never pregnant	337 (74.1 %)
Proximity to ovulation in the cycle	
Median number of days	14 (11–20)
12–16 days (n)	130 (28.6 %)
<12; 16<	325 (71.4 %)
Median hours since last intercourse	14 (5–32)
Method of contraception	
Condoms	270 (59.3 %)
No contraception	134 (29.5 %)
Other	51 (11.2 %)

Categorical parameters are presented as n. Continuous data are presented as median (interquartile range).
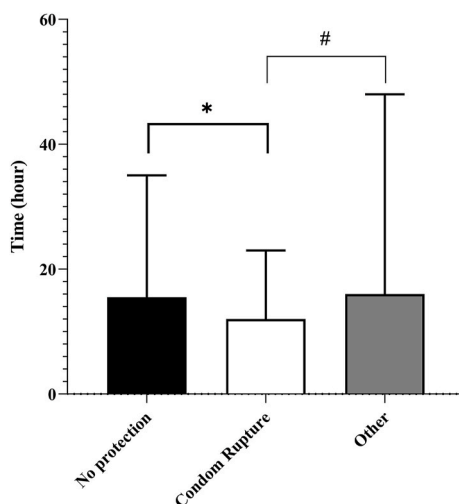
Fig. 1. Method of protection in correlation with time since last intercourse. Time elapsed since last intercourse was significantly higher in the no-protection group than in the condom rupture group. Furthermore, this time was significantly lower in the condom rupture group than in the group of patients with other protection methods (e.g., coitus interruptus). Data are presented as median with interquartile range. Kruskal-Wallis test with Dunn's post hoc test. *p = 0.032 Condom Rupture vs No Protection; #p = 0.048 Condom Rupture vs. Other.
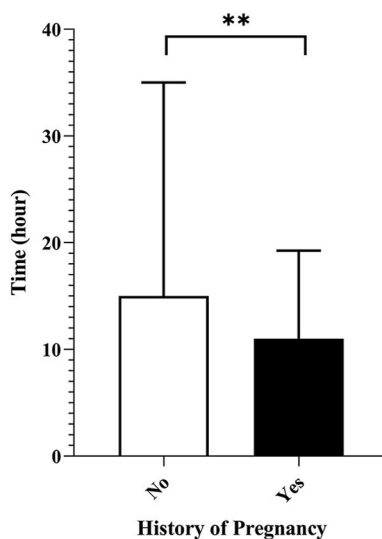

Fig. 2. Distribution of the sample in regard to previous pregnancy in history as a motivational value to apply emergency pills sooner. Shorter time elapsed in the case of patients with a history of a previous pregnancy vs. no pregnancy in history). Data are presented as median with interquartile range. Mann-Whitney test. **p = 0.0052 history of a previous pregnancy vs. no pregnancy in history.

0.03) Fig. 3, Fig. 4).

4. Discussion

This is the first study to examine the potential role of epidemiologic factors (methods to avoid pregnancy, age, stability of relationship, history of pregnancies and abortion, awareness of ovulation) as motivators for EC on the basis of a large patient cohort, the MEEC cohort.

Our study demonstrates the significant role of reported condom rupture/condom use and the history of previous pregnancies to be the strongest motivators for EC. Despite the behavior of avoiding pregnancy, there was no clear association between the examined epidemiologic factors and the methods of protection during the intercourse. This finding was particularly significant when the time of ovulation was examined.

Condoms are among the most popular contraceptive methods [10–14]They can be used to prevent pregnancy and sexually transmitted diseases as well [15]. Condom manufacturers are popular and, unlike pharmaceutical companies in Hungary, their

Table 2
Relationship between time since intercourse and patient characteristics.

Characteristics	Median time (SE)
Age	
< 30 (n = 216)	14.5 (1.6)
> 30 (n = 239)	13.0 (1.4)
Mann-Whitney p-value	0.8596
Relationship status	
In relationship (n = 319)	13 (1.3)
Not in relationship (n = 136)	15 (2.0)
Mann-Whitney p-value	0.1042
Proximity to ovulation in cycle	
Ovulation (12–16) (n = 130)	13.5 (1.8)
Before ovulation (<12) (n = 167)	14.0 (1.7)
After ovulation (16<) (N = 158)	14.0 (1.7)
Kruskall-Wallis p-value	0.771

products can be easily advertised; therefore, they reach much more people. The effectiveness of reported condom use has been examined in five independent studies in the United Kingdom, and they show an average failure rate (Pearl Index) of 3.26/100 [16]. Compared to hormonal contraceptives, condoms have a significantly less favorable Pearl Index (Pearl Index of 0.6 in the case of LNG-IUD, 1.85 in the case of oral contraceptives). Thus, the use of condoms may result in a false sense of security in the prevention of an unintended pregnancy [17–19]. In our study, it was clearly shown that condom rupture was an important reason for the use of emergency contraception. Adequate patient education plays a major role in ensuring that couples use an appropriately safe and effective method of contraception. Promoting methods with a Pearl Index higher than a condom could help reduce the use of morning-after pills and the number of unintended pregnancies.

Unplanned pregnancy awareness is relatively low in the postpartum period of women, significantly influenced by sociodemographic factors like household income, educational level, and gravidity [20]. Analyzing 1795 survey charts, Goldsmith et al. highlighted that expanding the awareness of women could prevent unintended pregnancies in postpartum women [21,22]. Our study showed that a previous pregnancy was one of the major motivational factors for the use of EC after an intercourse not adequately protected. This raises the question of the appropriateness of patient education in Hungary in the postpartum as the stressful situation of needing emergency contraceptives could probably be avoided with appropriate patient education in the post-pregnancy period. Progesterone-only pills (with a typical failure rate of 7 %), or intrauterine devices (with a typical failure rate of 0.7 %) are highly effective contraceptive methods during breast-feeding [23]. According to recommendations from the American College of Obstetricians and Gynecologists (ACOG), the utilization of Long-Acting Reversible Contraceptives (LARC) during the postpartum period markedly diminishes the incidence of unintended pregnancies. LARC with an impressive 99 % effectiveness encompasses intrauterine devices (IUDs) and contraceptive implants [24]. LARCs, in addition, demonstrate superior continuation rates compared to less efficacious contraceptive alternatives [25]. Notwithstanding this compelling body of evidence, the prescription and utilization of LARCs continue to be infrequently observed. IUDs may be considered as a first-choice long-acting reversible contraceptive (LARC) option for women [26,27]. Previous research has substantiated that, despite the availability and pivotal role of the LARC method in mitigating unintended pregnancies, its utilization is hindered by a multitude of factors. These encompass concerns related to public health and cost savings considerations, the necessity for multiple visits, as well as apprehensions regarding potential side effects [28–30]. Greater emphasis on appropriate patient education on LARC could prevent postpartum women from using emergency contraceptives and lead them to use safer methods.

We also examined the association between protective methods and epidemiological factors. Our study showed no correlation between the use of any contraceptive method and abortion in the medical history, or the status of the relationship. Moreover, there was no significance found when comparing the methods of protection (condom use vs. no protection) with the time of ovulation despite the obvious intention of avoiding pregnancy. Hampton et al. came to a similar conclusion in their study published in 2015 [31]. They found that less than one-third of women were able to say with certainty whether they were in a fertile period of their cycle, which was a clear sign of the lack of fertility awareness.

Overall, the fertility rate in Europe is relatively low, with no countries above 2.0. Hungary had a fertility rate of 1.52 in 2020, meaning that most women do not have two children in their lifetime [32]. Much more emphasis should be placed on fertility awareness education in Hungary in order to reduce the difference between the number of children desired and the final fertility rate.

4.1. Limitations and strengths

This is a single-center study; however, a large number of patients were involved in the cohort compared to other publications in the literature. Direct questionnaires were used and the participants were real-time users, self-reporting their data, not only a collection of opinions on the topic. The strengths of this study include the large sample size, and the practical implications for healthcare providers and policymakers.

Table 3
Relationship between methods of contraception and patient characteristics.

Relationship status		
	Condom Rupture + Other (n)	No Protection (n)
Relationship	225 (70.5 %)	94 (29.5 %)
No Relationship	96 (70.6 %)	40 (29.4 %)
Chi-square p-value	0.920	
Proximity to ovulation in cycle		
	Condom Rupture + Other (n)	**No Protection (n)**
12–16 days (n)	82 (63.1 %)	48 (36.9 %)
<12; 16 < (n)	239 (73.5 %)	86 (26.5 %)
Chi-square p-value	0.036	
History of prior pregnancies		
	Condom Rupture + Other (n)	**No Protection (n)**
Pregnancies	83 (70.3 %)	35 (29.7 %)
No pregnancies	238 (70.6 %)	99 (29.4 %)
Chi-square p-value	0.953	
Proximity to ovulation in cycle – in relationship (n = 319)		
	Condom Rupture + Other (n)	**No Protection (n)**
12–16 days (n)	52 (64.2 %)	29 (35.8 %)
<12; 16 < (n)	173 (72.7 %)	65 (27.3 %)
Chi-square p-value	0.191	
Proximity to ovulation in cycle – not in relationship (n = 136)		
	Condom Rupture + Other (n)	**No Protection (n)**
12–16 days (n)	20 (64.5 %)	11 (35.5 %)
<12; 16 < (n)	76 (72.4 %)	29 (27.6 %)
Chi-square p-value	0.535	
Proximity to ovulation in cycle		
	Condom Rupture + Other (n)	No Protection (n)
12–16 days (n)	82 (63.1 %)	48 (36.9 %)
<12; 16 < (n)	239 (73.5 %)	86 (26.5 %)
Chi-square p-value	0.036	
Relationship status		
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Chi-square p-value	0.535	

4.2. Future plans

Future studies are needed to explore contraceptive use and the fertility awareness of the Hungarian and European population.

5. Conclusions

We can conclude that our results highlight two motivators for earlier access for emergency contraception: the rupture of reported
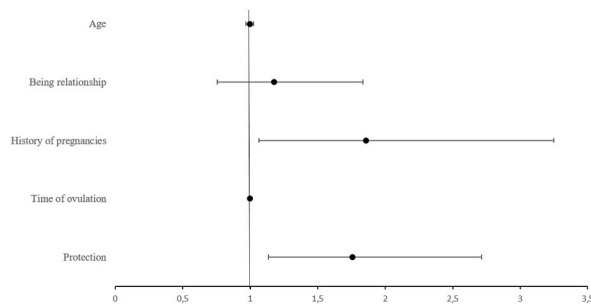
Fig. 3. Forest Plot of Odds ratios for request of EC. Logistic model analysis showed that using any protection (condom, interrupt sex, and other) significantly increased the risk of EC request (odds ratio = 1.757, 95 % confidence interval: 1.137–2.715; p = 0.011); furthermore, earlier pregnancy also significantly increased the risk of EC request (odds ratio = 1.858, 95 % confidence interval: 1.063–3.248; p = 0.03).
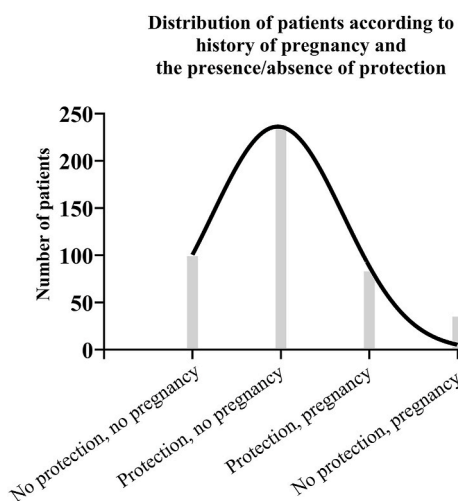

Fig. 4. The distribution of patients with previous pregnancy in history and the presence and absence of protection.

condom and the history of pregnancy.

Ethical approval

This study was reviewed and approved by Semmelweis Universitiy Reginal and Institutional Committee of Science and Research Ethics, with the approval number: SE RKEB: 125/2022.

All participants provided informed consent to participate in the study.

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CRediT authorship contribution statement

Lotti Lúcia Lőczi: Data curation, Formal analysis, Funding acquisition, Investigation, Project administration, Writing – original draft, Writing – review & editing. **Marianna Török:** Methodology, Visualization. **Márton Vezér:** Project administration. **Dóra Gerszi:** Investigation, Project administration. **V. Anna Gyarmathy:** Methodology, Software, Supervision, Validation. **Nándor Ács:** Supervision, Validation. **Szabolcs Várbíró:** Funding acquisition, Methodology, Project administration, Supervision, Validation. **Márton Keszthelyi:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Validation, Visualization, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to

influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.heliyon.2023.e23757.

References

[1] L.B. Finer, M.R. Zolna, Declines in unintended pregnancy in the United States, 2008-2011, N. Engl. J. Med. 374 (9) (2016) 843–852.
[2] J. Bearak, et al., Unintended pregnancy and abortion by income, region, and the legal status of abortion: estimates from a comprehensive model for 1990-2019, Lancet Global Health 8 (9) (2020) e1152–e1161.
[3] M. Gharaee, H.R. Baradaran, Consequences of unintended pregnancy on mother and fetus and newborn in North-East of Iran, J. Matern. Fetal Neonatal Med. 33 (5) (2020) 876–879.
[4] Available from: https://www.ksh.hu/docs/hun/xftp/idoszaki/mo/mo2016.pdf.
[5] ACOG Committee Opinion Number 542, Access to emergency contraception, Obstet. Gynecol. 120 (5) (2012) 1250–1253.
[6] G. Noé, et al., Contraceptive efficacy of emergency contraception with levonorgestrel given before or after ovulation, Contraception 81 (5) (2010) 414–420.
[7] M.L. Bauzà, et al., Emergency contraception and risk habits in a university population, Eur. J. Contracept. Reprod. Health Care 23 (6) (2018) 427–433.
[8] B.N. Williams, et al., Adolescent emergency contraception usage, knowledge, and perception, Contraception 103 (5) (2021) 361–366.
[9] L. Han, et al., Emergency contraception in Mexico: trends in knowledge and ever-use 2006-2014, Matern. Child Health J. 21 (11) (2017) 2132–2139.
[10] T. Silverstone, Condoms: still the most popular contraceptive, Prof. Care Mother Child 7 (4) (1997) 108–110.
[11] J. Manuel, Condoms becoming more popular, Netw Res Triangle Park N C 13 (4) (1993) 22–24.
[12] M. Zgliczynska, et al., Contraceptive behaviors in polish women aged 18-35-a cross-sectional study, Int. J. Environ. Res. Publ. Health 16 (15) (2019).
[13] T.L. Schumacher, et al., Contraception usage and the desired number of offspring of Indigenous women from the Gomeroi lands, Aust. J. Rural Health 28 (4) (2020) 360–365.
[14] M.I. de Molina-Fernandez, et al., Medication adherence and contraceptive counseling, Healthcare (Basel) 11 (9) (2023).
[15] K.K. Holmes, R. Levine, M. Weaver, Effectiveness of condoms in preventing sexually transmitted infections, Bull. World Health Organ. 82 (6) (2004) 454–461.
[16] E.C. Corderoy, Condom effectiveness, Fam. Plann. Perspect. 11 (5) (1979) 271.
[17] D. Mansour, P. Inki, K. Gemzell-Danielsson, Efficacy of contraceptive methods: a review of the literature, Eur. J. Contracept. Reprod. Health Care 15 (1) (2010) 4–16.
[18] ACOG Practice Bulletin No, 121: long-acting reversible contraception: implants and intrauterine devices, Obstet. Gynecol. 118 (1) (2011) 184–196.
[19] C. Gerlinger, et al., Different Pearl Indices in studies of hormonal contraceptives in the United States: impact of study population, Contraception 90 (2) (2014) 142–146.
[20] E. Baser, et al., Unplanned pregnancy and awareness of emergency contraception: a postpartum period survey, Eur. J. Contracept. Reprod. Health Care 26 (6) (2021) 507–512.
[21] K.A. Goldsmith, et al., Unintended childbearing and knowledge of emergency contraception in a population-based survey of postpartum women, Matern. Child Health J. 12 (3) (2008) 332–341.
[22] H.L. Paladine, C.E. Blenning, Y. Strangas, Postpartum care: an approach to the fourth trimester, Am. Fam. Physician 100 (8) (2019) 485–491.
[23] R.A. Hatcher, Contraceptive Technology, 2018.
[24] M. Cavanagh, et al., Counseling increases immediate postpartum Long-Acting Reversible Contraception (LARC) acceptability in Hispanic women, J Gynecol Obstet Hum Reprod 51 (9) (2022), 102457.
[25] D. Hubacher, et al., Long-acting reversible contraceptive acceptability and unintended pregnancy among women presenting for short-acting methods: a randomized patient preference trial, Am. J. Obstet. Gynecol. 216 (2) (2017) 101–109.
[26] M. Ali, R. Folz, M. Farron, Expanding choice and access in contraception: an assessment of intrauterine contraception policies in low and middle-income countries, BMC Publ. Health 19 (1) (2019) 1707.
[27] I. Mavranezouli, The cost-effectiveness of long-acting reversible contraceptive methods in the UK: analysis based on a decision-analytic model developed for a National Institute for Health and Clinical Excellence (NICE) clinical practice guideline, Hum. Reprod. 23 (6) (2008) 1338–1345.
[28] M.L. Evans, et al., Use of long-acting reversible contraception by obstetrics and gynecology residents: an examination of access for all women, Obstet. Gynecol. 131 (3) (2018) 538–541.
[29] A.J. Hoopes, et al., Knowledge and acceptability of long-acting reversible contraception among adolescent women receiving school-based primary care services, J Prim Care Community Health 7 (3) (2016) 165–170.
[30] E.L. Thompson, et al., Patients and providers' knowledge, attitudes, and beliefs regarding immediate postpartum long-acting reversible contraception: a systematic review, Women Health 60 (2) (2020) 179–196.
[31] K. Hampton, D. Mazza, Fertility-awareness knowledge, attitudes and practices of women attending general practice, Aust. Fam. Physician 44 (11) (2015) 840–845.
[32] I. Szántó, Child and family benefits to halt Hungary's population decline, 1965 2020: A comparison with Polish and Romanian family policies, Hungarian cultural studies, J. Am. Hungarian Educ. Assoc. 14 (2021), https://doi.org/10.5195/ahea.2021.429. http://ahea.pitt.edu.