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# Evaluation of the use of hormonal contraceptive methods and awareness of a group of women with cardiological symptoms and diseases

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**Ethics Committee Approval**
The study was approved by the SBU Istanbul Training and Research Hospital Clinical Research Ethics Committee (Decision No: 1995, Date: September 27, 2019), and institutional permission was obtained from Beylikdüzü State Hospital. All procedures in this study involving human participants were performed in accordance with the 1964 Helsinki Declaration and its later amendments.

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## Abstract

**Background/Aim:** Hormonal contraceptives can carry risks, particularly for women with chronic conditions such as heart disease and diabetes. A wide range of basic science, animal, and human studies indicate an enduringly heightened risk of venous thromboembolism, hypertension, myocardial infarction, and ischemic stroke associated with birth control hormones (estrogen and progestogen). According to the guidelines, women aged 35 and over considering hormonal contraceptives should be evaluated for vascular diseases and cardiovascular risk factors. However, the number of studies on this subject is insufficient. This study aimed to assess the use of hormonal contraceptive methods and the knowledge levels of women with cardiological symptoms and diseases attending a cardiology outpatient clinic.

**Methods:** A descriptive and cross-sectional study was conducted with cardiological problems (diagnosed or being treated at the Cardiology Polyclinic) of women between the ages of 18 and 45. Data were collected through face-to-face interviews using the Sociodemographic Characteristics Form and the Structured Contraception Knowledge Level Form. The study sample consisted of 190 women visiting a state hospital's Cardiology Polyclinic in Istanbul between October 2019 and January 2020.

**Results:** Among the participants, 24.8% used hormonal contraceptives, and 15.8% reported facing problems while using them, most commonly experiencing constant headaches (53.3%) and iron deficiency (30%). The study revealed that 7.9% of the participants had cardiovascular disease, with 52.1% experiencing cardiological symptoms, such as palpitations and rapid heartbeat. A total of 24.7% had received family planning counseling, and 59.6% believed that counseling influenced their contraceptive choices. Those who received counseling showed greater knowledge regarding the safety of progesterone-only birth control pills for women with heart disease.

**Conclusion:** Women with cardiovascular disease should be well informed about the risks associated with hormonal contraceptives. The study emphasizes the importance of counseling services provided by nurses in cardiology and obstetrics clinics to guide women toward safer contraceptive options. Continuous monitoring and education are essential to ensure women's health and safety in contraceptive choices.

**Keywords:** hormonal contraceptives, cardiologic disease, cardiologic symptoms, contraceptive counseling, progesterone

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## Introduction

The main objectives of contraceptives include preventing pregnancy-related risks in women, reducing fetal mortality, preventing sexually transmitted diseases such as human immunodeficiency virus / acquired immune deficiency syndrome (HIV/AIDS), reducing unwanted pregnancies and induced abortions, improving education, reducing adolescent pregnancies, and slowing down population growth [1]. In particular, hormonal contraceptives should be used selectively in cases of chronic diseases such as heart disease and diabetes [2,3]. Due to their estrogen and progestogen content, hormonal contraceptives play a crucial role in developing conditions such as venous thromboembolism, hypertension, myocardial infarction, and ischemic stroke [4]. The estrogen functions by increasing the plasma levels of particular coagulation factors (Factor II, Factor VII, and Factor X) and lowering the plasma levels of antithrombin III. These effects are dose-dependent, and the risk increases within four months after starting the medication [3].

The World Health Organization (WHO) has published a guide called "Medical Eligibility Criteria for Contraceptive Use (WHO-MEC)" to ensure the safety of various contraceptive methods for individuals with specific health conditions and characteristics. According to the guidelines, combined oral contraceptives (OCs) from the WHO-MEC Stage 4 contraceptive group are not recommended and/or contraindicated in risk factors, such as venous thromboembolism, obesity (BMI >35), smoking in women over 35 years of age, ischemic and cyanotic heart disease, heart failure, arrhythmia, and the use of bosentan [5].

Oral contraceptives may increase the risk of vascular disease by acting directly on the vessel wall, disrupting fat and carbohydrate metabolism, affecting the hemostatic system, and influencing blood pressure. COC use in smokers over 35 has an anti-synergistic effect on the cardiovascular system [4,6]. It also increases the risk of arterial thrombosis and hypertension. On the other hand, contraceptives containing only progesterone do not increase the risk of venous thromboembolism, hypertension, ischemic stroke, or myocardial infarction, because they lack estrogen. Progesterone-containing oral contraceptives are suitable for almost every woman, and for those with hemodynamically unstable heart disease, the intrauterine device (IUD) is safe and highly effective. Thus, informing women diagnosed with cardiovascular disease about hormonal contraceptives is necessary [4,7] and of public health importance for women. It is essential for nurses to offer guidance on preventive health services to patients. However, previous studies have not adequately addressed this issue. This study aims to investigate the use of hormonal contraceptive methods and the knowledge levels of women with cardiovascular symptoms and diseases.

## Materials and methods

The study was conducted as a descriptive and cross-sectional research to evaluate the characteristics and knowledge level of women with cardiological symptoms and diseases using hormonal contraceptive methods.

The study sample consisted of 190 women who applied to the Cardiology Polyclinic of a state hospital in Istanbul between October 2019 and January 2020. In the study, the 3-month average number of patients attending the outpatient clinic was determined, and the plan was to involve 190 patients. Consequently, when working with 190 patients and considering Cohen's medium effect size (d=0.5) with a margin of error of 0.05, the statistical power of the study was calculated to be 95%. Participants were selected using a simple random sampling method, which is a non-probability sampling method. All patients attending the outpatient clinic were included in the research.

The study included women between the ages of 18 and 45 who had the ability to communicate verbally, were sexually active and had cardiological problems diagnosed or being treated at the Cardiology Polyclinic. Participants were required to have no diagnosis of any psychiatric disorder and express willingness to participate verbally or in writing. Those who did not meet the mentioned criteria were excluded from the study.

Data were collected through face-to-face interviews, with an average duration of 15-20 minutes, on weekdays when both the patients and the researchers were available. Data collection tools included the Sociodemographic Characteristics Form and the Structured Contraception Knowledge Level Form. The Sociodemographic Characteristics Form consisted of questions about the patient's age, height, weight, marital status, education level, and income status. The Structured Contraception Knowledge Level Form was prepared by the researchers based on the literature and was presented to three nursing faculty members for their expert opinions.

A pilot test was conducted with a group of 20 individuals, and their feedback was obtained to measure the adequacy of the surveys. It included questions about contraceptive use and experienced symptoms, cardiovascular disease and related symptoms, and the awareness of women with cardiovascular disease and/or symptoms regarding the use of hormonal contraceptive methods.

The accuracy of information provided by participants regarding dependent variables, such as medication use, lifestyle habits, and other medical conditions, as well as their willingness to consciously provide misleading responses is a common source of bias in studies of this nature. However, it is believed that conducting the study face-to-face and employing a pilot study minimizes such issues. While it was essential to have a larger sample size in the study, the study group's need to have characteristics such as cardiovascular disease and symptoms prevented this.

### Statistical analysis

Statistical analyses were performed using the IBM SPSS Statistics 26 package program. Frequencies (number, percentage) were provided for categorical variables, while descriptive statistics (mean, standard deviation) were given for numerical variables. Chi-square analysis was used to interpret relationships between two independent categorical variables. Fisher's Exact test results were utilized when the expected value assumption was not met in the chi-square analysis. A statistical significance level of 0.05 was considered in the analyses.

### Ethics

The study was approved by the SBU Istanbul Training and Research Hospital Clinical Research Ethics Committee (Decision No: 1995, Date: September 27, 2019), and institutional permission was obtained from Beylikdüzü State Hospital.

Participants were informed about the purpose of the study, the procedures involved, and their rights as participants. Written and verbal consent was obtained from all participating women.

## Results

As seen in Table 1, the average age of the participants is 35.80 (7.27) years, with an average BMI of 25.80 (4.61). In terms of education level, 25.8% of the participants have completed high school, 25.8% have a college education, and 25.8% have postgraduate education. Regarding economic status, the majority reported being in good economic condition. The overwhelming majority of the participants are married.

Table 1: Distributions by sociodemographic characteristics (n=190)

| | Mean | SD |
|---|---|---|
| **Age** | 35.80 | 7.27 |
| **Weight** | 68.49 | 12.85 |
| **BMI** | 25.80 | 4.61 |
| | **n** | **%** |
| **Education Status** | | |
| Primary education | 27 | 14.2 |
| High school | 49 | 25.8 |
| College | 49 | 25.8 |
| License | 16 | 8.4 |
| Postgraduate | 49 | 25.8 |
| **Economic Status** | | |
| My income is less than my expenses | 7 | 3.7 |
| My income is equal to my expenses | 78 | 41.1 |
| I'm in good condition | 105 | 55.3 |
| **Marital status** | | |
| Married | 174 | 91.6 |
| Single | 16 | 8.4 |

SD: standard deviation

Upon examining Table 2, it becomes apparent that within the group of hormonal contraceptive users, 22% opt for progesterone mini-pills, 16.2% prefer monthly injections, and the majority, 59.4%, choose estrogen-progesterone combination pills. It is noteworthy that 15.8% of the participants encountered difficulties with birth control pills. Among these participants, the most frequently reported issue was persistent headaches, reported by 53.3%, followed by iron deficiency, reported by 30%.

Table 2: Contraceptive use and symptoms experienced

| (n=190) | n | % |
|---|---|---|
| **Current Contraception Status** | | |
| Yes | 177 | 93.2 |
| No | 13 | 6.8 |
| **Contraceptive Method** | | |
| Monthly Injections | 6 | 3.4 |
| Vaginal Ring | 1 | 0.6 |
| Hormone Intrauterine Devices | 19 | 10.7 |
| Birth Control Pills | 20 | 11.3 |
| Male Condom | 60 | 33.9 |
| Protective gel | 1 | 0.6 |
| Calendar method | 16 | 9.0 |
| Withdrawal method | 38 | 21.5 |
| Tube ligation | 8 | 4.5 |
| **Hormonal contraceptives (n=37)** | | |
| Mini Pills with Progesterone | 8 | 21.6 |
| Monthly Injections | 6 | 16.2 |
| Pills Containing Estrogen-Progesterone Combination | 22 | 59.4 |
| Vaginal Ring | 1 | 2.78 |
| **Having Problems Using Oral Contraceptives** | | |
| Yes | 30 | 15.8 |
| No | 160 | 84.2 |
| *** Problems Experienced While Using Birth Control Pill (n=30)** | | 13.3 |
| Migraine | 7 | 23.3 |
| Persistent Headache | 16 | 53.3 |
| Vertigo | 2 | 6.7 |
| Anemia | 7 | 23.3 |
| Psychiatric Discomfort | 4 | 13.3 |
| B12 Deficiency | 5 | 16.7 |
| Iron Deficiency | 9 | 30.0 |
| Heart Disease | 1 | 3.3 |
| No Problem | 19 | 40.4 |

* In this variable. the participants were able to give more than one answer.

Table 3 indicates that 46.7% of those with cardiovascular disease use drugs related to cardiovascular disease. Of these participants, 52.1% experienced cardiological symptoms; 40.4% complained of palpitations; and 28.3% reported unexplained rapid heartbeat. Family planning counseling had previously been received by 24.7%, and 59.6% of those women indicated that this counseling affected the method of protection they use.

Table 3: Information on having cardiovascular disease and experiencing symptoms

| (n=190) | n | % |
|---|---|---|
| **Do You Have Cardiovascular Disease?** | | |
| Yes | 15 | 7.9 |
| No | 175 | 92.1 |
| **Diagnosis of Cardiovascular Disease (n=15)** | | |
| Heart valve diseases | 3 | 20.0 |
| Rhythm Disorders | 6 | 40.0 |
| Hypertension | 6 | 40.0 |
| **Drug Use for Cardiovascular Disease (n=15)** | | |
| Yes | 7 | 46.7 |
| No | 8 | 53.3 |
| **Experiencing Cardiological Symptoms for the First Time** | | |
| Yes | 99 | 52.1 |
| No | 91 | 47.9 |
| *** Symptoms (n=99)** | | |
| Leg Swelling. Redness Pain | 17 | 17.2 |
| Blue Purple Red Color on Skin | 4 | 4.0 |
| Shortness of breath | 14 | 14.1 |
| Chest Pain | 4 | 4.0 |
| Unexplained Cough | 1 | 1.0 |
| Unexplained Fast Heartbeat | 28 | 28.3 |
| Sweating Restlessness Fear of death | 11 | 11.1 |
| Feeling of fainting | 9 | 9.1 |
| Nausea | 27 | 27.3 |
| Palpitation | 40 | 40.4 |
| Fatigue quickly | 19 | 19.2 |
| Other | 2 | 2.0 |
| **Getting Family Planning Counseling Before** | | |
| Yes | 47 | 24.7 |
| No | 143 | 75.3 |
| **Did the Counseling Received Affect the Method Used?** | | |
| Yes | 28 | 59.6 |
| No | 19 | 40.4 |

* In this variable. the participants were able to give more than one answer.

According to Table 4, the utilization rate of hormonal intrauterine devices among patients with cardiovascular disease is 28.6%, which is significantly higher than the rate among patients without cardiovascular disease.

Table 4: Hormonal birth control methods used by cardiovascular disease status

| | Cardiovascular Disease | | | | Chi-square | *P*-value |
|---|---|---|---|---|---|---|
| | Yes | | No | | | |
| | n | % | n | % | | |
| **Vaginal Ring** | | | | | 2.446 | 0.079 |
| **Yes** | 1 | 7.1 | 0 | 0.0 | | |
| **No** | 13 | 92.9 | 163 | 100.0 | | |
| **Hormone Intrauterine Devices** | | | | | 3.791 | **0.048*** |
| **Yes** | 4 | 28.6 | 15 | 9.2 | | |
| **No** | 10 | 71.4 | 148 | 90.8 | | |
| **Birth Control Pills** | | | | | 0.005 | 1.000 |
| **Yes** | 1 | 7.1 | 19 | 11.7 | | |
| **No** | 13 | 92.9 | 144 | 88.3 | | |

* $P<0.05$

In Table 5, 41.7% of women answered "yes" in agreement to the statement, "Women with heart disease (those who have had clots before, etc.) should not use birth control pills containing estrogen hormone". In addition, 19.5% answered "yes" to "Birth control pills (mini-pills) containing only progesterone hormone are safer for women with heart disease".

Table 6 applies the statistical analysis, which shows a statistically significant relationship between the status of previously receiving family planning counseling and the answers given to the statement "Only birth control pills (mini-pills) containing only progesterone hormone are safer for women with heart disease" ($P=0.005$). Accordingly, the proportion of those who previously received family planning counseling responding "yes" to the statement compared to those who had not previously received family planning counseling was significantly higher than the rate of those who said "yes" to the statement "The pill is safer for women".

Table 5: Findings of women's awareness of the use of hormonal methods by heart patients

| | (n=190) | % |
|---|---|---|
| **Women Over 35 Who Smoker Should Not Use Estrogen Containing Estrogen Hormone** | | |
| Yes | 80 | 42.1 |
| No | 8 | 4.2 |
| I don't know | 102 | 53.7 |
| **Birth Control Pills Containing Estrogen Hormone May Cause Clot Formation In Women With Heart Disease** | | |
| Yes | 65 | 37.1 |
| No | 1 | 0.6 |
| I don't know | 109 | 62.3 |
| **Women with Heart Disease (Those Who Have Had a Clot Before. etc.) Should Not Take Birth Control Pills Containing Estrogen Hormone** | | |
| Yes | 73 | 41.7 |
| No | 2 | 1.1 |
| I don't know | 100 | 57.1 |
| **Containing Progesterone Only Birth Control Pills (Mini Pills) Are Safer For Women With Heart Disease** | | |
| Yes | 37 | 19.5 |
| No | 10 | 5.3 |
| I don't know | 143 | 75.3 |

Table 6: Knowledge levels on hormonal contraceptive use

| | Getting Family Planning Counseling Before | | | | Chi-square | *P*-value |
|---|---|---|---|---|---|---|
| | Yes | | No | | | |
| | (n=190) | % | (n=190) | % | | |
| **Women Over 35 Who Smoker Should Not Use Estrogen Containing Estrogen Hormone** | | | | | 2.134 | 0.344 |
| Yes | 24 | 51.1 | 56 | 39.2 | | |
| No | 2 | 4.3 | 6 | 4.2 | | |
| I don't know | 21 | 44.7 | 81 | 56.6 | | |
| **Birth Control Pills Containing Estrogen Hormone May Cause Clot Formation In Women With Heart Disease** | | | | | 3.055 | 0.217 |
| Yes | 21 | 47.7 | 44 | 33.6 | | |
| No | 0 | 0.0 | 1 | 0.8 | | |
| I don't know | 23 | 52.3 | 86 | 65.6 | | |
| **Women with Heart Disease (Those Who Have Had a Clot Before. etc.) Should Not Take Birth Control Pills Containing Estrogen Hormone** | | | | | 1.369 | 0.504 |
| Yes | 20 | 46.5 | 53 | 40.2 | | |
| No | 1 | 2.3 | 1 | 0.8 | | |
| I don't know | 22 | 51.2 | 78 | 59.1 | | |
| **Containing Progesterone Only Birth Control Pills (Mini Pills) Are Safer For Women With Heart Disease** | | | | | 10.691 | 0.005* |
| Yes | 16 | 34.0 | 21 | 14.7 | | |
| No | 4 | 8.5 | 6 | 4.2 | | |
| I don't know | 27 | 57.4 | 116 | 81.1 | | |
| **I Can Explain the Side Effects of Birth Control Pills and Hormonal Methods** | | | | | 2.492 | 0.288 |
| Yes | 12 | 60.0 | 66 | 42.0 | | |
| No | 7 | 35.0 | 84 | 53.5 | | |
| Yes But Not Enough | 1 | 5.0 | 7 | 4.5 | | |
| **I Know the Side Effects of Birth Control Pills and Hormonal Methods** | | | | | | |
| Yes | 14 | 70.0 | 113 | 72.0 | 0.074 | 0.853 |
| No | 6 | 30.0 | 44 | 28.0 | | |
| I'm undecided | 0 | 0.0 | 0 | 0.0 | | |
| **I Know What To Do When I Have A Side Effect With Birth Control Pills And Hormonal Methods** | | | | | | |
| Yes | 10 | 50.0 | 90 | 57.3 | 0.387 | 0.534 |
| No | 10 | 50.0 | 67 | 42.7 | | |
| I'm undecided | 0 | 0.0 | 0 | 0.0 | | |

## Discussion

In this study, 24.8% (n=46) of the participants were using hormonal contraceptives. This percentage aligns with the findings of a previous study by Acar et al [8], where 21% of the respondents reported using hormonal contraceptives. In our study, 15.8% (n=30) of the participants reported experiencing problems while using birth control pills, similar to the findings of Acar et al's study, where women using birth control pills complained of headaches, amenorrhea, and weight gain [8].

Studies have established a link between hormonal contraceptives and risks, such as thromboembolism, myocardial infarction, and ischemic and hemorrhagic stroke [9]. In this study, 7.9% of the participants had previously had cardiovascular disease, and these patients should be protected from the abovementioned risks. Data from the Chronic Diseases and Risk Factors Study in Turkey provided important information on chronic diseases, revealing that the incidence of coronary heart disease in women aged 15 and over was 2.3% [10,11]. The difference may be attributed to the fact that this study was conducted specifically in the cardiology outpatient clinic. Among the participants, 52.1% (n=99) experienced cardiological symptoms, with 40.4% reporting palpitations and 28.3% experiencing an unexplained rapid heartbeat. Considering cardiovascular diseases rank first among the most common chronic diseases worldwide (37%) [11], our findings support this. Of the total participants, 24.7% had previously received family planning counseling, and among those, 59.6% believed that it influenced their choice of contraceptive method. In a study of women who received counseling, 95.2% preferred the method suggested by the family planning counseling service staff, indicating a significant influence of counseling on women's preferences [12]. The difference in our study may be attributed to the fact that women with cardiological symptoms sought a safer contraceptive method, leading to a relatively higher use of condoms (33%) in our study.

The rate of using hormonal intrauterine devices in patients with cardiovascular disease was 28.6%, whereas it is 9.2% in patients without cardiovascular disease. In another study, IUD use among women aged 15-49 was 21%, which aligns with our results [13]. Additionally, the rate of using birth control pills in patients with cardiovascular disease was 7.1%, whereas it was 11.7% in those without cardiovascular disease. This difference may be due to heart patients' preference for contraceptive methods with fewer side effects [12].

It was explained to 42.1% of the participants that women over 35 years of age should not use estrogen-containing preparations. Additionally, most participants were aware that

individuals with heart conditions should avoid using combined oral contraceptives and that contraceptives containing progesterone were more reliable than combined ones.

Counseling services provided to women may have contributed to these results. In one study, 95.2% of women preferred the method first suggested by the family planning counseling staff. It was observed that family planning counseling services significantly influenced women's preferences [12]. As both venous and arterial thrombosis are the most common serious side effects of combined oral contraceptives, modifications have been made to the hormonal components of contraceptive pills in the last decade to reduce harmful thrombotic risks. However, an increase in the CRP level is still evident [14]. On the other hand, third-generation low-dose combined OCs can cause myocardial infarction in young women, even in the absence of other cardiovascular risk factors [15]. Therefore, as these risks are explained during counseling services, it is likely that women will turn to mini-pills.

Findings indicate that there are significant differences between those who received counseling about hormonal contraceptives and those who did not, with women who received counseling demonstrating greater knowledge about contraceptives [12]. As a result of the statistical analyses applied, a statistically significant relationship was found between receiving family planning counseling and the answers given to the statement, "Only birth control pills (mini-pills) containing only progesterone hormone are safer for women with heart disease". Progestin-only pills (POP) have a progestin dose very close to the contraceptive efficacy threshold, with a failure rate of 0.3% in perfect use and 8-9% in typical use [16]. The women's responses to this question also indicate their awareness that progesterone pills are not associated with myocardial infarction or stroke risk. Accordingly, the proportion of those who answered "yes" to the statement "Only birth control pills (mini-pills) containing only progesterone hormone are safer for women with heart disease" among those who received family planning counseling is significantly higher than those who did not receive family planning counseling. This result suggests that family planning counseling contributes to an important awareness of progesterone-only contraceptives in women with heart disease.

**Limitations**

The sample size in the study was limited to 190 women. Conducting future research with a larger sample size and in more centers may be more beneficial for generalizing the results. Although the researchers prepared the questions, the objectivity could have been influenced. However, the pilot study conducted on the questions alleviated this concern. Participants may not have disclosed their other medications, lifestyle habits, or other medical conditions. They might have attempted to provide socially acceptable answers and conceal their actual situations, which could affect the accuracy of the data.

**Conclusion**

The results of this study highlight that palpitations were the most frequently reported symptom among participants, with the majority of birth control pill users experiencing persistent headaches. The study also revealed that male condoms are the prevailing choice for birth control among the participants. Furthermore, there is a notably higher usage of estrogen-progestogen combination birth control pills in hormonal contraceptive use among the participants. Statistical significance further emphasizes the participants' greater preference for hormonal intrauterine devices. Additionally, the study underscores that counseling enhances awareness of hormonal contraceptives among women with cardiovascular disease.

The study shows that nurses in cardiology and obstetrics polyclinics and clinics have essential advisory roles in family planning options. Close monitoring of women with heart disease or symptoms is crucial for safeguarding their health. Future comprehensive research should delve deeper into this subject, providing valuable insights to assist women in making well-informed choices regarding family planning methods that best suit their health status.

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