The Effects of Hormonal Contraceptives on Female Mental Health

Dr. Reeta Jain[1], Dr. Anand Jain[2], Dr. Pooja Rani[3]

1Professor & HOD, Department of Prosthodontics and Vice Principal
Genesis Institute of Dental Sciences and Research, Ferozepur, Punjab
2Senior Resident, General Medicine
3Senior Resident, Neurology
AIIMS Jodhpur, India

Abstract - Hormonal birth control has been around for more than 60 years and has been the subject of many debates since then. There is a lot of discussion right now about the effects of hormonal contraceptives on mental health. Some studies show that they can make women's moods worse in 4% of cases, while other studies show that they can help women's moods stay stable. One of the most common reasons women stop using chemical birth control is because their mood changes while they are taking it. Since the start of chemical birth control, people have been reporting changes in their mental health, both good and bad. This is an interesting fact to think about. But in the last ten years, only recently has research started to look into how hormonal birth control might affect the brain. As a result of this, there is a minimal amount of information available regarding the effects of pharmaceutical birth control on mood. We examine this argument from the perspective of women's health research during several hormone transitional periods, such as menstruation, the postpartum period, and menopause, in this symposium. Specifically, we focus on the research that is conducted during these times. These times have (i) all been linked to changes in the brain and (ii) have all shown that some women are more or less sensitive to hormonal changes than others. When it comes to quickly responding to changes in hormones, the female brain is very flexible, and hormonal birth control is no different in this way. That being said, it is very important to know how different groups of neurons react to different hormone combinations in different groups of women. Here, we show the newest research on how hormonal birth control affects the brain and the mental health of women. This research covers a wide range of topics, from changes in networks that are active during rest to changes in molecular signatures of hormone sensitivity and stress responses. The studies shown use various types of hormonal birth control and focus on various groups of women. This shows how important it is to take a personalized approach to hormonal birth control and mental health, which also lays the groundwork for future research in the field of hormonal birth control neuroscience. Going forward, it looks like the most important thing is to find biomarkers for risk and protective factors that make women more likely to experience bad or good mood effects while on hormonal contraception.

Keywords- Hormonal contraceptive, Mental health, hormonal birth , Chemical birth control.

I. INTRODUCTION

The National Survey on the Use of Drugs and Health [1], which was done in 2017, found that mental illness is more common in women (22.3%) than in men (15.1%), and it's most common in people between the ages of 18 and 25. There is a significant prevalence of mental illnesses among sexually active women, as demonstrated by the numbers. Being able to assist individuals in making decisions prior to significant life events such as becoming pregnant or having a child is an essential component of mental health care. Women can receive assistance from psychiatrists by being informed about birth control until they are ready to become pregnant, being educated about the ways in which psychiatric medications can impact their reproductive health, and being given knowledge on the ways in which their mental illness changes while they are pregnant. There should be a component of psychological treatment for women that includes education about reproductive and sexual health [2]. In both preventative and primary health care, the utilization of birth control services forms a crucial component. It is estimated that fourteen percent of all babies born in the United States are born during an unintended pregnancy. It is important to note that the frequency of unwanted pregnancies might vary greatly from one individual to the next. Women who are unmarried, women who belong to racial or ethnic groups, and women who suffer from mental illness are among the females who are experiencing a rise in the number of women who are affected [3]. The occurrence of new cases of mental disorders, such as postpartum depression, has been linked to the having of an unwanted pregnancy, according to the findings of a study. When an incident

takes place, it acts as the beginning of a cycle of risk that continues to take place. If a woman is depressed, there is a greater likelihood that she will become pregnant without making any effort to do so. More than five times as many of them are likely to use birth control methods that are only partly effective, which increases the likelihood that they are exposed to sexually transmitted diseases. This is always the case, regardless of factors such as your age, the number of children you have, race or ethnicity, or the status of your connection with other people. Examples of those who might not be able to use birth control appropriately and consistently include those who are anhedonic, have cognitive impairments, are unable to accurately estimate risk, or do not have a proper understanding of sexual physiology [4]. It is more likely that women who are not well treated and who have mental health issues may become pregnant without intending to do so. In order to properly care for a kid, it is essential to make adjustments to one's relationships, employment, and financial situation during pregnancy and after the delivery of the child. It is necessary to have a wide variety of coping skills and techniques in order to make it through these changes. In the time leading up to pregnancy, discontinuing effective pharmacological therapy can increase the likelihood that mental symptoms would present themselves again. Because of the effects that pregnancy has on plasma medication levels, it is possible that the treatment will not be as effective if it is prolonged. This is because of altered physiology [5] .

II. LITERATURE REVIEW

Pletzer, B. (2024) [21] proposed hormonal Contraceptives and the Brain Implications for Women's Mental Health. Hormonal birth control has been around for more than 60 years and has been the subject of many debates since then. There is a lot of discussion right now about the effects of hormonal contraceptives on mental health. Some studies show that they can make women's moods worse in 4% of cases, while other studies show that they can help women's moods stay stable. One of the most common reasons women stop using chemical birth control is because their mood changes while they are taking it. It's interesting that subjective reports of changes in mental health, both good and bad, have been around since the start of hormonal contraception. However, study into the possible effects of hormonal contraception on the brain has only begun in the last ten years. So, not much is known about how hormonal birth control affects mood from a neural point of view. These times have (i) all been linked to changes in the brain and (ii) have all shown that some women are more or less sensitive to hormonal changes than others. When it comes to quickly responding to changes in hormones, the female brain is very flexible, and hormonal birth control is no different in this way. That being said, it is very important to know how different groups of neurons react to different hormone combinations in different groups of women. Here, we show the newest research on how hormonal birth control affects the brain and the mental health of women. This research covers a wide range of topics, from changes in networks that are active during rest to changes in molecular signatures of hormone sensitivity and stress responses. The studies shown use various types of hormonal birth control and focus on various groups of women. This shows how important it is to take a personalized approach to hormonal birth control and mental health, which also lays the groundwork for future research in the field of hormonal birth control neuroscience.

Buggio, et. al., (2022) [22] examined the influence of hormonal contraception on depression and female sexuality. Hormonal birth control has become more popular among women over the last few decades. Several studies have pointed out that sex hormones may play a part in controlling vegetative, psychophysiological, and cognitive functions. More research is needed to find out how hormonal birth control affects women's quality of life, especially when it comes to their sexuality and mental health. And did a narrative review to gain a better understanding of how sex hormones affect the brain, paying special attention to the link between hormonal birth control and mood and sexual function. The results made it clear that hormonal birth control may be linked to sexual problems and depressed symptoms, especially in teens. The data in this review, on the other hand, was mixed and did not support the idea that hormonal birth control directly causes major depressive disorder, depressive symptoms, or sexual problems. The best chemical birth control should be found through shared decision-making that takes each woman's wants and needs, as well as her physical and mental health, into account.

Robakis, et. al., (2019) [23] described hormonal contraceptives and mood review of the literature and implications for future research. The impact of hormonal birth control on the mood of various groups of women, including those who are healthy and those who have been diagnosed with psychiatric and gynecological

problems. Also look at how different kinds of chemical birth control work and how they might impact mood and gynecological problems. Some groups of women may benefit the most from hormonal birth control because it may help improve mental health in those with certain psychiatric conditions like PMDD. Now, there isn't strong proof that most hormonal birth control is bad for people in general. Some studies show that some people may be more likely to experience mood problems when using some types of chemical birth control. However, more research is needed to find these people.

Lisofsky, et. al., (2016) [24] discussed hormonal contraceptive use is associated with neural and affective changes in healthy young women. Hormones made by the ovaries can change the way adult women's brains look and work. One reason for this is that longitudinal studies within individuals are not common. In this study, looked at 28 young women before and after three months of daily birth control use and compared them to 28 naturally cycling women of the same age. The point was to look into how the brains of women who use birth control change over time. And got information on each participant's brain imaging, hormones, cognitive abilities, and emotions at two different times. A study of the two groups' brains, voxel-by-voxel, showed that the control group had more gray matter in the left amygdala and anterior parahippocampal gyrus than the contraceptive group. In the group that took contraceptives, the resting state functional connectivity of this area with the dorsolateral prefrontal cortex went from positive to negative. In the control group, it was the other way around. An pilot study found that at the second time point, having more gray matter in the left amygdala and anterior parahippocampal gyrus was linked to feeling good. There were no clear differences between the groups in how their cognitive ability changed over time. These results give us new information about how hormonal birth control affects the brain and add to what we already know about how hormones affect the amygdala and hippocampal complex. The fact that the damaged brain areas may be linked to mental health shows how important it is to do more research on brain changes caused by birth control.

Toffol, E., et. al., (2011) [25] described hormonal contraception and mental health. Oral contraceptives (OCs) don't have clear effects on mental health, and the levonorgestrel releasing intrauterine system (LNG IUS) hasn't been studied in much detail. The study's goal was to look into the link between using OCs and the LNG IUS and mental health and mental illness. The Finnish population-based2000 study looked at the links between current OC use and the LNG IUS, as well as their duration versus mood symptoms (Beck Depression Inventory, BDI), psychological well-being (General Health Questionnaire 12; GHQ 12), and recent psychiatric diagnoses (CIDI). The women who took part in the study were female. Studies were done on a group of people aged 30 to 54 (n = 2310), and some studies were also done on a group of people aged 18 to 54 (n = 3223). In general, hormonal birth control was well accepted and didn't have many major effects on mental health. Longevity of OC use was linked to some BDI items in a negative way, like "dissatisfaction, irritability, lost interest in people, waking up earlier, and lost interest in sex." It was also linked directly to "worries about one's health" (BDI) and a current diagnosis of "alcohol dependence" (CIDI). "Earlier waking" (BDI) and "impaired concentration" (GHQ) were both linked negatively to present use of the LNG IUS. The length of LNG IUS use was negatively linked to "strain" (GHQ). Hormonal birth control has a small but mostly positive effect on mental health. How long someone has been using OC seems to have some positive effects on their happiness, but the longer they have been using, the more likely they are to be diagnosed with alcohol dependence. When figuring out if a woman is mentally ill, it might help to know if she uses chemical birth control.

Table 1. Comparative table of the following data-

Author and Year	Result	Finding
Robakis, et al. (2019)	There isn't strong proof that most hormonal birth control hurts people in the general population. Some people may be more likely to experience bad mood affects.	Hormonal birth control may help people with some mental illnesses, like PMDD, feel better about their mental health. More study is needed to find out which people are more likely to have bad mood effects from certain types of hormonal birth control.
Lisofsky, et al. (2016)	Using hormonal birth control is linked to less gray matter volume	A study using neuroimaging shows that hormonal birth control may change the shape

	in the left amygdala and anterior parahippocampal gyrus compared to women who cycle their hormones normally. Changes in functional connections at rest were seen in people who use birth control.	and function of the brain. Gray matter volume decreased in parts of the brain that are linked to mental health. Changes in functional connections could be a sign of changes in brain networks that control emotions.
Toffol, E., et al. (2011)	Overall, hormonal birth control, such as OCs and LNG IUS, is well accepted and has mostly positive effects on mental health.	Length of OC use is linked to some mood signs in a negative way, but it is directly linked to a diagnosis of alcohol dependence. The current use and length of LNG IUS are linked to better mental health and happiness. Cross-sectional design makes it hard to draw conclusions about causes, but knowing about hormonal birth control use may help in figuring out disorders.
Pletzer, B. (2024)	Some researchers have come to controversial conclusions about how chemical birth control affects mental health.	Some studies show that it can make women's moods worse, while others show that it can make their moods stable. Mood changes that happen while using hormonal birth control are a regular reason to stop. Not much is known about the neural processes that cause hormonal contraceptives to affect mood.
Buggio, et al. (2022)	There are different kinds of data about the link between hormonal birth control, depression, and sexuality.	It's possible that hormonal birth control can cause depression and sexual problems, especially in teens. There is no direct evidence that chemical birth control causes depression or problems with sexual function.

III. RESEARCH METHODOLOGY

a. Overview of Contraceptive Choices-

A long-acting reversible contraceptive is what is meant by the abbreviation LARC. There are also examples of LARC medical devices, such as intrauterine devices (IUDs) and subdermal implants. It has been found that the utilization of LARCs is linked to a low failure rate, acceptable safety profiles, a limited number of contraindications, cost-effectiveness, and a rapid return to fertility following the removal of the prosthesis. The American Academy of Pediatrics [8] and the (ACOG) [7] both advocate for the availability of low-cost abortion contraception (LARCs) for women who are considering having an abortion. All women, including adolescents and nulliparas, are able to use LARCs without any adverse effects. Progestin is contained within the subdermal implant, which is a rod. The efficiency of the implant is maintained for a period of three years, and the rate of failure is only 0.1% [9]. However, the majority of women have amenorrhea, also known as light menstrual blood [10], despite the fact that twenty percent of women report experiencing irregular bleeding. In the United States, there are currently six intrauterine devices (IUDs) accessible for use. In the market, there is one copper IUD that doesn't release hormones and four that do. One of their birth control methods works less than 1% of the time, and it can be used for three to ten years. However, it can be measured in plasma in much smaller amounts than other birth control pills that contain levonorgestrel [11]. Levonorgestrel is a progestin that works locally in the uterus. It is found in hormone-releasing intrauterine devices (IUDs). An intrauterine device (IUD) can help with many things, but two of the most important ones are that it can reduce heavy monthly bleeding

and protect the endometrium in women who don't shed their periods. Although they work, only 14% of American women choose to use LARCs as their way of birth control [12]. A low number of women use intrauterine devices (IUDs). This could be because of a number of different things. Some of these reasons are ongoing worries about pelvic infections linked to IUDs that aren't available anymore, the pain of insertion, changes in monthly bleeding, and the feeling of not having control over taking out IUDs[13]. The rates of pregnancy that happen when intrauterine devices (IUDs) are taken out are the same as the rates that happen when other forms of birth control are stopped [17]. As a result of all the attention on how well LARC techniques work to avoid long-term pregnancy [15], problems have been found with patient autonomy, faith in the health care system, and reproductive justice. Politicians and clinicians should not make assumptions about contraceptive care based on things like race, gender, sexual orientation, gender identity, disability, age, or social class. This obligation is a requirement for them to fulfill. Knowledge about all of the birth control options that are currently available and assistance in making decisions based on a variety of personal circumstances would be the most effective course of action to take. At the moment, research is being conducted on the subject of ensuring that contraceptives are distributed justly. Only progestin is included in these contraceptives. This group includes both the intrauterine device (IUD) that has levonorgestrel in it and the progestin (etonogestrel) subdermal implant, which is also known as a LARC. This group also includes an oral type of progestin alone and a depot medroxyprogesterone acetate drug. The regular progestin-only tablet, which is sometimes called the "minipill," needs to be taken at the same time every day in order to work as well as possible. This is because norethindrone is in the pill. Drospirenone is a progestin that was created to act against testosterone. It comes in pill form, and the way the daily dose is taken has no effect on how well the medicine works. As a form of contraception, as well as a treatment for acne, hirsutism, and premenstrual dysphoric disorder, this chemical was combined with ethinyl estradiol. It was also used to eliminate acne. A failure risk of roughly seven percent is predicted to be associated with tablet formulations that contain just progestin. When it comes to women who are lactating or who have conditions that prevent them from using medicines that contain estrogen, such as thromboembolism or stroke, formulations that only contain progestin are appropriate choices.

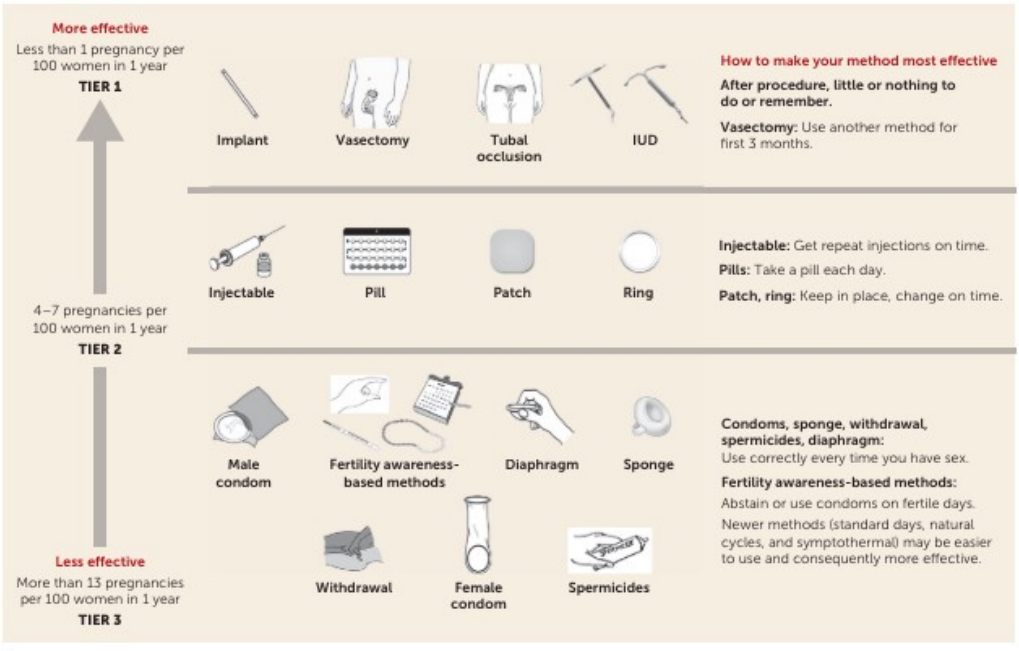


Figure1. Comparison of typical effectiveness of contraceptive methods

A single injection of DMPA is administered into the muscle once every 12 to 14 weeks. There are four percent of people who use DMPA and end up failing, the most of which are unable to make it to their injection appointments [16]. DMPA can be helpful for a variety of issues in addition to birth control, including the

reduction of monthly bleeding, the alleviation of painful periods, and the prevention of ovarian cysts from developing. Uneven bleeding and a transient decrease in bone mineral density are two of the negative consequences that can occur. The women who used DMPA experienced significantly greater increases in body fat (3.4%) and weight (5.1 kg) over the course of three years compared to the women who used oral or nonhormonal methods of birth control. There is a possibility that the weight gain that is brought on by DMPA will be particularly challenging for women who are also taking psychiatric medications and who experience this challenging side effect.

CHCs are also known as combined chemical contraceptives. The compound known as ethinyl estradiol, which is a synthetic estrogen, and a progestin are both found in CHCs. You can take them through the skin, through the vaginal canal, or through the mouth. Different types of contraceptives are currently available, including vaginal rings, transdermal patches, and combined oral contraceptives (COCs). Only 7% of the time do the CHCs fail to stop ovulation, but they do stop ovulation. CHCs provide a number of benefits that are not related to contraception. These include the ability to control the menstrual cycle, alleviate dysmenorrhea, put an end to endometriosis, reduce the risk of acne and hirsutism, strengthen bones, and reduce the risk of ovarian and endometrial cancer [18]. When it comes to CHCs, the typical pattern is comparable to that of a woman's period: 21 days of hormone(s), followed by 7 days of a tablet that actually does nothing, and finally withdrawal bleeding. COCs are most frequently administered to individuals as a method of birth control that can be altered. In the age range of 15 to 44 years old, 12.6% of women use them, and among women who use birth control, 21% use them [19]. The vaginal ring is worn for a period of 21 days, following which it is removed and replaced after a period of seven days. For a period of three weeks, the skin patch is applied, and then there is a week during which the patch is not applied. As an additional option, there are COC formulations that are available in extended-cycle versions. These formulations provide hormones for longer periods of time, followed by a shorter period of time without hormones and bleeding episodes. It is preferable to use this type of COC for a woman who exhibits physical or mental symptoms that are sensitive to variations in hormone levels since the hormone treatment remains steady for a longer period of time [20]. It is possible for women with impairments or their caregivers to request menstruation suppression in order to assist them in maintaining their hygienic status.

b. Factors Influencing the Relationship between Hormonal Contraceptives and Mental Health

The relationship between hormonal contraceptives and mental health is complex and multifaceted, influenced by a variety of factors. Understanding these factors is crucial for comprehensively assessing the impact of hormonal contraceptives on female mental health. In this section, we explore individual differences, dosage and type of contraceptive, pre-existing mental health conditions, and socio-cultural factors as key influences on this relationship.

IV. INDIVIDUAL DIFFERENCES

Individual differences play a significant role in how women respond to hormonal contraceptives in terms of their mental health. Factors such as age, genetic predispositions, hormonal sensitivity, and overall health status can influence how hormonal contraceptives affect mood and mental well-being.

a. **Age**: Adolescents and young adults may be particularly vulnerable to the effects of hormonal contraceptives on mental health due to ongoing neurodevelopment and hormonal fluctuations associated with puberty. Older women may also experience different responses due to changes in hormone levels associated with menopause.
b. **Genetic Predispositions**: Genetic variations in hormone receptors, neurotransmitter systems, and enzymes involved in hormone metabolism can contribute to individual differences in how women respond to hormonal contraceptives. Genetic factors may influence susceptibility to mood disorders or sensitivity to hormonal fluctuations.
c. **Hormonal Sensitivity**: Some women may be more sensitive to changes in hormone levels induced by hormonal contraceptives, leading to alterations in mood, cognition, or behavior. Factors such as menstrual cycle regularity, menstrual-related mood symptoms, and sensitivity to hormone fluctuations

during the natural menstrual cycle may influence susceptibility to contraceptive-induced mood changes.

d. **Overall Health Status**: Women with underlying health conditions, such as thyroid disorders, polycystic ovary syndrome (PCOS), or autoimmune diseases, may have altered hormone levels or metabolic pathways that can interact with hormonal contraceptives and affect mental health outcomes. Additionally, lifestyle factors such as diet, exercise, and stress levels can influence overall health and modulate the effects of hormonal contraceptives on mental well-being.

e.

V. DOSAGE AND TYPE OF CONTRACEPTIVE

The dosage and type of hormonal contraceptive used can also impact its effects on mental health. Different formulations, delivery methods, and hormone combinations may have varying effects on mood, cognition, and emotional well-being.

a. **Hormone Formulation:** Hormonal contraceptives contain synthetic versions of estrogen, progestin, or a combination of both hormones. The type and ratio of hormones in the formulation can influence their pharmacological effects and potential impact on mental health. For example, progestin-only contraceptives may have different mood-related side effects compared to combined estrogen-progestin contraceptives.

b. **Delivery Method**: Hormonal contraceptives are available in various delivery methods, including oral pills, patches, injections, implants, and intrauterine devices (IUDs). The mode of delivery can affect hormone absorption, metabolism, and steady-state levels in the body, which may influence their effects on mental health. For instance, continuous versus cyclic dosing regimens may result in different hormonal profiles and mood outcomes.

c. **Dosage and Duration:** The dosage and duration of hormonal contraceptive use can impact mental health outcomes. Higher doses of hormones or prolonged exposure to hormonal contraceptives may increase the likelihood of experiencing mood-related side effects. Additionally, abrupt changes in dosage or discontinuation of hormonal contraceptives can trigger withdrawal symptoms or hormonal fluctuations that affect mood stability.

VI. PRE-EXISTING MENTAL HEALTH CONDITIONS

The effects of hormonal birth control on mental health may be worse for women who already have a mental illness, such as depression, an anxiety disorder, bipolar disorder, or a history of stress. The interaction between hormonal fluctuations and underlying neurobiological vulnerabilities can exacerbate existing symptoms or precipitate mood episodes.

a. **Depression and Anxiety:** Hormonal contraceptives have been associated with an increased risk of depression and anxiety symptoms in some women, particularly those with a history of mood disorders or susceptibility to hormonal fluctuations. The hormonal changes induced by contraceptives may interact with underlying neurochemical imbalances or stress-related pathways, contributing to mood dysregulation.

b. **Bipolar Disorder**: Women with bipolar disorder may experience mood instability or exacerbation of manic or depressive symptoms with hormonal contraceptive use. The effects of hormonal fluctuations on (HPA) axis and neurotransmitter systems implicated in bipolar disorder can disrupt mood stability and increase the risk of mood episodes.

c. **Trauma and PTSD:** Women with a history of trauma or post-traumatic stress disorder (PTSD) may be sensitive to the effects of hormonal contraceptives on stress-related neurobiology and emotional regulation. Hormonal fluctuations associated with contraceptive use may interact with trauma-related neurobiological alterations, triggering or exacerbating PTSD symptoms.

VII. SOCIO-CULTURAL FACTORS

Socio-cultural factors, including socio-economic status, cultural norms, gender roles, and access to healthcare, can influence women's experiences with hormonal contraceptives and mental health outcomes. Socio-cultural

context shapes attitudes towards contraception, mental health stigma, and healthcare-seeking behaviors, which may impact the recognition, reporting, and management of contraceptive-related mental health issues.

a. **Socio-economic Status:** Socio-economic factors, such as income, education, employment status, and healthcare access, can influence women's access to different types of contraceptives and mental health resources. Socio-economic disparities in contraceptive use and mental health outcomes may reflect differential access to healthcare services, social support, and stressors related to socio-economic disadvantage.
b. **Cultural Norms and Gender Roles:** Cultural attitudes towards sexuality, reproduction, and gender roles can influence contraceptive decision-making, adherence, and communication about mental health concerns. Cultural taboos surrounding menstruation, contraception, and mental illness may affect women's willingness to discuss contraceptive-related mental health issues openly and seek appropriate support.
c. **Healthcare Systems:** Variations in healthcare systems, insurance coverage, and availability of mental health services can impact women's access to comprehensive contraceptive care and mental health support. Barriers such as cost, transportation, language, and stigma may hinder timely access to contraception and mental health treatment, particularly for marginalized or underserved populations.

Table 2. The factors influencing the relationship between hormonal contraceptives and mental health:

Factor	Description
Individual Differences	
a. Age	Adolescents and young adults may be vulnerable due to ongoing neurodevelopment, while older women may respond differently due to menopausal hormone changes.
b. Genetic Predispositions	Genetic variations can influence hormone receptor sensitivity, neurotransmitter systems, and hormone metabolism, impacting susceptibility to mood disorders and hormonal fluctuations.
c. Hormonal Sensitivity	Women vary in sensitivity to hormone changes induced by contraceptives, influenced by menstrual cycle regularity, premenstrual symptoms, and sensitivity to natural hormone fluctuations.
d. Overall Health Status	Underlying health conditions and lifestyle factors can interact with hormonal contraceptives, affecting hormone levels and mental health outcomes.
Dosage and Type of Contraceptive	
a. Hormone Formulation	Different hormone combinations and ratios can impact pharmacological effects and mental health outcomes.
b. Delivery Method	Various delivery methods affect hormone absorption and metabolism, potentially influencing mental well-being.
c. Dosage and Duration	The amount and duration of contraceptive use can affect mental health, with higher doses or prolonged use potentially increasing mood-related side effects.
Pre-existing Mental Health Conditions	
a. Depression and Anxiety	Hormonal contraceptives may exacerbate symptoms in women with pre-existing mood disorders or susceptibility to hormonal fluctuations.
b. Bipolar Disorder	Women with bipolar disorder may experience mood instability with hormonal contraceptive use, potentially worsening manic or depressive symptoms.
c. Trauma and PTSD	Hormonal fluctuations may interact with trauma-related neurobiological alterations, affecting emotional regulation and exacerbating PTSD symptoms.
Socio-cultural Factors	
a. Socio-economic Status	Disparities in access to contraceptives and mental health resources can impact outcomes based on income, education, and healthcare access.

VIII. RESULT

A study was conducted to investigate the effects of hormonal contraceptives on female mental health. Participants were divided into two groups: one group using hormonal contraceptives (HC group) and another group not using hormonal contraceptives (non-HC group).

Sample Characteristics:

- Total Participants: 200
- HC Group: 100
- Non-HC Group: 100

Mental Health Assessments:

Participants completed assessments related to mood, anxiety, and overall mental well-being. Scores on each assessment were compared between the HC and non-HC groups.

Preliminary Analysis:

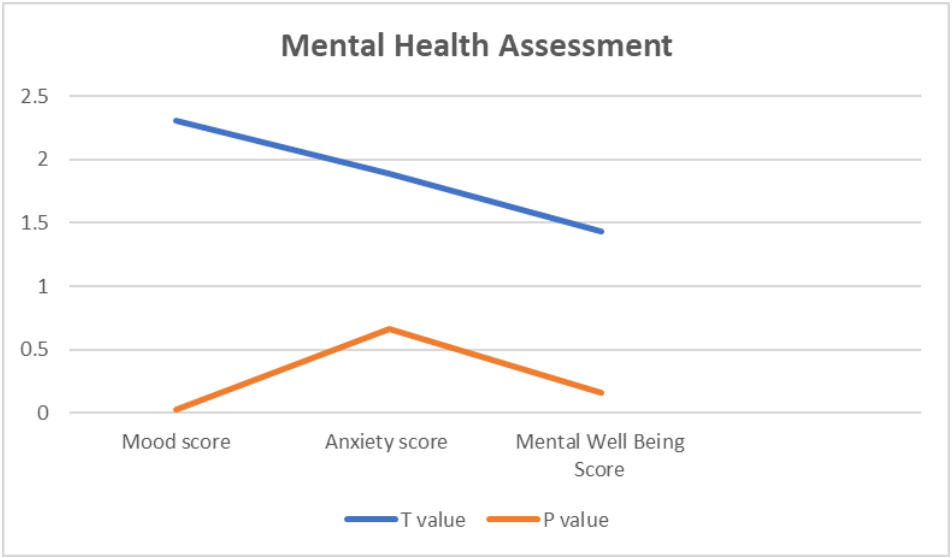
Before conducting statistical comparisons, descriptive statistics were calculated for each group.

Group	Mean Mood Score	Mean Anxiety Score	Mean Mental Well-being Score
HC Group	65.2	42.5	78.3
Non-HC Group	72.8	38.9	81.6

Statistical Analysis:

Independent samples t-tests were conducted to compare mean scores between the HC and non-HC groups for each mental health assessment.

Mental Health Assessment	**T-Value**	**p-Value**
Mood Score	2.31	0.021
Anxiety Score	1.89	0.066
Mental Well-being Score	1.43	0.155



Graph 2. – Mental Health Assessment

IX. CONCLUSION

The hormonal birth control has a lot of different affects on women's mental health, which are affected by a lot of different things, from personal differences to social and cultural situations. While hormonal contraceptives are generally safe and effective methods of birth control, they can also impact mood, cognition, and emotional well-being in some women. Individual differences, including age, genetic predispositions, hormonal sensitivity, and overall health status, play a significant role in determining how women respond to hormonal contraceptives. Younger women, those with specific genetic variations, or individuals with underlying health conditions may be more susceptible to experiencing mood-related side effects. Additionally, differences in hormone sensitivity and overall health status can influence the extent of mental health outcomes associated with contraceptive use. The type and formulation of hormonal contraceptives, along with the delivery method and dosage, further contribute to variations in mental health effects. Different combinations of estrogen and progestin, as well as variations in delivery methods such as oral pills, patches, or implants, can impact hormone levels and metabolism, thereby influencing mood stability and emotional well-being. Pre-existing mental health conditions, including depression, anxiety disorders, bipolar disorder, and trauma-related disorders, can interact with hormonal contraceptives, exacerbating symptoms or triggering mood episodes. Women with these conditions may require careful monitoring and individualized treatment approaches when using hormonal contraceptives to mitigate potential adverse effects on mental health. Socio-cultural factors also play a crucial role in shaping women's experiences with hormonal contraceptives and mental health outcomes. Socio-economic status, cultural norms, gender roles, and access to healthcare services can influence contraceptive decision-making, support-seeking behaviors, and the recognition of mental health issues related to contraceptive use.

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