



Original Article



Male Contraceptive Methods: A Comprehensive Review of Current Approaches, Emerging Technologies and Nursing Implications

Remzi Karasungur^a and Orhan POLAT^b

^a Baykan state hospital, Faculty of Health Sciences, Siirt, Turkey

^b The Vocational School of Higher Education for Health Services, Gaziantep Islamic Science and Technology University, Gaziantep, Turkey

Article Information

Received 29 Jun 2026

Accepted 9 Sep 2026

Available online 30 Sep 2026

Keywords: male contraception, nursing counseling, reproductive health, hormonal contraception, non-hormonal contraception

Abstract

Purpose: This study is designed as a comprehensive literature review of male contraceptive methods, which have evolved in the light of technological advances, and their implications for nursing. **Methods:** As part of the study, a comprehensive literature search was conducted using keywords in PubMed, Google Scholar, CINAHL, ScienceDirect, Scopus and Web of Science. **Findings:** The findings indicate that, in addition to vasectomy (tubal ligation), condoms and coitus interruptus (withdrawal) which are the most commonly used methods of male contraception from the past to the present some hormonal and non-hormonal methods of male contraception, developed using advanced technological infrastructure, are currently in use, and new methods are also being developed. **Conclusion:** While the development and diversification of male contraceptive methods increase men's responsibility in preventing pregnancy, the role of nurses providing services in this field in delivering accurate information and advice is also significant in this process.

Introduction

Within reproductive health services, family planning is one of the fundamental health services that enables individuals and couples to have children when they wish and, in the numbers, they desire. Worldwide, it is observed that responsibility for family planning is predominantly shouldered by women. However, in recent years, increasing men's active participation in reproductive health services has been regarded as an important public health objective in terms of achieving gender equality and enhancing the effectiveness of family planning services. Despite the various contraceptive methods available to women, the rate of unintended pregnancies worldwide has been reported to be 45 per cent. Between 2015 and 2019, there were approximately 121 million unwanted pregnancies worldwide each year [1]. Consequently, male contraceptive methods must also be used effectively to prevent unwanted pregnancies [2,3]. Among reversible methods for men, the failure rates for condoms and the withdrawal method are 13 per cent and 20 per cent respectively. The failure rates of condoms and the withdrawal

method under typical use are higher than those of long-acting reversible contraceptive methods and other highly effective female contraceptive methods [4]. A vasectomy, a permanent method of contraception for men, is more than 99 per cent effective in preventing pregnancy [5]. Studies have shown that if men are offered reliable and effective methods of contraception, they will accept and use them [6]. The limited range of contraceptive options currently available to men means that the responsibility for preventing pregnancy falls largely on women. This situation highlights the importance of research into the development of new, reliable, reversible and acceptable methods of contraception for men [2,3]. In order to achieve more effective and successful outcomes with male contraceptive methods, nurses, as healthcare professionals, are expected to play a more active role in this area. Consequently, it is of the utmost importance that nurses possess sufficient knowledge and experience in this field. Furthermore, it is important for nurses to possess the necessary knowledge regarding the socio-cultural structure, religious values and traditions of the communities they serve,

in order to provide a higher quality of care. In addition to all these rules that must be followed, obtaining legal information and consent regarding procedures, and upholding ethical values with regard to patient privacy, will also enable both patients and the nurses providing care to work more effectively [2–5]. The aim of this study is to provide comprehensive information on male contraception methods and their effectiveness, based on data obtained from literature reviews. It also aims to reduce existing misconceptions and prejudices regarding these methods and to contribute to raising awareness based on accurate information.

Materials and Methods

As part of this study, a comprehensive literature review was conducted between 3 January 2026 and 14 June 2026 using keywords in Google Scholar, PubMed, CINAHL, ScienceDirect, Scopus and Web of Science. The search in the databases was carried out using the terms ‘male contraception’, ‘nursing counselling’, ‘reproductive health’, ‘hormonal contraception’ and ‘non-hormonal contraception’.

Inclusion/Exclusion Criteria

For the purposes of this study, only male contraceptive methods have been included. Female contraceptive methods have not been included in the scope of this study.

Physiology of the Male Reproductive System

The physiology of the male reproductive system is based on spermatogenesis and steroidogenesis. Spermatogenesis is triggered by gonadotrophin-releasing hormone (GnRH), which is released from the hypothalamus in the brain; this, in turn, causes the anterior pituitary gland to secrete luteinizing hormone (LH) and follicle-stimulating hormone (FSH). While LH stimulates Leydig cells to support testosterone production, FSH acts on Sertoli cells to help maintain spermatogenesis. Testosterone is vital for both sperm maturation and the development of secondary sexual characteristics (such as deepening of the voice and muscle development). Testosterone plays a key role in the negative feedback loop that regulates the production of GnRH and gonadotropins. Testosterone levels in the testes are approximately 40 times higher than those in the blood and support the role of Sertoli cells in spermatogenesis [7]. After being released from the Sertoli cells, the sperm pass into the seminiferous tubules and then into the epididymis, where they develop into functional sperm. Once mature, they are expelled via the vas deferens, first into the urethra and then out of the body [8]. Given the physiology of sperm production, methods of contraception for men can work in various ways:

- By preventing sperm from reaching the egg using physical barriers (condoms, vasectomy and experimental vasectomy methods),
- By inhibiting sperm production (using experimental hormonal and non-hormonal methods).
- By killing sperm cells, impairing their function or eliminating the sperm’s ability to bind to the egg

after ejaculation (spermicides, experimental sperm motility inhibitors) [9].

Common Methods of Contraception for Men

Vasectomy: A vasectomy is an irreversible, permanent surgical method of sterilization for men [10]. In this procedure, the vas deferens is severed on both sides via an incision made in the scrotal region. This method, which has been performed on approximately 17 million men worldwide, has a failure rate of 1 per cent [11–12]. Minor side effects include scrotal bruising, scrotal swelling, acute pain, bleeding, haematoma and surgical infection. The main disadvantage is that the vas deferens distal to the surgical site may remain in the ejaculate for up to 3–4 months; therefore, the use of additional methods of contraception is recommended during this period [12]. Looking at global vasectomy rates, the rate fell from 2.4 per cent in 2011 to 1.4 per cent in 2019 [13]. Reasons for the low uptake include misconceptions about the procedure, cultural hesitations and the legal requirement for spousal consent [14].

Condoms: One of the oldest known methods of contraception, the condom is a barrier method made of latex that prevents both pregnancy and sexually transmitted infections. Its advantages include being reliable, affordable, easily accessible and not affecting the body’s hormonal balance; however, its disadvantages include interrupting sexual intercourse, reducing sensitivity and the risk of a latex allergy. It has been reported that, when used correctly, the effectiveness rate is 98 per cent [15].

Coitus interruptus (withdrawal): Commonly known as ‘withdrawal’ or the ‘withdrawal method’, coitus interruptus is one of the oldest and least reliable methods of contraception. It does not involve a medical or physical barrier, such as a vasectomy or a condom; it relies entirely on control and timing. The mechanism is based on the principle of the man withdrawing his penis from the vagina just before ejaculation. While the effectiveness rate is approximately 96 per cent when applied perfectly, this rate drops to as low as 78 per cent due to errors [16].

Experimental Hormonal Male Contraceptive Methods

The primary aim of male hormonal contraception is to inhibit testicular testosterone production and sperm maturation by suppressing the FSH and LH hormones [17–18]. Male hormonal contraceptive methods involve a combination of androgens and progestins, or high-dose testosterone [19]. As progestins can cause a loss of libido when used on their own due to their effects on testosterone, they are used in combination with androgens. Male hormonal contraceptives can be administered orally, by injection, transdermally or via implant [20]. In trials of hormonal contraceptives in men, symptoms such as acne, weight gain, depression and a reduction in sexual desire have been reported. Another challenge with male hormonal contraceptives is that it takes 2–3 months for many methods to reduce sperm concentrations to contraceptive levels, and it takes a long time for sperm counts to return to normal after the method is discontinued. It is encouraging that all hormonal methods used in studies are reversible [21].

As of 2026, there are no approved male hormonal contraceptive methods available. The methods currently in the research phase are as follows:

Segesterone acetate + testosterone (NES/T): This method, a gel containing progestin and testosterone, is applied daily between the shoulders to send a signal to the brain to halt sperm production and thereby reduce sperm count. Testosterone is intended to help prevent a reduction in libido and loss of muscle mass that may arise as a result of hormonal suppression [22]. In clinical trials evaluating the NES/T combination, it has been reported that sufficient gonadotropin suppression to inhibit spermatogenesis was achieved in approximately 90 per cent of participants [23]. Research into the safety and efficacy of the method is ongoing, and NES/T has the potential to be an effective and reversible method of contraception for men [22–24].

Dimetandrolone undecanoate (DMAU): DMAU, which possesses androgenic and progestogenic properties, is being investigated in oral and injectable forms as a hormonal method of contraception for men. Androgens or androgen-progestogen combinations may reduce spermatogenesis by suppressing gonadotropin secretion via negative feedback. In early-stage clinical trials involving DMAU, a marked suppression of testosterone and gonadotropin levels has been observed. However, clinical trials investigating the efficacy and safety of DMAU are ongoing [25–26].

11 β -methyl-19-nortestosterone dodecylcarbonate (11 β -MNTDC): This is a molecule with androgenic and progestogenic properties, similar to DMAU. In short-term (28-day) clinical trials, it has been shown to significantly suppress gonadotropin and testosterone levels and to be generally well tolerated [27].

Experimental Non-Hormonal Male Contraceptive Methods

The mechanism of non-hormonal male contraceptive methods focuses on halting sperm production, motility or transport by directly targeting sperm without affecting the body's testosterone balance [28]. In other words, by impairing sperm motility or function, it paralyses their ability to move and creates a physical barrier or causes chemical damage. As non-hormonal contraceptive methods have no effect on testosterone levels and consequently on sexual function, muscle and bone mass, or sexual drive –they may be more appealing to men than the hormonal approaches currently under development [12].

Gossypol: A complex phenolic molecule derived from the seeds, roots and leaves of the cotton plant [27]. It is the first non-hormonal method of male contraception. Studies on gossypol have shown that it affects both sperm production and motility in men and leads to abnormal sperm morphology. Although gossypol is 90 per cent effective in preventing pregnancy, the fact that it causes hypokalaemia in 1 per cent of

men and that fertility does not return in 20 per cent of men despite treatment has led to a move away from this approach [12,27,29].

Triptolide: This is a plant known in Chinese medicine as the ‘Thunder God Vine’. Triptolide, which is used in traditional Chinese medicine to treat conditions such as rheumatoid arthritis and chronic nephritis, was discovered after cases of azoospermia or necrospemia were observed in treated individuals [29]. Unfortunately, studies conducted on men have shown that, as with gossypol, fertility did not return in some men, leading to this approach also being abandoned [12,27,29–30].

Adjudin: One of the male contraceptive candidates identified in the early 2000s. It is a contraceptive method that prevents spermatids from attaching to Sertoli cells, causing them to undergo premature spermiation and produce non-functional sperm cells [29]. Although a study conducted on rats showed that it caused 100 per cent infertility after the fifth week and that fertility returned by the eleventh week, its high cost and the potential for the development of FSH autoantibodies have been identified as issues that need to be addressed when moving on to human studies [12,29].

H2-Gamendazole: Although H2-gamendazole, an adjudin derivative, functions in a similar way to adjudin, studies have shown that when a single oral dose of gamendazole (6 mg/kg) was administered to rats, all the rats became infertile, but half of them were unable to regain their fertility [30]. In another study, human trials could not be initiated because half of the rats given a high dose of gamendazole died [27,29–30].

Epididymal peptidase inhibitor (EPPIN): A protein found on the surface of sperm. The function of this protein is to facilitate the liquefaction of the ejaculate, thereby ensuring sperm motility. In its absence, sperm motility is severely impaired [31]. In the first immunisation study conducted on monkeys, it was reported that the majority of the monkeys developed immunity against EPPIN. The monkeys in the study were mated, but none became pregnant. When the monkeys' immune systems were suppressed, they regained their fertility [29]. As a new approach to developing a hormone-free male contraceptive, EP055—a small molecule that blocks EPPIN binding—has been developed. EP055 reduces sperm motility by lowering calcium levels in the sperm's internal pH [32]. In a study conducted on monkeys using EP055, it was reported that it reduced sperm motility by 80 per cent in male monkeys. The development of potent, orally administered compounds capable of replicating this effect and completely inhibiting sperm motility would be exciting for future male contraceptive methods [12].

Bromodomain testis-specific protein inhibition (BRDT): BRDT, a testis-specific protein, is essential for meiosis. In individuals with mutations in the BRDT gene, infertility develops due to abnormal sperm head formation [12]. Studies have shown that JQ1, a molecule that inhibits BRDT function,

reversibly suppresses fertility. Unfortunately, JQ1 also inhibits other members of the BRDT family, leading to toxic effects. Based on data from recent studies, research is currently underway to develop selective drugs that target only BRDT without affecting other similar proteins (BRD2, BRD3, BRD4) [8,12,29].

Retinoic acid receptor antagonists (RAR): This is one of the most advanced non-hormonal methods used to halt spermatogenesis. The mechanism behind this method involves 'switching off' the body's vitamin A (retinoic acid) signaling at the testicular level [33]. By binding to RAR-alpha receptors, which trigger the genes necessary for sperm production, they effectively 'occupy' these sites. Retinoic acid (vitamin A) is then unable to bind to these receptors. As no signal is received, the sperm production process stops right from the start. Consequently, the testicles can no longer produce mature sperm, and sperm count drops to levels associated with infertility. The advantages are that fertility returns to normal immediately after the drug is discontinued, and as it does not affect testosterone levels, there are no changes in mood, sexual desire or physical characteristics. YCT-529 is the most significant molecule in this category. In studies conducted on rats, it demonstrated 99 per cent efficacy and showed no side effects. Phase 1 human trials began in 2023 and are still ongoing [34].

Retinoic acid biosynthesis inhibitors: Rather than blocking RAR, they shut down the mechanism responsible for retinoic acid production in the testes. The ALDH1A1 (aldehyde dehydrogenase 1A1) enzyme is central to this mechanism. The mechanism of action involves the ALDH1A enzyme family, which comprises the primary enzymes responsible for converting vitamin A (retinol) into retinoic acid in the testes. The inhibitors render this enzyme inactive. Even if vitamin A is present in the body, the signal required for sperm production is not generated because the 'converting' enzyme in the testicles is not functioning. When the retinoic acid signal is disrupted, sperm stem cells cannot progress to the next stage and production ceases. The best-known, yet most controversial, compound in this category is WIN 18446. It is an extremely potent inhibitor; it is highly effective at reducing sperm count to zero. When the medication is stopped, sperm production returns to completely normal. The main drawback of this method is that the targeted enzymes also play a role in the metabolism of alcohol in the liver. Inhibitors such as WIN 18446 prevent the breakdown of alcohol. People taking this medication who consume alcohol may experience severe nausea, vomiting, palpitations and shortness of breath. Recent scientific studies emphasize the need to develop 'testis-specific' inhibitors (such as SBI-993) that target only the ALDH1A1 enzyme in the testicles and do not interfere with alcohol breakdown in the liver [35–36].

CatSper: A calcium channel complex found specifically in the tail region of the sperm cell and essential for the sperm to fertilise the egg. Sperm are motile at the moment of ejaculation, but this movement is not sufficient to fertilize the egg [37]. As they approach the egg, the CatSper channels open and calcium begins to flow in. This influx of calcium causes

the sperm's tail to become much stiffer, wider and to move in a whip-like manner. This powerful movement enables the sperm to pass through the protective layer surrounding the egg (the zona pellucida) and enter it [37–38]. CatSper inhibitors (such as HC-056456 or natural compounds) work by blocking this channel. The drug closes the opening of the CatSper channel. As calcium cannot enter, the sperm cannot progress to the hyperactivation stage. The sperm can swim as far as the side of the egg (basal motility), but does not have sufficient force to penetrate the egg membrane and enter. The advantage is that CatSper channels are not found in any other cells in the body (heart, muscle, nervous system). They are specific to the sperm tail. It never affects testosterone levels, sexual desire or body composition. As it targets existing sperm, it has great potential for use as a tablet or gel taken immediately before sexual intercourse. Once the drug has been eliminated from the body, newly produced sperm continue to function at full capacity [29,37].

Silodosin: It is a medicine approved for the treatment of benign prostatic hyperplasia (BPH); however, it has attracted significant interest in the medical literature as a potential 'non-hormonal male contraceptive'. The drug prevents pregnancy by inducing 'dry ejaculation' (anejaculation) due to its specific effect on the reproductive system. The mechanism of action is that silodosin is an alpha-1A adrenergic receptor antagonist. It exerts its contraceptive effect as follows: it relaxes the smooth muscles of the vas deferens, the prostate and the neck of the bladder. As the muscles are relaxed, no pressure builds up to expel semen during ejaculation. The semen either does not come out at all or flows back into the bladder. As the semen is not expelled, the risk of pregnancy is eliminated. In particular, the sensation of orgasm and the ability to achieve an erection are generally preserved, even if ejaculation does not occur [39]. Among its advantages is the fact that, while halting spermatogenesis (sperm production) takes months, Silodosin takes effect within 2–3 hours. Ejaculatory function and fertility return to completely normal 24–48 hours after the medication is discontinued. It does not affect testosterone; it has no adverse effect on voice pitch, muscle mass or sexual desire. Its disadvantages include nasal congestion, a sensation of dry ejaculation and mild dizziness. It is not currently officially approved as a 'contraceptive pill' anywhere in the world. However, clinical trials report that it has an efficacy ranging from 95 per cent to 100 per cent [40].

Vascular Occlusion Methods

RISUG: A non-hormonal, long-acting, injectable male contraceptive method developed in India. It is designed as a reversible alternative to traditional vasectomy. The procedure involves injecting a polymer gel into the sperm-carrying tubes without the need for a surgical incision. The injected 'styrene maleic anhydride' (SMA) polymer adheres to the inner lining of the duct, forming a plug. The surface of the polymer has a mosaic structure consisting of positively and negatively charged regions. When sperm attempting to pass through the channel encounter this electrical charge, their cell membranes rupture and they lose their ability to fertilize. The polymer also renders the sperm inactive by creating an acidic environment

within the channel [41]. One of its advantages is that, if desired, the polymer can be dissolved by means of a further injection (using solvents such as sodium bicarbonate) to reopen the duct. It is reported to provide protection for up to 10–15 years with a single application. It does not affect testosterone levels and does not cause loss of libido or hormonal side effects. In clinical trials, it has demonstrated over 99 per cent efficacy in preventing pregnancy. Among the current situation and challenges are the completion of Phase III clinical trials in India and the product's pending approval from the Directorate General of Drug Control (DCGI) in India for mass production [42].

Vasalgel: A non-hormonal, long-acting and reversible barrier gel method developed for male contraception [43]. It works by injecting a polymer gel into the sperm ducts (vas deferens) without the need for surgical incisions. Once inside the duct, the gel physically blocks the passage of sperm. While the gel stops sperm, it allows fluids to pass through; this prevents pressure build-up and pain within the duct. Sperm that come into contact with the gel suffer structural damage and lose their ability to fertilize [38]. Its advantages include the fact that it does not affect testosterone levels; nor does it cause loss of libido, acne or mood swings. This is its greatest advantage. If desired, the gel can be dissolved by injecting another solution (such as sodium bicarbonate) into the canal, thereby restoring fertility. It is designed to provide protection for up to 10 years with a single application. For men who do not wish to undergo a permanent surgical procedure such as a vasectomy, it acts as a 'temporary vasectomy'. The first clinical trials in humans in Australia are progressing successfully. In animal studies (particularly in monkeys), 100 per cent efficacy and full reversibility have been achieved [44]. Due to regulatory approval processes and large-scale human trials, widespread use is not expected before 2026–2027 [45].

Intra-tubal Devices (IVDs): These are small, mechanical plugs inserted into the sperm-carrying tubes (vas deferens). This method has been developed as a completely reversible, non-surgical alternative to a vasectomy (cutting of the tubes). It works by acting as a physical barrier within the tube. The micro-sized device, placed inside the duct, physically blocks the passage of sperm. The duct is neither cut nor cauterized; a foreign object (typically medical-grade silicone or polyurethane) is simply inserted into it. When the man wishes to have children again, this small device is surgically removed and sperm flow resumes. The main disadvantage is that sperm can sometimes leak around the edges of the device. This reduces its effectiveness to just under 100 per cent. With long-term use, the internal diameter of the vas deferens may widen, which can cause the device to slip out of place. Approval Status: Various models (e.g. 'Shug') have been tested and used in China; however, they have not yet been approved as a standard method in the Western world (FDA/EMA) [46].

Sperm Valve: In the scientific literature, this term generally refers to a mechanical device developed in Germany and

known as the Bimek SLV. This is a radical design that marks the beginning of the 'on-off' era in male contraception. The Bimek SLV is a mechanical valve, approximately the size of a paperclip, which is surgically implanted into the vas deferens. The user can feel the valve beneath the skin via the scrotum and physically rotate it with their fingers. When the valve is open, sperm flows normally and fertility is maintained. When the valve is closed, the passage of sperm is physically blocked, rendering the person infertile. Unlike hormonal methods, this method allows fertility status to be altered in a matter of seconds with a single procedure. Advantages: No medication, hormones or chemicals are released into the body. Once inserted, it is designed to function, in theory, for life [47]. A vasectomy is permanent; however, this device gives the individual the freedom to have children again whenever they wish. Risks and current status: The device's inventor, Clemens Bimek, has tested the design on himself. However, large-scale human clinical trials and medical approval processes (CE or FDA) have not yet been completed. Urologists are concerned that rigid devices of this kind, when inserted into the ducts, may lead to tissue damage, scar tissue (fibrosis) or blockage of the duct over time. If the valve does not close completely or becomes loose over time, there is a risk of 'leakage' [47–48].

The Impact on the Nursing Profession and the Counselling Process for Nurses

The increase in the use of contraceptive methods amongst men in family planning services is having a direct impact on nursing practice. As professionals who educate individuals and couples, provide counselling, promote healthy behaviors and support reproductive health, nurses bear significant responsibilities in raising awareness of contraceptive methods amongst men. It is of the utmost importance for nurses to be competent in matters of contraception, to keep abreast of the latest scientific developments so that they are prepared for future options, and to be able to provide counselling services [49]. Studies have shown that the rate at which men seek contraceptive advice is significantly lower than that of women. It is therefore recommended that nurses develop education and counselling programs that also target men. In nursing practice, advising men on contraceptive methods offers the following benefits:

- Reducing the number of unwanted pregnancies,
- Preventing sexually transmitted infections,
- Reducing the burden of contraception on women,
- Supporting couples' shared decision-making processes,
- Increasing the uptake of reproductive health services,
- Strengthening gender equality.

In family planning counseling, nurses serve as educators, counselors, advocates, and guides. An effective counseling process involves assessing the individual's level of knowledge, identifying their needs, and explaining methods appropriate

for them. High-quality family planning counseling incorporates the following fundamental principles:

- Assessing the individual's needs,
- Providing unbiased information about available options,
- Explaining the advantages and disadvantages,
- Discussing side effects and potential risks,
- Supporting the individual's ability to make an informed choice,
- Providing follow-up and evaluation services.

According to the family planning service standards published by the CDC (Centers for Disease Control and Prevention), the counseling process consists of the following steps: assessment, education, method selection, and follow-up. During this process, health professionals are encouraged to adopt an impartial, evidence-based, and patient-centered approach. It is also noted that when working with male clients, it is necessary to address topics such as evaluating the methods used by their partners, condom use, protection against sexually transmitted infections, and communication between partners [50-51].

In counseling services for men, the primary goal of nurses is to ensure that individuals have access to accurate information and to dispel misconceptions. Scientific data shows that these beliefs are incorrect. Therefore, nurses must use evidence-based information during the counseling process. During the counseling process, nurses:

- Assess men's current level of knowledge,
- Identify misconceptions,
- Explain contraceptive methods in a comparative manner,
- Provide education on protection against sexually transmitted infections,
- Encourage partner involvement,
- Adopt a couple-centered approach.

In addition, current guidelines emphasize the importance of couple-centered counseling in family planning services. When couples receive counseling together, it improves adherence to method use and reduces contraceptive failure rates [52].

Limitations

One of the limitations of this study is that it focuses solely on male birth control methods. Another limitation is that it does not address the roles and responsibilities of health professionals other than nurses.

Conclusion

Male contraceptive methods play a significant role in enhancing the effectiveness of family planning services and improving reproductive health. Men's active participation in family planning processes contributes not only to the prevention of pregnancies but also to the advancement of gender equality. Nurses are key health professionals who, through their educational and counseling roles, help raise

men's awareness of contraceptive methods. Expanding counseling services for men, adopting a couple-centered approach, and developing evidence-based educational programs will enhance the success of family planning services.

Conflict of Interest: NIL

Funding Sources: NIL

References

- [1] Nearly half of all pregnancies are unintended—a global crisis, says new UNFPA report. (2022). <https://www.unfpa.org/press/nearly-half-all-pregnancies-are-unintended%E2%80%99global-crisis-says-new-unfpa-report#:~:text=1,5> Access Date, 02.03.2026
- [2] Yan, W., Amory J.K. (2024) Emerging approaches to male contraception. *Andrology*.12(7):1568-1573. doi: 10.1111/andr.13652.
- [3] Nickels, L., Yan, W. (2023). Nonhormonal Male Contraceptive Development-Strategies for Progress. **Pharmacological reviews**, *76*(1), 37-48. <https://doi.org/10.1124/pharmrev.122.000787>
- [4] Sundaram, A., Vaughan, B., Kost, K., et al. (2017) Contraceptive Failure in the United States: Estimates from the 2006-2010 National Survey of Family Growth. *Perspect Sex Reprod Health*. 49(1):7-16.
- [5] Turkey Demographic and Health Survey, Hacettepe University Institute of Population Studies, Ankara, Turkey, 2018. http://www.hips.hacettepe.edu.tr/tnsa2018/rapor/TNSA_2018_main_report.pdf Access Date, 02.03.2026
- [6] Glasier, A. (2010) Acceptability of contraception for men: a review. *Contraception*.82(5):453-456.
- [7] Coviello, A.D., Bremner, W.J., Matsumoto, A.M., et al. (2004). Intratesticular testosterone concentrations comparable with serum levels are not sufficient to maintain normal sperm production in men receiving a hormonal contraceptive regimen. *J Androl*.25(6):931-938.
- [8] Reynolds-Wright, J.J., Anderson, R.A. (2019). Male contraception: where are we going and where have we been? *BMJ Sexual & Reproductive Health*, 45:236-242.
- [9] Amory, JK. (2016). Male contraception. *Fertil Steril*.106(6):1303-1309.
- [10] Aksu, H., Akdolun Balkaya, N., Özsoy, S., Demirsoy, G. (2016). Women's Knowledge and Views on Less Commonly Used Family Planning Methods. *KASHED*. 2(1):59-71.
- [11] United Nations, Contraceptive Use by Method, 2019: Data Booklet, 2019, <https://digitallibrary.un.org/record/3849735?v=pdf> Access date, 01.14.2026.
- [12] Amory, J.K. (2020). Development of Novel Male Contraceptives. *Clin Transl Sci*.13(2):228-237.
- [13] Jacobstein, R., Radloff, S., Khan, F., et al. (2023) Down but Not Out: Vasectomy Is Faring Poorly Almost Everywhere-We Can Do Better To Make It A True Method Option. *Glob Health Sci Pract*.11(1).
- [14] Toptaş, B., Aksu, H., Özgür, A., et al. (2021) Male patients' knowledge and opinions regarding vasectomy at a urology outpatient clinic. *Journal of Anatolia Nursing and Health Sciences*, 24(1), 68-75.
- [15] Fennell, J. (2014) "And Isn't that the point?": pleasure and contraceptive decisions. *Contraception*. 89(4).
- [16] Pull Out Method, 2022, <https://my.clevelandclinic.org/health/articles/24174-pull-out-method> Access date, 01.04.2026.
- [17] Avcı, N., Kaydırak, M.M., Güngör, İ. (2021). Contraception in Special Populations and Individuals with Chronic Health Conditions. *Haliç University Journal of Health Sciences*, 4(3), 173-186.

- [18] Thirumalai, A., Page, S.T. (2022). Androgens in male contraception. *Best Pract Res Clin Endocrinol Metab.* 36(5)
- [19] Güllü, A., Taşçı Duran, E. (2020). An Examination of Men's Views on Newly Developed Contraceptive Methods for Men. *KASHED.* 6(2):71-86.
- [20] Wang, C., Swerdloff, R.S. (2022) Approaches to Contraceptive Methods for Men. *Global Public Health.*
- [21] Abbe, C.R., Page, S.T., Thirumalai, A. (2020) Male Contraception. *Yale J Biol Med.* 93(4):603-613.
- [22] Nestrone: Birth control for men: researchers test a male contraceptive gel, 2018. <https://www.nbcnews.com/health/health-news/federal-health-researchers-start-testing-male-contraceptive-gel-n941381> Access date, 03.02.2026
- [23] Anawalt, B.D., Roth, M.Y., Ceponis, J., et al. (2019). Combined nesterone-testosterone gel suppresses serum gonadotropins to concentrations associated with effective hormonal contraception in men. *Andrology.* 7(6):878-887.
- [24] Roth, M.Y., Ilani, N., Wang, C., et al. (2013). Characteristics associated with suppression of spermatogenesis in a male hormonal contraceptive trial using testosterone and Nesterone gels. *Andrology.* 1(6):899-905.
- [25] Louwagie, E.J., Quinn, G.F.L., Pond, K.L., Hansen, K.A. (2023). Male contraception: narrative review of ongoing research. *Basic Clin Androl.* 33(1):30.
- [26] Dimethandrolone undecanoate shows promise as a male birth control pill, 2018. <https://www.endocrine.org/news-and-advocacy/news-room/2018/dimethandrolone-undecanoate-shows-promise-as-a-male-birth-control-pill> Access date, 04.03.2026
- [27] Long, J.E., Lee, M.S., Blithe, D.L. (2021). Update on novel hormonal and nonhormonal male contraceptive development. *The Journal of Clinical Endocrinology & Metabolism*, 106(6), e2381-e2392.
- [28] Nya-Ngatchou, J.J., Amory, J.K. (2013) New approaches to male non-hormonal contraception. *Contraception.* 87(3):296-299.
- [29] Thirumalai, A., Amory, J.K. (2021) Emerging approaches to male contraception. *Fertil Steril.* 115(6):1369-1376.
- [30] Goldberg, E. (2021). A plant root extract, triptonide, is a reversible male contraceptive in mice and monkeys. *Biol Reprod.* 104(6):1187-1188.
- [31] Drevet, J.R. (2018). Epididymal approaches to male contraception. *Basic Clin. Androl.* 28, 12
- [32] O'Rand, M.G., Hamil, K.G., Adevai, T., et al. (2018). Inhibition of sperm motility in male macaques with EP055, a potential non-hormonal male contraceptive. *PLoS One.* 13(4)
- [33] Chung, S.S., Wang, X., Wolgemuth, D.J. (2016). Prolonged Oral Administration of a Pan-Retinoic Acid Receptor Antagonist Inhibits Spermatogenesis in Mice With a Rapid Recovery and Changes in the Expression of Influx and Efflux Transporters. *Endocrinology.* 157(4):1601-1612.
- [34] A non-hormonal pill could soon expand men's birth control options, 2022, <https://www.acs.org/pressroom/newsreleases/2022/march/non-hormonal-pill-could-soon-expand-mens-birth-control-options.html> Access date, 04.03.2026
- [35] Chen, Y., Zhu, J.Y., Hong, K.H., et al. (2018). Structural Basis of ALDH1A2 Inhibition by Irreversible and Reversible Small Molecule Inhibitors. *ACS Chem Biol.* 13(3):582-590.
- [36] Paik, J., Haenisch, M., Muller, C.H., et al. (2014). Inhibition of retinoic acid biosynthesis by the bisdichloroacetyldiamine WIN 18,446 markedly suppresses spermatogenesis and alters retinoid metabolism in mice. *J Biol Chem.* 289(21):15104-15117.
- [37] Curci, L., Carvajal, G., Sulzyk, V., Gonzalez, S.N., Cuasnicú, P.S. (2021). Pharmacological Inactivation of CatSper Blocks Sperm Fertilizing Ability Independently of the Capacitation Status of the Cells: Implications for Non-hormonal Contraception. *Front Cell Dev Biol.* 9:686461.
- [38] Kim, J., So, B., Heo, Y., So, H., Jo, J.K. (2024). Advances in Male Contraception: When Will the Novel Male Contraception be Available?. *World J Mens Health.* 42(3):487-501.
- [39] Sönmez, B., Uzun, H., Hüner, M., et al. (2025) Silodosin-induced anejaculation: a promising agent for male oral contraception. *Revista internacional de Andrología: salud sexual y reproductiva,* 23(2), 9.
- [40] Nouh, I., Eldib, H., Noah, K., Farag, M. (2026). Efficacy of daily silodosin 8 mg as a potential reversible male contraceptive: A prospective placebo-controlled study. *Int Urol Nephrol.* 58(5):1753-1760.
- [41] Khilwani, B., Badar, A., Ansari, A.S., Lohiya, N.K. (2020). RISUG® as a male contraceptive: journey from bench to bedside. *Basic Clin Androl.* 30:2.
- [42] What's the Hold-up on Male Contraception? <https://populationconnection.org/blog/whats-the-hold-up-on-male-contraception/#:~:text=Non%2Dhormonal%2Dmethods,Implants,adverse%2Dside%2Deffects%2Dwere%2Dreported> Access date, 01.04.2026
- [43] Waller, D., Bolick, D., Lissner, E., Premanandan, C., Gamerman, G. (2016). Azoospermia in rabbits following an intravas injection of Vasalgel. *Basic Clin Androl.* 26:6.
- [44] Colagross-Schouten, A., Lemoy, M.J., Keesler, R.L., et al. (2017) The contraceptive efficacy of intravas injection of Vasalgel for adult male rhesus monkeys. *Basic and clinical andrology,* 27, 4.
- [45] A First in Human Study, Evaluating the Safety and Efficacy of ADAM 1.0, 2026; <https://clinicaltrials.gov/study/NCT05134428> Access date, 07.04.2026
- [46] Aliyu, B., Onwuchekwa, C. (2018). Birth control: Contraceptive drugs/pills and methods in the last decades. *Tropical Journal of Obstetrics and Gynaecology,* 35, 233 - 240.
- [47] Tulsiani, D.R., Abou-Haila, A. (2017). Male contraceptives: present and future approaches. *Clin Res Gynecol Obstet,* 1, 1-12.
- [48] Contraception you don't need to worry about. <https://bimek.com/this-is-how-the-bimek-slv-works/> Access date, 07.04.2026
- [49] Sade, G., Özkan, H., Mucuk, Ö. (2019) Male Reproductive Health Issues and the Midwifery Approach. *akted.* 28(4):253-258.
- [50] Vieira, J., Jeffery, J., Warren, C., Voleti, S., Johnson, K., & Punjani, N. (2026). Do U.S. males receive contraceptive counseling during medical visits? Insights from the National Survey for Family Growth. *Contraception,* 158, 111373. <https://doi.org/10.1016/j.contraception.2026.111373>
- [51] Centers for Disease Control and Prevention. (2014). Providing quality family planning services: Recommendations of CDC and the U.S. Office of Population Affairs. *MMWR Recommendations and Reports,* 63(4), 1-54. Access Date, 02.05.2026
- [52] Wang, C., Behre, H. M., Jungwirth, A., vd. (2024). Practice and development of male contraception: European Academy of Andrology and American Society of Andrology guidelines. *Andrology,* 12(2), 233-270. <https://doi.org/10.1111/andr.13525>

Declarations:**Authors' Contribution:**

- All Authors Conceptualization, data collection, interpretation, drafting of the manuscript and intellectual revisions
- The authors agree to take responsibility for every facet of the work, making sure that any concerns about its integrity or veracity are thoroughly examined and addressed

Correspondence:

Orhan POLAT

orhan_m56@hotmail.com
