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Male Hormonal Contraception: Attitudes and Perceptions of Young Adults

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Abstract

Introduction: Despite 65% of reproductive age females using contraception, nearly 50% of pregnancies in the United States are unintended, the highest rate being among young adults ages 18-24. Females have access to dozens of contraceptive methods while limited options exist for males, placing a disproportionate burden of pregnancy prevention on female partners. Male Hormonal Contraception (MHC) has the potential to reduce unintended pregnancy rates and extend the responsibility of pregnancy prevention to male partners. The purpose of this study was to examine the attitudes and perceptions of young adults regarding the use of MHC.

Methods: A sample of 553 young adults, ages 18-24, was recruited from a large, mid-Atlantic, public university. Participants completed a 28-item, anonymous, self-report survey to assess factors pertaining to MHC including receptiveness, desired characteristics, and social barriers to use.

Results: Sixty-eight percent (N=553) of participants indicated positive receptiveness to MHC use. Females were more receptive (81.8% *vs.* 44.4%) and more likely to encourage MHC use (53.4% *vs.* 26.3%) than males. Social barriers to MHC use included mutual partner trust and impact on self-perceived masculinity. Females perceived themselves to be more trustworthy than males in contraceptive use. Male participants were significantly more likely to feel that MHC threatened self-perceived masculinity.

Conclusion: Attitudes and perceptions of young adults regarding MHC are generally positive, suggesting that MHC would be well received by the public. MHC has the potential to significantly redistribute the burden of pregnancy prevention among partners and ultimately reduce unintended pregnancy rates.

Keywords: Male hormonal contraception; Male contraception; Contraception; Attitudes; Perceptions; Receptiveness; Pregnancy prevention; Unintended pregnancy; Masculinity

Introduction

Approximately 65% of reproductive-age females in the United States (U.S.) use some form of contraception. Multiple pregnancy prevention methods are available, yet nearly 50% of pregnancies are unintended each year, and the majority occur among individuals ages 18-24. Unintended pregnancy may result in negative maternal and fetal health outcomes including increased risk for premature birth, low infant birth weight, infant mortality, maternal depression and suicide. Further, unintended pregnancies may impose significant economic and financial burdens on individuals and families, including cost of child care, medical care, and additional resources (food, water, time). The correct and consistent use of contraception, as well as improved accessibility, has been proven to significantly reduce unintended pregnancy rates.

Currently, the responsibility of pregnancy prevention rests primarily with female partners, and factors such as cost, negative side effects, and limited access to health care may make obtaining or continuing contraception extremely difficult [1]. The long-standing female burden of pregnancy prevention began with the Comstock Law of 1873, when contraceptives were identified as “obscene” materials, and subsequently banned. To continue distributing the products, companies relabeled contraception as “feminine hygiene products”, shifting marketing primarily to females. This marketing shift paved the way for the contraceptive pill nearly 60 years ago. The female contraceptive pill afforded many benefits, allowing women to take control of their fertility and step outside of the social norms that had long confined them to the home and child rearing. The contraceptive pill played a significant role in the social advancement of women in many ways, including having a voice in family planning, but it has also led to an often one-sided burden.

The research and development of Male Hormonal Contraception (MHC) was initiated in the 1970's, just 10 years after the advent of the contraceptive pill [2]. There are now currently over two dozen forms of female contraception in the U.S., yet no hormonal options exist for males. Given the high incidence and risks of unintended pregnancies, it is clear that a novel approach to pregnancy prevention is needed. The development and use of MHC will increase available

contraceptive options, may potentially decrease unintended pregnancy rates, and extend the responsibility of pregnancy prevention to male partners. Public receptiveness to this novel contraceptive approach may significantly impact its success, but scant research examining this factor in the U.S exists. The purpose of this study was to examine the perceptions and attitudes of young adults regarding the concept of MHC and its potential use in pregnancy prevention.

The idea of male contraception was initially introduced in the 1970's, yet there is little research to support the extensive delay in the development of this form of contraception. Several different forms of MHC have recently advanced in human drug trials, but little research has been done to examine how MHC products may be received by the general public in the United States. Previous research, primarily conducted in Europe, indicates a positive male response to MHC and a general willingness to utilize MHC in the future. Brooks found that male participants (N=115) consistently ranked the male contraceptive pill among their top three MHC choices [3]. Brooks and Eberhardt, et al., found an increased willingness to use a male pill among participants in stable relationships [4]. Walker found that 49.5% of participants (N=188) would be willing to use a male pill, regardless of relationship status [5]. Amory et al., conducted a pilot study of 38 males to test the effectiveness and acceptability of an injectable MHC, and found that 55% of the participants were satisfied or very satisfied with this method after 12 weeks [6]. Additionally, 42% indicated that they would use the product if it were commercially available, and 40% found this method preferable to their previous contraception of choice. Similarly, Meriggiola, et al., examined male attitudes and acceptability of an injectable MHC, and found that 66% of participants (N=90) were willing to use an injectable form of MHC [7].

While research supports a general willingness to utilize MHC, it also highlights potential barriers to public receptiveness including partner trust, perceived threat to masculinity and potential adverse effects associated with using hormones. A qualitative study by Marcell, et al., found that 47% (N=30) of female participants had concerns about male partners' ability to be responsible enough to correctly and consistently use MHC [8]. Similarly, Walker found that 42% (N=188) of all participants were concerned that males would forget to take a pill daily. International studies have found that the majority of females are ready for males to share in the responsibility of pregnancy prevention despite concerns over consistent and reliable use. Glasier, et al., surveyed 1,894 females across Scotland, China, and South Africa regarding the acceptability of a hypothetical male pill [9]. Ninety percent of those in Scotland and South Africa, and the majority of those in China (71%), liked the idea of a male pill. Sixty-five percent of participants felt that the burden of pregnancy prevention falls too heavily on females, with only 2% stating that they would not trust their male partners to correctly use MHC.

Current research also suggests that the perceived threat to masculinity is a unique and challenging barrier to male receptiveness of MHC [10]. Historically, male public and personal sense of masculinity was closely tied to his progeny, while contemporary masculinity is often demonstrated through risk taking behaviors, such as sexual promiscuity and alcohol and drug use [11,12]. Further, research suggests that males may be hesitant to engage in health enhancing behaviors, such as regular health checks and mental health wellness, due to a perceived threat to masculinity [13]. Several studies indicate that males experience a similar hesitancy and perceived threat to masculinity regarding potential MHC [14,15].

Receptiveness to MHC and potential discontinued use has been significantly associated with adverse effects such as acne, oily skin, weight gain, fatigue, mood changes, increased or decreased libido, decreased HDL, increased hemoglobin and hematocrit levels, and increased risk of sleep related breathing disorders [16]. Dismore, et al., interviewed 22 men, focusing on the social constructs surrounding potential MHC, and found that few of the participants were willing to tolerate any side effects, despite agreeing that pregnancy prevention should be a shared responsibility. Similarly, Brooks found that 71% of male participants (N=115) felt that they would not be prepared to tolerate any adverse effects associated with MHC.

Research and development for MHC began in the 1970's, yet no MHC methods are currently commercially available. Research suggests that there are several potential reasons for this delay, including a lack of financial incentive by pharmaceutical companies, partner mistrust, a perceived threat to masculinity, and a concern for adverse effects [17]. Despite these potential barriers, there have been recent advancements in the development of MHC, and several potential products are currently proceeding through human testing drug trials. With the majority of unintended pregnancies in the U.S occurring among those ages 18-24, the young adult population would stand to benefit the most from this novel approach to contraception.

Materials and Methods

Sample and setting

A convenience sample of 553 students (196 male, 352 female) was recruited from colleges and universities in the mid-Atlantic region of the United States. Inclusion criteria included participants between the ages of 18-24, enrolled in college or university, and English-speaking. Participants were recruited *via* informational flyers, university-affiliated mass electronic mailing systems, and social media platforms. Initial messaging contained an anonymous survey link, and follow-up recruitment emails and flyers were posted two weeks after the initial recruitment method launched. Approval from the university institutional review board was obtained, and all participants were required to sign a consent form prior to participating. To protect the confidentiality of the participants, no personal identifying data was collected.

Instruments

A 28-item, self-report survey was developed by the researchers to examine the perceptions and attitudes of young adults surrounding the use of MHC. The survey items included six multiple choices, three ranking, nine likert-scale, and one prototype-willingness model item.

Four items were designed to assess attitudes and receptiveness toward MHC use, and gauge participant willingness to use MHC or recommend its use. Five items focused on preferred aspects of MHC including cost, tolerable side effects, route of administration, and frequency of use. Nine Likert-scale items were designed to identify common social barriers associated with MHC, such as partner trust and reliability, perceived effect on masculinity, and user responsibility.

The prototype willingness model item was included, with permission, from a study conducted by Peterson, et al., in which it was used to assess the participants' perceptions of a typical male using MHC. The prototype willingness model was first developed by Gibbons and Gerrard to assess risky behaviors in adolescents [18]. It has since been found to be a reliable predictor for undergraduate female condom preparedness and pregnancy risk behavior among male and female college students [19,20].

Data collection and analyses

Data was collected for one month *via* an anonymous survey to maintain participant confidentiality. Participants were provided a link to access the consent form and basic facts about MHC prior to completing the survey. Participants completed the survey and all data was stored in a secure, password protected Qualtrics database.

A total of 823 surveys were initiated and just 553 completed surveys were included in the data analyses. Data were cleaned by deleting incomplete surveys and those that didn't meet the established inclusion criteria. Data were analyzed using SPSS statistical software (version 27.0; IBM Corp Armonk, NY). Descriptive statistics and *Chi-square* tests were used to analyze data. Tests were considered significant at $p<0.05$.

Results

Sample demographics

The majority of participants were White/Caucasian (79%), identified as female (64.2%), and most identified as heterosexual (81.9%). Participants' religious affiliations were Christian (50%) or Atheist/Agnostic (37.7%), and nearly half of the participants were single (43.6%) or in a committed relationship (42%) (Table 1).

Table 1: Demographic data.

Sex	Male	196 (35.8%)
	Female	352 (64.2%)
Gender[a]	Male	196 (35.6%)
	Female	347 (63.1%)
	Other	7 (1.3%)
Sexuality[b]	Heterosexual	449 (81.9%)
	Bisexual	57 (10.4%)
	Other	31 (5.7%)
	Prefer not to answer	11 (2%)
Race/ethnicity[c]	White	437 (79%)
	Black or African American	34 (6.1%)
	Asian or Asian Indian	87 (15.7%)
	Hispanic, Latino, or Spanish	29 (5.2%)
	Other	14 (2.5%)

Religion[d]	Christian	274 (50.2%)
	Atheist/agnostic	206 (37.7%)
	Prefer not to answer	38 (7%)
	Other	28 (5.1%)
Educational major[e]	Business	70 (12.7%)
	Health professions	130 (23.5%)
	Social sciences and history	62 (11.2%)
	Psychology	43 (7.8%)
	Biological and biomedical sciences	66 (11.9%)
	Liberal arts and sciences, general studies, humanities	80 (14.5%)
	Engineering	116 (21%)
	Other	51 (9.2%)
Relationship status	Single	239 (43.6%)
	Non-committed relationship	81 (14.7%)
	Committed relationship	227 (41.4%)
	Married	1 (0.2%)

Note: Categories selected by less than 5% of participants were consolidated.

[a:] The gender categories “trans-male”, “trans-female”, “gender queer/gender non-conforming”, and “other” have been collapsed into the category “Other”.

[b:] The sexuality categories “homosexual”, “asexual”, “pansexual”, and “prefer not to answer” have been collapsed into the category “Other”.

[c:] The racial categories “American Indian or Alaska Native”, “Native Hawaiian or Pacific Islander”, and “Middle Eastern or North African” have been collapsed into the category “Other”. Participants were able to select multiple categories.

[d:] The religion categories “Jewish”, “Islam”, “Hindu”, and “Buddhism” have been collapsed into the category “Other”.

[e:] The education categories “education”, “visual and performing arts”, “communication”, “English language and literature”, and “theological” have been collapsed into the category “Other”. Participants were able to select.

Receptiveness to MHC

Sixty-eight percent of participants (N=548) stated that they "liked" the idea of MHC, with more females expressing positive views when compared with male participants (81.8% *vs.* 44.4%) X^2 (2, N=548)=91.613, p<0.001 (Table 2). Females were also more likely to encourage the use of MHC than male participants (53.4% *vs.* 26.3%) X^2 (3, N=546)=75.878, p<0.001 (Table 3). When responding to the survey statement, "I would feel comfortable telling other people that I or my partner are using male hormonal contraception", 89.7% of females and 66.8% of m ales "agreed" or "strongly agreed" X^2 (3, N=548)=46.271, p<. 001. Further, when comparing methods of contraception, both sexes ranked the male contraceptive pill third, above other forms of currently available contraceptives.

Table 2: Participant attitudes towards MHC (N=548).

Attitude	Male	Female
I like the idea of MHC	87 (44.4%)	288 (81.8%)
I am skeptical about the idea of MHC	87 (44.4%)	62 (17.6%)
I do not like the idea of MHC	22 (11.2%)	2 (0.6%)
Note: MHC: Male Hormonal Contraception		

Table 3: Likelihood of participants to use/encourage the use of MHC (N=546).

Likelihood to use/encourage the use	Male	Female
Very likely	51 (26.3%)	188 (53.4%)
Somewhat likely	67 (34.5%)	127 (36.1%)
Somewhat unlikely	45 (23.2%)	30 (8.50%)
Very unlikely	31 (16%)	7 (2%)
Note: MHC: Male Hormonal Contraception		

Females rated a hypothetical male partner taking MHC significantly higher than males on multiple character traits, including intelligence, attractiveness, confidence, maturity, popularity, excitement, and similarity to self (Table 4).

Table 4: Prototype willingness model ranking (N=545).

	Female	Male
Smart	4.48	3.93
Attractive	3.81	3.32
Confident	4.09	3.60
Mature	4.52	4.04
Popular	3.47	3.13
Exciting	3.68	3.12
Similar to you	4.08	3.23

Note: Participants rated a hypothetical individual on a scale from 1 to 5, with 1 being not at all and 5 being very, on the above characteristics. The results were then averaged, to create one average score between 1 and 5 for each category.

Preferred aspects of MHC

Males were more likely to prefer a daily method of MHC, ranking it 1.80/3, while females preferred an every 1-6 month method, ranking it 1.85/3. Both sexes stated that the primary benefits of using MHC would be sharing the responsibility of pregnancy prevention and not being concerned about their partner's contraception status. No significant differences were found between sexes and the amount they would be willing to pay for MHC, with 48% of males and 44% of females (N=545) indicating a willingness to pay $25 or less. Both sexes selected erectile dysfunction, acne, and insomnia as their top three side effects that would lead to discontinuation.

Trust and masculinity

Females were more likely to strongly disagree than males with the statement "contraception is just for females" (X^2 (3, N=548)=30.837, p<.001). Similarly, given the statement "females are expected to be more responsible than males regarding contraception", females were more likely to strongly agree than males (X^2 (3, N=548)=84.280, p<.001).

When responding to the statement "females are more trustworthy than males in using contraception appropriately", 67% of females strongly agreed, while 45.9% of males strongly agreed (X^2 (3, N=548)=27.471, p<.001). Similarly, 69% of females strongly agreed to the statement, "females are more trustworthy than males when they say that they are using contraception" compared with 45.9% of males (X^2 (3, N=548)=33.809, p<.001). When responding to the statement "contraception should be a shared responsibility between partners",

79.5% of females strongly agreed, while only 47.7% of males strongly agreed. (X^2 (3, N=546)=65.444, p<.001). Similarly, 69.7% of females agreed that males and females should have equal responsibility of family planning, while 41.3% of males strongly agreed (X^2 (3, N=546) =43.487, p<.001) (Table 5). When provided with the statement "taking MHC would make an individual less masculine", 75.6% of females strongly disagreed, while only 33.2% of males strongly disagreed (X^2 (3, N=548)=106.755, p<.001).

Table 5: Participant agreement to statements on trust regarding contraception usage (N=548).

Statement	Male	Female
"Men can be trusted to use MHC correctly."	147 (75.4%)	229 (65.1%)
"Females are more trustworthy than men when they say they are using a form of contraception."	90 (45.9%)	243 (69%)
"Females are more trustworthy than men in using contraception appropriately."	90 (45.9%)	143 (67%)

Note: MHC: Male Hormonal Contraception. The percentages shown reflect the number of participants that selected strongly agree or agree for each individual statement.

Discussion

Although the attitudes and perceptions of young adults regarding MHC have not been sufficiently studied in the United States, European research suggests overall positive attitudes. The results of this study indicate a similarly favorable reception, with over two-thirds of the study population expressing positive opinions towards MHC, despite a variety of different sexual orientations, ethnicities, religions, relationship statuses, and college majors.

While both males and females demonstrated a high level of interest in MHC, female participants indicated a higher level of enthusiasm and willingness to use MHC than males. The desire to share in the responsibility of pregnancy prevention was cited as the leading benefit of MHC by both sexes, with females again indicating a higher level of enthusiasm. These results align closely with previous research, and suggest that females are ready and willing for males to play a more active role in pregnancy prevention. The enthusiasm shown by females regarding MHC is juxtaposed by their concerns related to partner trust and reliable MHC use. Females demonstrated a higher level of mistrust in the ability of males to reliably, consistently, and appropriately use MHC, and were more likely to agree that females are more trustworthy in using contraception than males. The contrast between the desire for increased male involvement in pregnancy prevention and a mistrust in the ability of males to appropriately use MHC has been found in several other studies. A potential explanation for this contrast could be the long standing history of females shouldering the responsibility of pregnancy prevention. For over 60 years, females have endured the various side effects accompanying hormonal contraception, the discomfort of procedures for Long Acting Reversible Contraceptives (LARCs), and the costs associated with contraception use. These factors

may have led to a desire for relief from this burden, but also skepticism in the ability of males to handle this responsibility. Additionally, the implications of failed contraceptive use are arguably greater for females than males. Females may have to endure the complex emotions associated with termination versus continuing a pregnancy, adoption, or self-parenting, as well as the emotional, physical, and financial strains of pregnancy and birth. These potential consequences may contribute to distrust and a reluctance in entrusting pregnancy prevention to males.

Male participants in this study demonstrated a higher level of trust in themselves regarding the appropriate and reliable use of contraception, and disagreed that females were inherently more trustworthy and responsible when using contraception. When examining the effect of perceived masculinity on the willingness to use MHC, both males and females disagreed that utilizing MHC would make an individual less masculine, although females were more likely to strongly disagree than males. This suggests that perceived masculinity does play a role in the willingness of males to use MHC, although not to the extent that other studies have reported. Interestingly, potential adverse effects did not seem to negatively influence the willingness to use MHC as greatly as in other studies. While certain adverse effects were identified as being more likely to lead to discontinuation, no statistically significant differences were found between genders.

Despite the hesitancy to use MHC expressed by males, and the concerns regarding partner trust and reliable use expressed by females, the majority of study participants indicated a high level of interest in using MHC. When asked to rank different forms of MHC among currently available methods, both sexes placed a MHC pill above current popular female methods such as IUDs, hormonal implants, and hormonal injections. This suggests that young adults are open to new pregnancy prevention measures and would be receptive to MHC if made commercially available.

Conclusion

The results of this study suggest that MHC methods would be well received by young, reproductive-age adults in the general public. Both males and females indicate they are ready and willing to try a new form of contraception, and support males taking a more active role in pregnancy prevention. Historically, females have shouldered the responsibility of contraception due to social expectations and a lack of available, reliable male contraception. However, current unintended pregnancy rates suggest changing perspectives on social expectations, and that a new approach to pregnancy prevention is necessary. MHC has the potential to help decrease the number of unintended pregnancies, and break down the gender stereotypes surrounding contraception. The interest and willingness to use MHC has been well established by this, and other studies, suggesting that male hormonal contraceptive methods should become commercially available. Future research should focus on the satisfaction surrounding MHC, once it has been made widely available.

Strengths and Limitations

There are several strengths to this study, including the size and diversity of the study sample. Previous research examining the attitudes and perceptions of MHC primarily used sample sizes of less than 200 participants, or interviewed small focus groups. The current study drew from a large, public university allowing recruitment of a large, diverse study sample. However, there are some limitations in this study. The study used a convenience sample from a single, mid-Atlantic university, suggesting that regional bias may limit the generalizability of the results. Additionally, this is the first time this survey has been distributed and has not been previously validated in this population.

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