



Journal of Sexual Health Psychology

e-ISSN. (2821-1510). Journal homepage: <https://www.journalshp.com>

College Students Attitudes Towards Male Birth Control

James M Bishop, Brittany L Rosen, Liliana Rojas-Guyler, Amy L. Bernard, Bradley R. A. Wilson, Hannah Moynihan, Julia Shreve

To link to this article: <http://dx.doi.org/10.52547/SHP.2023.701689>



Published online: 01 June 2023.



Submit your article to this journal



View Crossmark data

**ORIGINAL
ARTICLE**

Article type

College Students Attitudes Towards Male Birth Control

James M Bishop^{a1}, Brittany L Rosen^b, Liliana Rojas-Guyler^c, Amy L. Bernard^c, Bradley R. A. Wilson^c, Hannah Moynihan^d, Julia Shreve^d

^dDepartment of Health and Human Performance, Texas State University; ^bDepartment of Pediatrics, Cincinnati Children's Hospital Medical Center, University of Cincinnati College of Medicine, Cincinnati, OH, USA; ^cUniversity of Cincinnati College of Education, Criminal Justice and Human Services, Cincinnati, Ohio, USA; ^dJames Madison University, College of Health and Behavioral Studies, USA

KEYWORDS

contraception
male;
birth Control
relationship;
pregnancy
prevention;
college Students;

Submitted
2022.12.31

Accepted
2023.02.09



Abstract

Background: Up to 50 percent of pregnancies in the United States are unintended with the highest rates occurring among women between the ages of 18 and 24 years old. Only 52 percent of sexually active college students used a method of contraception during their most recent sexual intercourse with male condoms and female birth control pills being the most common methods. Both methods however are used inconsistently and incorrectly. These challenges create a need for alternative methods of contraception. Male-directed contraception (MDC) is seen as a potential solution to this challenge.

Purpose: The purpose of this study was to assess college students' attitudes towards various developmental methods of MDC including male birth control pills, transdermal gels, injections, and implants.

Methods: Data were collected from college students at one Midwestern University.

Results: Females had higher attitudes towards each method of MDC compared to males. Identifying as female, agnostic, Jewish, and being single but in a monogamous relationship were associated with more positive attitudes towards various MDC methods. Being on a government healthcare policy and race were associated with more negative attitudes towards MDC. The number of sexual partners and condom use were not significant predictors of attitudes towards MDC.

Conclusions: This analysis provides additional evidence to the growing literature of attitudes towards and acceptability of MDC. Despite this evidence, research remains inconsistent. These inconsistencies provide researchers with opportunities to continue our understanding of factors associated with attitudes towards and acceptability of MDC methods in college students and other populations.

Introduction

Up to 50 percent of pregnancies in the United States are unintended (Finer & Zolna, 2016) with the highest rates of unintended pregnancy occurring among women aged 18-24 years old (Finer & Henshaw, 2006). Preventing unintended pregnancies continues to be a goal in the Healthy People 2030 campaign. Specifically, the Healthy People 2030 campaign seeks to reduce pregnancies in adolescence and reduce the proportion of unintended pregnancies (U.S. Department of Health and Human Services [HHS], 2021). Although the majority of women between the ages of 15 and 44 in the United States use some form of contraception (Daniels et al., 2015), condoms and vasectomy are the only contraceptive methods available to men and are only used by 45.2% and 1.4% of unmarried men respectively (CDC, 2017). Although condoms are 98% effective at preventing unplanned pregnancies; condoms typically have a 13% user error rate (CDC, 2022; Langmaid, 2020). Vasectomy is the most successful male contraceptive with a 0.15% failure rate (CDC, 2022) but is not easily reversible (Mayo Clinic, 2021). Moreover, the majority of men believe women bear too much contraceptive responsibility (Glasier, 2010; Martin et al., 2000). Expanding men's involvement in contraception, through the development and adoption of male based hormonal contraceptives, could potentially serve as a catalyst to increase men's involvement in family planning, create contraceptive equality, and help decrease rates of unintended pregnancy.

Male-directed contraceptives (MDC) broaden couples' contraceptive choices (Piotrowska et al., 2016) and are a potential solution to the unmet need in alternative contraceptive methods (Darroch, 2008; Peterson et al., 2013). Currently, multiple methods of MDC are under development including oral pills, transdermal gels,

injections, and implants. A prior decade of research has confirmed the effectiveness, reversibility, and short-term safety of MDC (Gu et al., 2009; Liu et al., 2006; Liu et al., 2008; McLachlan et al., 2000; Meriggiola et al., 2006; Mommers et al., 2008; Roth et al., 2014; Sjogren & Gottlieb, 2001; Zhang et al., 2006).

A recent review of MDC options concluded MDC is comparable to both the female pill and vasectomy and is ready for implementation (Manetti & Honig, 2010). The acceptability of MDC can be assessed directly or indirectly by understanding predicated use, which is influenced by various factors including cost, availability, accessibility, and attitudes (Glasier, 2010). When controlling for participant characteristics (age, race/ethnicity/nativity, employment status, education, and reception of Medicaid/welfare in the past year), contraceptive knowledge, and attitudes toward contraception have been found to be the most important factors associated with contraceptive behavior (Frost et al., 2012). Although multiple studies have investigated the acceptability or willingness to use MDC, few have focused on college students. Therefore, the purpose of this study was to investigate attitudes towards MDC methods among college students. The study was guided by the following aims:

1. Describe the attitudes of college men and women towards MDC methods.
2. Identify differences between college men and women's attitudes towards MDC methods.
3. Identify factors associated with college men and women's attitudes towards MDC methods.

Method

Participants

Participants were a convenience sample of undergraduate and graduate college students enrolled in one college at a large Midwestern University. The college includes four academic schools and over 5,000 students. Students were recruited via their university email address. Three recruitment emails were sent over a three-week period to all students in the college including those students enrolled part-time. The recruitment emails consisted of a description of the study, consent form, primary investigator’s contact information, and short descriptions of different MDC methods under development, and a link to the survey. Those agreeing to participate clicked a button to advance and complete the survey. Prior to beginning data collection, this study was reviewed and approved by the [Blinded for Review] Institutional Review Board (IRB 2019-0916).

All data collection occurred through qualtrics in the Fall of 2019. A total of 546 students completed the survey. The majority of the sample was female (n = 327, 59.5%), between the ages of 18 and 24 (n = 250, 72.6%), and white (n = 314, 82.6%). More participants (n = 247, 65.3%) were on their parent’s insurance policy compared to other response options. More participants identified as non-denominational Christian (n = 116, 30.5%), Catholic (n = 77, 20.3%) or agnostic (n = 73, 19.2%) compared to other response options. Thirty seven percent of the sample identified as single and not in a monogamous relationship (n = 143, 37.8%) and roughly 39% of the sample identified as single, but in a monogamous relationship (n = 150, 39.7%). Additional participant characteristics are shown in Table 1.

Table 1. Participants Characteristics (n = 546)

Variable	n	%
Sex		
Female	327	59.5
Male	219	39.8
Age		
18-24	250	72.6
25-31	43	12.5
32-38	23	6.7
39-45	12	3.5
46+	16	4.7
Race		
White	314	82.6
African American	20	5.3
Asian	20	5.3
Multi-Racial	13	3.4
Hispanic	8	2.1
Other	5	1.3
Relationship Status		
Single, but in a monogamous relationship	150	39.7
Single and not in a monogamous relationship	143	37.8
Married	61	16.1
Other	21	5.6
Divorced	3	0.8
Religion		
Non-Denominational Christian	116	30.5
Catholic	77	20.3
Protestant	16	4.2
Jewish	7	1.8
Hindu	5	1.3
Buddhist	6	1.6
Islamic	4	1.1
Atheist	37	9.7
Agnostic	73	19.2
Other	39	10.3
Insurance		
Parent’s Policy	247	65.3
Individually Purchased Policy	61	16.1
School Policy	40	10.6
Government Policy	13	3.4
Military Policy	9	2.4
None	8	2.1

NOTE: Differences in counts the result of missing values.

Measures

Demographic variables. Demographic variables of interested included sex, age, race/ethnicity, relationship status, religion, and insurance.

Dependent variables. The dependent variables for the current study included:

attitudes towards a male contraceptive pill, attitudes towards a male contraceptive transdermal gel, attitudes towards a male injectable contraceptive, and attitudes towards a male contraceptive implant. Each dependent variable was measured by seven items using a seven-point scale and bipolar adjectives. The overall attitude for each contraceptive method was calculated as the sum of responses to seven items ranging from 7 to 49 (Bishop et al., 2022). Higher scores indicate more positive attitudes towards the contraceptive method.

Independent variables. Number of sexual partners was measured by one item. Participants were asked, “Vaginal intercourse involves inserting the penis into the vagina. Within the last 12 months, with how many partners have you had vaginal intercourse?” Contraceptive use during recent vaginal intercourse was measured by one item. Participants were asked, “within the last 30 days, how often did you or your partner(s) use a condom or other protective barrier (e.g., male condom, female condom, dental dam, glove) during vaginal sex?”. Response options include (1) N/A, never did this sexual activity, (2) Have not done this sexual activity during the last 30 days, (3) Never, (4) Rarely, (5) Sometimes, (6) Most of the time, and (7) Always. For data analysis, this item was recoded to include three response options including: (1) N/A, never did this sexual activity or have not done this sexual activity during the last 30 days, (2) never, and (3) sometimes, most of the time, or always.

Data analysis

Independent t-tests were used to examine differences between college men and women’s attitudes towards male birth control methods. T-test were calculated for the overall attitude towards each contraceptive method. Regression analysis was used to investigate the relationship between attitudes and sexual behavior. An alpha of $<.05$ was set

as the criteria to determine statistical significance. Beta weights and structure coefficients were also examined. All data were analyzed utilizing Statistical Package for the Social Sciences (SPSS) 24 (IBM, Armonk, NY).

Results

Attitudes Towards MDC Between Males and Females

Means and standard deviations were calculated for attitudes towards each MDC method. Females had higher mean attitude scores and standard deviations for each MDC method including the pill (42.10 ± 9.90 ; 38.33 ± 10.46), transdermal gel (38.06 ± 11.64 ; 35.22 ± 11.27), contraceptive injection (40.18 ± 10.51 ; 33.07 ± 11.91), and contraceptive implant (38.76 ± 11.25 ; 31.96 ± 11.79) compared to males.

An independent samples t-test was conducted to determine if the mean attitude towards 1) a male hormonal pill, 2) transdermal gel, 3) injection, or 4) implant differed between males and females. The independent t-test indicates the attitudinal differences were statistically significantly different for males and females between the pill ($t = -4.13$, $df = 304$, $p = .001$, $d = 0.41$), transdermal gel ($t = -1.98$, $df = 391$, $p = .048$, $d = .218$), contraceptive injection ($t = -6.34$, $df = 420$, $p = .001$, $d = .631$), and contraceptive implant ($t = -5.612$, $df = 397$, $p = .000$, $d = .582$) with females having more positive attitudes towards each method, on average, than males. Results for independent samples t-tests are shown in [Table 2](#).

Table 2. Differences in Attitudes Towards Male Directed Contraception Between Males and Females

	Males		Females		<i>t</i>	<i>df</i>	<i>p</i>
	<i>m</i>	SD	<i>m</i>	SD			
Pill Attitudes	38.33	10.46	42.10	9.90	-4.139	304	.000
Irresponsible/Responsible	5.86	1.77	6.26	1.54	-2.448	301	.015
Unacceptable/Acceptable	5.75	1.85	6.15	1.61	-2.298	305	.022
Unhealthy/Healthy	4.87	1.86	5.70	1.71	-4.814	305	.000
Disadvantageous/Advantageous	5.69	1.76	6.13	1.57	-2.686	308	.008
Undesirable/Desirable	5.15	2.08	5.90	1.80	-3.901	301	.000
Ineffective/Effective	5.21	1.75	5.82	1.66	-3.741	455	.000
Unsafe/Safe	4.95	1.83	5.75	1.67	-4.774	454	.000
Injection Attitudes	33.07	11.91	40.18	10.51	-6.347	420	.000
Irresponsible/Responsible	5.04	2.04	6.15	1.5	-5.746	220	.000
Unacceptable/Acceptable	4.72	2.06	5.78	1.81	-5.153	247	.000
Unhealthy/Healthy	4.18	1.92	5.43	1.77	-6.634	425	.000
Disadvantageous/Advantageous	5.09	1.96	5.95	1.66	-4.729	423	.000
Undesirable/Desirable	3.77	2.27	5.38	1.99	-7.510	425	.000
Ineffective/Effective	5.25	1.77	5.79	1.65	-3.095	423	.002
Unsafe/Safe	4.26	1.86	5.38	1.80	-5.950	423	.000
Gel Attitudes	35.22	11.27	38.06	11.64	-1.985	391	.048
Irresponsible/Responsible	5.59	1.65	5.79	1.76	-1.084	393	.279
Unacceptable/Acceptable	5.31	1.82	5.62	1.88	-1.529	393	.127
Unhealthy/Healthy	4.70	1.83	5.52	1.84	-4.095	393	.000
Disadvantageous/Advantageous	5.53	1.83	5.53	1.85	-1.38	392	.168
Undesirable/Desirable	4.96	1.90	5.21	2.04	-1.153	392	.250
Ineffective/Effective	4.68	1.82	4.76	2.01	-.386	392	.700
Unsafe/Safe	4.77	1.86	5.38	1.88	-2.951	393	.003
Implant Attitudes	31.96	11.79	38.76	11.25	-5.612	397	.000
Irresponsible/Responsible	5.09	1.85	5.99	1.67	-4.685	227	.000
Unacceptable/Acceptable	4.67	1.91	5.58	1.99	-4.410	400	.000
Unhealthy/Healthy	4.13	1.95	5.15	1.92	-4.970	401	.000
Disadvantageous/Advantageous	4.80	2.04	5.85	1.71	-5.011	208	.000
Undesirable/Desirable	3.55	2.11	5.06	2.10	-6.710	401	.000
Ineffective/Effective	5.17	1.85	5.75	1.71	-3.076	400	.002
Unsafe/Safe	4.09	1.97	5.09	1.95	-4.782	401	.000

Factors Associated with Attitudes Towards a Male Hormonal Birth Control Pill

Hierarchical linear regression was used to run three models for predicting college students' attitudes towards a male hormonal birth control pill, injection, gel, and a contraceptive implant. The final model included all demographic variables, condom use, and the number of sexual partners. For hormonal birth control pills, the final model was statistically significant and accounted for

18 percent of the variance ($F [22, 212] = 2.22, p = 0.002, R^2 = 0.18$). Attitudes towards male hormonal birth control pills were positively predicated by identifying as agnostic ($\beta = .19, p = 0.006$). Attitudes towards male hormonal birth control pills were negatively predicted by having a government healthcare policy ($\beta = -.23, p = 0.03$) and identifying as Protestant ($\beta = -.13, p = 0.04$). In assessing the squared structure coefficients, identifying as agnostic positively accounted for 18 percent of the variance and having a government healthcare policy and identifying as Protestant

negatively accounted for 5 percent and 8 percent of the variance respectively.

For male hormonal injections, the final model was statistically significant and accounted for 19 percent of the variance ($F [22, 214] = 2.22, p = 0.001, R^2 = 0.19$). Attitudes towards male hormonal birth control injection were positively predicated by sex ($\beta = .13, p = 0.037$) and identifying as agnostic ($\beta = .17, p = 0.012$). Attitudes towards a male hormonal birth control injection were negatively predicted by identifying as non-white ($\beta = -.16, p = 0.016$) and having a government healthcare policy ($\beta = -.19, p = 0.044$). In assessing the squared structure coefficients, sex and identifying as agnostic positively accounted for 46 percent and 24 percent of the variance respectfully. Identifying as non-white and having a government healthcare policy negatively accounted for 10 percent and 2 percent of the variance in the final model.

For male contraceptive implants, the final model was statistically significant and accounted for 19 percent of the variance ($F [22, 214] = 2.41, p = 0.001, R^2 = 0.19$). Attitudes towards an implant were positively predicated by sex ($\beta = .17, p = 0.009$) and identifying as agnostic ($\beta = .24, p = 0.001$). In assessing the squared structure coefficients, sex and identifying as agnostic positively accounted for 36 percent and 20 percent of the variance.

The final model for contraceptive gels was not statistically significant. Regression weights, structure coefficients, and confidence intervals for all MDC methods are shown in [Table 3](#).

Discussion

The current study assessed college students' attitudes and factors associated with attitudes towards four developmental methods of MDC. In the current study, participants identifying as female, agnostic, Jewish, and

being single but in a monogamous relationship were associated with more positive attitudes towards various MDC methods. Being on a government healthcare policy and race were associated with more negative attitudes towards MDC. Additionally, the number of sexual partners and condom use were not significant predictors of attitudes towards MDC.

Prior research has identified females have more positive attitudes towards contraception (Vasilenko et al., 2015); however, a study on male contraception specifically found gender did not affect acceptability (Walker, 2011). In the current study, females had more positive attitudes towards each method of male contraception when compared to males; however, men in the current study did have positive attitudes towards each method of male contraception. Current research suggests men have positive attitudes towards and high acceptability of a male hormonal pill (Dismore et al., 2016; Walker, 2011); however, there are concerns these attitudes would not extend to all contraceptive methods (Walker, 2011). Gender norms have been identified as a modifying factor of attitudes towards MDC, although results in the literature are conflicting. Some scholars have identified gender norms, links to femininity or associations of masculinity, as barriers of willingness to use MDC (Peterson et al., 2019; Walker, 2011; Zhang et al., 2006). Qualitative researchers, however, found men would be willing to use male birth control pills as they represent contraceptive responsibility (Dismore et al., 2016). Contraceptive responsibility is portrayed as a significant act of masculine valor (Terry & Braun, 2012), and thus, an engagement of masculinity. Given the inconsistencies in how sex and gender modify attitudes towards MDC, additional research is needed. The Prototype-Willingness Model (PWM)

Table 3. Factors Associated with Attitudes Towards a Male Directed Contraceptives (N = 235)

Predictor	Pill Final Model $R^2 = .18$ $F = 2.22$				Injection Final Model $R^2 = .19$ $F = 2.34$				Gel Final Model $R^2 = .13$ $F = 1.58$				Implant Final Model $R^2 = .19$ $F = 2.41$			
	B	r_s^2	β	95% CI	B	r_s^2	β	95% CI	B	r_s^2	β	95% CI	B	r_s^2	β	95% CI
Sex ^a	1.76	0.20	.07	[-1.19, 4.71]	3.47	0.46	.13	[.20, 6.74]	.91	0.07	.03	[-2.49, 4.31]	4.54	0.36	.17	[1.16, 7.93]
Age	.21	0.00	.19	[-.02, .44]	.20	0.04	.16	[-.06, .46]	.28	0.04	.23	[.01, .55]	.08	0.01	.06	[-.18, .35]
Race/Ethnicity ^b																
White	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Non-White	-1.79	0.09	-.06	[-5.54, 1.96]	-4.96	0.10	-.16	[-9.00, -.94]	-.08	0.01	-.00	[-4.30, 4.14]	-4.11	0.04	-.13	[-8.31, .07]
Relationship Status ^c																
Single, not in a monogamous relationship	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Single, in a monogamous relationship	2.03	0.07	.10	[-1.03, 5.09]	3.63	0.09	.16	[.23, 7.03]	1.26	0.01	.05	[-2.26, 4.79]	2.24	0.04	.09	[-1.29, 5.78]
Married	-2.45	0.00	-.10	[-7.71, 2.80]	-.09	0.00	-.00	[-5.91, 5.71]	-4.24	0.02	-.16	[-10.33, 1.83]	-.81	0.00	-.03	[-6.86, 5.24]
Divorced	4.15	0.00	.03	[-10.28, 18.58]	8.57	0.01	.07	[7.56, 24.71]	-1.31	0.01	-.01	[-18.25, 15.61]	12.08	0.01	.09	[-4.72, 28.88]
Religion ^d																
Non-denominational Christian	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Catholic	-.90	0.02	-.03	[-4.24, 2.42]	-2.24	0.05	-.08	[-5.92, 1.44]	1.11	0.02	.04	[-2.73, 4.96]	-.58	0.04	-.02	[-4.42, 3.24]
Protestant	-6.70	0.08	-.13	[-13.35, -.07]	-2.57	0.05	-.04	[-9.94, 4.79]	-6.90	0.04	-.11	[-14.63, .82]	1.21	0.00	.02	[-6.45, 8.88]
Jewish	6.71	0.01	.10	[-1.78, 15.21]	6.56	0.00	.07	[-4.09, 17.21]	11.04	0.01	.14	[1.07, 21.00]	7.30	0.00	.09	[-2.58, 17.19]
Hindu	7.48	0.02	.07	[-5.95, 20.91]	12.16	0.01	.10	[-2.82, 27.16]	11.00	0.07	.09	[-4.72, 26.74]	13.30	0.03	.10	[-2.30, 28.91]
Buddhist	5.09	0.00	.05	[-5.68, 15.87]	8.31	0.00	.08	[-3.74, 20.37]	4.30	0.00	.04	[-8.34, 16.96]	9.32	0.00	.09	[-3.22, 21.87]
Islamic	-5.57	0.08	-.05	[-19.64, 8.49]	-3.00	0.08	-.02	[-18.74, 12.73]	-1.25	0.11	-.01	[-17.76, 15.26]	1.32	0.06	.01	[-15.06, 17.70]
Atheist	1.73	0.06	.05	[-2.54, 6.00]	1.87	0.04	.05	[-2.88, 6.64]	2.39	0.05	.06	[-2.60, 7.39]	2.83	0.03	.07	[-2.19, 7.86]
Agnostic	4.73	0.18	.19	[1.40, 8.08]	4.77	0.24	.17	[1.06, 8.49]	2.18	0.10	.07	[-1.71, 6.07]	6.89	0.20	.24	[3.03, 10.76]
Insurance ^e																
No Insurance	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Parent's Policy	-3.37	0.01	-16	[-13.07, 6.33]	-5.41	0.00	-24	[-15.05, 4.22]	-3.75	0.00	-16	[-13.86, 6.35]	-4.08	0.00	-17	[-14.12, 5.94]
School Policy	-4.45	0.00	-13	[-14.73, 5.82]	-6.98	0.01	-19	[-17.46, 3.50]	-6.00	0.02	-16	[-17.00, 4.98]	-4.38	0.03	-11	[-15.28, 6.52]
Individually Purchased Policy	-3.49	0.04	-14	[-13.43, 6.43]	-6.45	0.06	-24	[-16.70, 3.78]	-3.28	0.02	-12	[-14.02, 7.45]	-4.47	0.02	-16	[-15.13, 6.18]
Military Policy	2.54	0.02	.02	[-13.63, 18.71]	-.39	0.02	-.00	[-17.86, 17.07]	7.55	0.07	.06	[-10.77, 25.88]	5.57	0.03	.04	[-12.60, 23.76]
Government Policy	-13.24	0.05	-.23	[-25.20, -1.29]	-12.66	0.02	-.19	[-24.99, -35]	-14.06	0.05	-.21	[-26.99, -1.13]	-11.17	0.02	-16	[-24.00, 1.65]
Never Used a Condom During Last 30 Days	1.27	0.06	.06	[-2.31, 4.86]	-.42	0.05	-.01	[-4.39, 3.53]	2.84	0.04	.12	[-1.30, 6.98]	.56	0.03	.02	[-3.56, 4.69]
Used a Condom at Least Once During Last 30 Days	2.39	0.03	.12	[-.90, 5.70]	1.25	0.03	.05	[-2.45, 4.97]	3.28	0.00	.14	[-.57, 7.14]	3.02	0.06	.13	[-.83, 6.87]
Number of Sexual Partners	-.00	0.00	-.00	[-.29, .28]	.06	0.00	.02	[-.26, .38]	.00	0.00	.00	[-.33, .33]	.08	0.00	.03	[-.25, .42]

Note. r_s^2 = squared structure coefficient. CI = 95% confidence interval. Statistically significant ($p < 0.05$) associations are bolded.

^a Sex was represented by one dummy variable with Male serving as the reference group.

^b Race/Ethnicity was represented by one dummy variable with White serving as the reference group.

^c Relationship status was represented by four dummy variables with Single, not in a monogamous relationship serving as the reference group.

^d Religion was represented by ten dummy variables with Non-denominational Christian serving as the reference group.

^e Insurance was represented by six dummy variables with no insurance serving as the reference group.

(Gerrard et al., 2008; Gibbons et al., 2003; Gibbons et al., 2015) maybe an avenue to addressing these inconsistencies. PWM posits health decision making involves two types of information processing: a reasons pathway and a social reaction path. Both pathways include attitudes and subjective norms; however, the social reaction pathway includes two constructs unique to PWM: willingness and prototypes. Prototypes are images that individuals have of the type of person who engages in a behavior (Gibbons et al., 2020). If the correct prototypical characteristics of a male user of contraception can be identified, researchers might be able to address the inconsistencies in attitudes towards MDC and potentially develop effective interventions to increase MDC uptake.

In the current study, participants who identified as agnostic had more positive attitudes towards male birth control pills, injections, and implants. The link between religiosity and male contraception, however, remains unclear as previous studies have found no association between religious commitment and acceptance of MDC (Heinemann et al., 2005). Considering religiosity and spirituality influence contraceptive method preference (Hill et al., 2013) and sexual behavior (Luquis et al., 2012), future research should continue to investigate the relationship with MDC and religiosity.

In the current study being single but in a monogamous relationship was positively associated with attitudes towards a male hormonal injection. This is consistent with previous research on contraception (Vasilenko et al., 2015) and male birth control pills specifically (Dismore et al., 2016; Eberhardt, 2009); however, there is conflicting research suggesting relationship status is unrelated to potential use of male contraception (Heinemann et al., 2005). For example, a qualitative study on social

constructions of the male contraceptive pill found single men not in monogamous relationships would be more willing to use a method of male contraception if it were available (Dismore et al., 2016). This is consistent with published literature on condom use which shows preference for condoms in casual sexual relationships, while more effective contraceptive methods are favored in stable relationships (Milhausen et al., 2013). This potentially suggests the target group of MDC methods would be males in monogamous relationships. Although there are concerns men, including men in casual sexual relationships, would forgo condom use with the use of MDC (Dismore et al., 2016). While the current study found no association between attitudes towards MDC and condom use behaviors or the number of sexual partners, this is a practical concern that may impact sexually transmitted infection (STI) rates, treatment, and prevention efforts. Therefore, future research needs to investigate the potential of decreased condom use in correlation with MDC use and the possible impact this would have on STI rates.

In the current study, being on a government health insurance policy such as Medicare or Medicaid was negatively associated with attitudes towards each of the four MDC methods. This is consistent with research on long-acting reusable contraception (LARC) for women which shows women with Medicaid are significantly less likely to use LARCs compared to privately insured women (Higgins et al., 2018). This is concerning because approximately 45 percent of US births are covered by Medicaid (Kaiser Family Foundation, 2020). Moreover, cost has been identified as a potential barrier to the acceptability of MDC (Vera Cruz et al., 2019). If men are unable to afford MDC, then uptake will remain suboptimal and the current contraceptive arrangement between men and women will remain unchanged.

Limitations

While this study provides critical information about attitudes towards MDC, there are several limitations to consider. First, the data collected is self-reported, making the responses introspective. The data are also cross-sectional, and casual relationships cannot be determined. Data were also collected from a convenience sample of college students from one Midwestern university, and results may not be generalizable to all college students. Finally, use of MDC is a hypothetical behavior. Information on side effects, dose, and exact administrative method (pill, transdermal gel, injection, or implant) is currently unavailable allowing only for a tentative understanding of attitudes and factors associated with attitudes towards MDC.

Conclusion

MDC innovations have remained stalled for almost 5 decades despite growing interest to expand men's role in family planning. The results of the current study add to the growing literature on men's attitudes towards MDC. If MDC uptake is to become a reality, it is important to consider socially driven cognitions including attitudes, of MDC. In particular, future research should aim at identifying how societal norms influence men's attitudes and potential adoption of MDC. The introduction of MDC will promote shared responsibility in pregnancy prevention and give men an impetus to have more involvement in family planning. Men's attitudes towards MDC will be a central theme in the success or failure of MDC.

Conflict of interest

The authors report no conflicts of interest.

References

- Bishop, J. M., Rosen, B. L., Rojas-Guyler, L., Bernard, A., & Wilson, B. (2022). Intention to use novel methods of male directed contraception among college students. *Journal of Sexual Health Psychology*, 1(1), 11-29. <https://doi.org/10.52547/jshp.1.1.11>
- Centers for Disease Control and Prevention. (2017). Unmarried Men's Contraceptive Use at Recent Sexual Intercourse: United States, 2011-2015. Retrieved from <https://www.cdc.gov/nchs/products/databriefs/db284.htm>
- Centers for Disease Control and Prevention. (2022). Contraception. Retrieved from <https://www.cdc.gov/reproductivehealth/contraception/index.htm>
- Daniels, K., Daugherty, J., Jones, J., & Mosher, W. (2015). Current contraceptive use and variation by selected characteristics among women aged 15–44: United States, 2011–2013 (National Health Statistics Reports, No. 86). Hyattsville, MD: National Center for Health Statistics.
- Darroch, J. E. (2008). Male fertility control—where are the men? *Contraception*, 78(4), S7-S17. <https://doi.org/10.1016/j.contraception.2008.04.117>
- Dismore, L., Van Wersch, A., & Swainston, K. (2016). Social constructions of the male contraception pill: When are we going to break the vicious circle? *Journal of health psychology*, 21(5), 788-797. <https://doi.org/10.1177/1359105314539528>
- Eberhardt, J., Van Wersch, A., & Meikle, N. (2009). Attitudes towards the male contraceptive pill in men and women in casual and stable sexual relationships. *BMJ Sexual & Reproductive Health*, 35(3), 161-165. <https://doi.org/10.1783/147118909788707986>

- Finer, L. B., & Henshaw, S. K. (2006). Disparities in rates of unintended pregnancy in the united states, 1994 and 2001. *Perspectives on Sexual and Reproductive Health*, 38(2), 90-96. <https://doi.org/10.1363/3809006>
- Finer, L. B., & Zolna, M. R. (2016). Declines in unintended pregnancy in the united states, 2008–2011. *The New England Journal of Medicine*, 374(9), 843-852. <https://doi.org/10.1056/nejmsa1506575>
- Frost, J. J., Lindberg, L. D., & Finer, L. B. (2012). Young adults' contraceptive knowledge, norms and attitudes: associations with risk of unintended pregnancy. *Perspectives on Sexual and Reproductive Health*, 44(2), 107-116. <https://doi.org/10.1363/4410712>
- Gerrard, M., Gibbons, F. X., Houlihan, A. E., Stock, M. L., & Pomery, E. A. (2008). A dual-process approach to health risk decision making: The prototype willingness model. *Developmental review*, 28(1), 29-61. <https://doi.org/10.1016/j.dr.2007.10.001>
- Gibbons, F. X., Gerrard, M., & Lane, D. J. (2003). A social reaction model of adolescent health risk. In J.M. Suls & K.A. Wallston (EDS.), *Social psychological foundations of health and illness* (pp. 107-136). Oxford, England: Blackwell.
- Gibbons, F.X., Stock, M.L., Gerrard, M., & Finneran, S. (2015). The prototype-willingness model. In M. Conner & P. Norman (Eds.), *Predicting and changing health behavior: Research and practice with social cognition models* (3rd ed., pp. 189-224). Berkshire, UK: Open University Press.
- Gibbons, F. X., Stock, M. L., & Gerrard, M. (2020). The prototype-willingness model. *The Wiley encyclopedia of health psychology*, 517-527. <https://doi.org/10.1002/9781119057840.ch102>
- Glasier, A. (2010). Acceptability of contraception for men: a review. *Contraception*, 82(5), 453-456. <https://doi.org/10.1016/j.contraception.2010.03.016>
- Gu, Y., Liang, X., Wu, W., Liu, M., Song, S., Cheng, L., ... & Peng, L. (2009). Multicenter contraceptive efficacy trial of injectable testosterone undecanoate in Chinese men. *The Journal of Clinical Endocrinology & Metabolism*, 94(6), 1910-1915. <https://doi.org/10.1210/jc.2008-1846>
- Heinemann, K., Saad, F., Wiesemes, M., White, S., & Heinemann, L. (2005). Attitudes toward male fertility control: results of a multinational survey on four continents. *Human Reproduction*, 20(2), 549-556. <https://doi.org/10.1093/humrep/deh574>
- Higgins, T. M., Dougherty, A. K., Badger, G. J., & Heil, S. H. (2018). Comparing long-acting reversible contraception insertion rates in women with Medicaid vs. private insurance in a clinic with a two-visit protocol. *Contraception*, 97(1), 76-78. <https://doi.org/10.1016/j.contraception.2017.08.016>
- Hill, N. J., Siwatu, M., & Robinson, A. K. (2014). “My religion picked my birth control”: The influence of religion on contraceptive use. *Journal of religion and health*, 53(3), 825-833. <https://doi.org/10.1007/s10943-013-9678-1>
- Kaiser Family Foundation. (2020) Births Financed by Medicaid. Retrieved from <https://www.kff.org/medicaid/state-indicator/births-financed-by-medicaid/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D#notes>
- Langmaid, S. (2020). Pull Out Method (Withdrawal). Retrieved from <https://www.webmd.com/sex/birth-control/pull-out-withdrawal>

- Liu, P. Y., Swerdloff, R. S., Anawalt, B. D., Anderson, R. A., Bremner, W. J., Elliesen, J., ... & Nieschlag, E. (2008). Determinants of the rate and extent of spermatogenic suppression during hormonal male contraception: an integrated analysis. *The Journal of Clinical Endocrinology & Metabolism*, 93(5), 1774-1783. <https://doi.org/10.1210/jc.2007-2768>
- Liu, P. Y., Swerdloff, R. S., Christenson, P. D., Handelsman, D. J., & Wang, C. (2006). Rate, extent, and modifiers of spermatogenic recovery after hormonal male contraception: an integrated analysis. *The Lancet*, 367(9520), 1412-1420. [https://doi.org/10.1016/s0140-6736\(06\)68614-5](https://doi.org/10.1016/s0140-6736(06)68614-5)
- Luis, R.R., Brelsford, G.M. & Rojas-Guylar, L. (2012). Religiosity, Spirituality, Sexual Attitudes, and Sexual Behaviors Among College Students. *J Relig Health* 51, 601–614. <https://doi.org/10.1007/s10943-011-9527-z>
- Manetti, G. J., & Honig, S. C. (2010). Update on male hormonal contraception: Is the vasectomy in jeopardy? *International Journal of Impotence Research*, 22(3), 159-170. <https://doi.org/10.1038/ijir.2010.2>
- Mayo Clinic. (2021). Vasectomy reversal. Retrieved from <https://www.mayoclinic.org/tests-procedures/vasectomy-reversal/about/pac-20384537>
- McLachlan, R. I., McDonald, J., Rushford, D., Robertson, D. M., Garrett, C., & Baker, H. G. (2000). Efficacy and acceptability of testosterone implants, alone or in combination with a 5 α -reductase inhibitor, for male hormonal contraception. *Contraception*, 62(2), 73-78. [https://doi.org/10.1016/s0010-7824\(00\)00139-6](https://doi.org/10.1016/s0010-7824(00)00139-6)
- Meriggiola, M. C., Cerpolini, S., Bremner, W. J., Mbizvo, M. T., Vogelsohn, K. M., Martorana, G., & Pelusi, G. (2006). Acceptability of an injectable male contraceptive regimen of norethisterone enanthate and testosterone undecanoate for men. *Human Reproduction (Oxford, England)*, 21(8), 2033-2040. <https://doi.org/10.1093/humrep/del094>
- Milhausen, R. R., McKay, A., Graham, C. A., Crosby, R. A., Yarber, W. L., & Sanders, S. A. (2013). Prevalence and predictors of condom use in a national sample of Canadian university students. *The Canadian Journal of Human Sexuality*, 22(3), 142-151. <https://doi.org/10.3138/cjhs.2316>
- Mommers, E., Kersemaekers, W. M., Elliesen, J., Kepers, M., Apter, D., Behre, H. M., . . . Zitzmann, M. (2008). Male hormonal contraception: A double-blind, placebo-controlled study. *The Journal of Clinical Endocrinology & Metabolism*, 93(7), 2572-2580. <https://doi.org/10.1210/jc.2008-0265>
- Peterson, Herbert B., Darmstadt, Gary L., Bongaarts, John. (2013). Meeting the unmet need for family planning: Now is the time. *Lancet, The*, 381(9879), 1696-1699. [https://doi.org/10.1016/s0140-6736\(13\)60999-x](https://doi.org/10.1016/s0140-6736(13)60999-x)
- Peterson, L. M., Campbell, M. A. T., & Laky, Z. E. (2019). The next frontier for men's contraceptive choice: College men's willingness to pursue male hormonal contraception. *Psychology of Men & Masculinities*, 20(2), 226-237. <https://doi.org/10.1037/men0000174>
- Piotrowska, Katarzyna., Wang, Christina., Swerdloff, Ronald S., Liu, Peter Y. (2017). Male hormonal contraception: Hope and promise. *Lancet Diabetes & Endocrinology, The*, 5(3), 214-223. [https://doi.org/10.1016/s2213-8587\(16\)00034-6](https://doi.org/10.1016/s2213-8587(16)00034-6)

- Roth, Mara Y., Shih, Grace., Ilani, Niloufar., Wang, Christina., Page, Stephanie T., Bremner, William J, Swerdloff, Ronald S., Sitruk-Ware, Regine., Bliithe, Diana L., Amory, John K. (2014). Acceptability of a transdermal gel-based male hormonal contraceptive in a randomized controlled trial. *Contraception*, 90(4), 407-412. <https://doi.org/10.1016/j.contraception.2014.05.013>
- Sjögren, B., & Gottlieb, C. (2001). Testosterone for male contraception during one year: Attitudes, well-being and quality of sex life. *Contraception*, 64(1), 59-65. [https://doi.org/10.1016/s0010-7824\(01\)00223-2](https://doi.org/10.1016/s0010-7824(01)00223-2)
- Terry, G., & Braun, V. (2012). Sticking my finger up at evolution: Unconventionality, selfishness, and choice in the talk of men who have had “preemptive” vasectomies. *Men and Masculinities*, 15(3), 207-229. <https://doi.org/10.1177/1097184X1143012>
- U.S. Department of Health and Human Services. (2021). Family Planning. Retrieved from <https://health.gov/healthypeople/objectives-and-data/browse-objectives/family-planning>
- Vasilenko, S. A., Kreager, D. A., & Lefkowitz, E. S. (2015). Gender, contraceptive attitudes, and condom use in adolescent romantic relationships: a dyadic approach. *Journal of Research on Adolescence*, 25(1), 51-62. <https://doi.org/10.1111/jora.12091>
- Vera Cruz, G., Humeau, A., Moore, P. J., & Mullet, E. (2019). Identifying determinants of Mozambican men’s willingness to use a male contraceptive pill. *The European Journal of Contraception & Reproductive Health Care*, 24(4), 266-273. <https://doi.org/10.1080/13625187.2019.1630816>
- Walker, S. (2011). Attitudes to a male contraceptive pill in a group of contraceptive users in the UK. *Journal of Men's Health*, 8(4), 267-273. <https://doi.org/10.1016/j.jomh.2011.04.003>
- Zhang, L., Zhang, L., Shah, I. H., Liu, Y., & Vogelsong, K. M. (2006). The acceptability of an injectable, once-a-month male contraceptive in china. *Contraception*, 73(5), 548-553. <https://doi.org/10.1016/j.contraception.2005.10.012>

Submit your next manuscript to Journal of Sexual Health Psychology (JSHP): <https://www.journalshp.com>

