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Contraceptive Education for Active-Duty Service Members:  
An evaluation using the RE-AIM framework

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**Abstract**

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The views expressed are those of the author(s) and do not reflect the official policy of the Department of the Army, the Department of Defense, or the U.S. Government. The investigators have adhered to the policies for protection of human subjects as prescribed in 45 CFR 46.

**Background:** Nearly two-thirds of military pregnancies are unintended, with 5.5% of military women experiencing unintended pregnancy in 2015. Education-based interventions are effective at improving contraceptive knowledge as well as contraceptive behaviors among military populations. However, traditional education-based interventions often require multiple hours or days of staff and participants' time. Additionally, little is known about baseline contraceptive knowledge of Army service members. We assessed the impact of a one-hour contraceptive education course embedded within a same-day contraceptive clinic.

**Methods:** Participants were recruited from a convenience sample of active-duty service members presenting for a scheduled bi-weekly contraceptive clinic. All service-members participating in the contraceptive clinic were offered the opportunity to participate in the contraceptive education course. Education course participants were asked to complete a pre and

post intervention questionnaire. Pre and post course questionnaires included a validated 25-question contraceptive knowledge assessment and asked about preferred contraceptive method. The post-course survey included an additional validated 16-question contraceptive decision conflict scale. A control group consisted of active-duty Army women presenting for routine appointments to the same primary care clinic who did not complete the education course. The control group participants were asked to complete pre and post appointment questionnaires for contraceptive knowledge, preference, and decision conflict. Implementation of the contraceptive clinic and education course was qualitatively assessed using the RE-AIM evaluation model as described by Glasgow et al.

**Findings:** Fourteen contraceptive class participants and ten control participants enrolled in the study and completed baseline surveys. Baseline contraceptive knowledge was similar between groups, with mean aggregate score of 13.58 out of a possible 25. The questions most frequently missed pertained to proper use of contraceptive methods, method side effects, and medical contraindications. Follow-up surveys were only completed by 4% of total study participants. As a result, change in contraceptive knowledge and preferred contraceptive method could not be assessed. In qualitative program evaluation, several threats to program adoption were identified at the provider and clinic level.

**Discussion:** This study was unable to assess the primary outcome of change in contraceptive knowledge or preferred contraceptive method. However, it provides valuable information about specific contraceptive knowledge deficits among Army women. This information can be used to design future education interventions. Additional studies are needed to assess the impact of this contraceptive education program on contraceptive knowledge retention, contraceptive behaviors, and pregnancy.

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# CHAPTER 1. INTRODUCTION

## 1.1 UNINTENDED PREGNANCY IN THE MILITARY: IMPACT TO READINESS

Unintended pregnancy (UIP) and its impact on soldier readiness is an issue of concern in the US military. The DoD Health Related Behaviors Survey is a voluntary online survey of active component service members, which surveys self-reported data about numerous health behaviors. Results from this survey have shown rates of UIP among military women to range from 7.2% in 2008 to 5.5% in 2015. UIP rates in the civilian population during a similar time frame are reported to range between 4.5 and 5.2% (Grindlay & Grossman, 2015) (Meadows S. O., Engel, Collins, & et al., 2018). However, rates of UIP and overall trends vary by branch. For example, while the 2018 DoD Health Related Behavior Survey reported an UIP rate of 5.5% among all service women, this rate was 6.1% among Army women. Further, 2.9% of all service members (male and female) reported experiencing or causing an UIP in 2018 (Meadows S. O., et al., 2021).

While there is substantial literature documenting the health risks associated with UIP, in the context of the military, there are additional unique concerns related to this issue. UIP can have important impacts on soldier and troop readiness. For example, according to a review by Braun et al. pregnancy occurred among 10.1% of military women in a deployed setting and accounts for 2% of medical evacuations to stateside locations. (Braun, Kennedy, Womack, & et al., 2016).

## 1.2 RISK FACTORS FOR UNINTENDED PREGNANCY

Braun et al. found several studies which described risk factors for UIP in the military population. Notably, service members under the age of twenty are at highest risk for UIP with rates reported as high as 16%. Studies which examine marital status and the risk of UIP demonstrate differing results depending on the population surveyed and measure used. On a postpartum survey, 82% of pregnancies were reported as unintended among single women, compared to 45% among married women. (Braun, Kennedy, Womack, & et al., 2016). In 2011, data from the DoD Health Related Behaviors Survey found married women (odds ratio (OR) 1.30) and enlisted women (OR 2.71) had higher odds of reporting an unintended pregnancy within the last year compared to their counterparts (Grindlay & Grossman, 2015). These differing results may be related to study methodology and potentially influenced by stigma associated with pregnancy and marital status, as well as differences in the likelihood of carrying an unintended pregnancy to term.

## 1.3 CONTRACEPTIVE USE IN THE MILITARY

The DoD Defense Health Behaviors Survey found that among military women two short-acting methods of contraception — birth control pills and condoms— were by far the most commonly used methods (Meadows S. O., Engel, Collins, & et al., 2018). Notably, long-acting reversible contraception (LARC), including intrauterine devices (IUDs) and contraceptive implants, have the potential to reduce UIP and use is increasing among military women. Erickson et al described the characteristics of LARC users within the military. Among 114,661 servicewomen, 14.5% received a LARC method, 60% of whom received an IUD. From 2011-2014, overall LARC insertion rates increased from 59 to 71.3 insertions per 1,000 women per year ( $P < .05$ ). This increase was primarily driven by increased number of implant insertions which increased from

20.3 to 35.4 insertions per 1,000 women per year ( $P < .05$ ), while IUD insertions declined slightly from 38.7 to 35.9 insertions per 1,000 women per year ( $P < .05$ ). Younger age was a positive predictor of LARC uptake: 32.4% of IUD users and 62.6% of implant users were in the youngest age category (18–22 years) compared with 9.6% and 2.0% in the oldest (36–44 years). The likelihood of uptake among the youngest women (compared with oldest) was most marked for implants (adjusted relative risk 7.12, CI 5.92–8.55;  $P < .001$ ). The majority (52.2%) of those initiating IUDs were married, which was predictive of uptake over never-married women (adjusted relative risk 1.52, CI 1.44–1.59,  $P < .001$ ) (Erickson, et al., 2017).

#### 1.4 DIFFERENCES AMONG THE SERVICES

A review by Roberts et al. describes the difference between branches in contraceptive use and pregnancy within the first 24 months of entering military service. The Navy demonstrated the highest rates of use of highly effective contraceptive methods (pills, patch, ring, shot, implants, or intrauterine contraception) at 6 months on active service [Army (18.1%), Air Force (27.4%), Marines (26.5%) and Navy (37.6%),  $p < .001$ ], and the highest rates of LARC use at 6 months on active service [Army (2.0%), Air Force (3.7%), Marines (11.0%) and Navy (19.6%),  $p < .001$ ]. The Air Force demonstrated the lowest childbirth rates in the first 24 months of service [Army (11.1%), Air Force (6.0%), Marines (8.4%) and Navy (6.7%)]. After adjusting for age at basic training and contraceptive use at 6 months on active duty, childbirth rates differed among all branches. Those in the Army (hazard ratio 1.86), Marine Corps (1.48) and Navy (1.24) all had a higher risk of delivery than the Air Force (Roberts, Smalley, Weir, & Adelman, 2019). Overall, women in the Marine Corps experienced the highest rate of UIP (8.7%) compared to women in the Army (6.1%), Navy (5.8%), Air Force (3.7%), and Coast Guard (1.6%) (Meadows S. O., et al., 2021). The causes of interservice variation are likely multifactorial and understudied.

Differences may stem from baseline characteristics of these populations including education level, differences in health system structure, and access to women's reproductive health services, as well as differing health education curriculum and occupational roles.

### 1.5 CONTRACEPTIVE KNOWLEDGE AMONG SERVICE-MEMBERS

Despite having some of the lowest rates of LARC use and highest rates of UIP of any service branch few to no studies have examined contraceptive knowledge among Army service members. Most military contraceptive studies have been conducted among Navy service members. Navy service members have been found to have poor baseline contraceptive and pregnancy prevention knowledge. In one Navy study participant mean score was 2.24 out of 5 for baseline contraceptive knowledge (Chung-Park, Evaluation of a pregnancy prevention programme using the contraceptive behavior change model, 2008). In another Navy study, contraceptive knowledge was assessed using the Sexual Knowledge Scale. Mean score for Female service members was 21.22, and for Males was 17.29, out of thirty-two possible (Gallagher, Lall, & Johnson, 1997). These studies suggest that contraceptive knowledge deficits may be a significant contributor to high rates of UIP in the military.

### 1.6 EVIDENCE-BASED INTERVENTIONS

Multiple different interventions have demonstrated efficacy at reducing UIP in the military and in the general population. These interventions typically either increase access to contraceptives through policy, care delivery and removal of cost as a barrier, or make use of education and healthcare interventions to influence individuals' contraceptive behavior. Some studies combine policy and education strategies into a single intervention.

## 1.6.1 *Increasing access*

### 1.6.1.1 Increased access in a civilian population

The Contraceptive CHOICE project demonstrated the efficacy of removing cost, increasing education, and decreasing access barriers to improve choice and continuation of highly effective contraception. This study of 9,256 women in the St. Louis Missouri area provided tiered contraceptive counseling which focused on long-acting reversible contraceptive (LARC) methods and provided contraception at no cost for 2-3 years to study participants. A majority (75%) of study participants chose a LARC method at baseline enrollment. Abortion rates were significantly lower among study participants compared to regional and national rates of abortion (4.4, 17.0, and 19.6 per 10000, respectively). Adolescent pregnancy was used as a proxy for UIP. Results indicated substantial reductions in adolescent pregnancy, birth, and abortion (34.0, 19.4, and 9.7 per 1000 teens, respectively) compared with national rates among sexually experienced adolescents (158.5, 94.0, and 41.5 per 1000, respectively) (Peipert, Madden, Allsworth, & Secura, 2012).

### 1.6.1.2 Increased access in military populations

The military health system has recently focused on increased access to contraceptive services. A program description of “Operation PINC” describes utilization rates of a novel walk-in contraceptive clinic within the Navy health system. During the 6 months study period 2,207 women received contraceptive services through this program. The mean age of participants was 25 years old. 70% of attendees were active-duty women and 88% were enlisted service members. LARC initiation increased from 12 to 39%. Cost savings to the department of the Navy through this program are estimated at \$15 million dollars and 2.7-million-person hours per year through prevention of UIP (Adams, 2017).

Military policy changes focused on contraceptive access influence contraceptive use and may influence childbirth rates. Roberts et al. conducted a secondary analysis of insurance records from 70,852 servicewomen who started Navy basic training from Oct 2013 to Dec 2016. This study assessed the impact of a Navy policy expanding contraceptive access during basic training implemented in January 2015, and Marine corps policy change restricting contraceptive access in January 2016. Navy policy increased access by emphasizing LARC methods in contraceptive education, implementing walk-in contraceptive clinics, and creating group appointments for LARC placement in the third or fourth week of basic training. The Navy policies which increased contraceptive access increased contraceptive use from 33.1 to 39.2% of sailors and LARC use from 11 to 22.7%, although this policy change was not associated with a decline in childbirth rate among sailors relative to the change among women in the Army and Air force over the same period. In contrast, Marine policy restricted LARC access so that it was not available until completion of the 10<sup>th</sup> week of basic training and emphasized depot medroxyprogesterone in contraceptive education for contraception and menstrual changes. This Marine Corps policy change decreased contraception use from 29.6% to 24.4%, long-acting reversible contraception use from 14.6% to 7.3%, and increased childbirth rates from 8.0% to 9.6% (Roberts, Smalley, Baker, Weir, & Adelman, 2020).

### 1.6.2 *Education interventions*

Education interventions have typically focused on contraceptive and reproductive knowledge and contraceptive decision-making. Vargas et al conducted a systematic review of existing interventions to Improve Sexual and Reproductive health in US Active-Duty Military Service members. This review found ten articles on STI and UIP. Education-based interventions demonstrated improved knowledge of contraception in five out of five studies, decreased rates of

STI and/or UIP in four out of four studies. Effects were mixed for behaviors and behavioral mediators (Vargas, et al., 2020).

Chung-Park conducted a study to assess key themes for contraceptive decision making. The primary theme identified was “taking responsibility” with four related sub-themes (Chung-Park, Contraceptive decision-making in military women, 2007):

- having personal goals related to avoiding pregnancy
- having family values related to childbearing
- having support from families, peers and healthcare providers related to sexual and contraceptive decisions and
- choosing the method based on effectiveness to pregnancy prevention

These contraceptive decision-making themes should be integrated into interventions to address UIP.

Motivational Interviewing (MI) has been shown to increase LARC use and use of effective contraception at nine months (OR 2.04). MI is a counseling technique that is used to promote health behavior change. With this technique, the care provider asks about the individual’s goals and motivations, affirms their goals, and develops a health behavior plan together with the individual. In two studies, participants who were counseled using MI were less likely to report using ineffective contraception at three months (OR 0.31) and four months (OR 0.56), respectively. In the fourth trial, participants in the MI group were more likely than a group with non-standardized counseling to initiate long-acting reversible contraception (LARC) by one month (OR 3.99) and to report using LARC at three months (OR 3.38) (Lopez, Grey, Chen, Tolley, & Stockton, 2016).

An education-based initiative consisting of two class sessions 2 months apart in the Navy was

found to significantly reduce pregnancy rates among the intervention group. The experimental groups' knowledge increased statistically significantly with repeated interventions, while the control group's knowledge did not change over the same period. Both groups started with no pregnancies, and at the end of the study, the difference in pregnancy rate between the two groups was statistically significant: experimental group 0%, and control group 14% (Chung-Park, Evaluation of a pregnancy prevention programme using the contraceptive behavior change model, 2008).

While educational interventions and motivational interviewing have demonstrated efficacy, it is imperative that the risk for reproductive coercion or implicit pressure be considered when designing an educational intervention. In one study of 38 Black and Latina women in San Francisco, the majority (71%) reported experiences of pressure in reproductive care. Counseling factors that contributed to implicit pressure included imbalanced provision of information, tone of voice and affect, and minimization of or failure to describe potential side effects (Gomez & Wapman, Under (implicit) pressure: young Black and Latina women's perception of contraceptive care, 2017). To prevent reproductive coercion, it is recommended that education or clinical encounters be woman centered. Gomez et al. recommend achieving this by focusing first on understanding the woman's preferences and priorities for method selection. A provider may ask the patient to rank their priorities such as ability to start and stop the method themselves, efficacy, or side effects. Once the priorities are identified, individual methods can be discussed (Gomez, Fuentes, & Allina, Women or LARC first? Reproductive Autonomy and the Promotion of Long-Acting Reversible Contraceptive Methods, 2014).

### 1.6.3 *Selecting an intervention*

Education interventions have demonstrated efficacy at influencing contraceptive behavior and UIP. Despite favorable evidence, there is currently no standardized contraceptive education for service members in the DoD or in the Army. In contrast, there are currently efforts to standardize and improve contraceptive access through dissemination of the Navy's PINC clinic model throughout the Military Health System. It is likely that both increased education and increased access are needed to address UIP in the military. One barrier for education initiatives has been the time required, as many of the studied interventions required multiple hours or days of staff and participants' time. Understanding the impact of a brief, 1 hour or less, education session on contraceptive knowledge and choice will be useful to develop feasible interventions that can be implemented throughout the military.

## 1.7 SUMMARY

Unintended pregnancy significantly impacts military readiness and the service members experiencing UIP. Education based interventions and policies which increase access to contraception, and particularly LARC methods, are effective at increasing contraception use and reducing UIP. These programs have been integrated throughout the Navy. However, UIP continues to pose a significant challenge to the Army. The goal of this thesis was to describe baseline contraceptive knowledge among active-duty service members and to identify specific knowledge gaps and/or strengths. We planned to evaluate a 1-hour education intervention's impact on service members' contraceptive knowledge and preferred contraceptive method. Implementation of the contraceptive clinic and education course was qualitatively assessed using the RE-AIM evaluation model as described by Glasgow et al.

## Chapter 2. PROGRAM DESCRIPTION

### 2.1 CONTRACEPTIVE CLASS

There is currently an ongoing voluntary reproductive health education class offered through the soldier-centered medical home (SCMH) at Joint base Lewis-McChord (JBLM), WA. JBLM is a military base with approximately 40,000 assigned active-duty service members. Units on JBLM are primarily Army and Air Force units (U.S. Army, n.d.). The SCMH provides primary care services to assigned active-duty Army service members. This class is available to all service members assigned to JBLM and is offered at no cost. Participants must call or present in person to register in advance for this class. This class is advertised by flyers placed throughout the soldier centered medical homes and unit communal areas. Approximately six service members per week attend this education class. A clinical pharmacist typically teaches this course. However, during the study period, a Gynecologic Surgeon and Obstetrician taught this class due to a provider absence.

Topics covered during this course include

- Physiology: menstrual cycle, ovulation, conception
- Contraceptive method overview of proper use, efficacy, contraindications, and side effects
- Menstrual cycle suppression
- Sexually transmitted infection risk and prevention

This education course has been reviewed and approved by clinical subject matter experts from Pharmacy and Obstetrics and Gynecology.

## 2.2 CONTRACEPTIVE CLINIC

The contraceptive class is part of a comprehensive contraceptive clinic. This clinic is offered ½ day twice per month. Participants must call or present in person to register in advance for this clinic. Walk-ins are accepted on a space available basis. Prior to the contraceptive clinic all participants are asked to complete a pregnancy test in the lab. All contraceptive clinic participants are offered the opportunity to participate in the contraceptive education class. However, class participation is not required to receive individual's preferred contraceptive method. All clinic participants, including contraceptive education class participants, can receive their contraceptive method of choice prior to class completion, if medically appropriate. Contraceptive methods offered include all short acting and long-acting contraceptive methods (pill, patch, ring, shot, intrauterine device, subdermal contraceptive implant). Patients desiring permanent sterilization receive a referral to the Gynecologic Surgery and Obstetrics department.

## Chapter 3. METHODS

### 3.1 STUDY DESIGN

#### 3.1.1 *Study overview*

This study sought to assess the impact of a one-hour contraceptive education course on contraceptive knowledge, contraceptive method selection, and decision conflict scale. In addition, this study assessed the implementation of the contraceptive education class using a structured framework.

#### 3.1.2 *Mixed methods study*

This study used a pre-post design in which education course participants were asked to complete a pre and post intervention knowledge assessment and contraceptive preference questionnaire. The post-course survey included an additional contraceptive decision conflict scale. A control group consisting of servicemembers presenting for routine appointments to the soldier centered medical home were asked to complete the same pre and post appointment questionnaires for contraceptive knowledge, preference, and decision conflict. In addition, implementation of the contraceptive clinic and education course was assessed using the RE-AIM evaluation model as described by Glasgow et al (Glasgow, Vogt, & Boles, 1999).

#### 3.1.3 *IRB approval*

This study was reviewed and determined to be IRB exempt by the Madigan Army Medical Center Institutional Review Board on 22 October 2021 with IRB Protocol #: 222012

#### 3.1.4 *Participants and recruitment procedures*

Participants in the intervention arm were recruited from among active-duty service-members presenting for contraceptive education class at SCMH. Recruitment occurred from January through March of 2022. At the time of check-in for the contraceptive education class patients were provided a study information sheet by the nurse performing medical screening. Patients were then offered the opportunity to complete the pre-course survey or to decline participation in the research study.

Participants in the control arm were recruited from among female active-duty service members presenting for any routine healthcare appointment to the SCMH. At the time of check-in for their appointment patients meeting recruitment criteria were provided a study information sheet and pre-course survey by the MSA for them to review and complete prior to their scheduled appointment. The control arm was not assessed for their interest level in receiving information about or initiating a contraceptive method.

#### 3.1.5 *Informed consent*

Participants were informed of the study prior to the beginning of the contraceptive class. They were provided information in written format which included the study purpose, the option to participate, and that choosing not to participate does not impact the participant's ability to receive the education class or preferred contraceptive method. Written informed consent was not required, per institution protocol for IRB exempt studies.

#### 3.1.6 *Inclusion criteria*

All study participants were required to be female gender, currently serving on active duty, and aged 18-44. Participants were recruited between 01 January 2022 and 31 March 2022.

3.1.6.1 Participants in the study arm needed to be presenting for contraceptive clinic and participating in contraceptive education class through SCMH.

3.1.6.2 Participants in the control group needed to be presenting for any routine scheduled appointment at the SCMH.

### 3.1.7 *Exclusion criteria:*

Contraceptive class participants or patients who elected not to participate in survey. Non-active-duty, age younger than 18 or older than 44, and non-female gender.

### 3.1.8 *Sample size calculation*

Sample size was calculated based on the planned primary outcome of change in mean contraceptive knowledge assessment score. A student's T-test was planned to assess pre and post course contraceptive knowledge scores. Assumptions for power calculation were pre-intervention mean score of 10, post-intervention mean score of 15, change in score of 5, alpha 0.05, power 80%.

A sample size of 16 participants per group was required to detect a significant difference pre and post intervention. Our goal recruitment was 25 subjects per arm, with the assumption that 25% would not complete post course surveys.

## 3.1 INTERVENTION AND USUAL CARE PROCEDURES

### 3.1.1 *Contraceptive class*

At the time of check-in for the contraceptive education class, patients were provided a study information sheet by the nurse performing medical screening. This sheet described the study goals and format. Patients were then offered the opportunity to complete the pre-course survey or to decline participation in the research study. A paper-based study questionnaire was provided

together with the research information sheet for baseline data collection. Completed questionnaires were collected prior to the start of the contraceptive education class by the provider conducting the class. Patients then participated in the contraceptive class as described above in program description, including the opportunity to receive their preferred contraceptive method.

### 3.1.2 *Routine appointment*

At the time of check-in for their appointment patients meeting recruitment criteria were provided a study information sheet and pre-course survey by the MSA for them to review and complete prior to their scheduled appointment. Completed questionnaires were collected by the nurse prior to the start of the soldier's scheduled appointment. Participants then completed their routine scheduled appointment.

### 3.1.3 *Post course questionnaire*

On the initial pre-course questionnaire, participants were asked to provide a non-DoD email to receive a two-week post course/appointment follow-up questionnaire. A DoD approved web-based survey platform, “Hermes” was used to e-mail post-course/appointment questionnaires to participants’ previously provided e-mail addresses. Each questionnaire link was uniquely correlated with the participant ID number to allow comparison of responses pre and post intervention. Survey links were e-mailed two weeks after the participant's scheduled appointment or class. Participants who did not respond within 7 and 14 days received a reminder e-mail requesting that they complete the follow-up survey.

## 3.2 MEASURES

### 3.2.1 *Pre-intervention questionnaire*

The baseline participant questionnaire included a validated contraceptive knowledge assessment, baseline demographic data, current contraceptive use, and preferred contraceptive method.

### 3.2.2 *Contraceptive knowledge assessment*

This survey used the contraceptive knowledge assessment as developed and validated by Haynes et al (Appendix A). This tool contains 25 multiple-choice questions and was reviewed by subject matter experts. In validation studies the mean score on the CKA was higher than the mean score on the gold standard (9.1 vs. 5.8,  $p < .001$ ). Patients scored lower on the CKA than did medical students (9.1 [36.4%] vs. 19.4 [77.6%],  $p < .005$ ). There were no differences within patients' results with repeat testing over time ( $p = .667$ ) (Haynes, Ryan, Saleh, Winkel, & Ades, 2017). This contraceptive knowledge assessment tool covers multiple methods of contraception as well as different domains of contraceptive knowledge. The domains of contraceptive knowledge covered include reproductive physiology, contraceptive method efficacy, non-contraceptive benefits, proper use of contraceptive methods, mechanism of action, medical contraindications, and side effects and complications of various contraceptive methods.

### 3.2.3 *Follow-up questionnaires and decision conflict*

Participants in intervention and control arms were asked to complete a post-course questionnaire which included the contraceptive knowledge assessment, course satisfaction, preferred contraceptive method, contraceptive decision conflict scale and contraceptive method received. Decision conflict was assessed using a validated 16 question decision conflict scale (O'Connor, 1995).

### 3.2.4 *Demographics*

The demographic characteristics assessed were: Age, Grade/Rank, Military Branch, Race/Ethnicity, Pregnancy history

- 3.2.4.1 Age categories were: 17-22, 23-30, 31-38, 39-44, and not reported
- 3.2.4.2 Grade/Rank categories were: E1-E4, E5-E9, O1-O3, O4-O9, and Not reported. Rank is a personnel classification system used by all branches of the military. This system corresponds to an individual's pay as well as level of responsibility. Enlisted service members, as indicated by the E prefix, have generally lower levels of pay relative to Officers, indicated by the O prefix. The number following the prefix correlates to level of seniority and experience with higher numbers correlating to higher seniority. There is some overlap in pay between senior enlisted and junior officers. In addition, a bachelor's degree is a prerequisite to be an Officer, while it is not required for enlisted personnel. In general, this results in Officers having higher levels of educational attainment, with some individual variance.
- 3.2.4.3 Military branches listed were Army, Air Force, Coast Guard, Marine Corps, Navy, and Not reported. JBLM is a joint Army and Air Force base. All branches were listed on the questionnaire because some individual service members may be stationed with different services for a variety of reasons.
- 3.2.4.4 Race/Ethnicities listed were: American Indian/Alaska Native, Asian, Black/African American, Hawaiian/Pacific Islander, Hispanic, and white. These categories were derived from the Office of Management

and Budget standards for the classification of federal data on race and ethnicity (National Institutes of Health, 2015).

3.2.4.5 Pregnancy history collected included yes/no responses for: prior pregnancy, prior live birth, prior pregnancy loss, and prefer not to answer.

### 3.2.5 *Current and preferred contraceptive method*

Contraceptive method preference was assessed by asking which method of contraception participants were most interested in using at the present time.

Contraceptive methods listed for current and preferred method were:

- Condoms (Male)
- Condoms (Female)
- Spermicide
- Other barrier
- Combined hormonal contraceptive pill
- Progesterone only contraceptive pill
- Contraceptive patch
- Contraceptive ring (monthly)
- Contraceptive ring (annual)
- Contraceptive shot
- Copper Intrauterine device
- Progesterone Intrauterine device
- Contraceptive implant
- Female sterilization
- Male sterilization
- Other
- None

## 3.3 OUTCOMES

### 3.3.1 *Primary outcome:*

Mean change in contraceptive knowledge assessment score as measured using the validated 25-question contraceptive knowledge assessment.

### 3.3.2 *Secondary outcomes:*

Secondary outcomes included: change in contraceptive method preference before and after intervention, correlation of preferred contraceptive method with contraceptive method received

within two weeks of education class completion, satisfaction and relevance of course material to participants, and contraceptive decision conflict as assessed during the post-course survey.

### 3.3.3 *Qualitative evaluation with RE-AIM framework*

A post-hoc qualitative evaluation of the contraceptive class and clinic implementation was performed to capture lessons learned for clinics seeking to implement similar initiatives in the future. The RE-AIM evaluation model as described by Glasgow et al was selected (Glasgow, Vogt, & Boles, 1999).

- 3.3.3.1 **Reach:** Reach is an individual-level measure of participation, which includes the characteristics of persons who receive or are affected by a policy or program. The reach should compare the program participants to the complete population (Glasgow, Vogt, & Boles, 1999). The Reach of the contraceptive clinic was determined by monitoring the number of class enrollees. The characteristics of the contraceptive class population were obtained through baseline demographic data collected on initial questionnaires. These class characteristics were compared to publicly available data which characterizes the military population and demographics.
- 3.3.3.2 **Effectiveness:** Effectiveness of the contraceptive clinic was to be determined by the post-course survey. Measures which assessed effectiveness were change in contraceptive knowledge scores, contraceptive method selection, and receipt of preferred contraceptive method.
- 3.3.3.3 **AIM:** Adoption, Implementation and Maintenance all assess program level outcomes, in contrast to Reach and Efficacy which focus on the characteristics of the individuals in the program. Adoption describes the number and representativeness of sites that adopt a program. Implementation refers to what portion of the program is delivered as

designed. Maintenance is the extent to which a program is maintained over time. Maintenance includes both an individual and organizational component (Glasgow, Vogt, & Boles, 1999). Because the RE-AIM evaluation is post-hoc, this evaluation used knowledge, expertise and lessons learned from the development, implementation and maintenance of the education course and clinic. This information was derived from informal conversations, feedback and planning meetings with clinic leadership including the officer-in-charge, clinical pharmacist, clinic administrators, nursing leadership, nursing staff supporting the clinic, and MSAs who coordinate scheduling.

This evaluation was supplemented with published medical literature of similar initiatives.

### 3.4 DATA ANALYSIS

#### 3.4.1 *Data recording and analysis tools*

All survey results were recorded using Microsoft Excel. Data analysis was performed using R studio and Microsoft Excel. Graphs and visuals were created using Microsoft Excel.

#### 3.4.2 *Data reporting groups*

All quantitative analyses were conducted for three groups. Aggregate data for all study participants, class participants (intervention) only, and routine appointment (control) only.

#### 3.4.3 *Demographics*

Demographic characteristics were reported as number and percent. Participants were able to select multiple racial or ethnic identities on their demographic questionnaire. Participants who noted multiple racial or ethnic identities were reported in the categories of multi-racial as well as in their individual reported ethnic categories.

#### 3.4.4 *Current contraceptive method*

Number and percent of patients using each individual contraceptive method was calculated and reported. Participants reporting multiple methods were counted for each contraceptive method they reported using currently.

#### 3.4.5 *Contraceptive knowledge assessment*

##### 3.4.5.1 Individual questions

For each individual contraceptive knowledge question, the number and percent correct was calculated.

##### 3.4.5.2 Total score

Mean total score and standard deviation was calculated along with median score, 1<sup>st</sup> and 3<sup>rd</sup> quartile.

#### 3.4.6 *Preferred contraceptive method*

##### 3.4.6.1 Individual contraceptive method

Number and percent of participants interested in each individual contraceptive method was calculated and reported. Participants expressing interest in multiple contraceptive methods were counted for each contraceptive method they reported.

##### 3.4.6.2 Contraceptive categories

Contraceptive method preference was further analyzed by contraceptive category. We sought to understand if preferred contraception changed pre and post intervention based on two different categorizations of contraceptive methods. The first categorization was based on length of use and the second categorization was based on hormonal vs. non-hormonal methods.

Categorization based on length of use:

- SARC: Condoms (Male and Female), spermicide, other barrier, combined hormonal contraceptive pill, progesterone only contraceptive pill, contraceptive patch, contraceptive ring (monthly and annual), contraceptive shot/depo provera
- LARC: Copper IUD, progesterone IUD, contraceptive implant
- permanent sterilization: male and female

Categorization based on use of hormones:

- Hormonal: Combined hormonal contraceptive pill, progesterone only contraceptive pill, contraceptive patch, contraceptive ring, contraceptive shot, progesterone IUD, contraceptive implant
- Non-Hormonal: Condoms, contraceptive spermicide, other barrier, copper IUD, female, and male sterilization

Number and percent of individuals interested in contraceptive categories was determined. If an individual expressed interest for multiple methods within the same category, they were only counted once for that category (e.g., a participant expressing interest in hormonal shot and hormonal IUD would only be counted once for the Hormonal category).

## Chapter 4. FINDINGS

### 4.1 STUDY PARTICIPATION

#### 4.1.1 *Routine appointment arm*

Ten service-members presenting for routine appointments at the soldier-centered medical home were enrolled in the routine appointment arm and completed baseline surveys. Of these, one completed a 2-week post-appointment follow-up survey online.

#### 4.1.2 *Contraceptive clinic and class*

Seven contraceptive clinics were held during the study period. All participants scheduled for the contraceptive clinic were offered the contraceptive class. Of forty-two contraceptive clinic participants, fifteen chose to participate in the contraceptive class. Fourteen out of fifteen contraceptive class participants enrolled in the study and completed baseline surveys. One contraceptive class participant initiated but did not complete the 2-week follow-up survey.

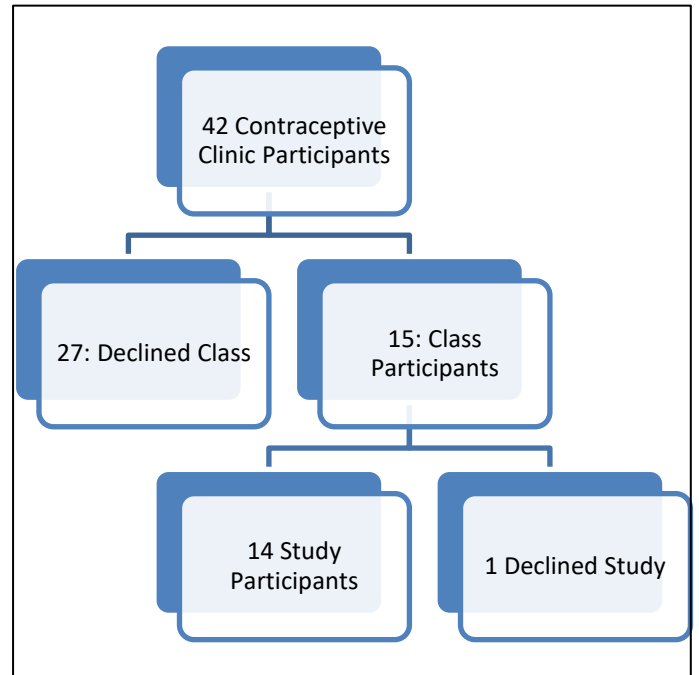


Figure 4.1. Participant Enrollment

## 4.2 BASELINE DEMOGRAPHICS

The vast majority (95%) of participants were age 30 years or younger. The class group was younger age than the routine appointment arm, with 78.6% of class participants aged 17-22 compared to 10% of routine appointment participants. Most study participants were junior enlisted, with two-thirds of participants in the rank of E-1 – E-4. Reported ranks were similar between contraceptive class and routine appointment arms of the study. Race and ethnicity were similar between study arms. Participants reported race and ethnicity were roughly evenly split between Black/African American, White, and Hispanic. Additionally, a smaller percentage reported Asian, Hawaiian/Pacific Islander, American Indian/Alaska Native, and Multiracial race. Most participants were Army service-members. One-third of participants had experienced prior pregnancy. Differences existed between study arms with most (60%) appointment participants reporting prior pregnancy compared to only 14% of class participants.

Table 4.1. A Baseline Demographics

<b>CATEGORY</b>	<b>N (%) Aggregate</b>	<b>N (%) Class</b>	<b>N (%) Appointment</b>
<b>AGE</b>			
17-22	12(50)	11(78.57)	1(10)
23-30	11(45.83)	3(21.42)	8(80)
31-38	0	0	0
39-44	0	0	0
Not reported	1(4.17)	0	1(10)
<b>Grade/Rank</b>			
E-1 – E-4	16(66.67)	11(78.57)	5(50)
E-5 – E-9	4(16.67)	2(14.29)	2(20)
O-1 – O-3	3(12.5)	1(7.14)	2(20)
O-4 – O-9	0	0	0
Not reported	1(4.17)	0	1(10)
<b>Military Branch*</b>			
Army	22(91.67)	14(100)	8(80)
Not reported	2(8.33)	0	2(20)
<b>Race/Ethnicity</b>			
Black/African American	8(33.33)	4(28.57)	4(40)
Asian	2(8.33)	1(7.14)	1(10)
White	7(29.17)	4(28.57)	3(30)
Hawaiian/ Pacific Islander	2(8.33)	1(7.14)	1(10)
Hispanic	6(25)	5(35.71)	1(10)
American Indian/Alaskan Native	1(4.17)	1(7.14)	0
Multi-racial	2(8.33)	2(14.29)	0
<b>Pregnancy History</b>			
Prior pregnancy	8(33.33)	2(14.29)	6(60)
Prior live birth	7(29.17)	1(7.14)	6(60)
Prior pregnancy loss	4(16.67)	0	4(40)

*\*Navy, Air Force, Marine Corps, and Coast Guard not displayed due to zero participants reporting membership in these branches of service*

### 4.3 BASELINE CONTRACEPTIVE USE

Rates of baseline contraceptive use were similar between class and control arms, with methods of contraception varying between groups. Rate of participants reporting no contraception use was 42% and similar between arms. Use of short-acting reversible contraceptives was more frequent among class participants, with 28.6% of class participants reporting current use of oral contraceptive pill (combined and progesterone only) and 14.3% reporting use of the contraceptive shot while no participants in the appointment arm reported use of a contraceptive pill or shot. One participant in the appointment arm reported use of male sterilization for contraception, compared to none in the class arm of the study. Contraceptive use by category was similar between study arms. Rates of SARC and LARC use were roughly equal (29.2% and 25%, respectively). More women were currently using hormonal than non-hormonal contraceptive methods (45.8% and 12.5%, respectively).

Table 4.2. Baseline Contraceptive Use

<b>METHOD</b>	<b>N (%) Aggregate</b>	<b>N (%) Class</b>	<b>N (%) Appointment</b>
Currently using condoms (Male)	2(8.33)	1(7.14)	1(10)
Currently condoms (Female)	1(4.17)	0	1(10)
Current spermicide	1(4.17)	0	1(10)
Current other barrier	1(4.17)	0	1(10)
Current combined hormonal contraceptive pill	3(12.5)	3(21.42)	0
Current progesterone only contraceptive	1(4.17)	1(7.14)	0
Current contraceptive patch	0	0	0
Current contraceptive ring (monthly)	0	0	0
Current contraceptive ring (annual)	1(4.17)	0	1(10)
Current contraceptive shot	2(8.33)	2(14.29)	0
Current copper IUD	2(8.33)	1(7.14)	1(10)
Current progesterone IUD	1(4.17)	0	1(10)
Current contraceptive implant	3(12.5)	2(14.29)	1(10)
Current female sterilization	0	0	0
Current male sterilization	1(4.17)	0	1(10)
Other	0	0	0
None	10(41.67)	6(42.86)	4(40)
<b>Category</b>			
Duration of use			
Short-acting reversible contraception	7(29.17)	5(35.71)	2(20)
Long-acting reversible contraception	6(25)	3(21.42)	3(30)
Permanent sterilization	1(4.17)	0(0)	1(10)
Content			
Hormonal	11(45.83)	7(50)	4(40)
Non-hormonal	3(12.5)	1(7.14)	2(20)

## 4.4 CONTRACEPTIVE KNOWLEDGE

### 4.4.1 *Cumulative contraceptive knowledge score*

Baseline contraceptive knowledge was similar between groups. Out of a possible 25 points, the mean aggregate score was 13.6 (SD 4.2), mean score for contraceptive class was 13.64(SD 3.7), and mean score for the routine appointment arm was 13.5(SD 5.0). Routine appointment arm showed greater variation of distribution with the 1<sup>st</sup> and 3<sup>rd</sup> quartile ranging from 10 – 18, compared to the IQR of 11.5-15.8 for the contraceptive class.

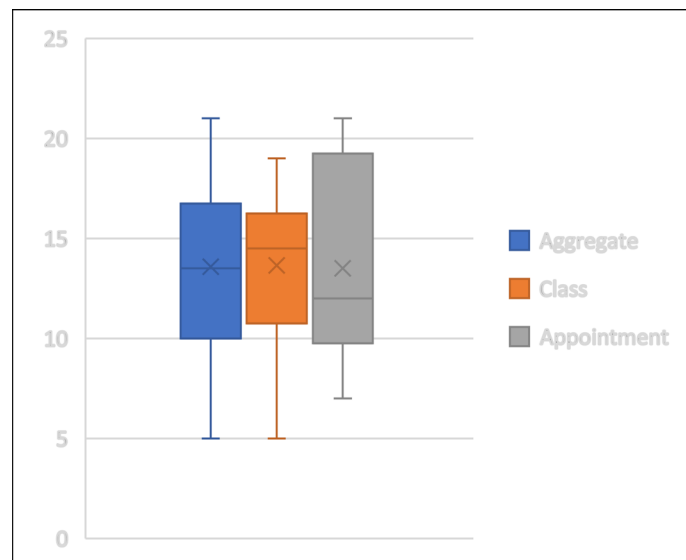


Figure 4.2. Contraceptive Knowledge Score  
X represents Mean

Table 4.3. Cumulative Contraceptive Knowledge Score

Study Arm	Mean	Standard Deviation	Median	1st Quartile	3rd Quartile
<b>Aggregate</b>	13.58	4.19	13.50	10.00	16.25
<b>Contraceptive Class</b>	13.64	3.71	14.5	11.5	15.75
<b>Routine Appointment</b>	13.5	4.99	12.0	10.0	18.0

### 4.4.2 *Individual contraceptive knowledge questions*

Knowledge deficits and strengths by topic area were identified. In addition, differences in correctly answered questions were observed between study arms. (Table 4.4)

Table 4.4. Individual Contraceptive Questions

Question	N (%) Correct Aggregate	N (%) Correct Class	N (%) Correct Appointment
<i>Reproductive physiology</i>			
1: When during a woman's cycle is she most likely to become pregnant?	11(45.83)	4(28.57)	7(70)
2: How long can sperm stay alive in a woman's body?	8(33.33)	4(28.57)	4(40)
3: Which of the following choices is true about pregnancy?	23(95.83)	14(100)	9(90)
15: How long after a woman stops using birth control can she become pregnant?	14(58.33)	9(64.29)	5(50)
<i>Contraceptive method efficacy</i>			
4: Which of the following choices is TRUE about withdrawal, or the "pull-out" method?	22(91.67)	12(85.71)	10(100)
5: Which birth control method guarantees you will not become pregnant?	17(70.83)	12(85.71)	5(50)
21: Which method of birth control is best at preventing pregnancy?	15(62.50)	9(64.29)	6(60)
<i>Non-contraceptive benefits</i>			
6: Which is the only birth control method that helps prevent infections?	19(79.17)	11(78.57)	8(80)
9: Which is NOT a benefit of hormonal birth control?	8(33.33)	3(21.43)	5(50)
<i>Proper use of contraceptive method</i>			
7: All of the following are true about using male condoms EXCEPT	15(62.50)	11(78.57)	4(40)
10: How long should the vaginal ring (NuvaRing) stay in place before changing it?	6(25.00)	3(21.43)	3(30)
11: Which of the following can make hormonal birth control less effective?	12(50.00)	7(50.00)	5(50)
16: If you forget to take one birth control pill and remember the next day, what should you do?	9(37.50)	6(42.86)	3(30)
18: Which of the following birth control methods may be reversed if you decide you want to become pregnant?	16(66.67)	11(78.57)	5(50)
20: A doctor places an IUD (Intrauterine device) in what part of the body?	14(58.33)	9(64.29)	5(50)
23: A doctor places the birth control implant (Nexplanon) in what part of the body?	21(87.5)	13(92.86)	8(80)
24: How soon after sex must the "morning after pill" (or Plan B) be used to be effective?	1(4.17)	0(0)	1(10)
25: How can you get the emergency contraceptive pill called Plan B (or "the morning-after pill")	18(75.00)	10(71.43)	8(80)
<i>Method composition and mechanism of action</i>			
8: Hormonal birth control comes in which of the following forms?	21(87.50)	12(85.71)	9(90)
12: What is the main way that birth control pills work?	14(58.33)	8(57.14)	6(60)
13: Birth control pills have which of the following ingredients?	14(58.33)	8(57.14)	6(60)
<i>Medical contraindications</i>			
14: You should NOT use the birth control pill if you have any of the following:	6(25.00)	4(28.57)	2(20)
22: Which choice is FALSE about IUDs (Intrauterine Devices)	5(20.83)	3(21.43)	2(20)
<i>Method side effects</i>			
17: Which of the following is FALSE about Depo-Provera (the "shot")?	5(20.83)	3(21.43)	2(20)
19: Which birth control method is not easily noticed by a partner?	12(50.00)	5(35.71)	7(70)

#### 4.4.3 High knowledge levels

High levels of knowledge were observed in the domains of method efficacy (91.7, 70.8, and 62.5 % correct), and method composition and mechanism of action (87.5, 58.3, and 58.3%).

Additionally, an individual question demonstrated high levels of knowledge in the domain of reproductive physiology (96%). Mixed knowledge levels were observed for proper method use with correct responses ranging from 25-87.5% correct. Knowledge domains were similar between arms with variation for individual questions.

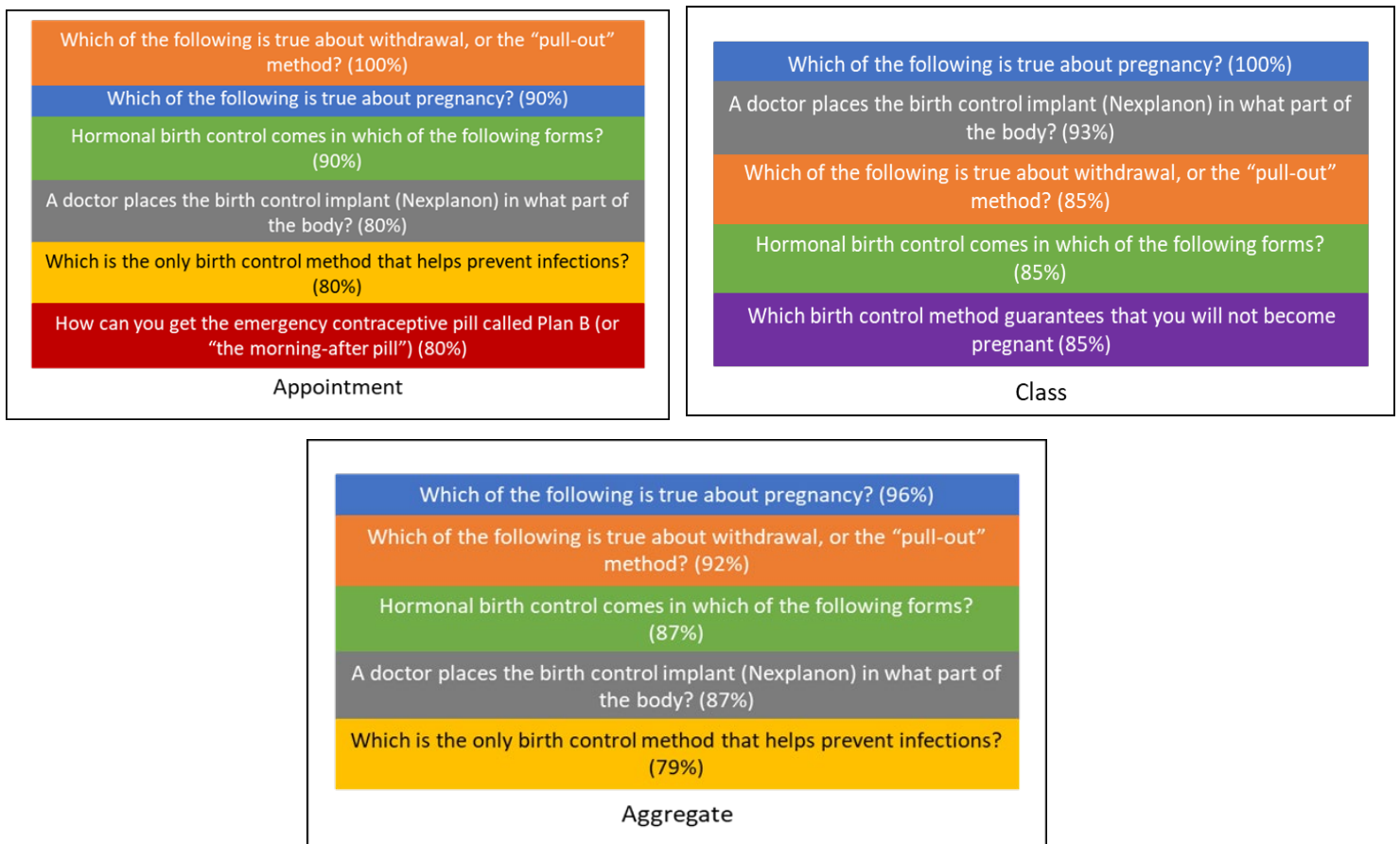


Figure 4.3. Most Commonly Correct Questions

#### 4.4.4 Low knowledge levels

Low levels of knowledge were observed for the domains of medical contraindications (25 and 20.8%) and method side effects (20.8 and 50.0%). Additionally, an individual question demonstrated low levels of knowledge in the domain of non-contraceptive benefits (21%).

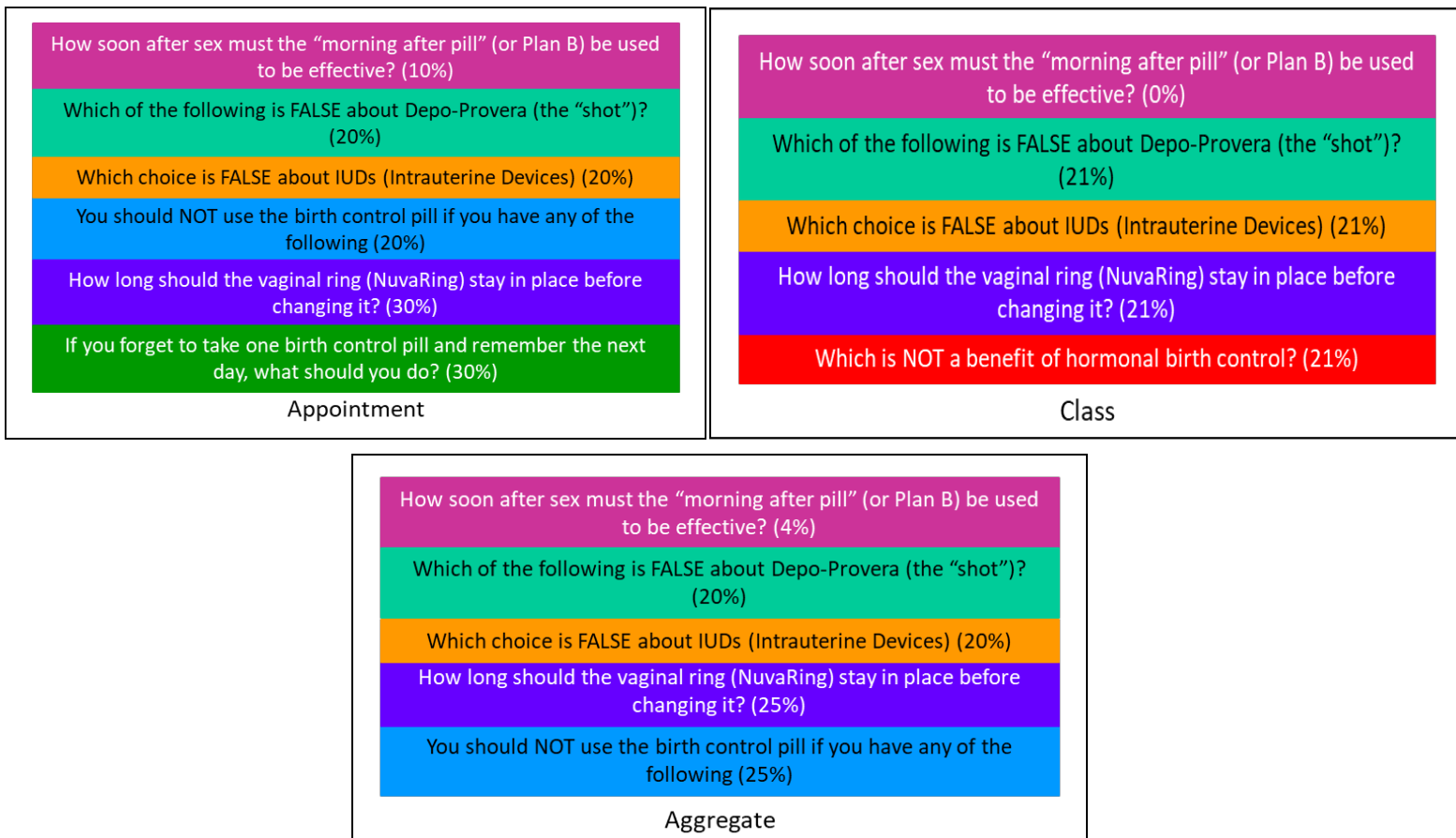


Figure 4.4. Most Missed Questions

#### 4.4.5 Question variation

Significant variation was noted between class and routine appointment arms for correct responses to four questions: When a woman is most likely to become pregnant, which birth control guarantees that you won't become pregnant, correct male condom use, and which method of birth control is not noticed by a male partner.

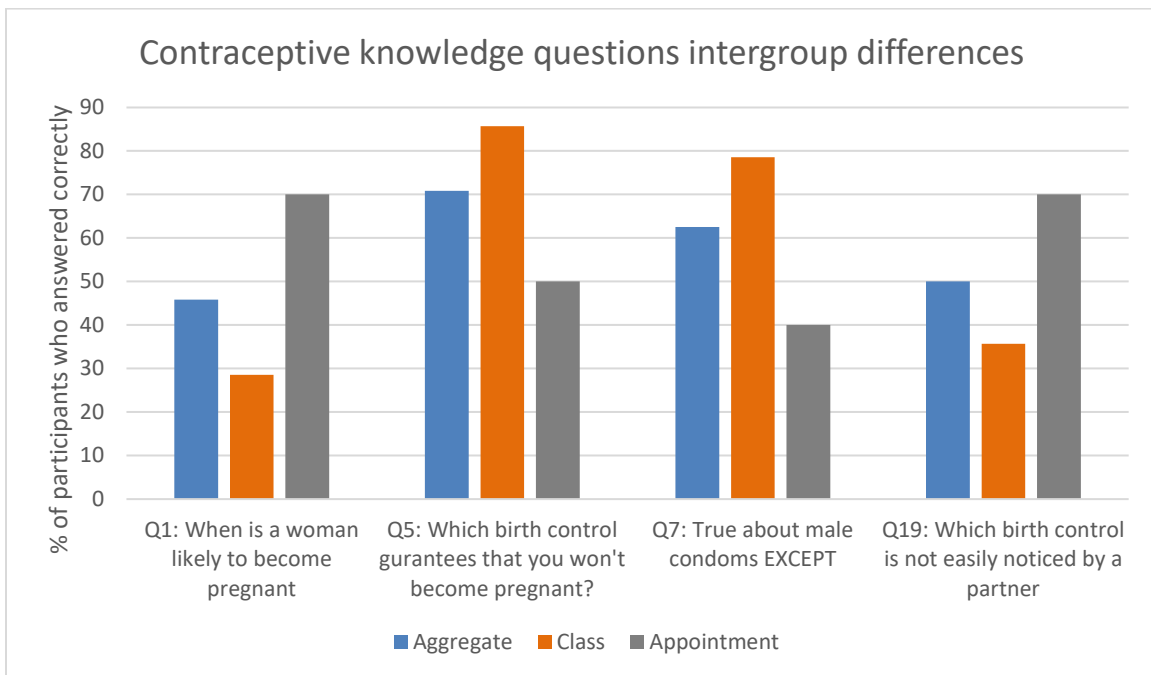


Figure 4.5. Intergroup Differences in Contraceptive Question Answers

#### 4.5 PREFERRED CONTRACEPTIVE METHOD

Participants expressed interest in a large variety of contraceptive methods. No participants reported interest in female condoms, contraceptive spermicide, or female sterilization. Of individual methods, the greatest interest was in the contraceptive implant (25%), copper IUD (21%), and the combined hormonal contraceptive pill (17%). For contraceptive categories, most participants reported interest in hormonal methods (54%) as well as LARC methods (50%). A greater portion of class participants expressed interest in the individual methods of contraceptive

implant, progesterone IUD, depo provera, and categories of LARC methods, and hormonal contraception. Figures 4.6 and 4.7 show contraceptive preference difference between groups.

Table 4.5. Preferred Contraceptive Method

<b>Individual Method</b>	<b>N (%) interested Aggregate</b>	<b>N (%) interested Class</b>	<b>N (%) interested appointment</b>
Condoms (Male)	1(4.17)	1(7.14)	0
Condoms (Female)	0	0	0
Contraceptive Spermicide	0	0	0
Other Barrier (Cervical cap, diaphragm)	0	0	0
Combined hormonal contraceptive Pill	4(16.7)	2(14.29)	2(20)
Progesterone only contraceptive pill	3(12.5)	1(7.14)	2(20)
Contraceptive Patch	2(8.33)	1(7.14)	1(10)
Contraceptive ring (monthly)	2(8.33)	1(7.14)	1(10)
Contraceptive ring (annual)	2(8.33)	0	2(20)
Contraceptive shot/depo Provera	2(8.33)	2(14.29)	0
Copper Intrauterine Device (IUD)	5(20.83)	2(14.29)	3(30)
Progesterone Intrauterine Device (IUD)	3(12.5)	3(21.43)	0
Contraceptive Implant (Nexplanon)	6(25)	5(35.71)	1(10)
Female sterilization (tied tubes)	0	0	0
Male sterilization (Vasectomy)	1(4.17)	0	1(10)
Other	0	0	0
None	7(29.17)	4(28.57)	3(30)
<b>Contraceptive Category</b>			
Short-Acting Reversible Contraceptives	7(29.17)	4(28.57)	3(30)
Long-Acting Reversible Contraceptives	12(50)	8(57.14)	4(40)
Permanent sterilization	1(4.17)	0	1(10)
Hormonal	13(54)	9(64.29)	4(40)
Non-Hormonal	7(29.17)	3(21.43)	4(40)

#### 4.5.1 Contraceptive method interest by study arm

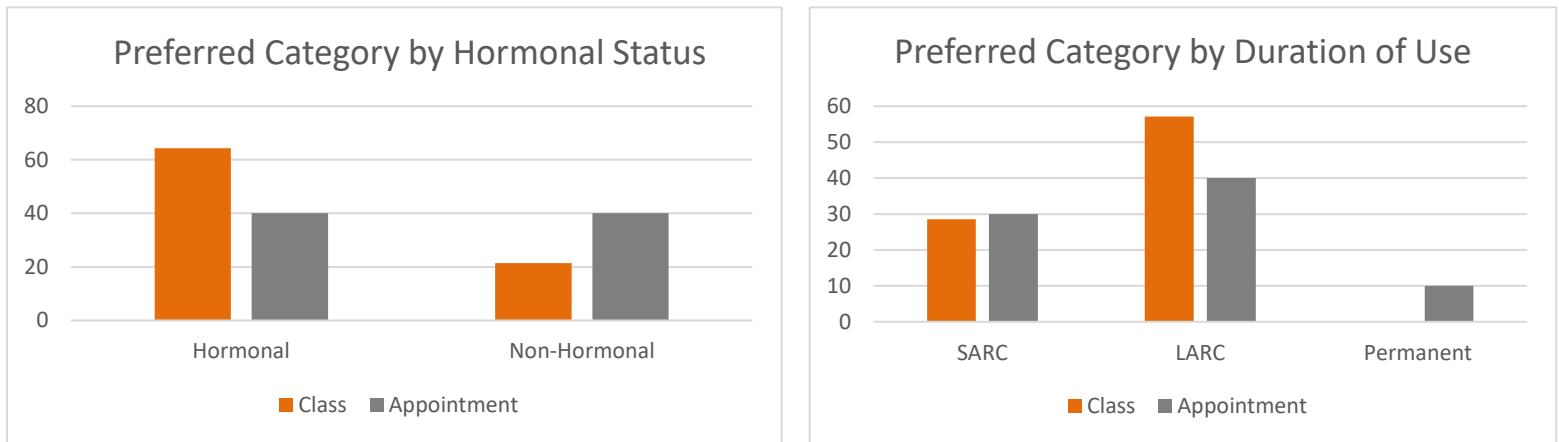


Figure 4.6. Percent of Participants Expressing Interest in Method by Contraceptive Category

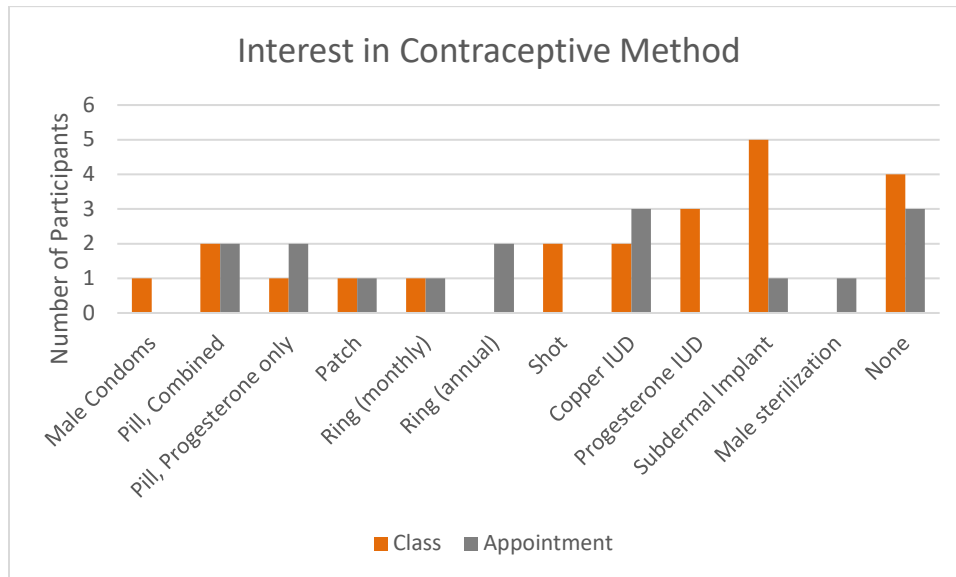


Figure 4.7. Number of Participants Expressing Interest in Individual Contraceptive Methods

## 4.6 OUTCOMES NOT ASSESSED

Due to the low rate of post-course survey return, several intended outcomes were unable to be assessed. One out of twenty-four (4%) study participants returned post-course surveys.

Outcomes unable to be assessed were change in mean contraceptive knowledge, change in preferred contraceptive method, or contraceptive decision conflict.

## 4.7 RE-AIM PROGRAM IMPLEMENTATION ASSESSMENT

### 4.7.1 *Reach*

During the study period which included seven half-day clinics, 42 patients participated in the contraceptive clinic, representing 0.6% of the estimated 6,400 reproductive aged active-duty female soldiers assigned to JBLM (DMDC, 2022). As only a small minority of the overall population of reproductive-aged female soldiers seeks care at the contraceptive clinic and would thus have been able to access our intervention, the overall reach of the intervention was limited. However, reach within the target population of soldiers scheduled in the contraceptive clinic was encouraging, with approximately one third of eligible patients opting to take the contraceptive education class.

Except for rank, demographic characteristics of study participants differed from that of the Army reproductive aged female soldier population. Study participants were younger than the general military population. The vast majority (95%) of study participants were 30 years or younger. In the Army, 66% of active-duty service members are 30 years or younger. (Military OneSource, 2020)

Study participants were more likely to be Black/African American (33%) Asian (29%) or Hispanic (25%) than the general Army population (17%, 5%, and 16%, respectively) (Military

OneSource, 2020). The majority (83%) of study participants were enlisted. In the Army, 82% of service members are enlisted (DMDC, 2022)

#### 4.7.2 *Effectiveness*

The intended measures of effectiveness were change in contraceptive knowledge, change in contraceptive method preference, and self-reported contraceptive prescription rates. These measures were intended to be obtained on post-course questionnaires. However, the low post-course questionnaire return rate prevented assessment of intervention effectiveness.

#### 4.7.3 *Adoption*

Adoption and implementation measures were assessed through informal feedback and conversations with clinic leadership throughout study planning and program implementation. The contraceptive education class and contraceptive clinic have been adopted by one out of four similarly structured SCMHS on JBLM. Factors considered in adoption include provider knowledge, provider productivity, lab capability for point of care pregnancy testing (POC hCG), patient population served and patient demand.

4.7.3.1 Provider knowledge: The contraceptive education class requires a provider who can provide education and counseling on all available contraceptive methods. In contrast, a same-day contraceptive clinic requires a provider who can provide all methods of contraception, including procedures for LARC methods. At the time of this study design, a clinical pharmacist provided the contraceptive education class who could not offer concurrent provision of LARC methods. During the study period

the clinical pharmacist was on leave and an OB/GYN provided contraceptive class and prescription of all available contraceptive methods. A worksite assessment failed to identify alternate providers organic to the SCMh who were privileged in providing all forms of contraception. This provider limitation is also cited as a reason that this program cannot be expanded to additional SCMhS on JBLM.

4.7.3.2 Provider productivity: Education classes must be tied to patient appointments for clinics to receive reimbursement for the provider time required to conduct the class. Provider and clinic productivity levels are monitored throughout the military health system and are tied to clinic resourcing and management decisions. Health system leaders are more likely to adopt a clinical care model that allows providers to care for more patients in each timeframe compared to the conventional individual appointment model. The contraceptive clinic provided appointments for approximately six patients per clinic, including 3-5 LARC procedures per clinic.

4.7.3.3 Lab capability for POC hCG: For patients to receive same-day contraceptive services, and particularly LARC methods, the patient must meet CDC criteria for reasonable certainty that they are not pregnant. This frequently includes a pregnancy test. Patients must be notified they should report to the lab for a pregnancy test prior to their appointment or the facility needs the

capability for POC hCG. Currently, no clinic has the capability to perform POC hCG. One clinic has in house lab testing with rapid turn-around times. However, this service is intermittently available. This is a significant limitation to the contraceptive clinic model and thus an education class embedded in the contraceptive clinic, and a barrier to program adoption at additional outlying clinics.

4.7.3.4 Patient population served: The percentage of females in the Army are disproportionately distributed based on unit type. Patient enrollment to clinics is aligned with soldiers' assigned units. As a result, one of the four clinics sees a small number of female service members. The benefit of providing a similar service at this clinic is perceived to be lower due to insufficient patient population to support this program.

4.7.3.5 Patient demand: Demand for services is correlated with clinic productivity levels. Higher levels of service demand will result in more patients participating in each individual contraceptive clinic and more efficient use of provider and clinic time. As described above, demonstrated provider productivity is critical for leadership support and program adoption. Prior to the study, 3-6 patients per week enrolled in the contraceptive class. With study initiation we saw a steady increase in contraceptive clinic enrollment. Over the first month patient enrollment in the contraceptive clinic rose to a

steady enrollment of nine participants per session, at which point appointment slots were capped. With this enrollment rate, a typical no-show or late cancellation rate was 2-3 patients per clinic.

#### 4.7.4 *Implementation*

Several factors resulted in unplanned changes to implementation of the contraceptive class and clinic from the time of study design to study implementation.

4.7.4.1 Provider type change. Due to a leave of absence, the provider conducting the contraceptive education class changed from a clinical pharmacist to an OB/GYN physician. This change increased the complexity of implementation because it required a partnership between two different departments to conduct the contraceptive education class.

4.7.4.2 The contraceptive clinic expanded the methods of contraception offered for same day prescription to include LARC methods. This change increased the difficulty of program implementation. Addition of LARC method prescription required additional facility space including a procedure room for LARC method placement, additional nursing staff support for placement procedures and supplies and equipment required for LARC method placement.

4.7.4.3 Clinic MSAs were an integral part of program implementation as they scheduled patients for the contraceptive clinic and class. Patients contacting the clinic for any contraceptive method were

informed by the MSAs scheduling appointments that the class was required prior to receipt of their preferred method. When nursing staff conducted screening for the class, they discovered that the patients did not want to attend the class, and patients were advised that the class was not required. Education of all clinic support staff on the purpose of the contraceptive clinic and class is critical to successful implementation. Clinic support staff may present inadvertent barriers to implementation if they are unclear about the purpose and process for accessing this service.

4.7.4.4 Due to availability of a new resource, patients were rescheduled into the contraceptive clinic from previously scheduled routine clinic appointments. This resulted in clinics being booked three weeks in advance. This precluded the ability to accommodate walk-in patients. The original intent of the class was to expand access to contraceptive methods. This shift in workload resulted in a failure to facilitate increased access following program implementation.

#### 4.7.5 *Maintenance*

Maintenance of the contraceptive clinic and education program is planned for one additional year. This program maintenance is the result of a partnership with the SCM and Department of OB/GYN. Two identified threats to program maintenance are lab capability for POC hCG and provider skills. Factors which facilitate program maintenance include the fact that program

materials and processes are currently in place as well as the fact that the program requires minimal additional resources beyond the traditional appointment care model.

4.7.5.1 Lab capability for POC hCG: The SCMH currently providing this program will lose ability to perform same day pregnancy tests. As a result, patients who do not perform a pregnancy test the day prior may be unable to receive their contraceptive method. This limits the ability to provide walk-in services. This may present an additional barrier to some patients who are unable to take the time for two separate clinic trips.

4.7.5.2 Provider skills: Currently, no providers assigned to the SCMH are capable of providing full scope contraceptive services. This poses a threat to maintenance if the department of OB/GYN is no longer able to support this initiative.

4.7.5.3 Program materials currently used for the contraceptive education class have already been developed. Additional program materials do not require creation, which facilitates program maintenance. Additionally, program materials that are given to patients during the contraceptive class and clinic are the same as those used for routine clinic appointments. The limited need for additional program development facilitates maintenance of the contraceptive clinic and class

4.7.5.4 Clinic resources for the contraceptive class and clinic are similar to those required for the traditional patient care model. Additional space requirements are for the use of a conference room located

within the facility for one hour of time. The contraceptive clinic uses a similar number of nursing support personnel as does a traditional clinic model. The limited need for resources beyond the traditional clinic model facilitates program maintenance.

## Chapter 5. DISCUSSION

### 5.1 CONTRACEPTIVE KNOWLEDGE

Overall, baseline knowledge in the study population was low and similar to results from a civilian population using the same scale. Data from the knowledge assessment provides key insights about content that should be included in future education initiatives. Contraceptive knowledge domains that should be emphasized in future education and counseling include medical contraindications and risks for various contraceptive methods as well as information about method side effects and emergency contraception. Clarifying and providing correct information for these domains supports patients' ability to make informed decisions about the contraceptive method best suited to their needs and priorities. Unfortunately, this study was unable to determine the impact of an education initiative to address knowledge deficits and knowledge retention.

### 5.2 RE-AIM PROGRAM EVALUATION

#### 5.2.1 *Program reach*

The contraceptive education class has limited reach, with only 0.6% of the target population participating during a three-month period. Some factors which may be contributing to the low reach include limited awareness of the contraceptive education class with additional need for advertising. Linking the contraceptive education course to the contraceptive clinic limits the number of soldiers who can participate in the contraceptive class due to provider capacity limitations. Increased advertising of the contraceptive education class through unit leadership and in common areas on the military base may increase interest and participation in the

contraceptive class. Decoupling the contraceptive education class from contraceptive clinics may increase the capacity of the contraceptive class. It is possible that this contraceptive class can be delivered by trained personnel other than licensed independent practitioners such as nursing staff or medics. This will allow healthcare providers to focus on the role of prescribing contraceptives. Alternative forms of contraceptive education are available to military servicewomen including a mobile application for self-paced contraceptive education. Provision of an independent contraceptive class may be effective at increasing contraceptive knowledge. However, if this contraceptive education causes an increased demand for contraceptive services health care facilities must be prepared to meet that increased demand. If the healthcare system fails to meet the increased levels of demand it is unlikely that increased contraceptive knowledge will translate to a change in rates of UIP.

### 5.2.2 *Program adoption*

Medical provider knowledge and lab capabilities for point of care pregnancy testing (POC hCG) present the biggest threat to program adoption. Primary care providers typically staff soldier-centered medical homes including General Medical Officers, Internal Medicine or Family Medicine physicians, Physician Assistants, and/or Nurse Practitioners. Women's health care specialists rarely staff these facilities.

This is consistent with prior studies which have demonstrated capability gaps in contraceptive care for military healthcare providers. In a survey comparing military women's health providers (OB/GYN, Midwifery, ow Women's Health Primary Care) with primary care providers (Internal Medicine, Family Medicine, Pediatrics), women's health providers were significantly more likely to have been trained in LARC methods. More than 90% of women's health providers were trained in all LARC methods. In contrast, of primary care providers only 50% were trained in

subdermal contraceptive implant insertion, 41% in progesterone IUD insertion, and 33% in copper IUD insertion (Deans, et al., 2019).

### 5.3 STRENGTHS AND WEAKNESSES

#### 5.3.1 *Strengths:*

This study has several strengths. This study used a validated questionnaire for assessment of contraceptive knowledge. Additionally, the education intervention is short (1 hour). The education intervention can be taught by an OB/GYN provider, primary healthcare provider, or pharmacist. Both the duration of the education intervention and flexibility in provider type to deliver increase the feasibility of broader implementation if this intervention is determined to be effective.

#### 5.3.2 *Weaknesses and limitations:*

The primary weakness of this study is the low recruitment rate for study participants and failure to assess intended primary outcome due to low post-course survey return rates. The small number of study participants increases the risk of sampling bias as the sample may not be sufficiently large to be representative of the target population. The control group and study group were significantly different, including differences in age, parity, and baseline contraceptive use. This study failed to assess the primary outcome of change in contraceptive knowledge due to low return rate of post-course surveys. Secondary outcomes of change in contraceptive method preference or contraceptive method received were also unable to be assessed due to low post-course questionnaire return rates. Due to the protocol under which this study was approved the medical record could not be reviewed to determine contraceptive use rates

## 5.4 FUTURE RESEARCH

Future studies are needed to understand contraceptive knowledge, and the impact of contraceptive education interventions on knowledge, method selection, and UIP, among women serving in the military. Additional contraceptive knowledge studies are needed to place our findings in the context of a larger military population. Additionally, understanding which populations have lower levels of contraceptive knowledge will be useful to determine when and where contraceptive education should be delivered. Studies with increased return rates of post-course surveys as well as longer intervals of follow-up will be useful to determine retention of knowledge, impact of contraceptive knowledge on contraceptive behaviors, as well as maintenance of contraceptive behaviors. Additionally, future studies will need to recruit more similar study and control populations, ideally using a randomized study to minimize bias. It is imperative that contraceptive education supports the individuals' preferences for building their desired family. Education programs should not be coercive and should provide service members with the information that they need and want. Including a contraceptive decision conflict scale in future studies can be a useful tool to monitor whether programs may be perceived as coercive or pushing service members towards contraceptive methods they do not desire.

Alternative forms of contraceptive education should be compared to in-person didactic style education. Specifically, the impact of mobile based education applications should be compared to in-person education to evaluate for potential differences in change in contraceptive knowledge, method preference, method use, and rates of UIP.

Additional information about contraceptive behavior maintenance and UIP will be useful to determine the value of contraceptive clinics and education programs. This information can be used for decision-making by clinics and healthcare administrators.

## 5.5 CONCLUSION

Despite the limitations noted above, this study provides valuable information about baseline contraceptive knowledge of female Army soldiers, a content area which is not well known. Content areas with knowledge deficits are identified. Further studies are needed to determine applicability to a larger population. Additional studies are needed to assess the impact of this contraceptive education program on contraceptive knowledge, contraceptive behaviors, and pregnancy. Obtaining this information is key to determining the value of program implementation, and whether similar programs should be implemented at additional sites.

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# APPENDIX A: CONTRACEPTIVE KNOWLEDGE

## ASSESSMENT

Select only ONE answer for each question.

1. When during a woman's cycle is she most likely to become pregnant?

- a. During her period (start of cycle)
- b. 3 days after her period ends
- c. Two weeks before her next period starts**
- d. 3 days before she gets her period (end of cycle)
- e. I don't know

2. How long can sperm stay alive in a woman's body?

- a. 1–3 h
- b. 24 h
- c. 3–5 days**
- d. 7–10 days
- e. I don't know

3. Which of the following choices is TRUE about pregnancy?

- a. You cannot become pregnant the first time you have sex
- b. You cannot become pregnant if you have sex standing up
- c. You cannot become pregnant if you do not have an orgasm
- d. None of the above are true**
- e. I don't know

4. Which of the following choices is TRUE about withdrawal, or the “pull-out” method?

- a. Semen may be released before ejaculation**
- b. Withdrawal works as well as condoms at preventing pregnancy
- c. Withdrawal can protect against some sexually transmitted diseases (STDs)
- d. Withdrawal works as well as the birth control pill at preventing pregnancy
- e. I don't know

5. Which birth control method guarantees you will not become pregnant?

- a. None**
- b. Using a condom every time you have sex
- c. Douching, showering, or bathing immediately after sex
- d. “Pulling out” before ejaculation
- e. I don't know

6. Which is the only birth control method that helps prevent infections?

- a. The birth control pill
- b. Male and female condoms**
- c. Depo-Provera (“the shot”)
- d. The IUD (intrauterine device, the “T”)
- e. I don't know

7. All of the following are TRUE about using male condoms EXCEPT:

- a. You should use water-based lubricants with spermicide
- b. Wear two condoms to be extra safe**
- c. Prevent air bubbles by holding the condom tip when putting it on
- d. Check the expiration date and keep them in a cool and dry environment (i.e., not in a wallet or in a car)
- e. I don't know

8. Hormonal birth control comes in which of the following forms?

- a. Pills taken by mouth
- b. Patch worn on the skin
- c. Ring placed in the vagina
- d. All of the above**
- e. I don't know

9. Which one is NOT a benefit of hormonal birth control?

- a. **Improvement of diabetes**
- b. Improvement of acne
- c. Reduction in menstrual cramps and bleeding problems like anemia
- d. Decreased risk of ovarian and uterine cancer
- e. I don't know

10. How long should the vaginal ring (NuvaRing) stay in place before changing it?

- a. 1 day
- b. 1 week
- c. **3 weeks**
- d. 1 month
- e. I don't know

11. Which of the following can make hormonal birth control less effective?

- a. Seizure (epilepsy) medicine
- b. HIV medicine
- c. Herbal supplements
- d. **All of the above**
- e. I don't know

12. What is the main way that birth control pills work?

- a. **It prevents the ovary from releasing the egg (ovulation)**
- b. It prevents sperm from entering the uterus
- c. It prevents the fertilized egg from implanting in the uterus
- d. It prevents the embryo from growing past a certain size
- e. I don't know

13. Birth control pills can have which of the following ingredients?

- a. Testosterone
- b. **Estrogen**
- c. Magnesium
- d. Calcium
- e. I don't know

14. You should NOT use the birth control pill if you have any of the following:

- a. Fibroids
- b. Drink alcohol
- c. Currently taking antibiotics
- d. **None: it is safe to use the birth control pill in all of these situations**
- e. I don't know

15. How long after a woman stops using birth control can she become pregnant?

- a. **Immediately**
- b. 1 month
- c. 3 months
- d. 6 months
- e. I don't know

16. If you forget to take one birth control pill and remember the next day, what should you do?

- a. Throw the missed pill away and then continue the following day from where you left off
- b. Take the rest of the week's pills at once and then start the placebo ("reminder") week
- c. **Take two pills then continue**
- d. Throw the missed pill away and wait 1 month to start a new pack
- e. I don't know

17. Which of the following is FALSE about Depo-Provera (the "shot")?

- a. It is administered every 3 months
- b. Gradual weight gain is possible
- c. It might take a few months after stopping to become pregnant
- d. **It cannot be used while breastfeeding**
- e. I don't know

18. Which of the following birth control methods may be reversed if you decide you want to become pregnant?

- a. Tubal ligation (“tying your tubes” or “cutting your tubes”)
- b. Essure coils
- c. Vasectomy
- d. IUD (intrauterine device)**
- e. I don't know

19. Which birth control method is not easily noticed by a partner?

- a. The IUD (intrauterine device)**
- b. The vaginal ring
- c. Male condom
- d. Female condom
- e. I don't know

20. A doctor places an IUD (intrauterine device) in what part of the body?

- a. Fallopian tube
- b. Uterus**
- c. Cervix
- d. Vagina
- e. I don't know

21. Which method of birth control is the best at preventing pregnancy?

- a. The IUD (intrauterine device)**
- b. Depo-Provera (“the shot”)
- c. Male Condom
- d. Withdrawal (“pull-out method”)
- e. They are all equally effective
- f. I don't know

22. Which choice is FALSE about IUDs (intrauterine devices)?

- a. Women of all ages may get an IUD
- b. Women who have never had a baby may get an IUD
- c. Women can have an IUD put in right after having a baby or having an abortion
- d. Women cannot get an IUD if they have ever had a sexually transmitted disease (STD)**
- e. I don't know

23. A doctor places the birth control implant (Nexplanon) in what part of the body?

- a. Thigh
- b. Vagina
- c. Arm**
- d. Buttock
- e. I don't know

24. How soon after sex must the “morning after pill” (or Plan B) be used to be effective?

- a. 1 h
- b. 24 h
- c. 5 days**
- d. 20 days
- e. I don't know

25. How can you get the emergency contraceptive pill called Plan B (or “the morning-after pill”)?

- a. If under age 18, you cannot get it, even with a prescription
- b. If under age 21, you must have your parent go with you to the doctor for a prescription
- c. All women must have a prescription, no matter her age
- d. You can buy it at the pharmacy, without a prescription, no matter what age**
- e. I don't know