THE ROLE OF RELATIONSHIP STATUS IN SEXUAL AND REPRODUCTIVE

HEALTH SERVICES UTILIZED BY FEMALES AGED 21 TO 50: A SECONDARY

ANALYSIS OF THE NATIONAL SURVEY OF FAMILY GROWTH

A Thesis

by

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ABSTRACT

Background: Sexual and reproductive health (SRH) – an individual's physical, mental, and social well-being in all matters of human sexuality and the reproductive system - is a vital part of females' overall health. However, influential factors that contribute to SRH, such as relationship status, are often overlooked when evaluating the utilization of SRH services. To provide foundational data on SRH service utilization based on relationship status, this thesis analyzed responses of female participants aged 21 to 50 years categorized as single or married and/or cohabiting of the 2017 to 2019 wave of the Centers for Disease Control's (CDC) department of National Center for Health Statistics' (NCHS) National Survey of Family Growth (NSFG).

Results: Responses of 4,832 NSFG female participants were included for analysis. Of the included female participants, 2,218 (45.9%) were single and 2,614 (54.1%) were married and/or cohabiting. A total of 24 questions regarding SRH service utilization were analyzed. Single participants reported higher odds of utilization in nine questions with an average odds ratio of 2.04. Questions with higher odds of SRH service utilization amongst single participants included services related to sexually transmitted diseases or infections (STD/STI), birth control, and abortion. Married and/or cohabiting female participants reported higher odds of utilizing the remaining 13 questions. SRH service topics included in the remaining questions were female sterilization, pregnancy, STD/STI, and breast cancer prevention reported an average odds ratio of 0.5636.

Conclusion: Relationship status is a statistically significant factor in determining the odds a participant of the NSFG utilized specified SRH service. Further studies should be conducted to understand the full impact relationship status has on female SRH service utilization to inform providers on providing the best care to patients.

CONTRIBUTORS AND FUNDING SOURCES

Contributors

This work was supervised by a thesis committee consisting of Dr. Kelly Wilson and Dr. Jennifer L. Evans of Texas A&M University's Health Department and Dr. Wen Luo of Texas A&M University's Educational Psychology department.

The analyzed data was conducted by the Centers for Disease Control (CDC) as part of their longitudinal study: National Survey of Family Growth (NSFG). The results obtained for use of this thesis were published in October 2020.

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NOMENCLATURE

SRH   Sexual and Reproductive Health

CDC   Centers for Disease Control

NCHS   National Center for Health Statistics

NSFG   National Survey of Family Growth

WHO   World Health Organization

STD/STI   Sexually Transmitted Disease/Sexually Transmitted Infection

HPV   Human Papillomavirus

HIV   Human Immunodeficiency Virus

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CHAPTER I: INTRODUCTION

Sexual and reproductive health (SRH) - a state of physical, mental, and social well-being in all matters relating to the functions, systems, and processes of the reproductive system and human sexuality (World Health Organization, 2021) - accounts for nearly 20% of the global burden of ill-health for females (World Health Organization, 2004). SRH services, like those of preventative care, often influence females' overall health by encouraging treatment and diagnosis of diseases not relating to SRH (Cohen, 2004). Preventative care, such as sexually transmitted disease (STD) and sexually transmitted infection (STI) testing, pap smears, pelvic exams, reproduction planning, disease screening, immunizations, and counseling of patients about maintaining a healthy lifestyle, bring females into the healthcare setting due to their routine nature (The American College of Obstetricians and Gynecologists, 2020). A study conducted on patient perspectives found "a substantial proportion of females consider their ob-gyns their primary care provider and do not visit another provider regularly" (Mazzoni et al., 2017). Despite this finding, the number of females receiving SRH services has decreased an average of 3.76 million females from the years 2015 to 2019, contradicting the steadily increasing females' population in the United States reported by the United States Census Bureau since 2010. (National Center for Health Services, 2021a; Data Commons, 2020).

One example of decreased SRH service utilized by females in the United States is the decrease in utilization of one of the most vital tools of preventative SRH, the pelvic exam. The pelvic exam, "long considered a fundamental component of the well-woman visit" (Committee on Gynecological Practice et al., 2020/2018 October), can be utilized to diagnose ovarian cysts, STI, uterine fibroids, early-stage cancer, explain gynecological symptoms a patient is experiencing, and provide an opportunity for patients and providers to discuss SRH issues

(Committee on Gynecological Practice et al., 2020/2018 October). This preventative measure has seen an average decrease of 16.4% amongst females who reported getting a pelvic exam within the last 12 months (Martinez, Qin, Saraiya, Sawaya, 2019). The largest decrease in pelvic exams, from 42.3% in 1988 to 14.9% in 2017, was seen in ages 15-20 years (Martinez, Qin, Saraiya, Sawaya, 2019). Although the recent change in recommended age patients are to receive pelvic exams increased to 21 years and older by the American College of Obstetricians and Gynecologists (ACOG) can account for the decrease seen within the ages 15-20 years over the last 30 years, it does not explain the overall decrease in the number of females who received a pelvic exam (The American College of Obstetricians and Gynecologists, 2020). While limited research has been published discussing reasons for the decreasing trend of females receiving pelvic exams, understanding influential factors contributing to the decrease in SRH services utilization is imperative to decrease the burden of ill-health and increase the overall health of females.

Role of Interpersonal Relationships on SRH

Since 1970, the average age of marriage for females in the United States has increased. As a result, the average number of females who report their marital status as "single" each year in the United States has also increased (Data Commons, 2020). Comparing the trends of relationship status to the decreasing trends of SRH service utilization brings up a question of correlation. That is; is there a correlation between SRH service utilization and relationship status of females?

In recent years, studies have suggested important affects interpersonal relationships - social connections or bonds between two or more individuals that vary in closeness, commitment, and duration - have on an individual's overall health (Huelsnitz, Jones, & Simpson,

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2018). Health theories and models such as the Social Cognitive Theory (SCT), Social Network

Analysis (SNA), and Social-Ecological Model (SEM) suggest interpersonal communication is

one of the most influential sources of critical change in health behavior interventions (Glanz, et

al., 2015).

Similarly, developmental psychology concepts discuss the importance of interpersonal

relationships and their effects throughout stages of life and their role in an individual's health.

During adulthood (ages 20-65 years) romantic relationships - mutual, ongoing, and voluntary

interactions between two partners that are characterized by specific expressions of affection and

intimacy (Usera & contributing authors, 2021) - are the primary interpersonal relationship

influencing one's well-being and decision making. Individuals in early adulthood (20-40 years)

are often observed changing romantic partners to forge a long-term romantic partnership. As a

result, females in early adulthood are likely to seek SRH services that correlate to risky sexual

health behaviors - having multiple partners in a short time, inconsistent condom use, and having

sexual intercourse under the influence - and family planning. Services such as STD/STI testing,

birth control, preventative gynecologic service, and fertility services are often sought by

individuals in this life stage (Healthwise Staff, 2020 & Glanz, et al., 2015). Individuals in early

adulthood ranging from ages 21 to 24, experienced a higher probability to engage in risky sexual

behaviors than their counterparts in the same stage of life aged 30 to 33. The only exception was

risky sexual behaviors that included drinking or using drugs. Females who are below the age of

27 years, the national average age of marriage, are more likely to engage in risky sexual

behaviors as they change partners to find a long-term relationship (Epstein, et al., 2014; United

States Census Bureau, n.d.). Meanwhile, individuals in early adulthood above age 27 years are

more likely to be in a long-term relationship and thus seek less SRH services focused on risky sexual behavior and utilize more SRH services focused on family planning.

While early adulthood focuses on individuals finding long-term partners to start a family, majority of females in late adulthood (41-65 years) have found their long-term partners and started a family (Huelsnitz, et al., 2018). Individuals in this stage of life value the quality of their relationships and need fewer relationships to satisfy their emotional needs. The higher importance placed on an individual in late adulthood's interpersonal relationships causes these relationships to take a more influential role on an individual in late adulthood's overall health (Huelsnitz, et al., 2018). As females in late adulthood shift from focusing on finding a partner to deepening the connection between their interpersonal relationships, the SRH services they seek evolve as well (Huelsnitz, et al., 2018). Risky sexual health behaviors and family planning are no longer driving factors for seeking SRH services. Rather, cancer screening, such as mammograms, self-breast exams, pap smears, or gynecological problems, such as vaginal dryness and menopause, as well as low sex drive become the focus in an individual in late adulthood's SRH (Mayo Clinic Staff, 2021). As the romantic relationship dynamics change in a woman's life so does her SRH service's needs.

Purpose and Research Questions

The purpose of this quantitative secondary analysis is to identify and compare SRH service utilization of married and/or cohabiting females to SRH service utilization of single females who participated in the Centers for Disease Control's (CDC) department of National Center for Health Statistic's (NCHS) publicly accessible longitudinal survey and data; National Survey of Family Growth (NSFG) (National Center for Health Statistics, 2021b). Through a binomial logistic regression this thesis aims to answer the following questions:

1) What SRH services have married and/or cohabiting females ages 21 to 50 years utilized?

2) What SRH services have single females ages 21 to 50 years utilized?

3) Are there any differences between SRH services utilized by married cohabiting and single ages 21 to 50 years females?

4) If differences are found between SRH services utilized by married and/or cohabiting and single females ages 21 to 50 years, what are they?

Limiting analysis of interpersonal relationships to those categorized as "romantic relationships" provides a fundamental understanding of the role interpersonal relationships have on females' SRH service utilization to be expanded through further studies and discussions. Identifying differences in types of SRH services females utilize based on relationship status will provide healthcare providers and health interventionists with the information necessary to promote SRH services efficiently and effectively to females depending on their relationship status.

CHAPTER II: LITERATURE REVIEW

While developmental psychology and shifts towards interpersonal relationships in health belief theories suggest the importance of interpersonal relationships on an individual's overall health, limited research is published discussing the role of interpersonal relationships, specifically that of a romantic relationship, on females SRH service utilization. This chapter details a scoping literature review that was conducted to determine the extent of research published on females' SRH service utilization as well as the role relationship status plays on females' SRH service utilization as well as published literature utilizing the National Survey for Family Growth. Details of how the scoping literature review was conducted and findings can be found in this chapter and Appendix A.

Scoping Literature Review

A scoping literature review - a type of research synthesis aimed to "map the literature on a particular topic or research area and provide an opportunity to identify key concepts; gaps in the research; and types and sources of evidence to inform practice, policymaking, and research" (Pham, et al., 2014) - was conducted using Texas A&M University Libraries database, Ovid MEDLINE, and PubMed. Keywords "interpersonal relationship", "single", "married", "cohabiting", "relationship status", "sexual health", "reproductive health", "sexual health services", "reproductive health services", "sexual/reproductive health", and "National Survey for Family Growth" were used when searching databases.

A study conducted in the Netherlands on health care utilization and marital status conducted by Joung, Van Der Meer, and Mackenbach (1995), discussed differences in utilization of health care services amongst different marital statuses. The purpose of this study was to determine if differences amongst marital status' health care utilization were due to demographics

other than sex and age. Participants who reported never being married were consistently less likely to utilize health care services than their married, divorced, or widowed counterparts (Joung, Van der Meer, and Mackenbach, 1995). This study provided evidence SRH service utilization differs between relationship statuses, however, it lacks relevance to this thesis due to the time (1995) and location (the Netherlands) of conduction.

Common SRH Research Topics

Although health and developmental psychology theories suggest interpersonal relationships have an influential role in one's SRH, literature results about SRH often focus on demographics such as age, socioeconomic status, education level, culture, ethnicity, and geographic location. Search results that discuss interpersonal relationships and SRH often evaluate interpersonal relationships between healthcare professionals and patients, interpersonal violence, and relationships' effect on sexual health. Results from the scoping literature review included only one publication that discussed relationship status and SRH services. A study conducted by Mutua et al., discussed wealth-inequalities in demand for family planning among married and unmarried adolescent girls and young females in sub-Saharan Africa. Mutua et al. (2021) aimed to understand changes in modern contraception, a SRH service, among sexually active adolescents and young females across the wealth spectrum in sub-Saharan Africa (Mutua et al., 2021). Mutua et al. (2021) adds to the body of literature about relationship status and SRH services but differs from the scope of this thesis due to constrictions of the priority population and purpose. Mutua et al.'s (2021) study observed differences amongst married and unmarried females, their overarching goal differed from this thesis' (understand the impact relationship status has on SRH services received by females).

National Survey of Family Growth Findings

Published articles using the National Survey of Family Growth (NSFG) discuss SRH topics of contraceptive use, infertility services, cohabiting experiences, menarche patterns, sexual activity, pelvic exam history, Human Immunodeficiency Virus (HIV) and Human Papillomavirus (HPV) testing and awareness, in comparison to the commonly used demographics listed previously as an independent variable. While these articles are vital in understanding factors that influence a priority population's SRH behaviors, many are broad statistics, or "quick stats", that do not expand on why SRH trends are occurring but rather just state the results from the NSFG. A finding provided by the Centers for Disease Control (CDC) described the statistics on percentage of females aged 22-44 years who have ever cohabited with an opposite-sex partner based on education level (Daniels & Nugent, 2021). While relationship status was analyzed, SRH outcomes of included participants were not mentioned, thus only adding to body of literature pertaining to relationship status and neglecting to add to the body of literature pertaining to SRH. Numerous research has been published utilizing the NSFG results of the 2017 to 2019 wave (see Appendix A), majority of which primarily focus on general statistics with little discussion of SRH services or the individuals using them.

CHAPTER III: METHODS

To better understand SRH service utilization of married and/or cohabiting females compared to SRH service utilization of single females, this chapter introduces the statistical analysis used to answer the research questions and explains why and how a binomial logistic regression was used. Additionally, a detailed description of the study methods is provided to enrich the understanding of how the results were met.

National Survey of Family Growth

A secondary analysis of female participants of the National Survey of Family Growth (NSFG) was conducted utilizing the publicly accessible 2017 to 2018 NFSG data set. The Center for Disease Control and Prevention's (CDC) department of National Center for Health Statistics (NCHS) gathered information on family life, marriage and divorce, pregnancy, infertility, use of contraception, and men's and women's health by conducting a nationwide longitudinal study utilizing a survey/interview guide as a data collection tool. The data collection tool, that is has been computer assisted since 1995, interviewed females beginning in 1973 and has conducted in-person interviews as well as self-administered interviews for more sensitive questions. While interviews have been conducted periodically since 1973, this thesis focuses on the female respondents who report their relationship status within the most recent wave of the study, 2017-2019 age 21 to 50 years through utilization of the publicly accessible NSFG data set (National Center for Health Statistics, 2021b).

Priority Population

The NSFG included responses from participants ranging in ages 15 years to 50 years. Due to the average age for marriage in the United States being 27 years old, the recommended age for a pelvic exam is 21 years, and developmental psychology's theorization of interpersonal

relationships being the most influential in adulthood (ages 20 to 65 years), only responses of participants ages 21years to 50 years were included in the analysis. Individuals who identified as single (not married), cohabiting (to live together or as if a married couple), or married (the relationship that exists between two people who are united as spouses) (Merriam-Webster, n.d.a-c) and provided responses to questions regarding SRH service utilization were included for analysis.

Research Questions

This thesis aims to answer the following questions:

1) What SRH services have single females utilized?

2) What SRH services have married/cohabiting females utilized?

3) Are there any differences between SRH service utilization between single and married/cohabiting females?

4) If there are differences between SRH services received by single and married/cohabiting females, what are they?

NSFG Sections and Questions Inclusion Criteria

The NSFG consists of nine sections. Each section and questions within the NSFG was analyzed for relevance to the research questions of this thesis. A total of nine sections and 24 questions were included for final analysis. Table 1 provides the title of each section of the NSFG that was excluded, while Table 2 provides the title of each section of the NSFG that was included. NSFG provided a code book with corresponding codes to each question, variable names were then assigned to questions by student, see Appendix B for questions and corresponding NSFG codes and variable names.

Table 1

Excluded Sections of NSFG

Section Letter	Section Title
SECTION B	Pregnancy & Birth History; Adoption & Nonbiological Children
SECTION C	Marital and Relationship History
SECTION G	Desires and Intentions for Future Births
SECTION I	Insurance; Residence and place of birth; Religion; Past and current work (R and current H/P); Attitudes

Note. National Center for Health Statistics (2021b). *National survey for family growth, 2017-2019.* Centers for Disease Control. https://www.cdc.gov/nchs/nsfg/index.htm

Table 2

Included Sections of NSFG

Section Letter	Section Title
SECTION A	Calendar Instructions; Demographic Characteristics; Household Roster; Childhood Background
SECTION D	Sterilizing Operations and Impaired Fecundity
SECTION E	Contraceptive History and Pregnancy Wantedness
SECTION F	Family Planning and Medical Services
SECTION H	Infertility Services and Reproductive Health

Note. National Center for Health Statistics (2021b). *National survey for family growth, 2017-2019.* Centers for Disease Control. https://www.cdc.gov/nchs/nsfg/index.htm

The focus of this thesis was on participants relationships status at the time the survey was conducted, only sections of the NSFG survey pertaining to current relationship status were utilized. Additionally, sections not accessing SRH service utilization were excluded from analysis. Based on this criterion, a total of five section remained for consideration; *SECTION A: Calendar Instructions;Demographics; Household Roster; Childhood Background, SECTION D: Sterilizing Operations and Impaired Fecundity, SECTION E: Contraceptive History and*

Pregnancy Wantedness, SECTION F: Family Planning and Medical Services, and *SECTION H: Infertility Services and Reproductive Health.*

Questions within included sections of the NSFG were examined for their relevance to the thesis, that is; did it relate to current relationship status of the participant and/or SRH service utilization? If an NSFG question related to the thesis' goal, it was included for analysis. A binomial logistic regression was used to determine if a statistically significant relationship among participants relationship status and SRH service utilization was observed. Binomial logistic regressions only evaluate questions with dichotomous response choices such as, "yes" or "no". Questions that did not provide dichotomous response choices of "yes" or "no" were excluded from analysis. However, the question "Now I'd like to ask about marital status and living together. Please look at Card 1. What is your current marital or cohabiting status?" in Section A was included to categorize participants into respective relationship statuses of "single" and "married and/or cohabiting" defined by the student, based on participants' answer. A total of 36 questions were left for analysis.

Participants

For this thesis, romantic relationships referred to the relationship status of an individual. Participants were categorized into three groups; single (not married), cohabiting (to live together or as a married couple), or married (the relationship that exists between two people who are united as spouses - Merriam-Webster, n.d.a-c). Participants were placed into one of the three relationship statuses based on their response to the question; "Now I'd like to ask about marital status and living together. Please look at Card 1. What is your current marital or cohabiting status?" in Section A of the NSFG. Participants were provided with the following answer choices:

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- "Married to a person of the opposite sex"

- "Not married but living together with a partner of the opposite sex"

- "Widowed"

- "Divorced or annulled"

- "Separated, because you and your spouse are not getting along"

- "Never been married"

- "Refused"

- "I don't know"

Participants who answered "Married to a person of the opposite sex" were coded as married (n=1,913) and participants who answered "Not married but living together with a partner of the opposite sex" were classified as cohabiting (n=754). Due to similar definitions and influencing factors (listed in the previous chapter, Chapter I: Introduction) participants categorized as married and cohabiting were condensed into one group and labeled with "1" (n=2,614; 54.1%) in an excel spreadsheet. Participants who answered, "Widowed", "Divorced or annulled", or "Never been married" were classified as single and labeled with "2" (n=2,218; 45.9%) in the same excel spreadsheet of married and cohabitated individuals. Finally, participants who answered "Refused", "I don't know", or "Separated, because you and your spouse are not getting along" (n=211) were excluded from the analysis due to lack of significance. Individuals who did not report their age as 21 to 50 years were excluded from the analysis. After all individuals who did not fit the criteria (n=1,045) were excluded, a total of 4,832 participants were included for analysis.

Statistical Analysis

Analyses were performed using Stata.SE version 17 (StataCorp LLC., 2017) with the assistance of sample codebooks and sample datasets provided by the NSFG website. Publicly accessible data, dictionary, and .do files of NSFG female respondents were downloaded from the NSFG website. Once files were downloaded, participants' username, questions related to demographics, and those previously decided for inclusion of analysis were copied to an excel spreadsheet. In the excel spreadsheet participants and their responses were limited to include female participants ages 21 years to 50 years who could be categorized into relationship status "single" or "married and/or cohabiting" as previously defined by the student. The nominal independent variable, relationship status, was coded a 1 for married and/or cohabitating, and 2 for single. The categorical dependent variable, SRH services utilization, was coded as 1 for "yes" (utilized SRH services) or 0 for "no" (did not utilize SRH service). Those who did not fit the criteria of analysis were deleted from the spreadsheet along with their answers. This excluded a total of 1,256 or 20.45% of participants. The cleaned data was then imported into Stata for analysis. In Stata, descriptive statistics of each relationship status (marstat) were gathered using the syntax in Table 3.

Table 3

Stata Syntax for Descriptive Statistics

Demographic	NSFG Code	Syntax
Marital Status	marstat	tab marstat
Age	AGE_A	table (AGE_A) (marstat)
Race	rscrrace	table (rscrrace) (marstat)
Highest Grade Level	higrade	table (higrade) (marstat)

After data was imported to Stata the assumptions of chi-square test were checked. When using statistical analysis, assumptions must be passed to ensure validity and accuracy of results. Assumptions of binomial logistic regression must be checked, and passed, to certify possible errors associated with one variable are not correlated to any other variables. According to Lund Research Ltd. (2018), there are five assumptions associated with binomial logistic regression, all of which are listed below

- Assumption 1: The dependent variable should consist of two categorical, independent groups.

- Assumption 2: There are two or more independent variables, which are measured at the continuous or nominal level.

- Assumption 3: There should be no relationship between observations, also called independence of observations

- Assumption 4: Data must not show multicollinearity, which occurs when two or more independent variables are highly correlated.

- Assumption 5: No significant outliers should be seen.

The dependent variable (SRH service utilization) was measured by categorizing participants based on their "yes" or "no" answer of a specific NSFG question related to SRH service utilization. Due to the participants being placed in two (yes or no), independent (unrelated) groups assumption one was passed. Participants were labeled and compared based on their relationship status (single, married or cohabiting). Assumption two was passed by the nominal nature of the independent variable (relationship status).

The NSFG was conducted "based on a stratified multi-stage area probability sample, using probability proportionate to size (PPS) selection within each of four key domains"

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(National Center for Health Statistics, 2021c). Due to the complex nature of the NSFG, assumption three was violated. A weighted variable was provided by the National Center for Health Statistics (NCHS) to correct this violation and provide the most accurate representation of the national population it aimed to provide data on. This weighted variable was applied to data before any analysis was conducted to ensure the most accurate results. The linearized standard error is provided with the final results of analysis to indicate how precise the odds ratio represents the national population.

Assumption four was passed because one predictor was used in the binomial logistic regression. Relationship status was the predictor, or independent variable, of this analysis and included two categories - single and married and/or cohabiting. The syntax used in Stata for questions that passed assumptions of tests can be found in table 4.

Table 4

Stata Syntax for Binomial Logistic Regression

Variable Names	Syntax
Essure	logistic essure ib(first).marstat
Ever Hysterectomy	logistic everhyst ib(first).marstat
Both Ovaries Removed	logistic everovrs ib(first).marstat
Other Sterilization	logistic everothr ib(first).marstat
Tubal Sterilization	logistic anytubal ib(first).marstat
Any Sterilization	logistic anyfster ib(first).marstat
Prescription Emergency Contraceptive	logistic ecrx ib(first).marstat
Depo-Provera 12	logistic DEPO_12 ib(first).marstat
Patch 12	logistic PATCH_12 ib(first).marstat
Contraceptive Ring Last 12 Months	logistic RING_12 ib(first).marstat
Prescription Birth Control 12	logistic BTHCON12 ib(first).marstat
Medical Check-up/Test 12	logistic MEDTST12 ib(first).marstat
Birth Control Counseling 12	logistic BCCNS12 ib(first).marstat

Table 4 Continued

Variable Names	Syntax
Sterilization Operation 12	logistic STEROP12 ib(first).marstat
Sterilization Counseling 12	logistic STCNS12 ib(first).marstat
Abortion 12	logistic ABORT12 ib(first).marstat
Pap smear 12	logistic PAP12 ib(first).marstat
Pelvic Exam 12	logistic PELVIC12 ib(first).marstat
Prenatal 12	logistic PRENAT12 ib(first).marstat
Post-pregnancy 12	logistic PARTUM12 ib(first).marstat
STD Testing 12	logistic STDSVC12 ib(first).marstat
STD Counseling 12	logistic STDOTHR12 ib(first).marstat
Ever HPV Test	logistic evhpvtst ib(first).marstat
Pregnant Assist Medical Talk	logistic hlpprg ib(first).marstat
Prevent Miscarriage	logistic hlpmc ib(first).marstat
Current Conception Medical Help	logistic hlppg0w ib(first).marstat
Improve Ovulation 12	logistic OVUL12M ib(first).marstat
Pelvic Inflammatory Disease	logistic pid ib(first).marstat
Uterine Fibroids Confirmed by Ultrasound	logistic ufso0 ib(first).marstat
Mammogram	logistic mammog ib(first).marstat
Clinical Breast Exam 12	logistic clinexam ib(first).marstat
Medical Check-up/Test 12	logistic talkdoct ib(first).marstat
Ever HPV Vaccine	logistic evervacc ib(first).marstat
Pelvic Inflammatory Disease Treatment	logistic pidtreat ib(first).marstat

Note. Variable names ending with "12" refer to participant service utilization in previous 12 months at the time the survey was conducted.

A binomial logistic regression was conducted to determine the odds of SRH service utilization based on relationship status. According to Lund Research Ltd. (2018), a binomial logistic regression "predicts the probability that an observation falls into one of two categories of a dichotomous dependent variable based on one or more independent variables that can be either continuous or categorical" (Lund Research Ltd., 2018). Results of a binomial logistic regression include odds ratio, z-score, p-value and 95% confidence interval.

The odds ratio describes an association between an outcome and a predictor. As the purpose of this thesis was to determine if relationship status was associated with SRH service utilization, the outcome would be utilization of a SRH service. Specifically, the outcome was a participant responding "yes" to a question.

CHAPTER IV: RESULTS

This chapter provides National Survey of Family Growth (NSFG) participants'

descriptive statistics before and after participants were excluded based on analysis criteria and

results from tests of assumptions and binomial logistic regression. All sections of this chapter

aim to provide data to answer the following questions: 1) What SRH services have married

and/or cohabiting females utilized? 2) What SRH services have single females utilized?

3) Are there any differences between SRH services utilized by married cohabiting and single

females? 4) If differences are seen between SRH services utilized by married and/or cohabiting

and single females, what are they?

Descriptive Statistics

Once collected data from the NSFG was cleaned and imported into Stata, the total

number of participants based on relationship status was gathered. Table 5 provides percentage

and frequency of single and married and/or cohabiting females related to the overall total of

participants included for analyses. A difference of 8.2% (n= 396.2) was observed between single

(n=2,218, 45.9%) and married and/or cohabiting participants (n=2614, 54.1%), indicating an

even distribution. This even distribution infers the relationship status of a participant would not

have to be taken into consideration for results of analysis as it was not a defining characteristic of

the priority population.

Table 5

Percentage and Frequency of Participants by Relationship Status

	Married and/or Cohabiting		
	Married	Cohabiting	Single
Frequency	1,899	715	2,218
Percent	39.3%	14.8%	45.9%

The frequency of single female participants and married and/or cohabiting female participants answers of "yes" or "no" to evaluated SRH service utilization questions were obtained. Table 6 provides these frequencies.

Table 6

Frequency of Female Participant Answers to SRH Service Utilization

SRH Service	Married and/or Cohabiting		Single		SRH Service	Married and/or Cohabiting		Single	
	Yes	No	Yes	No		Yes	No	Yes	No
Essure	20	2,111	8	1,941	Pregnant Assist Medical Talk	345	2,268	101	2,116
Ever Hysterectomy	163	2,325	102	2,064	Prevent Miscarriage	179	2,434	81	2,136
Other Sterilization	47	2,566	22	2,193	Mammogram	923	1,691	624	1,592
Tubal Sterilization	503	2,111	273	1,941	Clinical Breast Exam	2,365	249	1,845	369
Any Sterilization	598	2,016	344	1,870	Both Ovaries Removed	55	2,433	41	2,121
Depo-Provera 12	58	2,531	111	1,934	Contraceptive Ring 12	33	2,556	32	2,013
Patch 12	8	2,581	17	2,028	Pap Smear 12	1,485	1,125	1,266	947
Prescription Birth Control 12	644	1,970	677	1,540	Post-Pregnancy 12	178	23	62	13
Medical Check-up/Test 12	483	2,130	516	1,699	Current Conception Help	36	290	11	86
Birth Control Counseling 12	399	2,215	409	1,807	Improve Ovulation 12	20	144	2	29
Sterilization Operation 12	56	2,558	17	2,199	Pelvic Inflammatory Disease	103	2,508	97	2,119
Medical Provider Talk About HIV	870	1,742	878	1,334	Uterine Fibroids Ultrasound	237	12	163	14
Sterilization Counseling 12	105	2,509	51	2,165	Ever HPV Vaccine	104	81	280	192
Abortion 12	8	2,605	22	1,973	STD Testing 12	806	1,794	1,089	1,124
Pelvic Exam 12	1,504	1,107	1,216	999	STD Treatment 12	647	1,925	917	1,269
Prenatal Care 12	202	74	77	55	Ever HPV Test	1,463	908	1,171	866

Demographics such as age, race, and highest education level were recorded to provide brief characteristics of each relationship status. Figure 1 provides the distribution of ages amongst participants classified as single and married and/or cohabiting. As seen in the figure, significantly more participants in the age range of 21 years to 25 years are classified as single. The decreasing trend in the number of single participants as the age increases suggests single participants are more likely to be younger than married and/or cohabiting participants.

Figure 1. Distribution of ages amongst single and married and/or cohabiting participants included for final analysis.

Figure 2 provides a visual of race distribution amongst relationship status of participants whose responses were included for analysis. Majority of participants reported their race as white regardless of their relationship status. However, the number of single participants are only seen to be higher in one race when compared to the number of married and/or cohabiting participants. The number of single participants who reported their race as black or African American (n=722) is over double that of married and/or cohabiting participants (n=301).
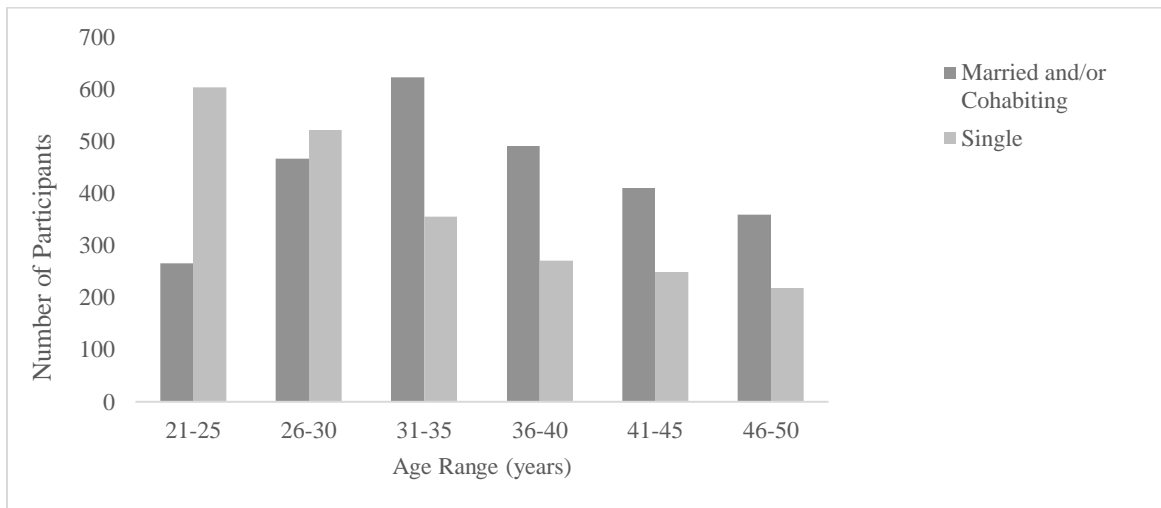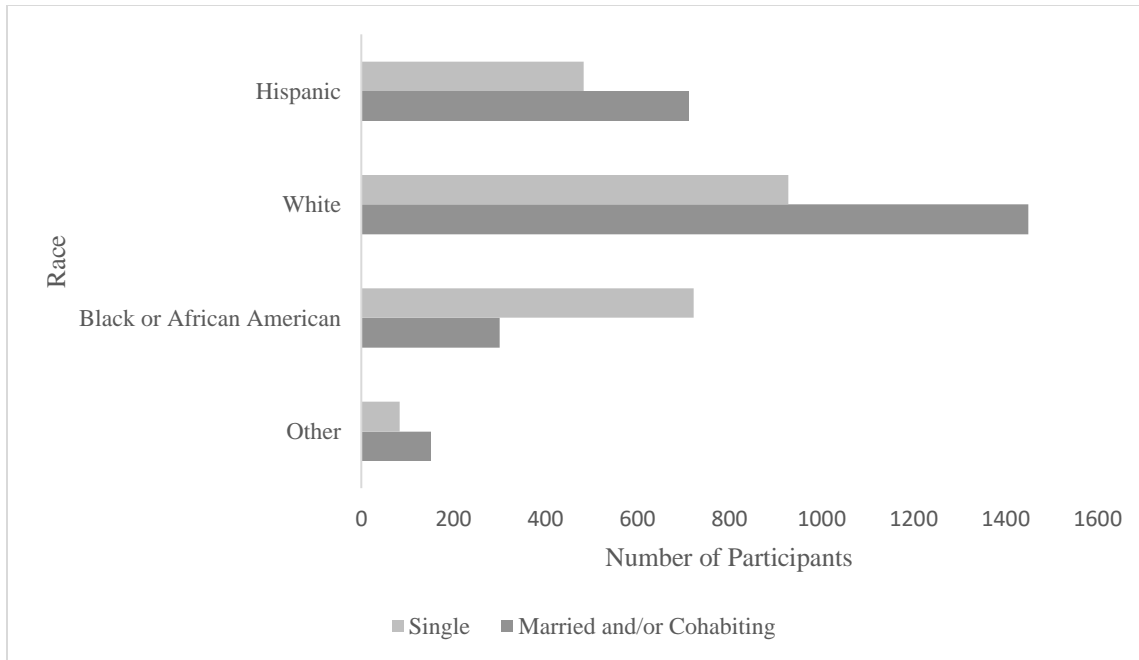
Figure 2. Distribution of race amongst single and married and/or cohabiting participants included for final analysis.

Figure 3 displays the reported highest grade level completed by single and married and/or cohabiting participants. An average difference of 40.2 or 0.8% can be observed between highest grade level reported between each relationship status. Additionally, both single participants and married and/or cohabiting participants demonstrate 12th grade and 4 years of college to be the most common highest grade level category reported.

Figure 3. Single participants and married and/or cohabiting participants highest grade level.

Due to the trends of the priority population observed in Figure 1, Figure 2, and Figure 3, demographics such as race, age, and highest grade level obtained can be described as potential defining characterist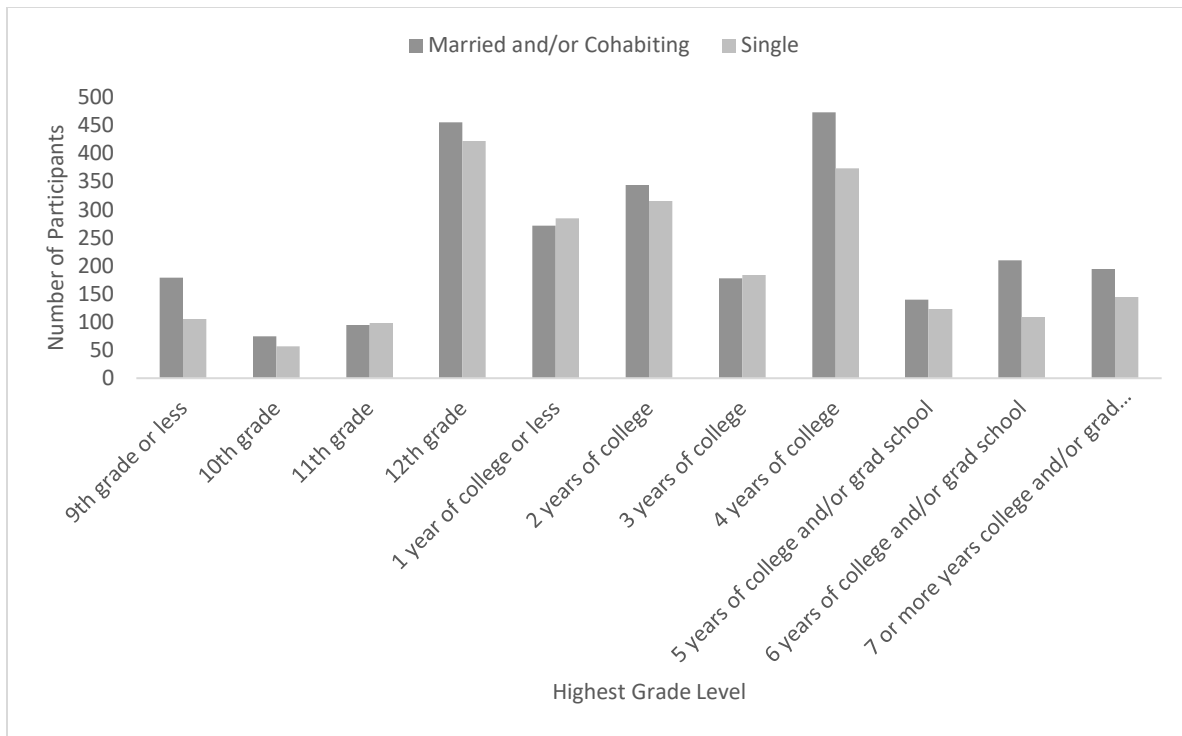ics of the priority population. As these defining characteristics are part of an individual's social determinants of health - economic stability, health care and quality, social and community context, neighborhood and built environment, and education access and quality - they have the potential of influencing behaviors and healthcare access of individuals in the priority population. Future studies should consider these demographics and other social determinants of health in future studies expanding on the foundations of this thesis.

Tests of Assumptions

Assumptions of binomial logistic regression tests had to be passed before binomial logistic regression results could be evaluated for accurate probabilities. When running a binomial

logistic regression in Stata, results of Chi-square goodness of fit test are reported. Table 7

provides results that were found to be significant.

Table 7

Significant Chi -Square Test Results

Variable Name	P>|t|	Variable Name	P>|t|
Tubal Sterilization	0.0000	Abortion 12	0.0215
Any Sterilization	0.0001	Pelvic Exam 12	0.0194
Depo-Provera 12	0.0000	Prenatal Care 12	0.0027
Patch 12	0.0440	STD Testing 12	0.0000
Birth Control Counseling 12	0.0422	STD Treatments 12	0.0000
Sterilization Operation 12	0.0399	Ever HPV Test	0.0005
Medical Provider Talked About HIV	0.0046	Pregnant Assist Medical Talk	0.0000
Mammogram	0.0000	Prevent Miscarriage	0.0004
Clinical Breast Exam	0.0000	--	--

Note: Variable names ending with "12" refer to participant service utilization in previous 12
months at the time the survey was conducted.
*p<0.05

Questions that showed non-significant results can be seen on Table 8. Questions in this

table were excluded from further analysis due to lack of significance.

Table 8

Insignificant Chi-Square Test Results

Variable Name	P>|t|	Variable Name	P>|t|
Both Ovaries Removed	0.8418	Essure	0.2226
Contraceptive Ring 12	0.6814	Ever Hysterectomy	0.0881
Pap Smear 12	0.0764	Other Sterilization	0.0511
Post-pregnancy Care 12	0.4314	Prescription Birth Control 12	0.0944
Current Conception Medical Help	0.4700	Sterilization Counseling 12	0.1546
Improve Ovulation 12	0.0627	Ever HPV Vaccine	0.1301
Pelvic Inflammatory Disease	0.1599	Uterine Fibroids Confirmed by Ultrasound	0.4879
Medical Check-up/Test 12	0.0046	--	--

Note: Variable names ending with "12" refer to participants service utilization in previous 12 months at the time the survey was conducted.
*p<0.05

Binomial Logistic Regression

Once assumptions had been met, a binomial logistic regression was performed to determine the odds single participants answered "yes" when compared to married and/or cohabiting participants. Results of the binomial logistic regression report single participants odds ratio resulting in married and/or cohabiting females as the baseline comparison group. Table 9 provides results with positive z-scores, indicating higher, or increased, odds of single participants utilizing (answering "yes") a SRH service when compared to married and/or cohabiting participants. Questions with variables names (see Appendix B) Abortion 12 (OR=4.68, 368%), Depo-Provera 12 (OR=3.00, 200%), and Patch 12 (OR=2.94, 194%), reported the three highest odds ratio values. The three lowest odds ratios were questions with variables names Birth Control Counseling 12 (OR=1.26, 25.7%), Medical Provider Talked About HIV (OR=1.39, 31.9%), and STD Testing 12 (OR=2.19, 119%).

Table 9

Binomial Logistic Regression Increased Correlation Results

Variable Name	Odds Ratio	Linearized Standard Error	t	P>|t|	95% Confidence Interval		n
Depo-Provera 12	2.998465	.5998404	5.49	0.000	2.007773	4.477993	4,634
Patch12	2.935022	1.531987	2.06	0.044	1.030694	8.357819	4,634
Birth Control Counseling 12	1.254404	.1366201	2.08	0.042	1.008339	1.560517	4,830
Abortion 12	4.683058	3.054246	2.37	0.022	1.266666	17.31399	4,608
STD Testing 12	2.190142	.236364	7.26	0.000	1.764022	2.719197	4,813
STD Treatment 12	2.249097	.2235599	8.15	0.000	1.842722	2.745089	4,758
Medical Provider Talked About HIV	1.39168	.1557286	2.95	0.005	1.112007	1.741692	4,824

Note. Baseline comparison group was married and cohabitating females.
Variable names ending with "12" refer to participant service utilization in previous 12 months at the time the survey was conducted.
*p<0.05

Similar to Table 9, Table 10 reports the calculated odds single participants answered

"yes" to a question about SRH utilization when compared to married and/or cohabiting

participants. The negative z-scores seen in Table 10 indicate single participants were less likely

to answer "yes" to a SRH service when compared to married and/or cohabiting females. A total

of ten questions reported negative z-scores. Questions with variable names Pregnant Assist

Medical Talk, Prenatal Care 12, and Clinical Breast Exam with values of 0.33, 0.36, and 0.42

respectively address the three lowest values of Table 10. Questions with variables names Ever

Pelvic Exam 12 (OR=0.79, 21%), Ever HPV Test (OR=0.67, 33%), and Mammogram

(OR=0.62, 38%) reported the highest values of Table 10.

Table 10

Binomial Logistic Regression Decreased Correlation Results

Variable Name	Odds Ratio	Linearized Standard Error	t	P>|t|	95% Confidence Interval		n
Tubal Sterilization	.5651243	.0705126	-4.57	0.000	.4400505	.7257473	4,828
Any Sterilization	.5910386	.072593	-4.28	0.000	.462033	.7560642	4,828
Sterilization Operation 12	.4854749	.1665658	-2.11	0.040	.2440214	.9658408	4,830
Prenatal Care 12	.359857	.1166496	-3.15	0.003	.1878292	.6894405	408
Ever HPV Test	.6652945	.073534	-3.69	0.001	.5330597	.8303324	4,408
Pregnant Assist Medical Talk	.3319391	.0489911	-7.47	0.000	.2469166	.4462381	4,830
Prevent Miscarriage	.4351873	.0948963	-3.82	0.000	.2810677	.6738164	4,830
Mammogram	.6219329	.0622453	-4.75	0.000	.5088618	.7601287	4,830
Clinical Breast Exam	.4215056	.0534097	-6.82	0.000	.3269449	.5434158	4.828
Pelvic Exam 12	.7929643	.0763201	-2.41	0.019	.6538092	.9617369	4,826

Note. Baseline comparison group was married and cohabitating females.
Variable names ending with "12" refer to participant service utilization in previous 12 months at the time the survey was conducted.
*p<0.05

CHAPTER V: SUMMARY AND CONCLUSION

This chapter discusses critical components that ensured the purpose of this thesis; to identify and compare SRH service utilization of married and/or cohabiting females to SRH service utilization of single females, was met. Through discussion and interpretation of results and findings from Chapter IV, implication and impacts of said findings on future research, health promotion, and sexual and reproductive (SRH) service utilization, limitations of the thesis and a summarization of the overall experience and thoughts of the student throughout the conduction of this thesis.

Discussion

The binomial logistic regression ran was based on one nominal independent variable with two categories, single and married and/or cohabiting. Due to this, married and/or cohabiting was the baseline comparison group, or reference group. The results shown describe the odds of a single participant saying "yes" to utilization of a SRH service questions over a married and/or cohabiting participant saying "yes" to utilization of the same SRH service question. An odds ratio that is greater than one indicates an increased correlation - more likely - and an odds ratio that is less than one indicates a decreased correlation - less likely.

An increased correlation was found in seven out of the seventeen questions demonstrating statistically significant differences, with an average odds ratio of 2.53. Meaning, on average single participants were 2.53 times more likely to respond "yes" to the seven questions in Table 9 than married and/or cohabitating participants. Alternatively, single females were 153% more likely to utilize SRH services related to the seven questions provided in Table 9 than married and/or cohabiting participants. The question "Have you received an abortion in the past 12 months", reported the highest odds ratio of 4.68. Single participants were 4.68 times, or

368%, more likely to respond "yes" to this question than married and/or cohabiting participants.

three out of the seven SRH services with a positive correlation surrounded birth control. In fact,

the second and third highest odds ratio, 3.00 and 2.94 respectively, discussed the topics of birth

control methods specifically that of the and Depo-Provera shot and the patch. Other than

abortion the only other SRH services single participants were more likely to use were those

relating to sexually transmitted diseases and infections (STD/STI).

A decreased odds associated with SRH service utilization amongst single female

participants was found in ten questions discussing SRH services related to sterilization,

pregnancy, breast cancer prevention and STD/STI's. On average, it was found that single

participants were 0.53 (47%) less likely to respond "yes" to one of the ten questions in Table 10.

The least likely question single participants would respond "yes" to was "A decreased

correlation was found in ten questions discussing SRH services related to sterilization,

pregnancy, breast cancer prevention and STD/STI's. On average, it was found that single

participants were 0.53 (47%) less likely to respond "yes" to one of the ten questions in Table 10.

The least likely question single participants would respond "yes" to was "(During any of your

relationships,) (have/did) you (or your husband/or your husband or partner at the time) ever been

to a doctor or other medical care provider to talk about ways to help you become pregnant?" with

an odds ratio of 0.33. Single participants were 0.33 times, or 66%, less likely to respond "yes" to

this question than married and/or cohabiting participants.

When comparing increased and decreased correlation results of the binomial logistic

regression, 59% of results were decreasingly correlated. Meaning, single participants responded

"yes" to fewer amounts of SRH service utilization questions than married and/or cohabiting

participants. However, the odds for single participants to be more likely to respond "yes" to the

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utilization of a specific SRH service compared to married and/or cohabiting were substantially higher than if married and/or cohabiting participants were more likely to report utilization of SRH services. This is evident in the difference of average odd ratios (2.0) and percentages (106%) between increased and decreased correlated binomial logistic regression results.

A large percentage of NSFG female participants reported utilization of pelvic exams, pap smear tests, and STD tests (50.4%, 49.0%, and 32.1%, respectively) from 2017 to 2019 (National Center for Health Statistics, 2021d). Of these reported SRH services, both pelvic exams (p=0.059, p>0.05), and pap test (p=0.83, p>0.05) were excluded from final analysis due to statistically insignificant Chi-square goodness of fit test results. In other words, there was not a large enough difference observed between single and married and/or cohabiting participants whom reported pap test and pelvic exam utilization to be considered statistically significant.

Comparatively, some of the lowest overall SRH services utilized by female participants of the 2017 to 2019 wave demonstrated statically significant differences in odds of utilization amongst single and married and/or cohabiting participants. A total of 16.7% of female participants reported utilization of birth control counseling, 4.4% of female participants reported utilization of prenatal care, and 2.5% of female participants reported utilization of sterilization counseling (National Center for Health Statistics, 2021d). Of these SRH services, single participants were 25.7% more likely to utilize birth control counseling, 48.7% less likely to utilize prenatal care, and 64.7% less likely to report utilization of sterilization counseling. Many possible explanations and factors could describe why SRH services with higher percentages of participant utilization demonstrate no statistical significance amongst relationship statuses while lower percentages of SRH service utilization demonstrate statistical significance amongst

relationship statuses. To better understand the relationship between SRH service utilization and relationship status amongst females, studies examining factors of relationship status are needed.

The findings of this thesis, provide the validation and foundation of expanding discussions on potential explanations for differences in SRH service utilization amongst relationship statuses to decrease the nearly 20% SRH global burden of ill-health females face (World Health Organization, 2004). Studies examining factors related to the disproportional averages observed in SRH services single participants were more likely to utilize (odds ratio=2.04) than less likely to utilize (odds ratio=0.5636) are needed to explain why this occurred.

Previous studies have evaluated demographics such as education level, age, sex, and socioeconomic status as explanations for SRH service utilization amongst females. While demographic pertaining to the social determinants of health - economic stability, health care and quality, social and community context, neighborhood and built environment, and education access and quality - play an influential role on individuals, relationship status expands the discussion of SRH demographic correlations due to factors within relationship status potentially influencing females' SRH. According to Huelsnitz et al. (2018), being married (or in a marriage-like relationship) influences an individual's overall health and lowers the risk of mortality due to romantic partners facilitating healthy habits and monitoring each other's health. The influence of partners on desires to seek SRH services should also be considered when expanding on the findings of this thesis.

Additionally, using the findings of this thesis as a guide, factors such as cultural stigma related to relationship status and SRH services should be considered. For example, healthcare professionals may have personal bias about providing specified SRH services to females based

on relationship status or desires of married females to receive birth control. Healthcare

professionals play an important role in decision making regarding SRH services deemed

beneficial to a patient. Therefore, understanding the results from this thesis about females'

relationship status can inform training and continuing education to address professional identity

and bias when determining what SRH services are beneficial to a patient.

Role of Results in Healthcare

The average time an obstetrician and gynecologist (OB/GYN) spends with their patients

is anywhere from 13-24 minutes (Wood, 2017). For an annual well females' exam, the OB/GYN

is tasked with performing a physical exam, a breast exam, a pelvic exam, and a pap smear during

this 13–24-minute window. This does not account for routine SRH services such as obtaining a

medical history, discussing gynecological problems, or fertility services. During this allotted

time, healthcare providers must decide what test would be most beneficial for their patients as

well as what health education the patient might need. Oftentimes, the latter is overlooked to

ensure all necessary tests are performed. As health education is a crucial tool in preventative

health, this can be detrimental to a patient's health. Identifying what SRH services single and

married and/or cohabiting females utilize allows health professionals to accurately priority

populations to increase the overall utilization of SRH services. Through completing medical

record forms and patient information forms, it is common practice for females to identify their

relationship status before ever seeing an SRH professional through. The results of this thesis

provide health professionals with evidence-based data to use as a reference and easily identify

SRH services females of a particular relationship status are most likely to utilize. Thus,

increasing the benefits of information on patient data forms, medical records and ensuring

healthcare professionals optimize time spent with their patients while not compromising the quality of patient care.

Limitations

Limitations to this thesis should be considered. The National Survey of Family Growth does not ask about sexual orientation, gender identity, or provide answer choices for individuals with same-sex partnerships. Thus, marriage and cohabitation only referred to individuals married to or living with the opposite sex. As marriage between same-sex individuals has been legal in the United States since 2015, results might differ if including individuals married to or cohabiting with the same sex (History.com Editors, 2020). Additionally, not considering individuals with same-sex partnerships into consideration decreases representation of the priority population (i.e., women in the United States). Individuals who are in long-term relationships but not married or cohabiting were considered single. Due to the nature of this study, participants in long-term relationships have the potential of experiencing the same factors as participants categorized as married and/or cohabiting thus affecting the results.

Conclusion

Utilization of sexual and reproductive health (SRH) services amongst single and married and/or cohabiting participants of the 2017 to 2019 wave of the National Survey of Family Growth (NSFG) was observed to have a statistically significant difference in the majority of NSFG questions evaluated. This thesis aimed to answer research questions:

1) What SRH services have married and/or cohabiting females ages 21 to 50 years utilized?

2) What SRH services have single females ages 21 to 50 years utilized?

3) Are there any differences between SRH services utilized by married cohabiting and single ages 21 to 50 years females?

4) If differences are seen between SRH services utilized by married and/or cohabiting and single females ages 21 to 50 years, what are they?

Results demonstrated single participants were less likely to utilize more SRH services than married and/or cohabiting participants but reported roughly 3.6 times higher odds of utilization on average than married and/or cohabiting participants. There is substantial evidence of a correlation between SRH service utilization and relationship status. To determine causation and expand on the findings of this thesis further research should be conducted.

Overall Thesis Summary

The purpose of this thesis was to provide foundational data for further research by determining and identifying differences in utilization of sexual and reproductive health (SRH) services amongst single and married and/or cohabiting participants ages 21 to 50 years of the 2017 to 2019 wave of the National Survey of Family Growth (NSFG) through Chi-square goodness of fit tests and binomial logistic regressions.

Chapter I provides background information on SRH and interpersonal relationships. Through developmental psychology theories and interpersonal relationship-based health belief models, an important connection between interpersonal relationships and individuals within adulthood are explained to provide background to the reader on why this thesis is important. Lastly, the purpose of and research questions to be answered by this thesis as well as the priority population were described.

Chapter II outlines and discusses the results of the scoping literature review that was conducted on literature relevant to SRH services and relationship status. The addition of Appendix A was created to provide greater detail of published literature relating to the NSFG.

Chapter III describes the methods of the thesis by outlining the steps the student took throughout the process of completing the thesis. A brief description of how the NSFG was conducted, the inclusion criteria of NSFG sections, questions, and participants, and description of the statistical analysis used can be found in this chapter. Appendix B was added to outline the questions included in final analysis and identify variable names used to describe said questions throughout the thesis.

Chapter IV provides results of the statistical analyses performed. Descriptive statistics such as frequency of marital status, age, race, and highest education level obtained of single and married and/or cohabiting participants are provided to gain a better understanding of the priority population. Tables outlining the results of assumption checking and the binomial logistic regression tests results are provided.

Chapter V interprets and explains the results from the previous chapter. Explanations of what the odd ratios and implications of these results are outlined. A call for future studies to use the results of the thesis as foundation and conduct further analysis into correlations and explanations of the statistically significant findings of this thesis is given. Finally, a brief conclusion of the entire thesis is provided.

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APPENDIX A

Literature Review Findings: National Survey of Family Growth (NSFG)

Research Focus	Brief Description of Research Focus
Cohabitation with the opposite sex	Percentage of females and men 15-49 years of age who are currently cohabiting with an opposite-sex partner.
Ever cohabited	Percentage of females and men 15-49 years of age who have ever cohabited with an opposite-sex partner.
Current marital or cohabiting status	Percent distribution of females and men 15-49 years of age by current marital or cohabiting status with regard to opposite-sex spouses or partners.
Ever use of contraceptive methods	Percentage of females who have ever used the specified contraceptive method (among females 15-49 who have ever had sexual intercourse).
Current use of contraceptive methods	Percentage of females 15-49 years of age using specified contraceptive method in month of interview.
Leading current contraceptive method by marital/cohabiting status	Leading current contraceptive method among females 15-49 years of age by marital/cohabiting status and percentage of contraceptive users using that method.
Family planning and related medical services	Percentage of females 15-49 years of age who received at least one family planning or medical service from a medical care provider in the last 12 months.
Family planning and related medical services	Family planning and related medical services received in the last 12 months among females 15-49 years of age.
HIV testing	Percentage of men and females 15-49 years of age who have ever had an HIV test, not counting blood donation.
STD/HIV risk-related behaviors	Percentage of females and men 15-49 years of age who engaged in the specified STD/HIV risk-related behavior in the last 12 months.
STD treatment	Percentage (SE) of females and men aged 15-49 who were treated for sexually transmitted diseases (STDs) in the past year.
Sterilization (female)	Percentage ever having a female sterilization operation, by type of operation.

Sexual activity between same-sex partners	Percentage of females 18-49 who had any sexual activity with another woman.
Pelvic inflammatory disease (PID)	Percentage of females who have ever been treated for PID.

Note: From National Center for Health Statistics. (2021d). Key statistics from the national survey of family growth. Centers for Disease Control and Prevention. https://www.cdc.gov/nchs/nsfg/keystatistics.htm

CODES FOR NATIONAL SURVEY OF FAMILY GROWTH QUESTIONS

NSFG Question	NSFG Code	Variable Names
Have you ever had…		
a tubal sterilization procedure called "Essure"? This is not generally considered an operation, but it makes it impossible for you to have a baby.	essure	Essure
a hysterectomy, that is, surgery to remove your uterus?	everhyst	Ever Hysterectomy
both of your ovaries removed?	everovrs	Both Ovaries Removed
any other operation that makes it impossible for you to have a(nother) baby?	everothr	Other Sterilization
R Interviewer checkpoint: Record if any of the following mentioned: Whether R has ever had…		
a tubal sterilization, regardless of reversal	anytubal	Tubal Sterilization
any sterilizing operations or procedures, regardless of later reversal	anyfster	Any Sterilization
In the past 12 months, have you received…		
a method of birth control or a prescription for a method?	BTHCON12	Prescription Birth Control 12
Depo-Provera injectables?	DEPO_12	Depo-Provera 12
contraceptive patch?	PATCH_12	Patch 12
contraceptive ring? Often called NuvaRing.	RING_12	Contraceptive Ring Last 12 Months
counseling or information about birth control?	BCCNS12	Birth Control Counseling 12
a sterilizing operation?	STEROP12	Sterilization Operation 12
counseling or information about getting sterilized?	STCNS12	Sterilization Counseling 12
an abortion?	ABORT12	Abortion 12

a Pap test - where a doctor or nurse put an instrument in the vagina and took a sample to check for abnormal cells that could turn into cervical cancer?	PAP12	Pap smear 12
a pelvic exam -where a doctor or nurse puts one hand in the vagina and the other on the abdomen?	PELVIC12	Pelvic Exam 12
received prenatal care?	PRENAT12	Prenatal 12
post-pregnancy care?	PARTUM12	Post-pregnancy 12
a check-up or medical test related to using a birth control method?	MEDTST12	Medical Check-up/Test 12
or been treated by a doctor or other medical care provider for a sexually transmitted disease like gonorrhea, chlamydia, herpes, or syphilis?	STDOTHR12	STD Counseling 12
have you received testing for a sexually transmitted disease?	STDSVC12	STD Testing 12

Have you ever …

had an HPV test -where a doctor or nurse put an instrument in the vagina and took a sample to test for the HPV virus?	EVHPVTST	Ever HPV Test
been to a doctor or other medical care provider to talk about ways to help you prevent miscarriage or pregnancy loss? (Not counting routine check-ups, prenatal care, or advice about a pregnancy,)	HLPMC	Help Miscarriage
been treated for an infection in your fallopian tubes, womb, or ovaries, also called a pelvic infection, pelvic inflammatory disease, or P.I.D.?	PID	Pelvic Inflammatory Disease
had a mammogram? A mammogram is an x-ray taken only of the breast by a machine that presses against the breast.	mammog	Mammogram
had a clinical breast exam? A clinical breast exam is when a doctor or other health care professional uses his or her hands to feel for lumps or other changes in your breasts.	CLINEXAM	Clinical Breast Exam 12
Has a doctor or other medical care provider ever talked with you about HIV, the virus that causes AIDS?	TALKDOCT	Medical Talk about HIV
Have you received the cervical cancer vaccine, also known as the HPV shot or Gardasil?	evervacc	Ever HPV Vaccine

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You mentioned you have used drugs to improve your ovulation. Have you used any such drugs within the last 12 months?	OVUL12M	Improve Ovulation 12
Are you currently pursuing medical help to become pregnant?	hlppg0w	Current Conception Medical Help
Was your diagnosis of uterine fibroids confirmed by ultrasound?	ufso0	Uterine Fibroids Confirmed by Ultrasound
(During any of your relationships,) (have/did) you (or your husband/or your husband or partner at the time) ever been to a doctor or other medical care provider to talk about ways to help you become pregnant?	HLPPRG	Pregnant Assist Medical Talk
What is your current marital or cohabiting status?	marstat	--

Note. Variable names ending with "12" refer to participant service utilization in previous 12 months at the time the survey was conducted.