ABSTRACT

Title of Thesis:	Knowledge, Attitudes, and Practices Towards Teaching of Menstruation and Sexual Health among Parents of Middle School Students
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Menarche (the onset of menstruation), along with puberty in general, presents as a trying time for adolescents as they adjust to changes occurring in their bodies. Family life and sexual education are imperative during this transitional stage as they set the foundation for future reproductive health decisions adolescents may make. Prior research on menstruation and menstrual health has primarily focused on rural populations in developing countries; few studies on this topic have been conducted in the United States (U.S.). The findings of these studies show disparities in knowledge related to menstruation and menstrual health among different racial and socio-economic groups in the U.S. We added to current literature by conducting a mixed-method study to investigate knowledge, attitudes, beliefs, and parenting practices related to menstruation

and sexual health education among the parents of middle school students in the U.S. We conducted an online study and collected survey data from parents of middle school students, followed by qualitative interviews with select parents (those who opted-in for this portion) to gain further insight into the attitudes and sentiments regarding menstruation and menstrual health.

KNOWLEDGE, ATTITUDES, AND PRACTICES TOWARDS TEACHING OF MENSTRUATION AND SEXUAL HEALTH AMONG PARENTS OF MIDDLE SCHOOL STUDENTS

by

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Table of Contents

List of Tables

Table 1: Demographics of Parents of Middle School Children across the U.S. (n=87)

Participants, No. (%)	**Total (N = 87) N (%)**
Age in years	*(1 missing)*
Over 40 (including 40)	77 (89.5%)
Under 40	9 (10.5%)
Mean	44.16471
Range	31-55
Race/Ethnicity	
White	70 (80.5%)
Non-White	17 (19.5%)
Sex Assigned at Birth	
Male	1 (1.1%)
Female	86 (98.9%)
Gender Identity	
Cis-male	1 (1.15%)
Cis-female	85 (97.7%)
Other	1 (1.15%)
Sexual Orientation	
Heterosexual	77 (88.5%)
LGBTQAI+	10 (11.5%)
Education Level	
Graduated college or more	77 (88.5%)
Some college	10 (11.5%)

Household Income	
< $100,000/year	21 (24.1%)
> $100,000/year	60 (69%)
Prefer not to answer	6 (6.9%)
Marital Status	
Single (never married)	4 (4.6%)
Married	74 (85.1%)
Other	9 (10.3%)
Religious Affiliation	
Christian	53 (60.9%)
Non-Christian	21 (24.1%)
No religion	13 (15%)
State of Residency	
New Jersey	32 (36.8%)
Maryland	26 (29.9%)
Other	29 (33.3%)
Number of Children	
1	76 (87.4%)
2	9 (10.3%)
3	2 (2.3%)
Public or Private School - Child	
Public school	71 (81.6%)
Private school	12 (13.8%)
Other	4 (4.6%)
Grade Level - Child	
6th grade	31 (35.6%)
7th grade	25 (28.7%)

8th grade	30 (34.5%)
Prefer not to answer	1 (1.2%)
Sex Assigned at Birth - Child	
Female	53 (60.9%)
Male	34 (39.1%)
Gender Identity - Child	
Cis-female	46 (52.9%)
Cis-male	33 (37.9%)
Other	8 (9.2%)

Table 2: SRH Knowledge Questions and Response Rates

Knowledge Questions	***Percent Correct***	***Percent Incorrect***	***Standard Deviation***
Fertilization of the egg by the sperm (conception) occurs in the uterus	40.23	59.77	0.4932043
An ovum (egg) is viable for fertilization for approximately 1 week after it is released.	28.74	71.26	0.4551526
A small amount of sperm can be released prior to ejaculation.	100	0	0
If a PWM has taken the pill for 2 years and then stops, they will have a much more difficult time getting pregnant, compared with a PWM who has never used the pill.	95.402	4.598	0.2106494

After unprotected sex, more than 98% of PWM will not get pregnant if the emergency contraceptive pill is taken in the first 72 hours.	83.91	16.09	0.3695869
Oral contraceptives* work immediately, therefore backup methods (additional methods of contraception) are not necessary when a PWM is on their first cycle of the pill.	98.851	1.149	0.1072113
During the mid-cycle* part of the menstrual cycle, PWM are more fertile and therefore more at risk of pregnancy.	88.51	11.49	0.3208016
Using Vaseline or petroleum jelly is a good way to increase the effectiveness of a condom.	96.552	3.448	0.1835234
A condom should not be unrolled before being put on a penis.	79.31	20.69	0.407429
Withdrawing (“pulling out”) the penis before ejaculating works just as well as a condom for preventing sexually transmitted diseases.	100	0	0
If your symptoms go away you probably	100	0	0

don't have a sexually transmitted disease.			
Some kinds of sexually transmitted diseases don't give you symptoms until 6 weeks or more after you catch the infection.	94.253	5.747	0.2340901
Only people who have lots of sexual partners get sexually transmitted diseases.	98.851	1.149	0.1072113
If you have a sexually transmitted disease, you probably got it from the last person you had sex with.	97.701	2.299	0.1507355

Table 3: Menstrual Knowledge Questions and Response Rates

Knowledge Questions	***Percent Correct***	***Percent Incorrect***	***Standard Deviation***
Menstruation is the monthly flow of blood through the vagina.	93.103	6.897	0.2548645
The typical age(s) of menarche* are between 12-15 years of age.	86.21	13.79	0.3468266
Hormones are responsible for regulating menstruation.	91.954	8.046	0.2735805

The source of menstrual blood is the inner lining of the Uterus.	90.805	9.195	0.2906362
Typical number of days for menstrual flow is between 3-5 days.	86.21	13.79	0.3468266
The typical duration of a menstrual cycle, the first day of menstrual bleeding of one cycle to the first day of menstrual bleeding of the next cycle, is between 21-35 days.	97.701	2.299	0.1507355
Is there a period when PWM are most fertile?	94.253	5.747	0.2340901
Can PWM ever be pregnant during menstrual flow?	89.61	10.39	0.3071266
The typical menopausal age is between 45-50 years of age.	77.01	22.99	0.4231979
Poor menstrual hygiene can lead to	87.36	12.64	0.3342676

infections			

Table 4: Psychometric Properties for Attitudes, Confidence, Practice, and Influence Scales

Constructs - Attitudes, Confidence, Practice, & Influence	***Mean***	***Median***	**SD**
Attitudes towards teaching sexual health at home (10-items)	4.627	4.800	0.4762
Attitudes towards menstruation/menstrual health education (25-items)	2.117	2.080	0.3298
Confidence in discussing menstrual/sexual health (8-items)	4.373	4.500	0.7235
Practices (7-items)	3.286	2.671	0.8428

List of Abbreviations

PWM: People who menstruate

SEM: Socio-ecological model

SRH: Sexual and reproductive health

Chapter 1: Introduction

Puberty marks a physiological and psychological transition in the lives of adolescents. As young people grapple with their shift to "adulthood," they must learn to adapt to the changes occurring in their bodies. For people who menstruate (PWM), puberty marks a crucial developmental period in which menarche, the onset of menstruation, occurs. Given that menstruation is a vital part of reproduction and parenthood, it is critical for adolescents to have the necessary knowledge and skills related to menstrual health and health (Sumpter & Torondel, 2013). Children and adolescents tend to learn about puberty and its related functions primarily from their parents (Tobey et. al, 2011). The extent of the information given and how it is approached is left completely at the discretion of the parents. In addition, not all children and adolescents have the privilege of complete transparency from their families on this subject matter for numerous reasons. Family dynamics vary, as do the degrees of comfort adolescents have in revealing private information to their parents. Thus, attitudes of parents can impact how their children view puberty or menstruation, making it less likely for there to be an open dialogue about their sexual health.

Through a process of socialization that begins with a child's caretaker, messages regarding modesty, nudity, and gender-specific notions of appropriate sexual conduct are shared subliminally (Shtarksall et al., 2007). At a young age, children are often asking questions that are easier for a parent to dodge or fabricate an answer to, such as "where was I before I was in your tummy?" It is only later on that children begin asking more complex questions, such as those regarding menstruation,

HIV and AIDS, and sexual assault. Parents may be hesitant to approach these subjects due to uncertainty about what age is appropriate for discussion, and the social implications surrounding menstruation (Blakey & Frankland, 1996). With the topic of menstruation being approached hesitantly in public settings, children often trust their family members to provide them with information regarding the sensitive topic of puberty. Mothers are often deemed as the primary source of information regarding menstruation, however, familial structure heavily influences the comfort PWM have in talking about sensitive topics with their family members (Girling et al., 2018). Studies show that daughters of single fathers, who lack a female role model, refrain from asking questions about puberty or menstruation (Kalman, 2003). Also, fathers either take on the responsibility of a female parent, or inconveniently dismiss or postpone their daughters' questions until a mothering figure is established (Kalman, 2003).

Parents have varying degrees of knowledge and comfort regarding sexual and reproductive health (SRH) and menstrual health topics. Since children get most of their SRH knowledge from their families, there is variation in the knowledge they receive (Tobey et. al, 2011). As a result, adolescents do not receive a uniform understanding of SRH. A lack of uniformity in adolescents' development of their SRH education leaves some children mis- or under-informed. A recent study explored how knowledgeable and comfortable parents felt in talking with their children about sex and relationships (Herbert et al., 2016). Only 59.5% of the parents in the study felt very knowledgeable and even less (52.4%) said that they felt very comfortable with talking to their children about these topics.

Girls often identify their mothers as the primary sources of education on puberty and menstruation, but many admit it is difficult to become fully informed (Herbert et al., 2016). Boys are also more likely to go to their mothers for information related to SRH, but receive even less SRH-related information from their families compared to girls (Tobey et. al, 2011). Fathers feel less equipped to handle the questions that PWM may have during puberty. Findings from one study showed that fathers felt isolated, stigmatized, and had little to no resources when their daughters needed support and information on bodily changes due to menarche (Kalman, 2003). Only 26% of parents in that same study answered that they had discussed all five of the outlined topics of human reproduction, including STIs, avoiding sexual intercourse, becoming sexually active, using protection, and where to get condoms with their children. The average number of topics discussed was 3.5 out of 5, or a little over half (Jermane & Constantine, 2010). The degree of discomfort parents or adolescents may feel in addressing these topics may impact the proper exchange of accurate and objective sexual health information.

Inadequate SRH-related knowledge disproportionately affects marginalized and low income communities in the United States (U.S.). Low income, African-American girls and adolescents are more likely to lean on interpersonal relationships, such as family, for menstrual information (Nixon et. al, 2001). This is due to the fact that schools are often a poor source of information on these topics. However, parents and other family members may not have the most accurate knowledge and might be hesitant to talk about these issues (Cooper & Koch, 2007). Similarly, other marginalized groups also struggle with getting SRH-related

information from their families. Arab-American and Mexican-American girls are the least likely to learn about menstruation from their mothers (Orringer & Gahagan, 2010). This is probably due to discomfort experienced by mothers in talking about issues related to SRH (Orringer & Gahagan, 2010).

The conditions in which an adolescent develops will influence the way they learn about and handle their own menstruation. Many girls report receiving mixed-messages surrounding menstruation - both it being a crucial biological function, while also being a part of themselves that they are encouraged to conceal. The stigma around menstruation is seen in many different ways throughout society; girls report shame at being seen holding a menstrual product, and some even report shame about the fact that they menstruate (Schooler et al., 2005). These messages may prohibit PWM from asking questions and developing habits that could be beneficial to their overall health. Restrictions set by cultural beliefs, economic status, available resources, and education place pressure on PWM to manage their menstruation in ways that may be unhygienic or inconvenient, increasing the risk of future health complications (Sumpter & Torondel, 2013). Menstrual issues affect 75% of adolescent PWM and are a common reason for PWM to seek medical attention (Houston, Abraham, Huang, & D'Angelo, 2006). Researchers from George Washington University collected data on the menstrual experiences of young women living in urban areas. The vast majority of participants reported experiencing both premenstrual syndrome (84.3%), and dysmenorrhea (65%). Despite the high prevalence of these disorders, only 2% shared that they had received information on menstruation from their health care providers (Houston et al., 2006). This indicates

that urban adolescents' knowledge of and access to healthy menstruation practices are limited, creating cyclical waves of misinformed individuals who may be inclined to neglect their SRH due to the lack of active conversation surrounding the topic.

Most of the current studies on menstrual education and its impacts have been conducted in developing countries, where social contexts tend to differ from that of the U.S.. Studies conducted in the U.S. show that puberty experiences can vary depending on socioeconomic status and race, and that girls in low-income families report a greater number of negative puberty experiences and have more difficulty during the transition (White, 2013 and Herbert et al., 2016). Many low-income girls do not cite school as a source of knowledge about puberty and feel uncomfortable asking questions in the classroom (Herbert et al., 2016). Further, participants in one study reported that their schools communicate negative information regarding menstruation, which was shared after they had already experienced menarche (Cooper & Koch, 2007). There is a strong association between school absenteeism among PWM and symptoms of Premenstrual Syndrome, which can vary from headaches and dysmenorrhea to flu-like symptoms (Houston et al., 2006). The results of these studies highlight the importance of schools offering SRH education classes that teach the correct information regarding menstruation and the ways it impacts health. In addition, it is crucial that PWM at this stage develop positive attitudes regarding changes in their bodies so that they can comfortably navigate the social interactions that occur in and outside of school.

Given that there is a small body of literature on menstruation and that negative experiences are disproportionately reported by racial and ethnic minority, low-income

PWM in the U.S., we hope to focus on PWM from these groups, and understand how their experience of menstruation is influenced by their family environment, more specifically, by cultural stigma. Girls report receiving mixed-messages surrounding menstruation - both it being a crucial biological function, while also being a part of themselves that they are encouraged to conceal. The stigma around menstruation is seen in many different ways throughout society; girls report shame at being seen holding a menstrual product, and some even report shame about the fact that they menstruate (Schooler et al., 2005). These messages may prohibit PWM from asking questions and developing habits that could be beneficial to their overall health.

The way in which a young person cares for their body at such a pivotal time in their life can have lasting impacts on their future health. It is for this reason that quality education at an early stage in puberty is crucial. Literature on this topic has also identified a correlation between adverse childhood experiences, like parental conflict or abuse, and menstrual problems, as well as fertility difficulties later in life (Jacobs et al., 2015). Those who had experienced high adversity were 2.75 times more likely to experience fertility difficulties and 2.54 times more likely to experience amenorrhea than those who had experienced no adversity (Jacobs et al., 2015). A lack of access to adequate menstruation education and other relevant resources could have severe consequences for adolescents.

There is little research on the development of adolescents' sexual health education curricula and even less research available on the sexual health knowledge of their parents. Studies already show that parents are the biggest influence on a child's sexual health education (Herbert et al., 2016). However, it is important to look

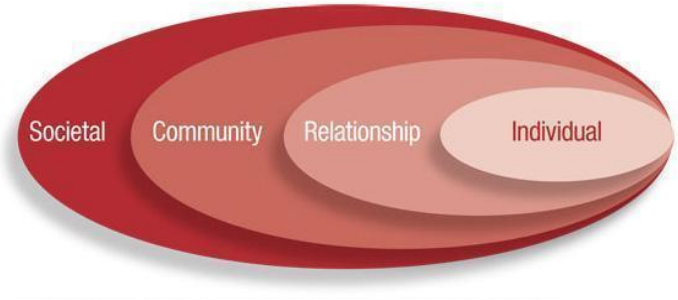
deeper into what parents know and how they are sharing that information with their children. This information will be helpful in developing menstrual and sexual health programmatic initiatives for parents that can provide them with the necessary information and skills to aid their children in the future. Our study aims to provide more in-depth information related to the following three questions: (1) What are parents' knowledge and attitudes towards sexual and reproductive health, including menstruation? (2) What are some of the sources of influence on their sexual health knowledge and attitudes? (3) What is the practice of transmitting this knowledge within families?

Socio-Ecological Model

Our study is being guided by the socio-ecological model (SEM). Research shows that using the SEM allows researchers to focus on and consider how individuals are impacted by the internal and external factors of their physical and social environments. (Lewis et. al, 2017). This model is divided into five systems as follows: the microsystem, or individual level, which includes the interactions and relationships the individual has in their immediate surroundings; the mesosystem, or relationship level, which includes relationships and interactions the individual has with family, friends, peers from school and/or the workplace and their neighborhood; the exosystem, or community level, which includes social networks and examines how workplaces, educational and governmental institutions within the community can indirectly impact the individual; the macrosystem, or society level, which includes the influence that values within society, religion and culture have on the individual. Lastly, there is the chronosystem which includes the influence of historical content

and, in some cases, policy (Kilanowski, 2017). Our literature review seeks to be comprehensive of the individual, relationship, community, and societal levels and how they relate to the transmission of information pertaining to sexual and reproductive health.

Figure 1. Socio-Ecological Model Diagram (CDC, 2007)



Chapter 2: Literature Review

Macrosystem

The macrosystem, or societal level of the social ecological model, identifies broad societal factors like politics and cultural norms. These societal level factors have, "trickling down" effects on all the other levels of the socioeconomic model. Societal characteristics shape societies as well as individuals. This section looks at various societal level factors in regrads to menstrual and sexual health in the United States.

Sexual health education in U.S. society has seen minimal change in content since its implementation into school curriculum (Charlesworth, 2001). There have been large advancements in science, but sociocultural and political factors have prevented the U.S. from implementing evidence-based sex education (Hall, McDermott, Komro, & Santelli, 2016). Federal funding often goes towards policies that favor abstinence-only sexual health education, which is found to be an ineffective method of teaching sexual health information. In addition, topics like sexuality and health inequalities are often omitted from sexual health curriculums (Schalet et. al., 2014). Moral debates surrounding abstinence and adolescent sexual activity result in inaccurate or incomplete sexual education for US students (Hall et al., 2016).This conservative approach to sexual health education results in poor sexual health outcomes for US adolescents in comparison to their counterparts in countries like the Netherlands, France, and Australia, that prioritize sex-positive curricula (Weaver, Smith, & Kippax, 2007). Comprehensive sex education (CSE) programs reduce teenage pregnancy rates and better suit the needs of adolescents who may be sexually

active. Parent and public opinion both show support for CSE in US schools (Rabbitte & Enriquez, 2018). However, US policy has not transitioned to CSE as the main vessel for sexual health education in US schools.

Educational interventions intended to inform adolescents about menstruation in a scientific manner often convey unintended cultural messages. Charlesworth's study of seven common educational menstruation pamphlets distributed from the 1950's through 1990's concluded that they possess conflicting "scientific narratives' ' and "cultural narratives". The scientific narrative explains the menstrual cycle in detached terms as a natural process of waste expulsion, alienating PWM's from a process that occurs in their own body. At the same time, readers are reminded that menstruation signifies a PWM's ability to produce children and their future "socially sanctioned" role as mothers (Charlesworth, 2001). The pamphlets also describe the onset of menstruation as the marker of a momentous transition in a PWM's life from child to woman, while simultaneously insisting that this very normal process need not have any significant effect on their day-to-day life. In this way, educational material teaches adolescents that menstruation is important but in many cases, the concealment of sanitary products is stressed, further diverting from the message that menstruation is normal and a positively regarded marker of womanhood (Charlesworth, 2001). Educational and informational resources may contribute to negative personal and/or cultural perceptions of menstruation.

The source through which boys primarily receive their menstrual education is unclear, but it is known that they tend to receive information from a variety of places, including health education and social media. Attaining their knowledge in these ways

can be harmful to boys, as the menstrual health information taught in health classes has been seen to cause a divide between boys and girls (Allen et al., 2011). The perspective that menstruation is unhygienic gets widely disseminated across different media sources, influencing boys to view women as inferior and to view men as the norm (Allen et al., 2011). Additionally, ignorance to menstrual experiences can occur when boys internalize this perception that menstruation makes girls inferior, causing them to avoid the topic altogether until they reach adulthood (Allen et al., 2011). To ensure a healthy relationship with menstrual health for everyone, boys and men need to receive menstrual health education and release the stigma surrounding menstrual health (Hennegan et al., 2021).

Exosystem

The exosystem, or the community level of the socio-ecological model, includes social networks and examines how workplaces, educational and governmental institutions within the community can indirectly impact the individual. People interact with these different networks and institutions daily, and thus receive various types of information regarding menstrual and sexual health topics. This section will analyze how different social networks and governmental institutions can impact both communities and individual's experiences with menstrual and sexual health topics.

The degree of information taught in sexual education is varied across the U.S.; the local community's attitudes and approaches to the subject may affect how much children are taught and will greatly impact their future sexual health practices. Communities of Latin American descent, more than other ethnic groups, experience

higher rates of pregnancy, childbirth, and STI rates (Alcalde & Quelopana, 2013). This can be explained by Latin Americans' cultural emphasis on women's innocence, leading to high degrees of discomfort between parents and children in addressing sex (Alcalde & Quelopana, 2013). Immigrants' views on sex and sexual health are shaped by their countries of origin; many Latin American countries are heavily influenced by Catholicism, which greatly impacts the messages children within these communities receive on sexual health (Alcalde & Quelopana, 2013). Regardless of community, religion influences how parents and their children view sexual health and how open their dialogue about it is. Religion within a community can also dictate the degree of formal education PWM are taught about sexual health. Research has shown that rural communities whose members attend church frequently are significantly less likely to support sexual education in schools (Baker, Smith, & Stoss, 2015). In some parts of the U.S., there are many schools that teach abstinence-only sexual health curriculum in part due to the religious values of their neighboring communities. One example is known as Project Alpha, in Houston, Texas in which the parents and church-goers in the community joined together to form and teach an abstinence only curriculum to the high school males in their town (Meshack et al., 2000).

Unfortunately, the outcomes of abstinence-only approaches to sexual health education are a factor in the increasing sexually transmitted infection (STI) rates in the United States, particularly for adolescents (Shannon & Klausner, 2019). Adolescents do not yet have a fully developed prefrontal cortex, making them particularly risk-prone due to lower executive function. Additionally, for adolescent biological females, genitalia do not yet produce sufficient levels of cervical mucus;

this puts them at higher risk of contracting STIs like chlamydia trachomatis (CT) and human papillomavirus (HPV), which are both mitigated by the self-cleaning nature of a mature vagina (Shannon & Klausner, 2019). Both of these differences mean that adolescents are especially vulnerable to contracting STIs, and thus should be receiving the most education about safe sex practices.

Rates of STIs have been increasing amongst adolescents in the past few years, particularly in southern states. Surveys indicate that especially vulnerable populations include racial minorities, young gay men, and homeless teens (Shannon & Klausner, 2019). This varying prevalence reflects increased poverty and limited access to sexual health-care services. A similar study revealing that states with higher minimum-wages have lower rates of some, but not all, STIs highlights the impact of socioeconomic status on STI vulnerability (Ibragimov et al., 2019). This is presumably the result of a multitude of factors frequently accompanying poverty, including less funding for education, riskier lifestyle choices, and a limited fulfillment of basic needs. Thus, instead of stigmatizing those who have contracted STIs, further research must be done to understand the complex social impacts that community attitudes and policies have on local STI prevalence.

The general attitudes towards menstruation have been shown to differ depending on the type of menstrual cycle (regular or irregular) and on the experience of the individual experiencing the menstruation which may likely play a role in their education. Specifically, the community of PWM being studied in this study are experiencing the onset of menarche and often experience irregular cycles. Historically, this has been associated with negative attitudes towards menstruation.

Those with less experience and more irregularity in their cycles were found to rate their experience of menstruation significantly lower than PWM who have many years of experience with regular menstruation (Stubbs, 1985).

Mesosystem

The mesosystem, or relationship level of the social ecological model, identifies relationships with people in one's inner circle, such as parents, family members, and friends. These relationship level factors influence the experiences one has during their life. Examining the relationships between parents and their children is a critical factor to consider when looking at the sexual and menstrual health education of adolescents. This section looks at various relationship level factors and how relationship dynamics affect the sexual and menstrual education that children receive from their parents.

Researchers find that menstrual information from families is shared unequally between boys and girls. Inadequate information from their families leads to an uncomfortable relationship with menstruation, with many boys believing that menstruation is "gross" and that they should not have to learn about menstruation since they do not have to experience it first-hand (Allen et al., 2011). In reference to sexual information overall, girls talk about sexual education topics with their parents more frequently than boys (Tobey et al., 2011). There are several reasons behind parents' decisions to discuss or not discuss sexual education topics with their children. As mentioned before, gender identity plays a large role in the type of

information that is shared with a child. However, there are other factors that play a role in this decision to share information as well.

One such factor that plays a large role in parents' decisions to speak to their children about sexual education topics is age and the idea of innocence. Fathers specifically have trouble speaking to their children about sex as they want to protect their child's innocence. However, this approach could cause more harm than good. Researchers argue that denying children sexual knowledge puts them in a vulnerable position (Bennett et al., 2017).

A qualitative study collected narratives of men sharing their knowledge on menstruation when they were younger and how that has changed as they grew older. This study found that most men got introduced to menstruation at a younger age, when their sisters reached menarche, however many reported feelings of ignorance and confusion on the topic due to having an inconsistent delivery of information on menstruation in schools and parents (Allen et al., 2011).

Having knowledge on a girl's experiences with menstruation was not valuable during boyhood, but this changes when they grow older and develop relationships with women where one-on-one communication with them can occur, especially with their spouses (Allen et al., 2011). Men who received their information on the topic by being exposed to primarily jokes and derogatory connotations about menstruation being "disgusting and gross," had the more misogynistic views on menstruation that made them believe that the process served little purpose in the lives of PWM (Allen et al., 2011). In comparison, men who were in intimate relationships with women lacked misogynistic views on menstruation because their female companions or

friends would have private conversations about their menstrual experiences. These findings tell us that an improvement may be seen in the attitude and knowledge boys have about menstruation if they have more intimate conversations with their siblings or parents.

One study from 2000 found that mothers could negatively influence how their daughters view menstruation. When mothers conceal their experiences with menstruation and are silent about the topic, their daughters believe that menstruation is unsanitary and unpleasant (Beausang & Razor, 2000). This study used a seven-point scale to assess how prepared girls felt for menstruation and the roles their parents play in menstrual education (Beausang & Razor, 2000). The girls were asked questions about menstruation to assess their knowledge on the process. The results indicated that girls generally felt that they were prepared for menstruation, but they also showed an incomplete understanding of the menstrual process (Beausang & Razor, 2000). Despite not having much knowledge on the biology of menstruation, the girls showed that they internalized negative myths and stereotypes about the menstrual process and symptoms (Beausang & Razor, 2000). The study also indicated that the girls cited their mothers as being their primary source of menstrual education (Beausang & Razor, 2000).

In another study, researchers found that mothers were commonly the primary source of menstrual education for African American girls, even though mothers often did not have access to adequate knowledge on menstruation themselves (Cooper & Koch, 2007). African American girls cite their female friends as sources of knowledge on menstruation due to the strong affinity levels shared between them

(Cooper & Koch, 2007). Some of the major themes were confusion and inaccurate beliefs about menstrual events, as well as avoidance or negative discussion of menstrual events (Cooper & Koch, 2007). It is also common for Latin American mothers to not provide much information to their daughters or sons about menstruation due to secual silence in households, which lead to ignorance about menstruation and sex (Alcalde & Quelopana, 2013).

These findings tell us that the knowledge girls attain on menstruation can impact the attitudes they have on the process. Mothers are usually the "main source of emotional and informational support" when girls, particularly lower-income, are first experiencing puberty. This support ranges from mothers who find talking about menstruation to be essential to others who feel unprepared to deal with puberty and related issues (Allen et al., 2011). The way mothers teach their children about menstruation may be impacted by the attitude they have on their own period or menstruation in general, which can cause a generational cycle of passing down incomplete knowledge and/or negative views about menstruation to their daughters (Beausang & Razor, 2000).

When reading through the literature on parents and menstruation, fathers are rarely ever the focus. Boys speak to their fathers more about sex than girls do, but mothers are overall the primary source of information for both boys and girls (Tobey et al., 2011). Fathers were less likely overall to be consulted for information or support around menstruation and sexual education.

A quantitative study of 60 fathers, mothers, and daughters conducted in Australia aimed to test the fathers' knowledge of menstrual symptoms and

understanding of their daughters' health (Girling et al., 2018). The results showed that the fathers' knowledge of menstrual symptoms was much lower compared to mothers' knowledge (Girling et al., 2018). This was not surprising, as most of the fathers indicated that they hadn't received this information from sex education classes, but instead from their wives (Girling et al., 2018). This study showed that fathers lack complete knowledge of menstrual symptoms and are another population in need of additional educational materials related to menstrual health. A separate study looked at men's attitudes, beliefs, and experiences related to menstruation and found that many of them reported that their menstrual education was inadequate, confusing, or just non-existent (Peranovic & Bentley, 2017). These findings are consistent with the idea that men are not learning about menstruation and sexual health in the same ways that women are, which could lead to differences in how they educate their children about these topics as well.

We are including an article from 2003 because it provided information on menstrual education from fathers who are both single parents and parenting alongside mothers. In their literature review, they described some difficulties for single fathers when raising pre-adolescent girls (Kalman, 2003). Fathers felt isolated, stigmatized, and had little to no resources when their daughters needed support and information on bodily changes due to menarche. Daughters of single fathers also lacked a female role model to answer their questions (Kalman, 2003). One study they cited said that fathers either have to assume the responsibility of a mother, or inconveniently dismiss or postpone their daughters' questions until a mothering figure is established (Kalman, 2003).

They also cited studies that addressed fathers in two-parent families, and the roles they have in their daughters' pre-adolescent years. This study found that daughters rarely discussed menstruation to their fathers, with only 7% discussing it with them (Kalman, 2003). When daughters were given the opportunity to say the advice they would give to fathers on providing menstrual education, they often said to let their mothers handle it (Kalman, 2003). Only 2 of 13 girls asked their fathers for support, and these same 2 girls also had no access to a female relative to turn to instead (Kalman, 2003).

Kalman's study was an exploratory study that used grounded theory, which is used to enhance existing theories where little is known about the phenomenon. The study found that adolescent girls experiencing menarche while living with their fathers felt that they had close relationships with them, but also that their fathers physically and emotionally distanced themselves from them (Kalman, 2003). They also communicated feelings of embarrassment and found that daughters felt that fathers were clueless about menstruation, and seeked out information from a female source (Kalman, 2003).

Microsystem

The microsystem, or individual level of the social ecological model, identifies personal factors, such as age, education, income, race, knowledge, attitudes, and personal experiences. These individual level factors influence each other as well as the other levels of the social ecological model. Demographic characteristics have a significant influence on the way that people were raised and therefore their knowledge and experiences with menstrual and sexual health. This section looks at

various individual level factors with respect to menstrual and sexual health and evaluates their implications for the study at hand.

Several studies have found that race and income impact the menstrual knowledge, attitudes and experiences of women. A qualitative study of 17 low-income African American women, identified a common theme of confusion and inaccurate beliefs about menstruation among this population (Cooper & Koch, 2007). In focus groups and individual interviews, many women explained that school was a poor source of menstrual education and that further information was provided at home when only absolutely necessary (Cooper & Koch, 2007). The women in this study also expressed a desire to know more about menstruation, especially so that they can teach their future daughters more about it than they were taught (Cooper & Koch, 2007). This study shows evidence that being a low-income African American woman tends to be associated with a lack of proper menstrual health knowledge.

Another population that has been found to lack proper menstrual and sexual health knowledge is Latin American immigrant women. A qualitative study of 24 Latin American immigrant women revealed that sexual silence was common in Latin American households (Alcalde & Quelopana, 2013). While many women in this study agreed that sexual education should be for both boys and girls, they also explained that the sexual silence of their childhood "made it difficult to speak openly to their children about sexual topics" (Alcalde & Quelopana, 2013). This study shows that due to their upbringing, Latin American women tend to lack proper menstrual and sexual health knowledge as well as self-efficacy in talking to their children about these topics.

While these studies might offer evidence that there is an association between race, income, and menstrual/sexual health knowledge, there is inconsistent and inconclusive evidence that there is an association between parents' race/ethnicity and income and their sexual health communication with their children (Jerman & Constantine, 2010). One study from 2006 found that low-income, non-White parents actually spoke with their children more about birth control and the negative consequences of sex than did higher income White parents (Swain et al., 2006). However, a different study from 2008 claimed that education and income were not found to predict mother-child sexual communication among African American mothers (Pluhar et al., 2008). These inconsistencies suggest that further research should be done on whether certain demographics are lacking the proper tools to educate their children about menstrual and sexual matters.

Parental attitudes are individual level factors that are important to understand when considering sexual health and communication. A study about parent perspectives on talking to their children about sex included focus groups of parents of children aged 10-12 (Wilson et al., 2010). The results showed that while most parents believe that they should talk to their children about sex, many perceive several barriers , including thinking that their children are not ready to hear about sex. A more recent study from 2019 found that parents who described themselves as having a more open sexual attitude scored higher on sexual knowledge (Shin et al., 2019). The same study also found that most parents are open to learning more about sex-related topics to better inform their children (Shin et al., 2019). Minimal literature

was found about the attitudes of parents towards menstruation specifically, indicating a need for more research on this topic.

Parental attitudes towards menstruation seem to stem from earlier experiences in their lives, as research suggests that menstrual attitudes, experiences, and behaviors during the early years of menarche have lasting effects into adulthood. For example, in a survey of over 300 college aged women, those who reported negative feelings towards their period as adolescents tended to maintain those feelings as adults, with the same pattern being found for those who had positive menstrual experiences as adolescents. In addition, positive past experiences were associated with more accurate menstrual knowledge, feelings of being physically healthy, and healthier body image than negative past experiences, which were conversely associated with viewing menstruation as debilitating (McPherson & Korfine, 2004). The question is, do these early experiences that shape parental attitudes as well as knowledge influence what information their children receive?

Chapter 3: Methodology

Our research stems from the lack of comprehensive literature on sexual and reproductive health (SRH) education including menstruation in the U.S. A review of existing literature demonstrates issues that adolescents have with attaining knowledge on SRH due to societal, scholastic, and generational teachings. These teachings often lead to stigmas that can be unconsciously internalized by them at young ages. Our study adds to current literature by investigating parental knowledge about SRH topics including menstruation, how this knowledge was attained, parental attitudes towards SRH topics, influences on these attitudes, and how SRH knowledge is transmitted within families. Our study was guided by the social-ecological model.

Study Design

We used a sequential mixed-method study design in this study. First, we collected quantitative data using a questionnaire (n = 87) and then conducted individual qualitative interviews with a sub-sample of the parents who completed the questionnaire (n = 6). Survey questions focused on five different domains: knowledge, attitudes, confidence, practices, and influences. The interviews aimed to gain a higher understanding of information provided in these surveys, such as quality of information that parents received in their youth, comfort in their current home when discussing SRH topics, and thoughts regarding what students should be learning in school. The survey and interview questions were developed during summer 2020. Our study was approved by the Institutional Review Board during spring 2021.

Survey responses were collected during summer 2021 and interviews took place during fall 2021.

Sample

The sample population for this study included individuals who are over the age of 18 and are parents to a middle school child in the U.S. There were no restrictions based on sex, race, ethnic origin, religion, socioeconomic or economic qualifications.

Our final sample consisted of 87 total participants. At the time of data collection, participant age ranged from 31 to 55 years old, with a mean age of 44 years old. Participants were mostly White, mostly female-identifying, and mostly heterosexual. Approximately three-quarters were married and over half identified as Christian. A majority of participants earned more than $100,000 annually. The grade level of participants' children was fairly evenly distributed, with 35.6% in the sixth grade, 28.7% in seventh grade, and 34.5% in the eighth grade, and most of the children attended public schools. Approximately 60% of participants' children were assigned female at birth and 52.9% of participants' children identified as cis-female.

Procedures

Study participants were recruited through distribution of our survey link using flyers, Facebook groups, personal contacts of the individuals on our team, PTA groups, school administrator emails, and student organizations at the University of Maryland.We sent the flier to Facebook groups such as parenting groups, middle school PTA groups, etc and asked them to share it with their group members. The

flier had a link (pictured as a QR code) for our survey, which was hosted virtually on Qualtrics, and interested participants were asked to use the link to access our survey.

When potential participants entered the survey, they were asked to confirm their eligibility. This page included the following statements: “Before beginning this survey, please confirm that you are at least 18 years of age: and “Before beginning this survey, please confirm that you are the parent/guardian of a current middle school (grades 6-8 only) student”. If the answer to either question was no, then they were directed to a page that said “We are sorry. You are not eligible to complete the survey at this time.” Eligible adults were then asked to read a consent form to which they agreed by clicking the ‘Next’ button at the bottom of the page.

The survey was estimated to take 20-25 minutes to complete and focused on parents’ menstrual and sexual health knowledge, attitudes, and comfort with talk about these issues in their family. The average time for the survey was approximately 13 minutes and 45 seconds, after removing outliers of individuals who took anywhere between approximately 362 minutes (approximately 6 hours) to 7432 minutes (approximately 124 hours), whom we presumed opened the survey and left it running in the background without completing it immediately. The questions cover basic knowledge of these topics, parents' experience of learning the topics, and how they discuss these topics with their middle school students. The goal is to better understand where menstrual and sexual health knowledge in middle schoolers comes from and the role parents play in that education.

Once the survey was completed, the participants were asked if they were interested in participating in a 45-minute maximum qualitative interview, which was

optional. If they indicate an interest, they were asked to provide their first name and contact information so that someone from our study team could contact them. The email address indicated in the contact information was linked to their survey answers.

For the qualitative interview, participants were chosen based on their interest, the time slots available for the interviews, and their survey responses. The interviews took place virtually over Zoom and all details, including the consent form, Zoom link, and potential time slots, were provided to the participant through email. The consent form stated that by signing up for a time slot they were consenting to the interview, but they are also asked to verbally confirm this once the Zoom session has started. The interviews were conducted by two of our team members and were audio recorded, but not video recorded. After the audio recording was transcribed, the audio file and all identifiable information for the person were destroyed.

Irrespective of their decision to participate in the qualitative interview, participants were asked if they wanted to enter their name into a lottery for a gift card after the survey was completed, and were provided a link to enter their contact information for the lottery if they chose to do so. Furthermore, if individuals participated in the interviews, they were given a second option of entering another lottery. Therefore, compensation was set up as a separate lottery system for the survey and the interview, and was designated as a $25 dollar gift certificate for every 50 people that participated in the survey, and a $25 gift certificate for every 5 individuals who participate in the interviews. The gift certificate was provided via tangocard.com and was of the participant's choosing.

Measures

Demographic Variables - Parent

Age. Participants self-reported their current age in years.

Race. Participants self-reported their race by selecting American Indian or Alaska Native, Asian, Black or African American, Hispanic, Latino or Spanish Origin, Middle Eastern or North African, Native Hawaiian or Other Pacific Islander, White, or other (please specify).

Sex assigned at birth. Participants self-reported their sex assigned at birth by selecting male, female, or intersex.

Gender identity. Participants self-reported their current gender identity by selecting man, woman, non-binary, or other (please specify).

Menstruation. Participants self-reported whether they menstruate by answering from a yes/no selection "do you menstruate?"

Sexual orientation. Participants self-reported their sexual orientation by selecting heterosexual, gay, lesbian, bisexual, asexual, or other (please specify).

Highest level of education. Participants self-identified their current highest level of education by selecting less than high school, graduated high school or obtained GED, some college, or graduated college or more.

Household income. Participants self-identified their current household income by selecting under $30,000, $30,000-$60,000, $60,000-$99,999, or $100,000 or more.

Relationship status. Participants self-reported their current relationship status by selecting married, divorced, separated, single (never married), or widowed.

Religion. Participants self-reported their religion by selecting Christian (Catholic, Protestant, or any other Christian denominations), Buddhist, Hindu, Muslim, Jewish, Sikh, Agnostic, no religion, or other (please specify).

Geographic location. Participants self-reported what state they currently reside in, choosing from a list of the 50 states and Washington, DC.

Demographic Variables - Child

Number of children in middle school. Participants self-reported the number of children they currently had in middle school as defined as 6th-8th grade.

Type of schooling. Participants self-reported what type of school their middle school aged child attended by selecting public school, private school, or other.

Grade. Participants self-reported what grade their middle school aged child is in by selecting sixth, seventh, or eighth.

Sex assigned at birth. Participants self-reported their middle school aged child's sex assigned at birth by selecting male, female, or intersex.

Gender identity. Participants self-reported their middle school aged child's current gender identity by selecting man, woman, non-binary, or other (please specify).

Menstruation. Participants self-reported if their middle school aged child menstruates by answering from a yes/no selection "does/will your child menstruate?"

Formal sexual health education. Participants self-reported whether their middle school aged child was receiving sex education classes in school by selecting yes or no.

Dependent Variables

Sexual health knowledge. A modified existing sexual health knowledge scale developed for American college students (Chi, Hawk, Winter, & Meeus, 2015) was used to measure parental knowledge of sexual health material. This 14-item measure is a series of true/false questions. Sample questions include: "After unprotected sex, more than 98% of PWM will not get pregnant if the emergency contraceptive pill is taken in the first 72 hours (*true*)" and "Withdrawing ("pulling out") the penis before ejaculating works just as well as a condom for preventing sexually transmitted diseases (*false*)". Correct answers were coded 1, and incorrect answers were coded 0. Total possible score is 14 points, and scores can range from 0 to 14 with higher scores indicating a higher knowledge.

Menstrual health knowledge. A menstrual health knowledge scale developed to test university students' knowledge on menstruation (Ameade & Garti, 2016) was used to measure parental knowledge of menstrual health material on correct/incorrect/don't know and yes/no/don't know scales. This measure has 10 items with statements such as "The typical menopausal age is between 45-50 years of age" and "Can PWM ever be pregnant during menstrual flow". Correct answers were coded 1, and incorrect or don't know were coded 0. Total scores of 0 to 4 are considered to be "poor knowledge", 5 to 6 to be "average knowledge", 7 to 8 to be "good knowledge", and above 9 to be "excellent knowledge."

Attitude towards teaching sexual health at home. A survey developed to measure sexual health communication between mothers and their daughters in Northern Nigeria (Iliyasu et. al., 2012) was revised to measure American middle school parents' attitudes towards teaching sexual health at home. The measure has 10

items with statements such as “It is *only* the mother/ mother-figure’s responsibility to inform her daughter about sexual education” and “Middle school aged boys should be informed about body changes in both women and men at puberty”. For each statement, participants provided their level of agreement with the given statement. In the original measure, three options were given (agree, neutral, disagree), and results were based on percentages +/- standard deviation. We revised this measure to be a 5-point Likert scale (1 strongly disagree to 5 strongly agree), with higher scores, a 5 for example, representing more open attitudes towards sex education between parents and children. These scores were calculated by taking the mean of an individual’s responses.

Attitude towards menstruation/menstrual health education. A scale developed to measure beliefs about and attitudes toward menstruation (Marván et. al., 2006) was used to measure parental attitudes towards menstruation and menstrual health education. This 25-item measure assesses five domains: secrecy, annoyance, proscriptions and prescriptions, disability, and pleasantness. One example question from the secrecy domain states “It is important to discuss the topic of the period at school with boys and girls together”. One example question from the annoyance domain states “Having a period is dirty”. One example question from the proscriptions and prescriptions domain states “PWM must avoid eating certain foods and drinks while they are having their periods”. One example question from the disability domain states “Having the period is a punishment for PWM”. One example question from the pleasantness domain states “There are PWM who enjoy having their periods”. For each statement, participants provided their level of agreement with

the given statement. The measure is scored on a 5-point Likert scale (1 strongly disagree to 5 strongly agree). Lower scores, 1 for example, indicate that parents are more open-minded in their beliefs surrounding menstruation. These scores were calculated by taking the mean of an individual's responses.

Confidence in discussing menstrual/sexual health. A scale developed to measure teachers' perceptions of puberty, health, and sexual education (Duffy et. al., 2012) was used to measure parental confidence in discussing menstrual and sexual health with their children. The 8-item measure assessed parents' level of confidence in discussing subjects such as menstruation and sexual intercourse. Example subjects addressed in this section include: "Naming the male and female parts of the reproductive system" and "Menstrual health and care". The measure is scored on a 5-point Likert scale (1 very unconfident to 5 very confident). A higher total score correlates with a higher confidence in discussing menstrual and sexual health with their middle school child. These scores were calculated by taking the mean of an individual's responses.

Practices. A 7-item scale on parental communication of sexual issues (Jordan, Price, & Fitzgerald, 2000) was used to measure how often they discussed given sexual health topics with their middle school child. Example topics addressed in this section include how often parents talk to their children about "How to resist pressures to have sex" and "Sexually transmitted diseases". The measure is scored on a 5-point Likert scale (1 never to 5 always). A higher total score correlates with being more open about sexual health topics with their middle school child. These scores were calculated by taking the mean of an individual's responses.

Influences. A measure developed to analyze who or what has influenced how parents currently view discussion of SRH and menstrual health topics. (Byers, Sears, & Weaver, 2008) was used to measure the communication parents received from their parents about sexual health. The 3-item measure presented participants with statements such as "I wish my parents had talked to me more about sexual health". Participants identified their agreement with the statements using a 5-point Likert scale (1 strongly disagree to 5 strongly agree). A higher total score indicates a greater overall satisfaction with the sexual education received from their parents. These scores were calculated by taking the mean of an individual's responses.

Data Analysis Plan

Mixed Methods Design

This study consisted of two distinct phases, a quantitative survey followed by a qualitative interview. This model follows the explanatory-sequential approach, where qualitative data is used in the subsequent interpretation and clarification of the results from the quantitative data analysis (Edmonds & Kennedy, 2017). In this case, our qualitative survey was used to provide numerical data for a cross-sectional study. We gathered information regarding parents' knowledge and attitudes towards sexual and reproductive health, the sources of influence on their sexual health knowledge and attitudes, and their level of confidence and practices of transmitting this knowledge within families. Following the completion of the quantitative survey, participants had the opportunity to opt into the qualitative survey. Participants were screened and selected based on varying demographics. Researchers hoped to embody

a diverse sample of qualitative interviews to provide an explanation for and expand on any observed patterns in our quantitative cross-sectional study.

Our goal was to better understand how knowledge, practices, and attitudes towards teaching sexual and reproductive health differed between various populations of parents of middle school students. Additionally, when looking at parents' sources of influence on their sexual health knowledge, attitudes, and practices we hoped to analyze these through the lens of the socio-ecological model. The qualitative interviews helped to further understand how parents learned about sexual and reproductive health, how these experiences shaped their attitudes toward sexual and reproductive health, and their current practices regarding teaching sexual and reproductive health in their home.

Quantitative Analysis

Quantitative data analysis was conducted using RStudio software. The quantitative survey is split into six measures: parents' knowledge of general sexual health topics and menstruation, parents' personal attitudes toward menstruation and how menstruation should be taught to middle school-aged children, confidence in parents' ability to talk to their middle school-aged children about menstruation and sexual health, confidence in parents' own understanding of different processes and acts involved with menstruation and sexual education, practices that parents' have used to teach their child about menstruation and sexual health, what/who has influenced how parents currently view the discussions of sexual health and menstrual education.

We chose to focus on a descriptive analysis of these data. In RStudio, we calculated percentages of populations who participated in our survey based on demographic information. This strategy was decided in order to determine if there were differences among these subpopulations of parents in terms of their knowledge or attitudes towards sexual or menstural health topics. We then determined the mean, median, and standard deviation in order to better help understand the trends of the data and each pattern studied (i.e., whether the mean was higher than the median and if there was a large deviation in responses among parents).

Qualitative Analysis

Qualitative analysis was conducted using NVivo. Our qualitative data was analyzed from the phenomenological approach, as we focused on individual experiences of each parent. Additionally, thematic analysis was employed to determine patterns between individual experiences and parents' knowledge and attitudes towards SRH and their practices of transmitting this knowledge within families (Braun & Clarke, 2006). For our study we used a bottom-up thematic analysis of our transcribed interviews. In other words, we created a variety of basic codes and drew patterns from these simple observations in order to draw a conclusion.

Interviews were transcribed from voice recordings utilizing Trint software and uploaded to NVivo. The interviews were coded based on 12 questions, which were compiled using the questions asked during the interview. For each question, each interview transcription was read and sections that applied to the question were pulled out for analysis. These responses were then codified by question. Each question was

coded by two individuals from our study team. After coding, each group met to discuss their coding. Disagreements in the coding were resolved through conversations within the team and by consulting with our mentor. Next, themes from the collective transcriptions were identified. A "theme" was defined as a recurrent underlying concept that offers a general insight from the entire data range (Gilmore, 2014). Following this, the groups were further coded into subgroups and categorized according to common themes within the subgroups (Gilmore, 2014).

Chapter 4: Results

The aim of this study was to investigate knowledge, attitudes, practices of transmission, and sources of influence regarding SRH knowledge among parents of middle school children across the U.S. using the SEM. In order to fully examine these questions, we conducted a mixed-method study. The measures in our survey focused on parental knowledge of basic menstrual and sexual health education, parental feelings about their children learning about health topics both in and out of school, parental confidence about talking to their middle school-aged children about sexual health topics, parental practices regarding sharing of information related to menstrual and sexual health topics, and who or what has influenced these parents in their views regarding menstrual and sexual health education. The qualitative interviews delved further into these topics by asking parents how they learned about SRH, how these experiences shaped their attitudes toward SRH, and their current practices regarding teaching about SRH issues in their home.

Description of the Sample

Our sample consisted of 87 participants. At the time of data collection, participant age ranged from 31 years-55 years, with 44 years being the mean of the group. Participants were mostly White (80.5%), mostly female (98.9%), and mostly heterosexual (88.5%). Approximately ¾ of parents were married (n=74) and over half of the group was Christian (60.9%). Sixty nine percent of participants earned more than $100,000 annually. The participants' children ranged in ages with 35.6% in the sixth grade, 28.7% in seventh grade, and 34.5% in the eighth grade. Most of the

children attended public schools (81.6%). Approximately 60% of participants' children were assigned female at birth and 52.9% of participants' children identified as cis-female.

Table 1: Demographics of Parents of Middle School Children across the U.S. (n=87)

Participants, No. (%)	**Total (N = 87) N (%)**
Age in years	*(1 missing)*
Over 40 (including 40)	77 (89.5%)
Under 40	9 (10.5%)
Mean	44.16471
Range	31-55
Race/Ethnicity	
White	70 (80.5%)
Non-White	17 (19.5%)
Sex Assigned at Birth	
Male	1 (1.1%)
Female	86 (98.9%)
Gender Identity	
Cis-male	1 (1.15%)
Cis-female	85 (97.7%)
Other	1 (1.15%)
Sexual Orientation	
Heterosexual	77 (88.5%)
LGBTQAI+	10 (11.5%)
Education Level	
Graduated college or more	77 (88.5%)

Some college	10 (11.5%)
Household Income	
< $100,000/year	21 (24.1%)
> $100,000/year	60 (69%)
Prefer not to answer	6 (6.9%)
Marital Status	
Single (never married)	4 (4.6%)
Married	74 (85.1%)
Other	9 (10.3%)
Religious Affiliation	
Christian	53 (60.9%)
Non-Christian	21 (24.1%)
No religion	13 (15%)
State of Residency	
New Jersey	32 (36.8%)
Maryland	26 (29.9%)
Other	29 (33.3%)
Number of Children	
1	76 (87.4%)
2	9 (10.3%)
3	2 (2.3%)
Public or Private School - Child	
Public school	71 (81.6%)
Private school	12 (13.8%)
Other	4 (4.6%)
Grade Level - Child	

6th grade	31 (35.6%)
7th grade	25 (28.7%)
8th grade	30 (34.5%)
Prefer not to answer	1 (1.2%)
Sex Assigned at Birth - Child	
Female	53 (60.9%)
Male	34 (39.1%)
Gender Identity - Child	
Cis-female	46 (52.9%)
Cis-male	33 (37.9%)
Other	8 (9.2%)

Descriptive statistics for knowledge

We asked participants to answer 14 true or false sexual health knowledge questions and 10 true or false menstrual health knowledge questions. The participants answered most of the sexual health knowledge questions correctly, as one can see in Table 2. However, two questions were answered incorrectly by a majority of the participants. Nearly 60% of respondents answered that fertilization of an egg by sperm occurs in the uterus, which is false and approximately 71% of respondents answered that an egg is viable for fertilization a week after it is released, which is also false. Respondents were fairly knowledgeable about the other 12 sexual health knowledge questions.

Table 2: SRH Knowledge Questions and Response Rates

Knowledge Questions	***Percent Correct***	***Percent Incorrect***	***Standard Deviation***
Fertilization of the egg by the sperm (conception) occurs in the uterus	40.23	59.77	0.4932043
An ovum (egg) is viable for fertilization for approximately 1 week after it is released.	28.74	71.26	0.4551526
A small amount of sperm can be released prior to ejaculation.	100	0	0
If a PWM has taken the pill for 2 years and then stops, they will have a much more difficult time getting pregnant, compared with a PWM who has never used the pill.	95.402	4.598	0.2106494
After unprotected sex, more than 98% of PWM will not get pregnant if the emergency contraceptive pill is taken in the first 72 hours.	83.91	16.09	0.3695869
Oral contraceptives* work immediately, therefore backup methods (additional methods of contraception) are not necessary when a PWM is on their first cycle of the pill.	98.851	1.149	0.1072113
During the	88.51	11.49	0.3208016

mid-cycle* part of the menstrual cycle, PWM are more fertile and therefore more at risk of pregnancy.			
Using Vaseline or petroleum jelly is a good way to increase the effectiveness of a condom.	96.552	3.448	0.1835234
A condom should not be unrolled before being put on a penis.	79.31	20.69	0.407429
Withdrawing (“pulling out”) the penis before ejaculating works just as well as a condom for preventing sexually transmitted diseases.	100	0	0
If your symptoms go away you probably don’t have a sexually transmitted disease.	100	0	0
Some kinds of sexually transmitted diseases don’t give you symptoms until 6 weeks or more after you catch the infection.	94.253	5.747	0.2340901
Only people who have lots of sexual partners get sexually transmitted diseases.	98.851	1.149	0.1072113
If you have a sexually transmitted disease, you probably got it	97.701	2.299	0.1507355

from the last person you had sex with.			

We then asked participants to answer 10 questions on a correct/incorrect/don't know scale for menstrual health knowledge. Most participants answered questions correctly, however the question with the least amount of correct responses (approximately 77%) was in regards to the typical onset of menopause.

Table 3: Menstrual Knowledge Questions and Response Rates

Knowledge Questions	***Percent Correct***	***Percent Incorrect***	***Standard Deviation***
Menstruation is the monthly flow of blood through the vagina.	93.103	6.897	0.2548645
The typical age(s) of menarche* are between 12-15 years of age.	86.21	13.79	0.3468266
Hormones are responsible for regulating menstruation.	91.954	8.046	0.2735805
The source of menstrual blood is the inner lining of the Uterus.	90.805	9.195	0.2906362
Typical number of days for menstrual	86.21	13.79	0.3468266

flow is between 3-5 days.			
The typical duration of a menstrual cycle, the first day of menstrual bleeding of one cycle to the first day of menstrual bleeding of the next cycle, is between 21-35 days.	97.701	2.299	0.1507355
Is there a period when PWM are most fertile?	94.253	5.747	0.2340901
Can PWM ever be pregnant during menstrual flow?	89.61	10.39	0.3071266
The typical menopausal age is between 45-50 years of age.	77.01	22.99	0.4231979
Poor menstrual hygiene can lead to infections	87.36	12.64	0.3342676

Descriptive statistics for attitudes, confidence, practices, and influences

Psychometric properties for the scales measuring all variables are presented in Table 4. In regards to attitudes towards teaching sexual health at home, on average parents were overall more open-minded (mean = 4.627, SD = 0.4762) when discussing attitudes towards sex education, including topics of body changes in puberty, sexuality, sexual topics, and menstrual health topics. This was based on a 10-item scale.

There was a 25-item scale employed to analyze attitudes towards menstruation and menstrual health education in which lower overall scores indicated more open-mindedness towards this topic. In general (mean = 2.117, median = 2.080, SD = 0.3298), parents leaned towards more open-minded attitudes towards menstruation. Apart from the overall analysis, there were five subscales that were also analyzed. In terms of secrecy, on average (mean = 1.665, median = 1.500, SD = 0.5465), parents were more comfortable discussing secrecy of menstrual and sexual health, i.e., that menstruation should *not* be shamed or kept a secret and that it *should* be discussed with both boys and girls. Scores for 'annoyance' (mean = 3.267, median = 3.400, SD = 0.5189) indicate that parents were mostly neutral in regards to annoyance about menstruation, i.e. that having a period is neither uncomfortable, dirty, painful, or comfortable, clean, and pain-free. When examining proscriptions and prescriptions, parents on average did not agree with the strict rules that individuals 'should' follow while menstruating, i.e. avoiding swimming, smoking, eating certain foods, or exerting energy (mean = 1.533, median = 1.400, SD = 0.6094). In terms of disability,

parents furthermore believe, on average (mean = 1.781, median = 1.500, SD = 0.8082), that menstruation is *not* disabling. Finally, the last subscale of attitudes towards menstruation was pleasantness, which, on average, rendered a mostly neutral opinion among parents (mean = 3.345, median = 3.000, SD = 0.6984), i.e. that they believe PWM are neither proud of nor ashamed of menstruation and that they neither enjoy nor dread the process of menstruating.

The final scales examined were confidence, practices, and influence. On average (mean = 4.373, SD = 0.7235), parents felt very confident when discussing menstrual and sexual health education with their children, including reproductive anatomy and systems, physical changes, menstrual and sexual, sexual intercourse, and pregnancy and fertilization. Subsequently, scores for 'practice', or the act of passing down generational knowledge of menstrual and sexual health, (mean = 3.286, SD = 0.8428) indicate that parents are sometimes discussing topics of menstrual and sexual health; they are typically not always having these discussions, but they also are typically not *never* having these conversations. Topics discussed in these conversations include menstruation, reproduction, contraceptives, waiting to have sex until marriage, resisting pressures of having sex, STDs, and the use of condoms. Finally, parents felt as though the influence on their personal sexual health education was relatively satisfactory, but not overly satisfactory, as indicated by a somewhat neutral score (approximately 3) on a 5-point Likert scale (mean = 3.390, SD = 0.5514).

Table 4: Psychometric Properties for Attitudes, Confidence, Practice, and Influence Scales

Constructs - Attitudes, Confidence, Practice, & Influence	***Mean***	***Median***	**SD**
Attitudes towards teaching sexual health at home (10-items)	4.627	4.800	0.4762
Attitudes towards menstruation/menstrual health education (25-items)	2.117	2.080	0.3298
Confidence in discussing menstrual/sexual health (8-items)	4.373	4.500	0.7235
Practices (7-items)	3.286	2.671	0.8428
Influences (3-items)	3.390	3.500	0.5514

Qualitative Results

We conducted a total of 6 qualitative interviews. Each participant was given a pseudonym to protect identities. Keisha is a 37-year-old African-American female, Maria is a 41-year-old Hispanic female, Molly is a 42-year-old White female, Cindy is a 45-year-old White female, Margaret is a 55-year-old White female, and Sarah is a 55-year-old White female. All six participants identified as ciswoman/cisfeminine and heterosexual. One participant had completed some college while the others reported graduating college. Three of the women reported an annual household income of more than $100,000, two of the women reported an annual household income of between $60,000 and $99,999, and one woman reported an annual household income of between $30,000 and $60,000. Four of the participants are married, one is divorced, and one is single and never married. Four of the participants identify as Christian, one identifies as Pagan, and one identified no religion.

Findings

While reading each interview transcript, we coded the interviews using a deductive approach (i.e., initial codes were developed within the research questions and we were open to the possibility of new codes or themes emerging from the data). Overall, there were ten overarching themes that manifested in participant interviews. They are presented below along with salient quotes from the study participants.

Sources of sexual and reproductive health education

The participants identified school as their main source of formal SRH education. Several participants discussed what they learned at school and when this information was presented. Most of the participants cited middle school and high school when asked when they received their formal sexual and menstrual health education. Molly and Keisha first received any sort of formal sexual or menstrual health education in 6th grade of middle school. Molly's first experience consisted of a brief section about menstruation during a PE class. Keisha first received any formal sexual or menstrual health education in the 6th grade, but she pointed out that it was brought up again in a health class in 7th grade and then in another health class when she was a sophomore in high school. Cindy claimed that she actually received her first "period talk" at school in the 5th grade. Meanwhile, Maria didn't receive her first formal education until high school. She shared,

> Health class for our freshman year was a year-long health class that went through the reproductive system of both genders, talked about everything from the menstrual cycle, STDs, to everything that happened from conception to birth all across the full year.

Our qualitative interviews showed that there was a wide range of when formal sexual and menstrual education took place, from 5th grade to sophomore year of high school, with most happening in middle school and high school. It can be noted that some participants (Molly, Margaret, and Sarah) recalled the boys and girls being separated during their formal SRH education. Molly reflected on how it was to be separated from the boys and be in a room with just the girls learning about the reproductive system for the first time:

> They separated the boys and the girls, and we went in and watched the video and had the conversation about it… all the girls that were in the 6th grade with me were all giggling and laughing and thinking it's really funny because we're just uncomfortable and don't understand what's going on.

While school was identified as the main source of formal SRH education by the participants, there were various types of informal education that took place as well. A couple participants brought up books as a way in which they informally learned about sex and menstruation. Molly mentioned the impact that the Judy Blume books had on her as a child. She disclosed, "I had read the Judy Blume books…so my concept of menstruation at that point in time was very much kind of rooted in that." Keisha also shared with us that she read some books regarding sex/menstruation, but failed to be able to recall any titles. Sarah remembered reading books specifically about sex and reproduction. She stated, "I do remember books that were more about sexual development and intercourse and things like that, I do not remember anything specifically about menstruation."

Another major source of informal education that was identified was family. All of the participants mentioned their experiences with their family during their interviews, and answers ranged widely from family having barely any influence to family having the major influence. Molly, Cindy, Maria, and Margaret all had the similar narrative of their family not discussing sex or menstruation much if at all. Cindy explained how her family's religion had an influence by saying, "I grew up in an Irish Catholic family…talking about sex wasn't something that was done in my family." Margaret had a similar religious upbringing and received minimal and vague information from her mother. She claimed that her mother wasn't telling her anything, but one thing she did tell her was that she couldn't wear a tampon because she was a virgin. Maria explained how her ethnicity played a role in her family's discussion of sex, or rather lack thereof:

> I come from a LatinX family, and sex is not something you talk about. It's not something we were taught that you should be doing or anything. So, there was no need to speak about it because it's not anything you can do.

Cindy's, Margaret's and Maria's experiences show that cultural values based on one's religion and ethnicity have an influence on what information related to SRH may or may not be discussed within families.

Parents were identified as a main source of informal SRH education. While most of the participants had little to say about the extent to which their parents told them about sex and menstruation, Molly first learned about menstruation from observing her mother:

> My extent of learning about menstruation from my mom was when I was young enough to be following her into the bathroom. And now I know she was on her period. But you know, she stood up and I was like, "Oh my gosh, mom, it looks like there's blood in there". And she said "Well, it is, and someday you'll bleed from there too." And that was the only discussion we had about it.

This excerpt shows how impactful observational learning was, especially from a mother to a daughter. Keisha was the only participant that seemed to have the most conversations with her parents about sex and menstruation. She remembered her parents talking to her about these topics, but she thought that they also tended to rely on what she was learning in school and trusted that what was covered in school was sufficient. Keisha also discussed that her parents had different roles in educating her. She shared, "When I did talk to my parents, I think for more of the menstruation side was my mom and more of the sexual health was my dad." She was the only participant to specifically mention her father's role in her informal education.

Siblings and friends were also found to play a significant role in informal education. Cindy grew up with four older sisters and explained their influence on her by stating, "I'm the youngest, I have four older sisters, so they were a great resource. I think that was helpful in shaping me." Margaret also learned from an older sister. Her sister would tell her about things when she was going through it, so Margaret then felt more prepared when it happened to her. Similar to siblings, friends also had an important influence on our participants in their formative years. Molly, Margaret, Sarah, and Keisha all mentioned that their friends had some influence on their

informal learning. Asking friends questions and talking to friends were mentioned by these participants, showing that a significant amount of informal education may occur by talking to peers.

It is hard to say whether most education received by these participants was formal or informal. While Molly claimed that most of the sexual and reproductive content she learned was through school and Maria received a very thorough formal education through her high school, Keisha claimed that her education was mainly informal. Keisha said “I would frame my education as both formal and informal, informal probably accounting for the majority of it.” Based on the small sample size, we cannot conclude whether formal or informal education was the main source of influence, but we can suspect that a lot of learning happened in informal settings like from family, friends, and media.

When discussing sources of information, one parent in our study highlighted a critical difference between their experiences and that of their kids. Molly spoke at length about the role of cell phones and social media currently plays in her child’s SRH education. She provided an example of nude photos sent online, which are a large part of sexual culture today but was not possible when she was in this age group. She also highlighted that social media has and is exposing this age group to behaviors they may have otherwise not known about. She stated,

> These are things that wouldn't have occurred when I was in junior high because we didn't have phones, like the cell phones didn't exist. Taking a picture was you got out of film camera and your parents took the film and had it developed. So, you know, that type of thing wasn't as common... And so, I

> think there really should be something kind of in the sixth through eighth grade curriculum where they're all getting to be legal age, to be on social media. A lot of them have been on it before, but that's where I see a lot of the kind of problems happening and just in that they're putting themselves in harm's way, both in terms of pictures or pressure to do things that maybe they aren't ready for, but kind of hearing that everybody else is doing it, so you should be too.

Quality of sexual and reproductive health education

Participants gave mixed responses when discussing the quality of the formal education they received. One participant, Maria, felt that their school provided helpful guidance on SRH that they were not being taught at home. Maria emphasized the importance of her formal education regarding SRH and the guidance she received from her high school health class, "The high school I went to was an all-girls school, and they were very good at explaining things that my family would not explain… And so, it was very informative, very thorough, and very needed." Maria went on to share how her formal education had shaped her view on SRH related topics and the value of the information she had learned in her health class. She stated, "…felt natural to talk about…felt very pertinent to what was going on in our lives…I wish everyone could go through health class the way I went through that health class…"

However, many of our participants did not receive a relatable SRH education class like Maria's. Many of our participants felt discontentment with their formal SRH education due to it being overly clinical. We found that schools were wary of presenting non-clinical information regarding SRH to students. Cindy commented on

her school's SRH education class and said, "...they were very, very specific about not talking about pleasure, not talking about anything related to intercourse or any sexual activity. It was...very technical…" Cindy added that since her family was not addressing these topics at home for religious reasons it was helpful information to receive formal education around SRH at school, however, the information that she received negatively impacted her feelings of normalcy regarding these topics. Another participant, Keisha, also commented on the issue of overly clinical SRH education that she received and how it limited her ability to relate or apply any of this information to her own experiences:

> It felt very clinical for the most part, at least for menstruation. It was just like, "These are these body parts and this is what happens." But there wasn't always a great conversation to be had about what do you do when this happens?

Overall, most participants found formal education to be overly clinical and as children they found the information to be incomprehensible. Many participants expressed an interest in learning about topics such as relationships, sexual behaviors, and consent during their formal SRH education. Keisha's comment exemplified this sentiment well, "I definitely think across the board having more practical conversations, especially around the decision, whether to engage in sexual behaviors and consent like that was not really a thing." She further shared that she did not receive information about consent and sexual behaviors until college.

Influence of one's own education on transmitting knowledge to one's children

Many of the participants in this study shared that the sexual and menstrual education that they are providing to and hoping to provide to their children is very different than the education that they received from their parents. Cindy disclosed, "My first influence was learning what not to do from my parents." Molly identified a generational shift in openness stating that the conversations about struggles she was having with her child--both related to menstrual and sexual health and not related--were much more open than the conversations she had with her mother. Keisha echoed this sentiment of more-openness nowadays compared to when she was growing up and highlighted that she wanted to be open with her child and be the go to person for them.

> I want her to be able to come to us for better or for worse. I want us to be able to be proactive in terms of educating her, having her be prepared if she decides to engage in sexual activities with anyone. I want her to know that we are there for her, so [if] she has questions and she ran into issues, we are the first person. We're the first people that she turns to and not. I don't want her to feel like she's alone and has to navigate things by herself. And so that's a big part of it for me. I didn't feel like I really had the space to do that without judgment.

This theme of feeling responsible to transmit menstrual and sexual health education was repeated by multiple participants. Molly noted this feeling and highlighted her tactic with her child was harm-reduction focused on assisting her son with navigating day-to-day scenarios and supplementing the education provided in

schools. Molly also has a much younger daughter and hoped to have open conversations with her as well. Cindy highlighted that as her child grew older the conversations needed to change to reflect the scenarios and needs in their child's life.

Margaret identified a theme not reflected by other participants. She highlighted that her upbringing with a mother in the medical field lead to a certain level of detachment from her body making the emotional side of sex more challenging. She expressed a desire to address that with her child.

> The technical stuff is the easy part. It's the vulnerability and emotional part...being okay to want it for yourself, but you have to be in a good place about it, it can't be for someone else...that's the hard stuff...I realized that there was a lack of that, and I want to make sure I address that with her.

Quality of sexual and reproductive health education experienced by their children

All the participants highlighted the importance of school in transmitting information on SRH. However, as described previously, only one participant, Maria, believed that her school when she was young provided adequate menstrual and sexual health education. Many of the participants believed that the current menstrual and sexual health education in their child's school was very clinical and biology focused and two thirds identified a need for the teachings to go more in depth in a wide variety of ways including topics of discussion, timing of the discussions, and methods of delivering this information.

One theme highlighted by two participants was the separation of girls and boys during menstrual education. Molly shared that her son along with other boys in his class received an explanation of a menstruation video geared towards the girls, but

was not provided the opportunity to watch the video. Cindy noted a similar trend with her son in which menstruation education was provided in the 4th grade for girls but no education was provided for the boys and noted this as a disservice.

> There was this assumption that the fourth-grade boys were going to be too immature to handle puberty, at which I think that's a big cop out...I think we need more training… I think we need to do more work with the boys.

She also highlighted the inaccuracies behind this training as "not all penis owners in the class identify male." Molly identified a large gap in timing for sexual education in her child's schooling. She was supportive of menstrual health education beginning in 5th grade, as opposed to 6th as it had when she was in school, because many girls start menstruation during 5th grade. However, she believed there were a few years in which minimal learning occurred, which was a missed opportunity. She said, "I think there should be something kind of in between that initial, hey, here's what's going to happen as you hit puberty and then whatever they're going to get in high school."

Keisha summarized many of the themes shared by several participants regarding the content and timing of current curriculum related to SRH and students not being supported during this phase of transition.

> I just don't think they go far enough to really support students from a social perspective, like I think sometimes curriculum can still be very naive in terms of what students are actually facing. So, excuse me. I think the conversations need to be had earlier. I think sometimes we wait until high school to have the conversations about sexual behaviors when you should start early…Just kind

> of anecdotally, I feel like students are engaging in sexual behaviors earlier. And so really giving them the tools to understand the implications of their decisions earlier, making sure they have the tools and resources at their disposal as early as possible would be something that needs to happen.

When asked about specific menstrual and sexual health education topics that they believe should be covered in school but are not currently being taught, many participants provided concrete topics that they believe should to be added into the curriculum. Molly shared that the education needed to be provided on non-traditional relationships such as same sex and polyamorous relationships. Cindy wanted more discussion on exploring gender identity, negotiating dating and relationships, and aiming to answer the age-old question of "Am I normal?" to better cater towards the emotional needs of the middle-school population. Sarah echoed these sentiments and shared that education needed to be less technical and more open-ended to guide students through real scenarios they may struggle with. She highlighted that children of this age were not aware of issues such as consent and other real-life scenarios. She also suggested implementing guided peer-to-peer conversations about these topics. Keisha also discussed the importance of consent, [STI] protection and pregnancy prevention, as well as an avenue for dispelling rumors shared between students. Margaret similarly believed that rumors needed to be addressed and highlighted songs and music as a source of some of these rumors.

Sarah identified a gap in knowledge for parents when assisting their children related to new menstrual products. She would love for the schools to also provide guidance for parents for teaching about these new methods.

> There's so many new products in terms of new for me, you know, like the things underwear and like the diva cups and, you know, things that are alternative to just the patterned tampon that I grew up with...I would love for her to try those, but I never did. So, I don't even know how to guide her on that other than like, you can just try it...maybe in terms of menstrual education at school, if they could introduce, I mean, they never would, you know, or educational materials for even parents are kind of more how-tos for some of these.

Main Findings

The results from our survey found that the participants were mostly able to answer sexual health knowledge questions correctly. Two commonly missed questions were about fertilization. Participants typically agreed that menstruation should not be shamed and that it should be discussed with both boys and girls. Our participants were fairly open-minded when discussing attitudes towards sex education and felt very confident when discussing menstrual and sexual health with their children. Overall the participants felt neutral in regards to the pleasantness of menstruation. Parents were also found to not always be having discussions with their children about menstruation and sex but but also not never having these conversations.

The results from the qualitative interviews found that school was the main source of formal sexual and reproductive health education among our participants and that it typically took place in middle school and high school. Some participants also emphasized that the boys and girls were separated during this formal education.

Several methods of informal education were found. Books were cited as an important source of informal education and one example that was given was the Judy Blume books. Family was also identified as an important source of informal education but there was variation in how much was actually spoken about in the home. Some Catholic participants and the sole LatinX participant shared that there was minimal information that was discussed within their families. Specifically, parents, siblings and friends provided means of learning through observation and conversations. Overall, there was a mix of formal and informal sexual and reproductive health education. There were also mixed opinions on the quality of education that was received by our participants. Some found the information they received very relatable and informative, others found it overly clinical and incomprehensible. It was found that many of the participants hope to provide their children with SRH education differently than they received from their parents and have learned what not to do from their parents. Overall there were shared feelings of being responsible to transmit menstrual and sexual healh education on to their children. Participants noted that there was also separation of boys and girls at their children's schools during formal SRH education. Participants also identified a gap in timing for sexual education and expressed some topics they think should be included, including non-traditional relationships, gender identity, negotiating dating and relationships, consent, addressing rumors.

Chapter 5: Discussion

Introduction

Our study sought to look deeper into what parents know about sexual and mesntrual health and how they are sharing that information with their children. Specifically, our a mixed methods study focused on the following three questions: (1) What are parents' knowledge and attitudes towards sexual and reproductive health, including menstruation? (2) What are some of the sources of influence on their sexual health knowledge and attitudes? (3) What is the practice of transmitting this knowledge within families? We will discuss the major findings of each question based on our quantitative data first, followed by qualitative data.

Attitudes and Knowledge

Data from our online survey revealed that most respondents were fairly knowledgeable about the topic of sexual health, answering the majority of questions correctly. Only two questions were answered incorrectly by the majority of respondents, as can be seen in Table 3, both questions relating to the biological mechanics of fertilization. We also found that the majority of parents were confident in discussing menstrual and sexual health education with their children. Many survey respondents believed that menstruation is not a shameful topic and should be discussed with both boys and girls. The responses from our online survey and our qualitative interviews will allow us to dive deeper on how parents' sources of education influence their knowledge and attitudes on the topic from adolescence to adulthood.

Sources of Influence

Data from our online survey revealed to us that respondents' personal sexual health education had an influence on their knowledge on the topic. Qualitative data revealed to us that parents received their education at various times in their childhood and cited school as a primary source of formal sexual and menstrual health education; while they cited family, friends and the media as primary sources of informal education on the topics.

Formal Sources

Qualitative interview participants discussed what they learned at school, when they received it, and the extent of the information they were taught. Many participants stated that they had received formal education in middle school and high school, however, the exact grade in which they received this education varied. Some participants, like Molly and Keisha, noted that menstruation would only be mentioned briefly in middle school and would only be discussed in depth once they got to high school. However, other participants expressed that they received education on menstrual topics either before or after middle school. One participant, Cindy, told us that her first "period talk" happened when she was in 5th grade, while Maria did not receive formal education on the topic until high school. These findings show us that while many depended on school to teach them about topics pertaining to sexual and menstrual health, the timing in which they recieved this happened inconsistently depending on where they were receiving this education.

Much of the existing literature on this topic has demonstrated that knowledge of menstrual and sexual education among parents is greatly impacted by their

individual education, which is then amplified by the variation of information taught in each school. Our results are consistent with the notion that this education can differ greatly across communities within the U.S (Sumpter & Torondel, 2013). Studies also show that the menstrual health information taught in health classes has been seen to cause a divide between boys and girls (Allen et al., 2011). Consistent with this finding, some of our participants reported that girls and boys were separated during their formal SRH education. This separation raised mixed feelings among respondents, one of which reported that it was an uncomfortable and confusing experience. Some respondents also reported that their SRH education classes were not "relatable," and these experiences caused participants to feel dissatisfied with the education they received on the topic. The implications of this may be that this same uncomfort and separation could be carried into adulthood, as some literature has revealed that negative past experiences were associated with less accurate menstrual knowledge and with viewing menstruation as debilitating (McPherson & Korfine, 2004).

Informal Sources

During their interviews, participants also shared several informal sources that were significant in shaping their current knowledge and attitudes on menstrual and sexual health topics. Several parents spoke about how books were often used as an informal source of education on menstrual and sexual health topics. For example, Judy Blume books played a significant role in Molly's understanding of menstruation as an adolescent. Keisha and Sarah also shared the importance of books in their SRH-related knowledge. These responses revealed to us that books were likely a

significant source of informal education. The literature, however, did not mention the importance or significance of books when discussing informal sources of education. This may indicate that more research needs to be done on how books can influence parent's knowledge, attitudes and beliefs on menstrual and sexual health topics.

Another major informal source of education was family, especially parents. Many participants stated that observational learning really shaped their attitudes on the topic. Four participants told us that their families barely discussed sex or mensturation, if at all. Cindy and Margaret spoke to how their families' respective religious beliefs contributed to their discussion on the topic; Cindy expressed that her family did not discuss sex and Margaret told us that she received vague, minimal, and inaccurate information on sexual and menstrual topics. Maria also spoke of how her Latinx identifying family did not have these conversations with her as it is standard in her community for sexual topics to be ommitted, seemingly as a preventative measure.

These responses revealed to us that the values a parent holds, formed by both religious and/or cultural norms, can influence the information they decide to include or omit when discussing sexual and menstrual health topics. The literature has also shown us factors such as ethnicity, religion, and region within the U.S. have influenced the practices parents use when teaching of sexual and menstrual health to their middle school children (Alcalde & Quelopana, 2013). Furthermore, the literature demonstrates that communities of Latin American descent are more likely to experience discomfort discussing these topics with their children, which is likely due to the cultural emphasis on innocence of women and the large influence of

Catholicism (Alcalde & Quelopana, 2013). While our findings are consistent with the themes reported in the literature, we are unable to elaborate on whether the said cultural emphasis on a women's innocence or cathlolic norms were an influencing force in Maria's case.

Maria's response does reveals to us that religious and/or cultural beliefs can intersect with one another, and influence the interpretation of teaching of sexual and menstrual health related topics as shameful or forbidden. More research needs to be conducted to understand the role of religious and cultural beliefs in the development of menstrual and sexual health practices, as well as their influence on families and their discussions surrounding menstrual and sexual health education.

Participants also discussed the roles that friends, parents and/or siblings had in their education on menstrual and sexual health. Kiesha was the only participant who specifically discussed her father's role in her informal education, while Cindy talked at length about how her sister would discuss topics related menarche, menstruation, and sexual health as she was going through it herself. Four participants also shared with us that conversations with friends and peers were a common way they informally learned about these topics. In the literature, we only saw a few mentions of how affinity groups played a large role in education on this topic, and that it is specifically common in African American communities of women (Cooper & Koch, 2007). We interviewed only one parent who identified as an African American, Kiesha. She was one of the four participants that spoke about the role of affinity groups in her life. The other three participants who spoke about the role of affinity groups in their life were White. This finding suggests that dialogue between friends

and peers plays a larger role in the development of menstrual and sexual health knowledge than is highlighted in current literature and should be investigated further.

Ultimately, we were unable to conclude whether formal or informal education was a main source of influence for parents in our study. However, our research highlights testimonial evidence that merits further research into the significance of informal sources of learning sexual and menstrual health education.

Knowledge Transmission Practices Within Families

Data from our online survey revealed to us that parents discuss sexual and menstrual health topics occasionally with their children, which includes conversations about menstruation, reproductive, contraceptives, whether to wait until marriage to have sex, sexual pressures and how to resist them, STD's and contraceptive use. While the practice of having these conversations with their children was occasional, the parents did express confidence in having these conversations.

The 6 participants who completed qualitative interviews highlighted the importance of open conversations within families to supplement the teachings in school. Some participants revealed that they have regular conversations with their child regarding what they are learning in school, as well as any questions they may have or clarifications they may need. Overall, participants expressed a strong duty to educate their children on the importance of sexual and menstrual health. Some participants felt this duty as a result of the discomfort they felt as a child in having discussions surrounding menstrual and sexual health with their families. One participant, Sarah, also expressed the desire for schools to provide guidance for parents that could aid them in educating their children on these topics. She suggested

schools implement guidance that would help parents learn about the newer menstrual products and methods that are used today.

These interviews, along with data from the survey, reveal that sexual health is a topic parents tackle personally with their children, when the occasion calls for it. These results also demonstrated that parents willing to participate in our study were also more willing to have conversations about sexual and menstrual health. This is consistent with a finding in the literature which stated that parents who described themselves as having a more open sexual attitude were more likely to score higher on sexual knowledge questionnare, and thus would be willing to learn more about SRH topics to better inform their children (Shin et al., 2019). One participant, Cindy, highlighted her experience as health educator at planned parenthood which likely influenced her desires to participate in the interview. With this likely participation bias in mind, the interviews were used to supplement the findings of the study and get a more in-depth view of specific methods parents use for educating their children on sexual and menstrual health topics.

Limitations and Strengths

With respect to qualitative interviews, our study is limited based on the number of participants and participation bias as the individuals included in the qualitative interview chose to participate. Our participants did not represent the range of diversity that would be conducive to making conclusions on the attitudes of parents regarding menstrual and sexual health education within the U.S. In the process of reviewing the data collected over the course of our survey, we recognized that an overwhelming majority of respondents were cisgender, White, and heterosexual. Our

sample primarily consisted of White mothers who were married and college educated. Nearly 70% of our sample reported a household income of more than $100,000.

Despite outreach efforts involving a wide range of mediums through which potential survey participants were contacted, we still found marginalized gender, sexual, and racial identities to be underrepresented in this study. This problem is further compounded by the amount of data that we were able to collect over the survey period. With a sample size of 87, we were limited in the scope of our analysis and the applicability of our results to a wider population.

A final pitfall of our data collection is that we only presented descriptive statistics in our data analysis. In the future, it would be beneficial to also include statistical analyses, such as correlation studies and ANOVA tests. This would allow a greater understanding of the data collected and would allow researchers to conclude, with more precision, statistically significant patterns in the data.

Additionally, we presume that by filling out the survey, especially without a direct monetary incentive, participants of our survey and consequently, our qualitative interviews, were already open to discussions around the topic. A potential participant who experiences discomfort around the entire topic of menstrual and sexual health, or may not have an open dialogue with their child surrounding the topic, may not feel inclined to fill out the survey or be reached out to further. Future research needs to address diverse communities and the experiences of their members in acquiring SRH knowledge to better understand persisting attitudes on the topic, and the influence ethnicity and culture may have on an individual's introduction to SRH.

Despite its limitations, our study has several strengths that address the issues we have witnessed throughout our research. Throughout the course of our study, in the preliminary research phase, we noticed a lack of research concerning parental attitudes surrounding SRH. Additional literature explained that parents were typically a significant influence in the development of a child's SRH knowledge, therefore our team desired to further investigate what factors influence parents in their discussions about SRH with their children. Our research has filled a gap in literature that we experienced, and hopefully lays the foundation for any additional findings that can be made on the matter.

Additionally, our study's mix of quantitative and qualitative research methods gives an intricate and more accurate analysis of our respondents' answers. The quantitative data gathered by our survey produced a larger, standardized set of responses, while our qualitative data, gathered by our interviews, produced a smaller set of data, but contained testimony that contextualized our survey findings. Overall, our mixed-method approach to research has aided us in presenting our limited findings with as much depth as possible.

Equity Impact Statement

Preliminary research supported the hypothesis that people of different races, genders, religions, and socioeconomic backgrounds received different SRH and menstrual health education compared to one another. We wanted to look closer into this, asking parents their opinions on the SRH and menstrual health knowledge that they received and that their children are receiving to see if there were any differences between the knowledge of current middle school parents and their kids. While we

were able to fill a large research gap with what we did find, we were unable to contribute to the current gaps of knowledge pertaining to the experiences of people who hold marginalized identities. We hope our work will inspire others to pick up where we left off and continue to diversify the data found in current literature on this topic.

Future Research

A primary intention of this study is to present information that can be utilized in the development of menstrual and sexual health programming for parents to better support their children as they go through puberty. Further research can take aim at addressing the issues outlined in our limitations, primarily those involving the size and diversity of our sample. In a study where in-person data collection is more feasible, outreach efforts can meet potential participants where they are. Cultural centers, majority-minority schools, and community newspapers may all serve as viable places to collect data that is more representative of the target population. Additionally, more time can be taken to collect data in order to present a more robust sampling that allows for greater application to the general public.

Given the social and political aspects of our study, further research can set an intention of influencing legislative reforms that expand menstrual and sexual health knowledge to a larger segment of the population. The research presented in this paper highlights an understudied issue in the U.S. menstrual and sexual health programmatic initiatives for parents and students alike, as well as educational material for parents that can be used to teach children at home. The parents we spoke to expressed a desire for schools to begin expanding the scope of their SRH

curriculum, to better equip students to handle the everyday scenarios they may face. Our qualitative participants witnessed the changes in society that have taken place since they were children and grappled with questions surrounding SRH. A parent we interviewed admitted that they feel unprepared to teach their children about products that didn't exist when they were younger, such as a menstrual cup. Another parent wishes their child would learn the emotional implications of sexual behaviors, and how to navigate modern relationships.

This study and its participants have highlighted the shortcomings of schools' SRH education, and evokes further thought on the adaptability of SRH curriculum to rapidly evolving society. Further research could be done on the portrayal of SRH education in school, and how it influences the role SRH behaviors play in the lives of students.

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