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Pregnancy Preferences and Contraceptive Use Among Adolescents and Young Adults in the Southwest United States

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Pregnancy Preferences and Contraceptive Use Among Adolescents and Young Adults in the Southwest United States

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Dedication and Acknowledgements

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Pregnancy Preferences and Contraceptive Use Among Adolescents and Young Adults in the Southwest United States

Sarah Nathan

Abstract

Background: The pregnancy desires of adolescents and young adults are not well understood, as researchers and health care providers have traditionally assumed that individuals in this age group want to solely prevent pregnancy. Efforts to promote reproductive autonomy and promote contraceptive use may have been misguided as they relied on research data based on this assumption. Traditional methods for assessing pregnancy intention use retrospective and binary measures that do not capture the range of feelings around pregnancy. Development of a new validated measure, the Desire to Avoid Pregnancy (DAP) scale, allows for a more holistic perspective, representing a range of pregnancy preferences.

Methods: This dissertation study is a secondary analysis of data from the Attitudes and Decision After Pregnancy Testing (ADAPT) study, which recruited participants from March 2019 to October 2022. Using the subset of participants aged 15 to 24 years old at enrollment (N= 1,020), pregnancy preferences were measured with the DAP scale and various demographic, contextual, and economic participant characteristics were analyzed in relation to these preferences and contraceptive use. This dissertation research described the range of youth pregnancy preferences and investigated factors associated with these preferences. The degree to which pregnancy preferences are aligned with contraceptive use was studied and whether these preferences mediated the effect of contextual factors on contraceptive use. Subsequent analysis investigated participants whose pregnancy preferences did not align with their contraceptive use, to identify individuals who may be at risk of compromised reproductive autonomy.

Results: Young people had a range of pregnancy preferences, including a high desire to avoid pregnancy, ambivalence, and a low desire to avoid pregnancy. Factors significantly associated with greater desire to avoid pregnancy were identifying as White (compared to Latine), having depressive symptoms, being enrolled in school, having a mother with higher educational attainment, and not having a main partner (compared to being in a high quality relationship). Factors significantly associated with more openness to pregnancy were having one child (compared to none) and being religious. Contraceptive use was more likely among youth who wanted to prevent pregnancy. Interestingly, both youth in high quality relationships (compared to no relationship) and religious youth were more open to pregnancy yet more likely to use contraceptives. As pregnancy preferences acted as a suppressing mediator for these two variables, the degree to which these participants are more likely to use contraception becomes more notable. At some points during the study period, participants' pregnancy preferences did not align with contraceptive use and a few participants' characteristics were associated with these discordant relationships. Contraceptive use declined by increasing age for both those who wanted to prevent and those open to pregnancy. Among those with a greater desire to avoid pregnancy, those not in school or not in a relationship were less likely to use a contraceptive. Among youth open to pregnancy, multiparous participants were more likely to use a contraceptive.

Conclusion: Having a more nuanced understanding of how youth pregnancy preferences are shaped by contextual factors and how, in turn, these pregnancy preferences impact contraceptive use can help to direct policy to help meet the reproductive needs of this population.

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Chapter 1: Introduction

Research studies have commonly defined unintended pregnancies as those that either happened sooner than desired or were never wanted (Kost et al., 2023; Tsui et al., 2010). A recent nationally representative study of the United States showed overall declines in the proportion of pregnancies that occurred sooner than desired, declining 18% from 2009 to 2015 (28% to 23%) (Kost et al., 2023). Among youth, 15 to 19 and 20 to 24 years old, there was a significant decline in those reporting having a pregnancy sooner than they desired, with the largest proportion of decrease in the youngest group (34% to 18%) (Kost et al., 2023). Increased use of highly effective contraceptive methods has contributed to this decline (Kavanaugh & Jerman, 2018; Kost et al., 2023). While these declines are evident, youth pregnancy remains a debated public health topic.

Pregnancies in youth are often assumed to be unintended and labeled as a public health issue due to a perceived negative impact on the individual and society at large (Furstenberg, 2007). Teenage mothers have been framed in medical literature as being a burden on their families and the broader society and to blame for getting pregnant (Breheny & Stephens, 2010). Pregnancy prevention strategies have therefore been a cornerstone of efforts to fix the problem of adolescent pregnancy (Gubrium et al., 2016). Young people can also desire a pregnancy or be ambivalent and it is important to understand the range of preferences in this population to better serve their healthcare needs. Research is necessary to help illuminate the preferences of youth and focus policy on meeting their reproductive goals instead of focusing solely on pregnancy prevention.

Consequences of Unintended Pregnancy

A consensus is lacking in the literature regarding the consequences of unintended pregnancy in people of all ages. Individual studies have found that those who continue unintended pregnancies to birth have an increased risk of low-birth weight babies, preterm deliveries, and the children have an increased risk of mental and physical health problems as compared to those with intended pregnancies (Finer & Zolna, 2016). However, Gipson et al. (2008), in a systematic review of the literature, found that evidence is limited and inconsistent that unintended pregnancies lead to adverse maternal or fetal health outcomes. Hall et al. (2017), conducted a systematic review on pregnancy intention and pregnancy outcomes (miscarriage, stillbirth, low birthweight, and neonatal mortality), finding an association between unintended pregnancies and poorer pregnancy outcomes. However, the authors note that the analysis is limited by the lack of studies on certain outcomes, inconsistencies in defining unintended pregnancy, and methodological flaws that fail to adequately account for mediators or confounders in this relationship (Hall et al., 2017).

Defining Unintended Pregnancy

Framing pregnancy as intended or unintended does not capture the complete range of feelings (Aiken, Borrero, et al., 2016; Rocca et al., 2018). Research has shown that women can be ambivalent about pregnancy and when given more survey options to convey their feelings, they are more likely to express this ambivalence (Kavanaugh & Schwarz, 2009; Schwarz et al., 2007). Providing more than a choice of intended versus unintended allows for a more complete understanding of the individual's perspectives.

Another problem in construct definition is that many studies combine mistimed and unwanted pregnancies into one category, which is problematic because not all unintended

pregnancies are undesired (Aiken, Borrero, et al., 2016). Without separating mistimed and unwanted pregnancies nuance was missed in the analysis, potentially obscuring results (Aiken, Borrero, et al., 2016). Pregnancy desires can also change once a person is pregnant. Aiken, Westhoff, et al. (2016) found that the feelings of the individual when they became pregnant was a better predictor of having an abortion, compared to the intention of the pregnancy, highlighting the importance of not conflating these two concepts. An unintended pregnancy can be desired once it is a reality.

Similarly, wanting a pregnancy once it has occurred can be different from planning for a pregnancy, as planning may not be relevant or possible for some people (Aiken, Borrero, et al., 2016; Arteaga et al., 2019; Trussell et al., 1999). In a qualitative study, Arteaga et al. (2019) found that both young men and women ages 18 to 24 years believed that planning a pregnancy is difficult without financial or career security. Many participants believed that while they may not be planning a pregnancy, if one occurred it would not be unwelcome (Arteaga et al., 2019). This reinforces the need to consider the many elements involved in individual pregnancy planning and intent. Inconsistencies and flaws in both defining and capturing the nuances make interpreting data for this phenomenon challenging.

Measuring Unintended Pregnancy

It is important to differentiate between the various methods used to measure pregnancy intention. Pregnancy intention can be measured with retrospective or prospective measures. Population measures, like unintended pregnancy, are commonly assessed with large national cross-sectional surveys that use retrospective measures (Tsui et al., 2010). The benefit of this approach is having access to large data sets that inform population level public health measures. Downsides to a retrospective approach that may introduce bias into the results include:

participants may find it difficult to remember how they felt when they got pregnant, they may be hesitant to report that a pregnancy was unintended, or they may feel differently after having a baby (Kemet et al., 2018).

Studies comparing prospective to retrospective measures have shown that participants are more likely to report that a pregnancy is more intended once it has occurred, indicating that retrospective measures likely underestimate unintended pregnancies (Rackin & Morgan, 2018; Ralph et al., 2020). A prospective measure, asking participants their feelings about a future pregnancy, eliminates this potential bias. However, downsides of this approach are the costly nature of doing longitudinal studies and that preferences change over short period of time so repeated measurement is required for accuracy. Cost and logistical barriers make it difficult to do large population studies with prospective measures (Ralph et al., 2020).

New Framing of Pregnancy Preferences

Many researchers, acknowledging the previously mentioned flaws in studies, have begun to move away from using the term pregnancy intentions, as it does not capture the range of feelings around pregnancy, including latent or undefined desires (Kost et al., 2023; Rocca et al., 2019; Samari et al., 2020). I will use the term pregnancy preferences in this dissertation to better represent the often latent, nuanced, and multifaceted feelings around pregnancy. The Desire to Avoid Pregnancy (DAP) scale, a psychometrically validated measure, was designed to address a need for improved instruments to investigate the concept of unintended pregnancy (Rocca et al., 2019). Specifically addressing the multiple perspectives around pregnancy, including ambivalence, this scale provides a unique prospective measure of pregnancy intention or preferences.

Purpose and Aims

The purpose of this dissertation research is to investigate the pregnancy intentions of adolescent and young adults 15-24 years old, identify factors associated with pregnancy preferences, and analyze how these preferences impact contraceptive use among Attitudes and Decision Making After Pregnancy Testing (ADAPT) study participants. The specific aims of this dissertation study are:

1. Identify the demographic, contextual, reproductive, and economic factors associated with pregnancy preferences of assigned female at birth youth 15-24 years old.
2. Assess how the pregnancy preferences of assigned female at birth youth 15-24 years old are associated with contraceptive use and if these preferences mediate the relationship between participants' characteristics and contraceptive use.
3. Evaluate the demographic, contextual, reproductive, and economic factors that are associated with a discordant relationship between pregnancy preferences and contraceptive use. Those who do not desire pregnancy but are not using any contraception, or those who do desire pregnancy using contraception.

Contribution to Literature

As pregnancies in this age group are often assumed to be unintended, previous research may have flaws and have misleading results. Without use of a more nuanced, validated tool to measure pregnancy desires, previous studies may not have fully captured the realities of this population. To fill this gap, my dissertation research uses the DAP scale to investigate pregnancy preferences among youth 15 to 24 years old, participating in the Attitudes and Decision-making After Pregnancy Testing (ADAPT) study. The DAP scale, using a short time frame to assess a desire for pregnancy (3 months) and childbearing (1 year), recognizing that preferences can

change rapidly (Rocca et al., 2019). The novel use of a validated, prospective measure to investigate pregnancy preferences among youth is a contribution to the literature.

Study Design

A longitudinal observational cohort study, Attitudes and Decision Making After Pregnancy Testing (ADAPT), recruited participants in reproductive or primary care clinics, in southeastern California, Nevada, New Mexico, Arizona, and West Texas. Individuals 15 to 34 years old, not currently pregnant, were included in the study if they had a risk of pregnancy in the following year. Participants completed baseline and follow-up surveys every 3 months for up to four years. This dissertation consists of secondary analyses using data from ADAPT, among participants 15 to 24 years old.

Theoretical Framework

Environmental and societal influences on the individual provide a useful structure to explore pregnancy preferences. My dissertation work is informed by two theories. The first theory is a structural, ecological framework. This theory, an ecological model for health promotion, creates a framework that describes structural influences over individual behavior (McLeroy et al., 1988). Behavior is not solely an individual choice but an outcome of societal constructs (McLeroy et al., 1988). The interconnection between individual behavior and the structural, environmental factors is illustrated by defining the following spheres of influence: intrapersonal factors, interpersonal processes and primary groups, institutional or organizational factors, community factors, and public policy (McLeroy et al., 1988). The ecological model for health promotion, as a social ecological theory, outlines that individuals are both influenced by and can influence their environment. This theory, built on other ecological frameworks, was developed to explain the impact of health promotion interventions. However, it has been widely

used in health research to analyze phenomenon from a multilevel structural framework (Golden & Earp, 2012). Framing unintended pregnancy as a phenomenon that exists in the context of environmental factors that impact an individual, rather than an individual failing, allows for a holistic approach. These structural influences in society, community, and public policy impact multiple aspects of life, including pregnancy preferences. Societal stigma related to youth sexual behavior, laws that regulate access for reproductive services for youth, and policy that fails to promote reproductive justice are all external factors that can shape individual behavior. For this dissertation analysis, socio-contextual variables were chosen to represent factors within the spheres of influence and are relevant to potential social inequities that result in health disparities.

The second theory presented by Schneider and Ingram, social construction of target populations, explains how societal perception of certain groups influences the creation and implementation of policy and why resources are allocated to specific populations (Schneider & Ingram, 1993). The social construction of target populations theory defines the social construction of a target population as the way in which society perceives a certain group, based on images, stereotypes, or language that is pervasive in portraying these target populations (Schneider & Ingram, 1993). These social constructs can be positive or negative and shape the way that people and policy makers view target populations, affecting the type of policies that are created (Schneider & Ingram, 1993). Policy is targeted toward a specific population, based on a perceived problem that needs to be solved, and the social construct of that population influences whether the policy is beneficial or punitive (Schneider & Ingram, 1993). Based on the perception that a group is weak and undeserving of help, due to a negative image in society, a policy would create more burdens than benefits to this group. Conversely, a group that is seen as deserving and politically powerful, would benefit from the same policy. The social construction of target

populations theory is a powerful tool to understand how policy is shaped by societal perception of populations, and a lens to examine current and past policies.

The social construction of target populations theory is applicable to this dissertation because it helps to explain why adolescent and young adult populations, often negatively perceived and weak groups in society, have not been the beneficiary of policies that address their specific reproductive health needs. Policies also impact other aspects of youth's lives, such as limiting economic and educational opportunity, which influences their decision making around childbearing (Geronimus & Korenman, 1992; Kearney & Levine, 2012). Policy in reproductive health for youth has been focused on pregnancy prevention rather than a wholistic view of the pregnancy desires of youth.

Both the ecological model for health promotion and the social construction of target populations theory consider societal and structural factors that impact the individual. By considering social determinants of health, youth pregnancy can be framed as a consequence of unequal societal structures, rather than an individual failing. As more research emerges to challenge the stereotypic image of youth pregnancy, use of these theories will allow for a more nuanced and equitable examination. An understanding of the pregnancy desires of youth may help to shift policy and interventions from pregnancy prevention to provision of reproductive services that match individual desires.

Impact and Innovation: Implications for Policy

Using an ecological framework to understand youth pregnancy preferences illuminates community, societal, and political influences on this population. Understanding the reproductive desires of youth may help to frame new policies that benefit this population and provide for increased reproductive autonomy. Policies that do not support confidential and accessible sexual

health services prevent youth from receiving needed care (Brindis et al., 2020). Additionally, using contraceptive counseling approaches in clinic that prioritize patient autonomy and personal desires, have been shown to increase patient satisfaction (Dehlendorf et al., 2021; Dehlendorf et al., 2023).

Moving away from a framework that assumes all youth pregnancies are unintended and towards embracing the nuances and ambivalence embedded in this topic, my dissertation research will provide new perspectives. Using the validated and comprehensive DAP scale, my research represents the first time the DAP tool has been used to specifically investigate a youth population (15 to 24 years old).

Organization of the Dissertation

The dissertation consists of five chapters. Chapter one is an introductory chapter providing background, overview of existing literature, and the context for the need for new research approaches. It also provides an overview of the larger research study used for this dissertation project. Chapter two presents the findings from the first research aim, investigating associations between individual demographic, contextual, and economic factors and pregnancy preferences. Chapter three includes findings from analyses exploring both the associations between pregnancy preferences and contraceptive use and whether pregnancy preferences have a mediating role between participants' characteristics and contraceptive use. Chapter four includes the findings from analyses identifying the associations between participants' characteristics and a discordant relationship between pregnancy preferences and contraceptive use. Chapter five summarizes the findings and describes the impact on future research, clinical practice, and policy.

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Chapter 2: Associations Among Sociodemographic and Contextual Factors and Youth Pregnancy Preferences

Abstract

Objectives: The purpose of this study is to investigate the pregnancy preferences and potential associations between participants' characteristics and these preferences, among youth 15 to 24 years old. Efforts to improve access to and use of contraception among young people have often inadequately accounted for the diversity in feelings adolescents and young adults hold about a potential pregnancy. This study aimed to describe the range of pregnancy preferences held by young people and identify social and contextual factors associated with these preferences.

Study Design: A series of bivariate and multivariate regression models were fit using data from the Attitudes and Decision Making After Pregnancy Testing (ADAPT) study, including n=1,020 assigned female at birth adolescents and young adults 15 to 24 years old recruited from 23 health facilities in the southwestern United States. Pregnancy preferences were measured with the Desire to Avoid Pregnancy (DAP) scale, a prospective validated measure.

Results: A range of DAP scale scores (pregnancy preferences) were found in this population, with a mean of 2.5 (SD 1.1, 0= least desire to avoid pregnancy, 4= highest desire to avoid pregnancy). Ten percent of participants had a DAP score of 0 to less than 1, 20% scored 1 to less than 2, 30% scored 2 to less than 3, and 40% scored 3 to 4. Factors significantly associated with greater desire to avoid pregnancy were identifying as White compared to Latine (mean DAP score 2.78 vs. 2.40, adjusted Coeff. 0.21, p=0.014), having depressive symptoms (2.70 vs. 2.40, adjusted Coeff. 0.19, p=0.007), being enrolled in school (2.80 vs. 2.25, adjusted Coeff. 0.43, p=0.000), having a mother who had some college education (2.60, adjusted Coeff. 0.18, p=0.038) or a bachelor's degree or higher (2.79, adjusted Coeff. 0.31, p=0.005) compared to

those whose mother had completed less than high school (2.34), and not having a main partner compared to those who had a good or very good relationship with a main partner (2.79 vs. 2.41, adjusted Coeff. 0.37, p=0.000). Factors significantly associated with less desire to avoid pregnancy was having one child compared to none (1.98 vs. 2.63, adjusted Coeff. -0.38, p<0.001) and those who considered religion to be somewhat (2.42, adjusted Coeff. -0.25, p=0.001) or very important (2.16, adjusted Coeff. -0.49, p=0.000) compared to those without religion (2.68).

Conclusion: While most adolescents and young adults have a preference to prevent childbearing in the next year, a significant minority were open to pregnancy. Interventions to help youth attain their reproductive preferences should appreciate that pregnancy preferences are likely shaped not only by one's partnership status and prior childbearing, but also one's social context and mental health.

Associations Among Sociodemographic and Contextual Factors and Youth Pregnancy Preferences

Pregnancies in youth populations are often assumed to be unintended. Without recognizing that some young people are open or ambivalent to the prospect of pregnancy and accounting for these preferences, research findings are not capturing the full breadth of youth's experiences. Additionally, clinicians and policymakers may design misguided interventions if there is an assumption that all pregnancies in this age group are unintended and the range of pregnancy desires is not considered.

Creating new perspectives on this topic requires investigating the previous framing of pregnancy intention and use of new validated measures. For individuals of all ages with the capacity for pregnancy (cisgender women and girls, transgender men, gender non-binary individuals with a uterus), there are many inconsistencies and flaws with the current approaches to studying the phenomenon of pregnancy intention (Hall et al., 2017). This paper will use the term women when this was the language used in the study cited, with the acknowledgement that there are individuals with capacity for pregnancy that do not identify as women.

Defining the Phenomenon

The problematic nature of defining pregnancy intention contributes to the inconsistent measurement approaches noted in the literature. Pregnancy intention as a binary choice of intended or unintended does not capture the range of feelings on this topic (Aiken et al., 2016; Rocca et al., 2019). Research has shown that women can be ambivalent about pregnancy and when given more survey options to convey their feelings, they are more likely to express this ambivalence (Kavanaugh & Schwarz, 2009; Schwarz et al., 2007). Pregnancy intention measures

that provide more than a choice of intended versus unintended allow for a more complete understanding of the individual's perspective (Rocca et al., 2019).

Intention also implies planning for a pregnancy, which may not be relevant or possible for some women (Aiken et al., 2016; Arteaga et al., 2019; Trussell et al., 1999). In a qualitative study, Arteaga et al. (2019) found that both young men and women ages 18 to 24 years believed that lived experiences such as the lack of a stable income, career, or living environment may make planning a pregnancy difficult for young people. Most participants endorsed the concept of an in-between option (between planned and unplanned), expressing that they may not be planning a pregnancy but if one occurred it would not be a negative thing (Arteaga et al., 2019).

Measuring Pregnancy Preferences

Pregnancy preferences change frequently, including over time before a pregnancy, from before to after pregnancy discovery, and over time after the pregnancy. Studies comparing prospective to retrospective measures have shown that women are more likely to report that a pregnancy is more intended once it has occurred, indicating that retrospective measures likely underestimate unintended pregnancies (Rackin & Morgan, 2018; Ralph et al., 2020). A prospective measure, asking participants their feelings about a future pregnancy, eliminates this potential bias.

Based on a need for more nuanced, prospective measures of pregnancy desires, (Rocca et al., 2019) developed the Desire to Avoid Pregnancy (DAP) scale. The developers specifically defined the construct as pregnancy preferences rather than pregnancy intentions to make explicit that not all people have intentions about pregnancy. The DAP scale is a validated and reliable tool including a self-report of pregnancy and childbearing preferences, as well as feelings and

consequences around a potential pregnancy and childbearing (Rocca et al., 2019). No study has previously used a validated measure to assess the prospective pregnancy preferences of youth.

Using the DAP scale, the purpose of this study is to investigate the pregnancy preferences of youth (aged 15-24 years) and the demographic, contextual and economic factors that are associated with these preferences. Investigating these associations may provide insight into structural or personal factors that influence these often latent preferences.

Methods

Study Design and Sample

Data for this study are from a larger longitudinal observational cohort study, the Attitudes and Decision Making After Pregnancy Testing (ADAPT) study. Following women for up to four years, including those who become pregnant, allowed for an investigation of women's pregnancy decisions and how unintended pregnancies impact well-being, health and socioeconomic status (US National Library of Medicine, n.d.). Participants included those seeking medical care in reproductive or primary care clinics across 23 facilities in southeastern California, Nevada, New Mexico, Arizona, and West Texas. The analysis population for this investigation, a subset of the larger study, includes youth 15- to 24-years-old and utilizes a cross-sectional analysis from the baseline survey.

Participant Eligibility and Recruitment

Recruitment occurred between March 2019 and October 2022. Due to the investigators' interest in the impact of pregnancy, eligibility criteria focused on individuals most likely to experience a pregnancy in the next year across the range of preferences (Table 2.1). Recruitment, by trained research assistants (RA), took place in participating clinics. Patients were notified about the study when they presented for their appointment. Once a RA determined

eligibility, prospective participants were given a recruitment flyer and the study was described using a script. Informed consent was obtained, a numeric number was assigned to the participant, and a secure electronic form was signed. Based on state laws and clinic policy, minors aged 15 to 17 years old were either able to give their own consent or received parental permission to participate. After informed consent was obtained, a baseline survey was completed. Participants received gift cards of fifty dollars for the baseline survey and 20 dollars for completion of subsequent surveys.

From February to September 2020, due to COVID-19 pandemic health restrictions, recruitment was suspended. In October 2020, recruitment resumed, adding remote recruitment. Procedures for remote recruitment differed in that RAs contacted prospective participants by phone after the individual was identified by the recruiting clinic. The study was approved by the Institution Review Board of the University of California, San Francisco.

Measures

Outcome

The outcome variable was pregnancy preferences, measured with the Desire to Avoid Pregnancy (DAP) scale. DAP is a 14-item self-report, prospective measure of the pregnancy preferences of women before they become pregnant. The measure's items capture three conceptual domains (cognitive, affective, practical consequences) that fit into one unidimensional construct (i.e., I wouldn't mind becoming pregnant in the next 3 months, thinking about being pregnant in the next 3 months makes me feel excited, and if I had a baby in the next year, it would be hard for me to manage raising a child) (Rocca et al., 2019). Each item on the scale has the following options for response: strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree (scored 0-4). For negatively worded items, 4 is strongly

agree, for positively worded items, 4 is strongly disagree. A sum of all the item scores is divided by 14 to get an average score ranging from 0 to 4, a higher score corresponding to a greater desire to avoid pregnancy.

Independent Variables

Based on subject matter expertise and previous literature, factors related to pregnancy preferences were selected a priori (Barber et al., 2019; Guzzo et al., 2019; Ralph et al., 2020; Samari et al., 2020). Socio-contextual variables were also chosen that represent possible indicators of inequities in health. A directed acyclic graph was created to outline hypothesized relationships between the variables. The following factors were included as potentially being associated with pregnancy preferences: age, race/ethnicity, nativity, parity, relationship quality with main partner, depressive symptoms, instrumental social support, importance of religion, currently in school, food insecurity, and mother's highest education. Food insecurity and mother's highest education were used to represent economic status because youth are often unaware of a total household income.

The presence of current depressive symptoms was assessed using a validated standardized tool, Patient Health Questionnaire-8 (PHQ8), omitting one item from the PHQ9 related to thinking about hurting oneself (Kroenke et al., 2009). An established cut point for this screening scale is 10, indicating clinically significant depression. A dichotomous variable was created for those scoring 10 or above (positive depression screen) and those under this cut point (negative depression screen) (Kroenke et al., 2009).

Social support was measured with a modified version of the 2 Way Social Support Scale, assessing the degree to which individuals feel they have received instrumental support from those around them (4 items). Instrumental support includes concrete forms of assistance that are

given to help others (e.g., someone would help if I was stranded, sick, needed financial assistance or would help with my responsibilities if I was unable) (Khodabakhsh & Tan, 2022). Only 4 questions that pertained to receiving instrumental support, were included in the variable used for this analysis. Items were scored and presented as a continuous score from 0 to 5 (5 indicating more social support). Due to an uneven distribution towards high levels of support, we chose a cut point of 4. A dichotomous variable was created, greater or equal to 4 represented high instrumental support and below 4 was low instrumental support.

Recruitment was conducted both before and during the COVID-19 pandemic. Rocca et al. (2022) found that pregnancy preferences during the first year of the pandemic compared to before did differ, so to understand if the timing of recruitment impacted pregnancy preferences in our sample, a variable was created to indicate when a participant entered the study.

Analysis

Descriptive statistics were used to describe participant characteristics from the baseline survey. A series of bivariate and a multivariate regression model were run to determine relationships between DAP score and participant characteristics, using a 95% confidence interval and level of significance of $p < 0.05$. Clustered random errors were used to account for intragroup observations potentially not being independent. Analyses were conducted with STATA version 18.

Results

Sample Description

The sample size for this analysis is 1,020, representing 51% of the total baseline sample of the larger study, including only those participants up to 24 years old (Table 2.2). Participants ranged from 15 to 24 years old (mean 21 years, standard deviation (SD) 1.1), 29% between 15

and 19 (n=291) and 71% between 20 to 24 years old (n=729). Six hundred-one (59%) participants identified as Latine or Hispanic, 205 (20%) identified as White, 75 (7%) identified as Black, and 138 (14%) identified as another race or ethnicity. Seven hundred eighty-nine (78%) were nulliparous, 152 (15%) were primiparous, and 76 (8%) were multiparous. Three hundred-fifty (43%) were living with a partner, 463 (47%) were in school, and 373 (38%) had food insecurity in the past 30 days.

The mean DAP score for the population was 2.5 (SD 1.1). The distribution of DAP scores ranged from 0 (least likely to avoid pregnancy) to 4 (most likely to avoid pregnancy). Ten percent of participants had a DAP score of 0 to less than 1 (n=103), 20% scored 1 to less than 2 (n=203), 30% scored 2 to less than 3 (n=305), and 40% scored 3 to 4 (Figure 2.1).

Factors Associated With DAP Scale Score

In multivariable analyses (Table 2.3), White participants had higher mean DAP scores (greater desire to avoid pregnancy) compared to their Latine counterparts (2.78 vs. 2.40, adjusted Coeff. 0.21, p=0.014), no other racial or ethnic groups differed significantly from Latine. Participants without a main partner had higher mean DAP scores compared to those who had a good or very good relationship with a main partner (2.79 vs. 2.41, adjusted Coeff. 0.37, p=0.000). Participants with current depressive symptoms had higher DAP scores compared to those without depressive symptoms (2.70 vs. 2.40, adjusted Coeff. 0.19, p=0.007). Participants who were enrolled in school had higher DAP scores compared to those not in school (2.80 vs. 2.25, adjusted Coeff. 0.43, p=0.000). Participants whose mothers had some college education (2.60, adjusted Coeff. 0.18, p=0.038) or a bachelor's degree or higher (2.79, adjusted Coeff. 0.31, p=0.005) had higher mean DAP scores than those whose mother had completed less than high school.

Primiparous participants had lower DAP scores (less desire to avoid pregnancy) compared to nulliparous participants (1.98 vs. 2.63, adjusted Coeff. -0.38, $p<0.001$). DAP scores were lower among those who considered religion to be somewhat (2.42, adjusted Coeff. -0.25, $p=0.001$) or very important (2.16, adjusted Coeff. -0.49, $p=0.000$) compared to those without religion. Age, nativity, social support and food insecurity variables in the multivariate analysis did not have significant associations.

Discussion

This study highlights that youth have a range of pregnancy preferences, associated with various factors in their life. As a novel study focusing on young people's prospective pregnancy preferences using a validated and comprehensive tool, these results provide new insight. The distribution of DAP scores reflects the range of pregnancy preferences, reinforcing the importance of viewing this phenomenon beyond a binary choice of intending or not intending pregnancy. The population in our study did skew towards higher desire to avoid pregnancy (higher DAP score), with 40% of participants indicating a strong desire to avoid pregnancy (score between 3 and 4). However, around a third of participants scored below the midpoint of the scale, indicating an openness to pregnancy and highlighting that a significant minority of young people are open to the prospect of pregnancy.

The Relationship Dynamics and Social Life Study, a landmark study on the pregnancy intentions of youth, also found that some young people are open to pregnancy (Barber et al., 2019; Miller et al., 2013). Participants (18 and 19 year old women) in this prospective longitudinal study in Michigan were asked weekly to both rate their desire to become and to avoid pregnancy. Barber et al. (2019), found that a sizeable minority (34% of participants), over the 2.5 year study period, reported a desire to become pregnant in the next month.

Factors Associated With Pregnancy Preferences

In addition to describing the range of feelings about pregnancy, our study found several factors associated with these preferences. Consistent with previous research in women of all ages, we found that youth who had birthed one child were more open to pregnancy compared to those without children (Samari et al., 2020). For those youth with a child, pregnancy and parenting are likely more tangible concepts and existing structures are already in place to support childrearing, which may contribute to more positive views on having more children. This finding, that youths' pregnancy preferences are impacted by their pregnancy history, is an important contribution. Due to a concern for worse health outcomes, significant research and public health measures have been dedicated to preventing short interpregnancy intervals in youth populations. Amjad et al. (2019), in a systematic review, found that social determinants of health do impact adverse pregnancy outcomes for adolescents, however a causal pathway is not understood. While there may be health related implications of short interpregnancy intervals, if the subsequent pregnancy is desired there should be a different set of considerations.

Beyond childrearing experience, partnership is an essential component in decision making around pregnancy. Relationship quality and having a main partner has been shown to positively impact a desire to be pregnant (Barber et al., 2019; Samari et al., 2020). Barber et al. (2019) found among young women (18-19 years old), as the level of commitment, duration, and intimacy of a relationship increased, so did the odds of desiring a pregnancy. While our study did find that having a main partner increased pregnancy desire, relationship quality was not significant.

Religiosity and Mental Health as Influential Factors in Pregnancy Preferences

Our study, consistent with previous research, found that increased importance of religion in a person's life (religiosity) was also associated with a greater openness to a potential pregnancy (Barber et al., 2015). In a nationally representative sample of women of all ages, Hayford and Morgan (2008) concluded that increased fertility desires among religious individuals is derived from family ideology or behavior and not a specific religion. Family or community norms around pre-marital sex, childbearing outside of marriage and the general importance of parenting, impact how individuals view potential pregnancies (Barber et al., 2015; Hayford & Morgan, 2008). Youth integrate family influences, including religion, into their personal beliefs around childbearing.

Personal mental health also plays a part in pregnancy preferences. Research on depression and pregnancy has focused on the relationship between unintended pregnancy and a greater risk of depression during pregnancy or postpartum (Abajobir et al., 2016; Mercier et al., 2013; Robbins et al., 2021). A history of depression before pregnancy also increases risk of depression during and after pregnancy (Jahan et al., 2021). We found that participants with a positive depression screen expressed higher levels of a desire to avoid a future pregnancy. Stidham Hall et al. (2013) found that among young sexually active women (18-20 years old) those with depressive symptoms were more likely to inconsistently use contraceptives, increasing their risk of pregnancy. An increased desire to avoid pregnancy coupled with a potential for more risk to become pregnant, highlights a role for providers to identify individuals with depression, discuss their pregnancy desires and work with them to meet their reproductive goals.

Economic, Educational, and Ethnic/Racial Factors Influencing Pregnancy Preferences

In our study, we used mother's highest level of education as one proxy for socio-economic status. Lower levels of educational attainment is both a result of poverty and contributes to a continuation of less income potential (Driscoll et al., 2001). Our findings are consistent with previous research finding that higher educational attainment of participant's mothers corresponded to a greater desire to avoid pregnancy (Lau et al., 2014). It has been hypothesized that economic disadvantage leads to perceived limited opportunities for education or employment, increasing openness to parent at an early age (Driscoll et al., 2001; Minnis et al., 2013).

While economic status may factor into individual pregnancy desires, it is also important to acknowledge the potential for stereotyping youth of color from low-income backgrounds. Yosso (2004), outlined the concept of aspirational capital by which people with limited economic resources or from marginalized communities can have future ambitions or desires that transcend their current reality. Carvajal and Zambrana (2020), in a qualitative study among low-income, Latina youth (15-24 years old), described a theme of aspirational capital in relation to wanting to delay childbearing. Youth felt that they not only had future aspirations but that they possessed reproductive autonomy and could make their own decisions around fertility (Carvajal & Zambrana, 2020).

Our findings, consistent with previous studies, did find that self-identified Latine participants were more open to the prospect of pregnancy compared to white youth (Guzzo et al., 2015; Lau et al., 2014). We recognize that race, as a social construct, encompasses many structural factors that contribute to its impact on pregnancy intention and our findings should not be interpreted as evidence of biological differences. The literature has highlighted, individuals in

racial/ethnic minoritized communities are exposed to historical and structural racism, income inequalities, as well as community norms that contribute to beliefs around childbearing (Dehlendorf et al., 2011; Geronimus, 2003; Kemet et al., 2018). Personal reflections help to broaden the narrative and deepen the analysis. Future research could build upon our work with the DAP scale, adding qualitative interviews to understand the intersectionality of being a young woman of color and pregnancy preferences. Presenting a range of options around pregnancy desires and planning, encourages reproductive agency.

Strengths and Limitations

There were limitations of this study. Selecting certain independent variables to examine a relationship to pregnancy preferences does not represent the entirety of structural factors in an individual's life that impact feelings around pregnancy. As participants resided in the Southwest United States and were all presenting to health clinics for care, results might not be generalizable beyond these populations.

There are also important strengths to consider. This study used a validated, prospective measure of non-pregnant people. Including a large sample of youth, this study is the first time that the comprehensive DAP scale was used to analyze a youth population and the multiple economic and contextual factors that impact these preferences.

Conclusion

Utilizing a validated tool this study broadens the understanding of the pregnancy preferences of adolescents and young adults. Providing an overview of factors that influence pregnancy preferences, this study is foundational for researching behaviors that impact becoming pregnant, such as contraceptive use. As this study did not exhaust the multiple environmental and political spheres surrounding young people, more research is needed to understand the influences

on individual behavior. Both individual clinical care and public health policies for a youth population can be improved by understanding the motivations, desires, and structural factors involved in pregnancy decision making.

Table 2.1

Inclusion Criteria

Assigned female at birth, transmasculine or gender non-conforming with a uterus
15 to 34 years old
Sexually active in the past 3 months with someone with sperm
Not currently pregnant
Not sterilized
Not using a long-acting reversible contraceptive (LARC) method at enrollment
Currently residing in the study states (southeastern California, Nevada, New Mexico, Arizona, West Texas) or the following bordering states (Colorado, Utah, Oklahoma, Kansas)
Access to a phone, internet, or smartphone
Able to speak and read English or Spanish
Willing to be contacted by research team for 1 to 4 years

Table 2.2

Baseline Characteristics, Youth Participants (aged 15-24 years) in the ADAPT Study, n=1020

Variable	n (%)
Desire to Avoid Pregnancy scale scores, mean (SD)	2.5 (1.1)
Demographic factors	
Age (range: 15-24 years), mean (SD) (n= 1,020)	21.4 (2.1)
Self-identified race/ethnicity (n=1,019)	
Hispanic/Latine	601 (59.0)
White	205 (20.1)
Black	75 (7.4)
Other	138 (13.5)
Born in the US (n=1,001)	879 (87.8)
State of residence (n=1,020)	
Arizona	214 (21.0)
Nevada	138 (13.5)
New Mexico	68 (6.7)
West Texas	282 (27.7)
Southeast California	318 (31.2)
Parity (n= 1,017)	
0	789 (77.6)
1	152 (15.0)
2+	76 (7.5)
Contextual factors	
Married (n= 1,020)	96 (9.4)
Relationship quality with main romantic partner (n= 1,019)	
Very good/good	716 (70.3)
Fair/poor/very poor	96 (9.4)
No main partner/don't know	207 (20.3)
Current depression symptoms measured with PHQ8[1] (n= 998)	
Negative screen	651 (65.8)
Positive screen	339 (34.2)
Social support, instrumental[2] (n= 986)	
High support	665 (67.4)
Low support	321 (32.6)
Importance of religion in daily life (n= 1,012)	
No religion	471 (46.5)
Not important	51 (5.0)
Somewhat important	285 (28.2)
Very important	205 (20.3)
Currently in school (n= 994)	463 (46.6)
Health insurance (n= 956)	
No insurance	289 (30.2)
Public insurance	360 (37.7)
Insurance exchange/marketplace	75 (7.9)
Private insurance	212 (22.2)
Other	20 (2.1)

Table 2.2 (continued)
Baseline Characteristics, Youth Participants (aged 15-24 years) in the ADAPT Study, n=1020

Variable	n (%)
Economic factors	
Food insecurity[3] (n= 996)	373 (37.5)
Mother's highest educational attainment (n= 979)	
< High school	291 (29.7)
High school diploma/GED	285 (29.1)
Some college	275 (28.1)
Bachelor's degree or higher	128 (13.1)

[1] PHQ8 depression screen (higher score indicates greater depression symptoms): Negative depression screen score= <10, Positive depression screen score= ≥10
[2] Instrumental support is tangible support that is given to an individual by others (survey questions scored 0-5, 5 indicating more support), ≥4 indicates high level of instrumental support, <4 low level instrumental support
[3] Concern that food would run out or did run out of food and did not have money to buy more in the past 30 days

Table 2.3

Mean Baseline Desire to Avoid Pregnancy (DAP) Scale Score (range 0-4), by Characteristics, and Group Differences based on Linear Regression Models

		Bivariate Regression		Multivariate Regression	
Variable	Mean DAP Score	Coefficient	(95% CI)	Adjusted Coefficient	(95% CI)
Age, years		-0.08***	(-0.11, -0.05)	-0.03	(-0.06, 0.00)
Race/ethnicity					
Hispanic/Latine (ref)	2.40				
White	2.78	0.38***	(0.21, 0.55)	0.21*	(0.05, 0.39)
Black	2.49	0.09	(-0.21, 0.35)	-0.02	(-0.27, 0.24)
Other	2.48	0.09	(-0.11, 0.28)	-0.01	(-0.21, 0.18)
US Born					
No (ref)	2.43				
Yes	2.52	0.09	(-0.11, 0.29)	-0.14	(-0.34, 0.05)
Parity					
0 (ref)	2.63				
1	1.98	-0.66***	(-0.83, -0.48)	-0.38***	(-0.57, -0.19)
2+	2.31	-0.32**	(-0.56, -0.08)	0.03	(-0.23, 0.29)
Relationship quality with main partner					
Good/very good (ref)	2.41				
Fair/poor/very poor	2.52	0.11	(-0.11,0.33)	0.18	(-0.40. 0.39)
No main partner/don't know	2.79	0.38***	(0.22,0.54)	0.37***	(0.21, 0.52)
Current depression symptoms measured with PHQ8					
Negative screen (ref)	2.40				
Positive screen	2.70	0.30***	(0.16,0.43)	0.19**	(0.05, 0.32)
Social support, instrumental					
No (ref)	2.58				
Yes	2.44	-0.13	(-0.27,0.01)	-0.09	(-0.23, 0.04)

*p<0.05, **p≤0.01, ***p≤0.001

Table 2.3 (continued)

Mean Baseline Desire to Avoid Pregnancy (DAP) Scale Score (range 0-4), by Characteristics

		Bivariate Regression		Multivariate Regression	
Variable	Mean DAP Score	Coefficient	(95% CI)	Adjusted Coefficient	(95% CI)
Importance of religion in daily life					
No religion (ref)	2.68				
Not important	2.70	0.02	(-0.28,0.32)	-0.09	(-0.39, 0.21)
Somewhat important	2.42	-0.27***	(-0.42, -0.12)	-0.25***	(-0.40, -0.10)
Very important	2.16	-0.52***	(-0.69, -0.35)	-0.49***	(-0.66, -0.32)
Currently in school					
No (ref)	2.25				
Yes	2.80	0.55***	(0.43, 0.68)	0.43***	(0.29, 0.57)
Food insecurity					
No (ref)	2.50				
Yes	2.48	0.03	(-0.16, 0.11)	-0.02	(-0.15, 0.11)
Mother's highest educational attainment					
< High school (ref)	2.34				
High school diploma/GED	2.42	0.09	(-0.08, 0.26)	0.03	(-0.14, 0.19)
Some college	2.60	0.26**	(0.09, 0.43)	0.18*	(0.01, 0.35)
Bachelor's degree or higher	2.79	0.46***	(0.24, 0.67)	0.31**	(0.96, 0.53)

*p<0.05, **p≤0.01, ***p≤0.001

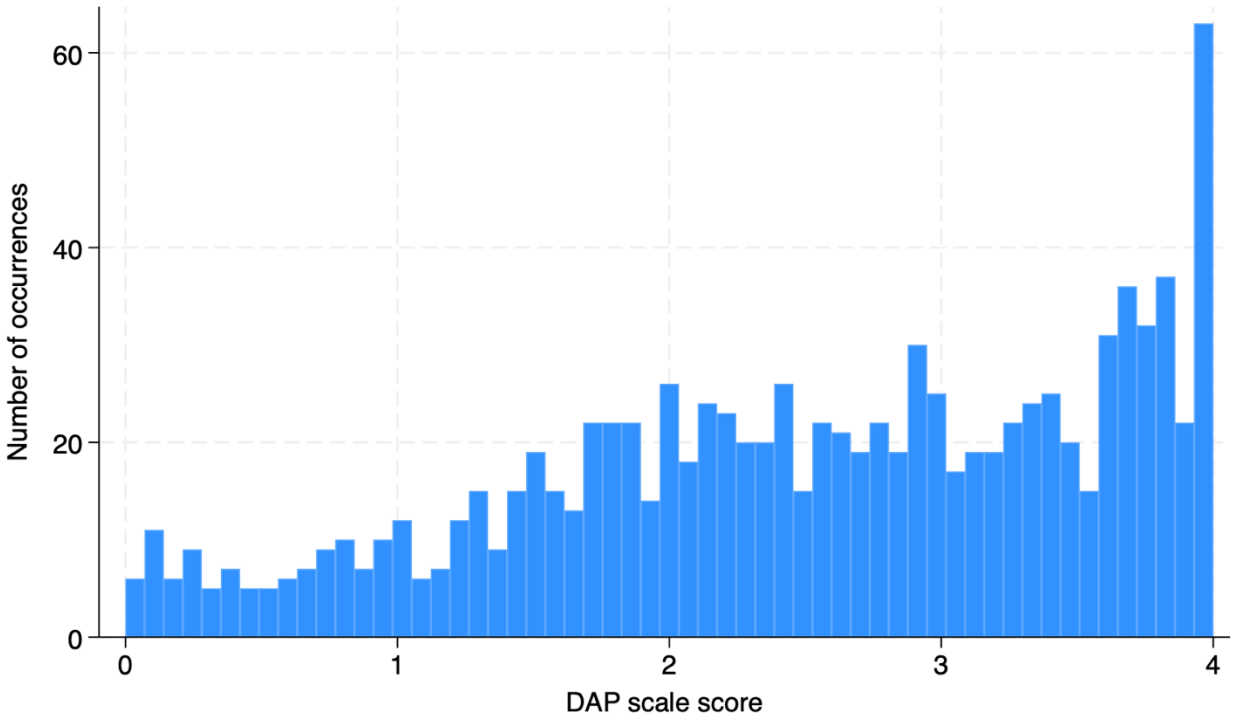

Figure 2.1
Distribution of Desire to Avoid Pregnancy Scales Scores, Youth Aged 15-24 Years, Baseline of the ADAPT Study

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Chapter 3: Youth Pregnancy Preferences and Contraceptive Use

Abstract

Objectives: Pregnancy preferences are associated with contraceptive use in adult populations. Little is known about this relationship in a youth population (15 to 24 years old) and the extent to which these preferences explain the differences in contraceptive use by sociodemographic and contextual factors.

Study Design: A multivariable multinomial regression model was created using baseline pregnancy preferences and 3-month contraceptive use survey data from a larger cohort study, the Attitudes and Decision Making After Pregnancy Testing (ADAPT) study. Pregnancy preferences were measured with the Desire to Avoid Pregnancy (DAP) scale, a prospective and validated tool. To see if pregnancy preferences (DAP scores) acted as a mediator we followed these steps: 1) fit a logistic regression to establish the association between pregnancy preferences and contraceptive use; 2) fit multivariate linear regression to identify associations between participants' characteristics and the hypothesized mediator; and 3) fit two multivariable regression models one with DAP scores and one without.

Results: A greater desire to avoid pregnancy was associated with a significantly higher likelihood of using SARC/LARC (rrr = 1.65, 95%CI= 1.29, 2.10) or condoms (rrr = 1.82, 95%CI= 1.40, 2.36) compared to no method. For the most part, these pregnancy preferences did not substantially mediate the relationship between participants' characteristics and contraceptive use. Contrary to expectations, for two factors, religiosity and relationship status, pregnancy preferences functioned as a suppressing mediator. Religious youth and those in a higher quality relationship were more likely to use contraception than might be expected considering their greater openness to pregnancy.

Conclusion: Youth who want to avoid pregnancy are more likely to use contraceptives than those who are more open to pregnancy, and the strongest predictor of contraceptive use was preference to avoid pregnancy. There were, however, youth who wanted to avoid pregnancy but not using contraceptives, and youth who were open to pregnancy but nevertheless using a method, emphasizing the nuanced and multifactored influences on contraceptive behavior. Differences in contraceptive use by participants' characteristics were for the most part not explained by pregnancy preferences, suggesting that other factors such as access or contraceptive preferences may have more impact on contraceptive use patterns.

Youth Pregnancy Preferences and Contraceptive Use

Pregnancies among youth in the United States are often assumed to be unintended, with public health interventions prioritizing increasing the use of contraceptives in this population. This assumption can lead to misguided interventions if researchers and providers do not understand the varied reasons for contraceptive use and non-use. Previous studies, using various metrics for measuring both pregnancy intentions and contraceptive use, have found that pregnancy desire impacts contraceptive use in women of all ages and yet feelings around pregnancy do not fully explain use or nonuse of contraception (Moreau et al., 2013; Samari et al., 2020). However, past research on pregnancy intentions has methodological flaws that limit its ability to provide a comprehensive analysis.

Large, nationally representative studies have relied on retrospective report to describe the intentions of past pregnancies. This methodology can introduce potential biases, as individuals' feelings about a pregnancy can shift over time or may be influenced by a societal prejudice against unintended pregnancy (Kemet et al., 2018; Ralph et al., 2020; Rocca et al., 2022). Additionally, pregnancy intentions, as a binary measure of intended versus unintended, do not account for ambivalence or being undecided (Aiken et al., 2016; Kavanaugh & Schwarz, 2009; Schwarz et al., 2007). To account for latent feelings rather than explicit intentions, the term pregnancy preferences has been adopted by some researchers and will subsequently be used in this paper (Rocca et al., 2019; Rocca et al., 2022). In the context of these methodological concerns, the Desire to Avoid Pregnancy (DAP) Scale was developed as a validated, prospective measure (Rocca et al., 2019). The DAP scale, encompassing three conceptual domains, includes a range of perspectives from desire to avoid pregnancy, ambivalence, and openness to pregnancy.

Recent research using the DAP scale to investigate the relationship between pregnancy preferences and contraceptive use in women of all ages has found that pregnancy preferences do impact contraceptive use, with those desiring to avoid pregnancy being more likely to use contraception (Rocca et al., 2022; Samari et al., 2020). While these studies demonstrate that pregnancy preferences are independently associated with contraceptive use, little is known about the extent to which these preferences explain the differences in contraceptive use by participant characteristics. Research has shown differences in contraceptive use patterns by social and contextual factors, but it is unclear what accounts for those differences (Geist et al., 2019; Grady et al., 2015; Raine et al., 2003; Rocca et al., 2022). Understanding the drivers of the differences in contraceptive use patterns among various youth populations is important because it allows for greater insight into if these differences are based on pregnancy preferences, disparities in access, or attitudes around contraceptive use.

Using the more nuanced DAP tool to provide a more comprehensive picture of the pregnancy desires of youth 15 to 24 years old, our novel study had two aims. Firstly, we investigated the relationship between pregnancy preferences and use of contraceptive methods. Secondly, we explored if these pregnancy preferences mediated the relationship between young people's individual characteristics and contraceptive use.

Methods

Study Design and Sample

Our study used a subset of participants (age 15 to 24 years old) from a larger ongoing cohort study, Attitudes and Decision Making After Pregnancy Testing (ADAPT) study. The ADAPT study followed participants aged 15 to 34 years at enrollment for up to four years, studying pregnancy preferences and decision making around pregnancy and its impact on health

and well-being. Our study utilized data from the baseline and 3-month follow-up surveys. Participants were recruited from 23 primary and reproductive health care clinics across southeastern California, Nevada, New Mexico, Arizona, and West Texas.

Participant Eligibility and Recruitment

Eligibility criteria for participation in the study included the following: capacity for pregnancy (not sterilized, assigned female at birth), 15 to 34 years old, sexually active in the past 3 months with someone with sperm, not currently pregnant, not currently using a long-acting reversible contraceptive, and ability to speak/read English or Spanish. Recruitment, conducted by trained research assistants (RA), took place in participating clinics between March 2019 and October 2022. Depending on state law, minors either could give their own consent or parental consent was obtained. Baseline and subsequent surveys every three months were completed. To remunerate participants for their time and effort, participants received gift cards after every completed survey. The study was approved by the Institutional Review Board of the University of California, San Francisco.

Measures

Independent Variables

The primary independent variable was pregnancy preferences, measured with the Desire to Avoid Pregnancy (DAP) scale (Rocca et al., 2019) administered at the baseline survey. Using a 14-item self-report questionnaire, DAP measures the feelings about a potential pregnancy within 3 months and having a child within a year. Although all items tap into one underlying construct, the DAP scale items represent three conceptual domains; cognitive, affective, and practical consequences (Rocca et al., 2019). Each item has multiple response options on a 5-point scale (strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree).

Responses are averaged, resulting in a score between 0 and 4, with higher numbers representing a greater desire to avoid pregnancy. In this study, DAP was analyzed as a continuous variable.

Additional independent contextual variables, chosen based on their impact on contraceptive use and as possible indicators of social inequities in health, included self-reported race/ethnicity, parity, relationship with main partner, importance of religion, currently in school, and health insurance (Dehlendorf, Park, et al., 2014; Raine et al., 2011; Rocca et al., 2022; Samari et al., 2020; Upadhyay et al., 2016). Food insecurity, a concern that food would run out or did run out and did not have money to buy more, and mother's highest educational attainment were also selected to represent economic status. These variables were used rather than using household income, because many young people do not know this information.

Mediation

To explore the extent to which pregnancy preferences impact the relationship between socio/contextual factors (participants' characteristics) and contraceptive use, we also investigated DAP score's potential role as a mediator. These socio/contextual factors may reflect groupings that experience social inequities. We hypothesized that pregnancy preferences may mediate the relationship between these participants' characteristics and contraceptive use. In these models the participants' characteristics were used as independent variables.

Dependent Variable

The dependent variable was contraceptive method use in the past month, as measured at the 3-month survey. Both a dichotomous variable (use of any method or none) and a categorical variable with 3 categories (barrier method, short acting or long-acting reversible contraceptives, and none) were created for analysis. The only barrier method used by participants was condoms. Short acting reversible contraceptives (SARC) included: oral contraceptive pills, vaginal ring,

transdermal patch, and medroxyprogesterone acetate injection. Intrauterine devices (IUDs) and the subdermal implant were included in long-acting reversible contraceptives (LARC). Participants using dual methods were categorized according to the more effective method used. Participants using emergency contraception, withdrawal, and natural family planning were included in the group not using contraception. These groups were collapsed due to small numbers of participants using emergency contraception, withdrawal or natural family planning, preventing a meaningful between group statistical analysis.

Baseline DAP scores and contraceptive use at the 3-month survey were used for our final analysis. We fit a second model with both DAP and contraceptive use at baseline as a sensitivity analysis.

Analysis

To understand the relationship between pregnancy preferences and contraceptive method type used, we fit a multivariable multinomial regression model including DAP scores. We calculated predicted probabilities of using each type of contraceptive method by DAP score based on these models.

We followed three steps to see if there was evidence of possible mediation of the relationship between participant characteristics and contraceptive use by pregnancy preferences (Baron & Kenny, 1986). First, we fit a logistic regression model to establish the association between pregnancy preferences (mediator) and contraceptive use (dependent variable). Second, we fit a multivariable linear regression model to determine the relationship between participants' characteristics and the hypothesized mediator (pregnancy preferences). Third, we fit two multivariable regression models, one without pregnancy preferences and then one adding pregnancy preferences (DAP scores). We considered that pregnancy preferences had a mediating

role if three criteria were met: 1) pregnancy preferences were associated with contraceptive use, 2) the sociodemographic variable was associated with pregnancy preferences and 3) the strength of the relationship between the sociodemographic variable and contraceptive use substantially changed when DAP scores were accounted for in the model. For the third criterion, we used a rule of thumb of a greater than a 20% change in the odds ratio as the threshold as indicative of a substantial change.

To account for clustering of participants, random effects models were used, incorporating random site intercepts. All analyses were done with STATA version 18.

Results

Sample Characteristics

Fifty-nine percent of participants identified as Hispanic/Latine, 20% as White, 7% as Black, and 14% as another race or mixed. On average participants were 21 years old, 70% reported being in a very good/good relationship, 47% were currently in school, and 38% reported food insecurity. Participants expressed a range of pregnancy preferences, with a mean DAP score of 2.5 (Table 3.1). The distribution of DAP scores ranged from 0 (most open to pregnancy) to 4 (strongest desire to avoid pregnancy). Ten percent of participants had a DAP score of 0 to less than 1 (n=103), 20% scored 1 to less than 2 (n=203), 30% scored 2 to less than 3 (n=305), and 40% scored 3 to 4.

Contraceptive Method Type

At the three-month survey, sixty-two percent of participants were using SARC/LARC, 13% were using condoms, and 25% were not using any contraceptive. In multivariable multinomial logistic regressions, higher DAP score (more desire to avoid pregnancy) was associated with a significantly higher likelihood of using SARC/LARC (rrr = 1.65, 95%CI=

1.29, 2.10) or condoms (rrr = 1.82, 95%CI= 1.40, 2.36) compared to no method. As age increased, use of LARC/SARC was less likely compared to no method use (rrr = 0.84 per year, 95%CI= 0.78, 0.91). Participants with a good/very good relationship with a partner compared to those without a partner were significantly more likely to use SARC/LARC relative to no contraceptive (rrr=1.97, 95%CI= 1.21, 3.19). Use of SARC/LARC was less likely compared to no method use in those experiencing food insecurity (rrr=0.64, 95%CI= 0.46, 0.87). Other than DAP score, no other covariable was significantly associated with use of condoms vs. no method (Table 3.2).

Predicted probability of using no contraception decreased as DAP score increased (more desire to avoid pregnancy). Fifty-three percent of participants open to pregnancy (DAP = 0) were not using a contraceptive. Thirteen percent of participants with a strong desire to avoid pregnancy (DAP= 4) were not using a contraceptive. Predicted probability of using either a condom or LARC/SARC increased as DAP score increased. Six percent of those open to pregnancy (DAP = 0) and 16% of those wanting to avoid pregnancy (DAP = 4) were using a condom. Forty-one percent of those open to pregnancy (DAP = 0) and 72% of those with a high desire to prevent pregnancy (DAP = 4) were using a LARC/SARC (Figure 3.1).

Sensitivity analysis was conducted comparing use of baseline only data with use of baseline for DAP scores and the 3-month survey results for contraceptive use. The results were largely consistent between both analyses.

Contraceptive Use at 3-Months: Mediation Model

In a multivariable model excluding DAP scores, contraceptive use declined with increasing age (aOR 0.85, 95%CI= 0.79, 0.91), and youth who had experienced food insecurity were significantly less likely to be using contraception (aOR 0.67, 95%CI= 0.48, 0.94) (Table

3.3). Additionally, in the multivariable model including DAP scores, participants who reported being in a good relationship with a main partner (aOR 1.76, 95% CI = 1.15, 2.68) were significantly more likely to be using a contraceptive method than those with no main partner. DAP scores were very strongly associated with contraceptive use (aOR 1.68, 95% CI= 1.34, 2.11) (Table 3.3).

Assessment of Mediation

Step 1. In a bivariable model assessing the relationship between baseline DAP score and contraceptive use at three months, we found a strong association (OR 1.56, p= <0.001, 95%CI= 1.27, 1.91).

Step 2. In our model assessing factors associated with pregnancy preferences, DAP scores varied significantly by several sociodemographic factors[1]. White participants had higher mean DAP scores compared to their Latine counterparts (aCoeff. 0.30, CI= 0.11, 0.50). Participants who were enrolled in school had higher DAP scores compared to those not in school (aCoeff. 0.39, CI= 0.22, 0.57). Participants whose mothers had some college or higher (aCoeff. 0.24, CI= 0.08, 0.41) had higher mean DAP scores than those whose mother had completed less than high school.

As age increased there were lower DAP scores (less desire to avoid pregnancy) (Coeff. -0.03, CI= -0.06, 0.01). Primiparous participants had lower DAP scores compared to nulliparous participants (aCoeff. -0.45, CI= -0.68, -0.22). DAP scores were lower in those that considered religion to be somewhat (aCoeff. -0.29, CI= -0.48, -0.01) or very important (aCoeff. -0.60, CI= -0.80, -0.40) compared to those without religion. Participants with a main partner had lower mean

[1] A more detailed analysis of these relationships was presented in Chapter 2, with slightly different variables, resulting in a different model but showing a similar pattern

DAP scores compared to those without a main partner (aCoeff. -0.34, CI= -0.50, -0.17). All other variables in the multivariate analysis did not have significant associations.

Step 3. For two characteristics, relationship quality and religiosity, we found a >20% change in the effect estimate for contraceptive use when DAP scores were accounted for. Because these characteristics also met the prior criteria, we concluded that pregnancy preferences were a significant suppressing mediator of their contributions to youth contraceptive use. This mediation was in the opposite direction as hypothesized.

Specifically, youth for whom religion was very important had lower DAP scores (more open to pregnancy) than those for whom religion was not important or who had no religion (mean DAP score: 2.2 vs. 2.7). Without considering these differences in DAP scores, contraceptive use was similar across religiosity groups. However, accounting for their lower DAP scores, their contraceptive use was elevated (shy of statistical significance). Thus, religious youth's contraceptive use was higher than would be expected considering their greater openness to pregnancy. Similarly, youth in a good relationship had lower DAP scores and were significantly more likely to use contraception compared to those without a main partner (mean DAP score: 2.4 vs. 2.8). The use of contraception was higher than would be expected considering their greater openness to pregnancy.

Discussion

Exploring the relationship between youth pregnancy preferences and contraceptive use, this study represents a novel analysis of this population. Previous research has found inconsistent results between prospective pregnancy preferences and contraceptive use, with some studies finding no significant relationship (Higgins et al., 2012; Wu et al., 2008) and others finding increased use of contraceptives with greater desire to avoid pregnancy (Moreau et al., 2013;

Schwarz et al., 2007; Wolgemuth et al., 2018). These studies did not have consistent metrics for measuring pregnancy intention. In contrast, we used a validated, comprehensive tool to measure multiple domains of prospective pregnancy preferences (DAP scale) and evaluated both the relationship with contraceptive use and the potential mediating effect of these preferences.

As with previous studies using the DAP scale, we found a range of pregnancy preferences in the youth population, underscoring the importance of not assuming all youth pregnancies are unintended (Rocca et al., 2022; Samari et al., 2020). Pregnancy preferences are influenced by a myriad of individual and structural factors that impact contraceptive use (Barber et al., 2015; Guzzo et al., 2019; Ralph et al., 2020; Samari et al., 2020). We found, consistent with others using the DAP scale, that pregnancy preferences do not impact the type of contraceptive method used (Rocca et al., 2022; Samari et al., 2020). This challenges the assumption that individuals with more desire to avoid pregnancy will choose higher efficacy contraceptive methods, highlighting the need for patient-centered contraceptive method counseling.

The role of pregnancy preferences and their influence on behaviors, like contraceptive use, is not well understood. Rocca et al. (2010), explored the relationship between participants' characteristics and pregnancy, finding pregnancy preferences were not mediators, but an independent predictor of pregnancy. Using a different outcome, our study found that pregnancy preferences were independently associated with contraceptive use, with contraceptive use more likely as a desire to avoid pregnancy increased. Pregnancy preferences represented only one of many influences on contraceptive use as we found youth open to pregnancy (low DAP score) that were using a contraceptive and those wanting to avoid pregnancy (high DAP score) that were not using a contraceptive.

We found that for the most part the differences seen in contraceptive use by participants' characteristics were not explained by their different feelings around pregnancy. For example, participants experiencing food insecurity were less likely to use contraception and this remained unchanged when pregnancy preferences were added to the model. This suggests that it is not their feelings towards pregnancy that impacted contraceptive behavior but another factor that we did not explore such as access or personal perceptions of contraceptive methods.

Pregnancy preferences did act as a suppressing mediator in two cases. Counter to our expectation, we found that young people in high quality relationships were both more open to pregnancy and at the same time more likely to use contraception compared to those not in a relationship. Individuals in relationships have different patterns of sexual behavior, often engaging in more frequent sexual activity compared to those without a partner (Harvey et al., 2018). In a longitudinal study of people 18 to 30 years old, Harvey et al. (2018) found that youth who perceive greater vulnerability to pregnancy, due to more frequent sex, are more likely to use a hormonal contraceptive method (Harvey et al., 2018). Yet at the same time our results are consistent, with previous studies, finding that participants in good quality relationships were more likely to be open to pregnancy compared to those not in a relationship (Barber et al., 2019; Samari et al., 2020). When considering the pregnancy preferences of this group (more open to pregnancy), the degree to which they were more likely to use contraception becomes more notable.

Pregnancy preferences also acted as a suppressing mediator for those who considered religion to be very important in their life. Among youth, religiosity has been associated with a greater openness to pregnancy (Offiong et al., 2022). Interestingly, we found that participants who considered religion to be very important, were more open to pregnancy but slightly more

likely to use contraception. Our findings differ from those of Raine et al. (2003), who found in young women aged 15 to 24, those raised with a religion were less likely to use any contraception compared to none. In our study, the fact that religious youth were more open to pregnancy, suppresses the extent of their higher contraceptive use. Perhaps this finding exists because due to religious norms, consequences of becoming pregnant are higher. Stigma against abortion and premarital sex may influence religious individuals to use more effective contraceptive methods to prevent pregnancy (Hill et al., 2014).

Strengths and Limitations

The strengths of our study include the use of a validated, prospective tool to measure pregnancy intentions, a novel investigation of a youth population, and establishing a temporal relationship between pregnancy preferences and contraceptive use. By including a mediation analysis, we add to the exploration into pregnancy preferences and their role in contraceptive use. The study is limited by including only one data point (3-month survey) for contraceptive use, as we know that method type can change over time. Due to small group size, we combined emergency contraceptive/withdrawal/natural family planning use in with no contraceptive use, however with a larger population it would be interesting to examine users of these methods as a discrete group. Generalizability may be limited due to all participants having access to health care, as they were recruited in clinical sites, located in the southwestern United States.

Conclusion

In conclusion, our study demonstrates that youth who want to prevent pregnancy are more likely to use contraception, and wanting to prevent pregnancy is one of the most significant predictors of its use. And yet there are other individual factors that influence contraceptive use or non-use. As the type of method used was not associated with pregnancy desires, it is vital for less

emphasis to be placed in clinical care and research on the selection of more effective contraceptive methods as the only means for reducing undesired pregnancy. A shared decision-making process in which the provider offers information to guide the discussion based on patient preferences, results in improved patient satisfaction with the encounter and contraceptive use (Dehlendorf et al., 2017; Dehlendorf, Krajewski, et al., 2014; Dehlendorf et al., 2016). A comprehensive, patient-centered approach that considers the structural and contextual factors that impact contraceptive use better meets the needs of individuals.

Table 3.1

Baseline Characteristics, Youth Participants (aged 15-24 years) in the ADAPT Study (n=1,020)

Variable	n (%)
Desire to Avoid Pregnancy (DAP) scale, mean score (SD)	2.5 (1.1)
Age (15-24), mean years (SD) (n= 1,020)	21.4 (2.1)
Self-identified race/ethnicity (n=1,019)	
Hispanic/Latine	601 (59.0)
White	205 (20.1)
Black	75 (7.4)
Another race or mixed	138 (13.5)
State of residence (n=1,020)	
Arizona	214 (21.0)
Nevada	138 (13.5)
New Mexico	68 (6.7)
West Texas	282 (27.7)
Southeast California	318 (31.2)
Parity (n=1,017)	
0	789 (77.6)
1	152 (15.0)
2+	76 (7.5)
Relationship quality with main romantic partner (n=1,019)	
Very good/good	716 (70.3)
Fair/poor/very poor	96 (9.4)
No main partner/don't know	207 (20.3)
Importance of religion in daily life (n= 1,012)	
No religion	471 (46.5)
Not important	51 (5.0)
Somewhat important	285 (28.2)
Very important	205 (20.3)
Currently in school (n= 994)	463 (46.6)
Insurance (n= 956)	
No insurance	289 (30.2)
Public insurance	360 (37.7)
Insurance exchange/marketplace	75 (7.9)
Private insurance	212 (22.2)
Other	20 (2.1)
Food insecurity[1] (n= 996)	373 (37.5)
Mother's highest educational attainment (n= 979)	
Less than high school	291 (29.7)
High school diploma/GED	285 (29.1)
Some college or associate degree	275 (28.1)
Bachelor's degree or higher	128 (13.1)

[1] Concern that food would run out or did run out of food and did not have money to buy more

Table 3.2

Baseline Factors Associated With Contraceptive Method Use Three Months Later (n= 779)

	Barrier (vs. no method)		Short acting/long-acting reversible contraceptive (vs. no method)	
Variable	aRRR	95% CI	aRRR	95% CI
Desire to Avoid Pregnancy scale score	1.82***	(1.40, 2.36)	1.65***	(1.29, 2.10)
Age, years	0.92	(0.79, 1.07)	0.84***	(0.78, 0.91)
Race/ethnicity				
Hispanic/Latine (ref)				
White	0.91	(0.54, 1.53)	0.89	(0.51, 1.53)
Black	1.29	(0.68, 2.48)	0.86	(0.49, 1.50)
Another race or mixed	0.64	(0.28, 1.45)	0.97	(0.56, 1.70)
Parity				
0 (ref)				
1	1.70	(0.80, 3.62)	1.52	(0.86, 2.69)
2+	1.13	(0.33, 3.79)	1.72	(0.75, 3.94)
Relationship quality with main partner				
No main partner/don't know (ref)				
Fair/poor/very poor	0.89	(0.29, 2.80)	1.35	(0.68, 2.68)
Good/very good	1.11	(0.60, 2.05)	1.97**	(1.21, 3.19)
Importance of religion in daily life				
No religion (ref)				
Not important	1.09	(0.25, 4.85)	1.62	(0.55, 4.76)
Somewhat important	1.25	(0.59, 2.64)	1.24	(0.87, 1.75)
Very important	1.75	(0.74, 4.18)	1.59	(0.98, 2.59)
Currently in school				
No (ref)				
Yes	0.85	(0.53, 1.38)	1.24	(0.87, 1.75)
Insurance				
No (ref)				
Yes	1.11	(0.71, 1.74)	0.81	(0.52, 1.25)
Food insecurity				
No (ref)				
Yes	0.63	(0.34, 1.17)	0.64**	(0.46, 0.87)
Mother's highest educational attainment				
< High school (ref)				
High school diploma/GED	1.31	(0.61, 2.83)	1.11	(0.76, 1.63)
Some college or higher	1.27	(0.53, 3.07)	1.26	(0.96, 1.66)

*p<0.05, **p≤0.01, ***p≤0.001

Table 3.3
Multivariable Logistic Regression Models of Contraceptive Use at 3-Months

	% Contraceptive use	Model without DAP scale *(n= 780)*		Model with DAP scale *(n= 779)*	
Variable		Adjusted Odds Ratio	(95% CI)	Adjusted Odds Ratio	(95% CI)
Desire to Avoid Pregnancy scale score (range: 0-4)				1.68***	(1.34, 2.11)
Age, years		0.85***	(0.79, 0.91)	0.85***	(0.79, 0.92)
Race/ethnicity					
Hispanic/Latine (ref)	75				
White	74	1.02	(0.64, 1.63)	0.89	(0.54, 1.47)
Black	75	1.04	(0.61, 1.78)	0.94	(0.54, 1.65)
Another race/mixed	74	0.95	0.63, 1.43)	0.91	(0.56, 1.49)
Parity					
0 (ref)					
1	70	1.32	(0.75, 2.32)	1.57	(0.89, 2.75)
2+	75	1.53	(0.67, 3.46)	1.59	(0.70, 3.63)
Relationship quality with main partner					
No main partner/ don't know (ref)	69				
Fair/poor/very poor	70	1.12	(0.54, 2.30)	1.24	(0.63, 2.44)
Good/very good	77	1.44	(0.90, 2.30)	1.76**	(1.15, 2.68)
Importance of religion in daily life					
No religion (ref)	74				
Not important	79	1.60	(0.63, 4.04)	1.52	(0.55, 4.23)
Somewhat important	74	1.03	(0.75, 1.42)	1.24	(0.87, 1.77)
Very important	75	1.13	(0.71, 1.80)	1.62	(0.98, 2.66)
Currently in school					
No (ref)	70				
Yes	80	1.41	(0.97, 2.05)	1.16	(0.83, 1.63)
Health insurance					
No (ref)	79.				
Yes	73	0.79	(0.53, 1.19)	0.85	(0.58, 1.27)
Food insecurity					
No (ref)	77				
Yes	69	0.67*	(0.48, 0.94)	0.63*	(0.44, 0.90)
Mother's highest educational attainment					
< High school (ref)	70				
High school diploma/GED	75	1.16	(0.79, 1.72)	1.14	(0.75, 1.74)
Some college or higher	78	1.43	(0.99, 2.06)	1.26	(0.88, 1.79)

*p<0.05, **p≤0.01, ***p≤0.001

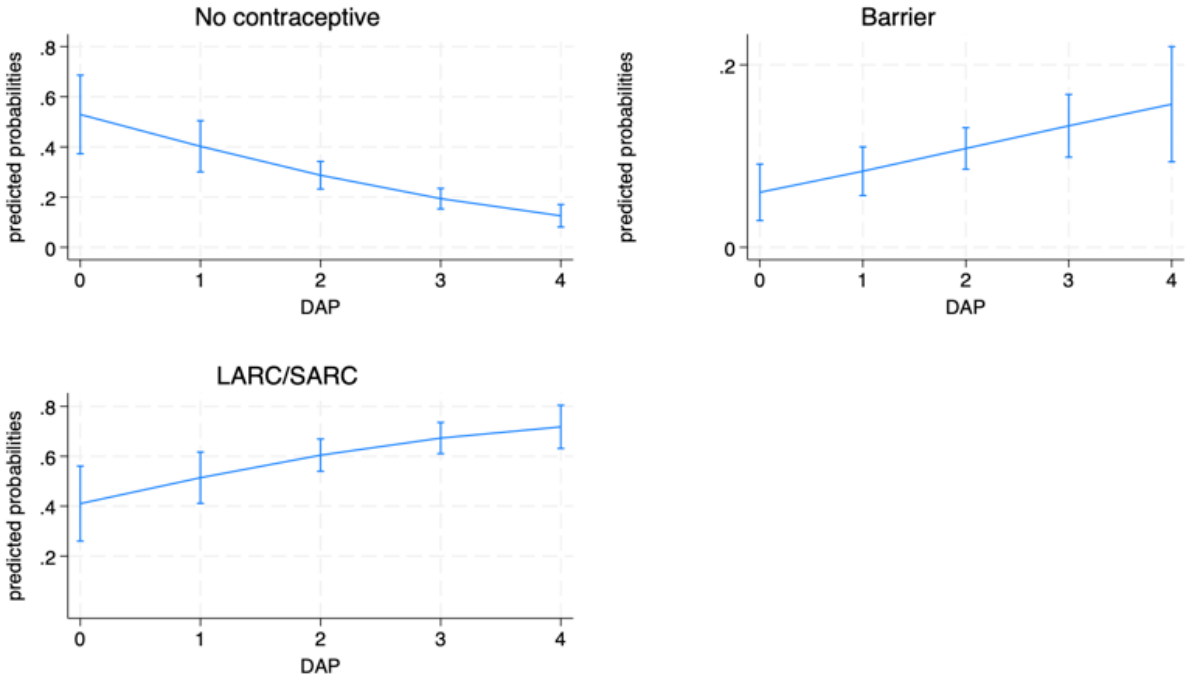

Figure 3.1
Predicted Probabilities of Contraceptive Type by DAP Score

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Chapter 4: Contraceptive Use Discordant with Pregnancy Preferences in Adolescents and Young Adults

Abstract

Objectives: Contraceptive use is impacted by multiple factors, and a greater understanding of the influences on this behavior can inform approaches to support youth to attain their own reproductive preferences. This study investigated participants' characteristics associated with contraceptive non-use among youth who want to avoid a pregnancy and, separately, contraceptive use among those open to a pregnancy to identify which youth may be at greater risk of not attaining reproductive autonomy.

Study Design: Using longitudinal quarterly data over one year from a larger cohort study, Attitudes and Decision Making After Pregnancy Testing (ADAPT), this study includes youth participants (15 to 24 years old). Multivariable logistic regressions, with contraceptive use as the outcome, were stratified by pregnancy preference using the Desire to Avoid Pregnancy (DAP) scale, a validated measure (open to pregnancy DAP >2 vs. preference to avoid pregnancy DAP ≤2). Each participant could contribute up to four observations to the analysis (n=2,569). In total, there were 1,760 observations in the high DAP score model and 809 observations in the low DAP score model.

Results: Among those with a greater desire to avoid pregnancy, a predicted 22% were not using a contraceptive method. Among those most open to pregnancy, 57% were nevertheless using a method. Contraceptive use among those with a greater desire to prevent pregnancy was more likely for participants in a high-quality relationship (compared to those not in a relationship) (82% vs 69%, aOR 1.91, 95% CI 1.14, 3.21) as well as those in school (82% vs 73%, aOR 1.91, 95% CI 1.14, 3.21). Among participants open to pregnancy, those with two or more children

(compared to none) were more likely to use a contraceptive method (68% vs 56%, aOR 4.87, 95% CI 1.02, 23.32). For both those wanting to prevent pregnancy (aOR 0.79, 95% CI 0.67, 0.94) and those more open to pregnancy (aOR 0.78, 95% CI 0.62, 0.97), contraceptive use declined by increasing age.

Conclusion: This study identified some youth whose pregnancy preferences and contraceptive use did not align. Pregnancy preferences do strongly impact contraceptive use but contraceptive behavior is complex and influenced by multiple factors.

Contraceptive Use Discordant with Pregnancy Preferences in Adolescents and Young Adults

Increased use of contraceptive methods is among the factors that have contributed to a decline in unintended pregnancies in the United States (Kost et al., 2023). An important public health goal is to help individuals attain their reproductive preferences by providing comprehensive contraceptive counseling to those who desire to prevent pregnancy. A Healthy People 2030 goal is to increase the numbers of sexually active adolescent and adult women who are using contraceptives (Office of Disease Prevention and Health Promotion, 2020). Interventions focusing on contraceptive uptake have targeted individuals who do not desire pregnancy and are not using contraceptives (Daniels et al., 2020; Rivet et al., 2021; Trussell et al., 1999).

Another relationship identified in the literature is individuals who desire pregnancy but are using a contraceptive method (Samari et al., 2020; Trussell et al., 1999). Regardless of pregnancy desires, contraceptives are used for multiple non-contraceptive health benefits (Bahamondes et al., 2015). Additionally, individuals open to pregnancy may be waiting until their life circumstances change such that they are better equipped to financially or socially to support a child (Downey et al., 2017). To better understand the contextual dynamics that exist for individuals whose contraceptive use does not match their underlying pregnancy preferences, investigation is needed into the relationship between pregnancy intent and contraceptive use.

Recent research has moved away from labeling pregnancies as intended or unintended because intent implies that everyone has clearly delineated ideas about a potential pregnancy (Kost et al., 2023). Feelings of ambivalence and uncertainty are also not adequately represented in a binary framing of an intended or unintended pregnancy (Aiken et al., 2016; Rocca et al.,

2019). Research has demonstrated that if participants are provided more comprehensive options to express their feelings, ambivalence is more prevalent (Kavanaugh & Schwarz, 2009; Schwarz et al., 2007). To better represent a range of feelings around pregnancy and potential parenting, the Desire to Avoid Pregnancy (DAP) scale was developed as a prospective, validated measure of pregnancy preferences (Rocca et al., 2019). The developers purposefully use the term "pregnancy preferences" instead of "intentions" to capture more accurately the latent and changing nature of the feelings, including ambivalence, towards a potential pregnancy that many people hold (Rocca et al., 2019).

Youth pregnancy preferences are not well studied, as most pregnancies are assumed to be unintended, resulting in a focus on pregnancy prevention efforts (Furstenberg, 2007). This study applies a more holistic frame to address the lack of studies investigating the range of pregnancy preferences in youth populations. Using a validated tool like the DAP scale allows for a comprehensive analysis of pregnancy preferences and a mechanism to explore if these preferences are in congruence with contraceptive use in this population. The aim of our study is to investigate relationships between socio-contextual factors and discordant relationships between pregnancy preferences and contraceptive use. Whether the goal is preventing or becoming pregnant, personal pregnancy preferences should be considered. This research is important because it looks at the spectrum of preferences to better understand the barriers to achieving reproductive autonomy.

Methods

Study Design and Sample

The Attitudes and Decision Making After Pregnancy Testing (ADAPT) study is a longitudinal cohort study that followed participants aged 15 to 34 years old for one to four years,

to examine decision making around pregnancy, health outcomes of more and less desired pregnancies, and health outcomes for the pregnant person. The larger study followed participants until they were lost to follow-up or became pregnant during the study period. Our study used the subset of participants aged 15 to 24 years old, who did not become pregnant during the first year after enrollment. We used longitudinal data from 5 waves, including baseline and quarterly surveys that followed non-pregnant participants for one year. We examined personal characteristics associated with contraceptive use in models stratified by desire to avoid pregnancy and open to pregnancy. We aimed to identify participants' characteristics associated with contraceptive use that did not match their underlying pregnancy preferences.

Participant Eligibility and Recruitment

Due to the interest in studying people at risk for pregnancy, eligibility criteria for participation in the ADAPT study included the following: capacity for pregnancy (not sterilized, assigned female at birth), 15 to 34 years old, sexually active in the past 3 months with someone with sperm, not currently pregnant, not currently using a long-acting reversible contraceptive, and ability to speak/read English or Spanish.

Recruitment, by trained research assistants, took place at 23 primary and reproductive health care clinics across southeastern California, Nevada, New Mexico, Arizona, and West Texas between March 2019 and October 2022. For minors, state law determined if they could give their own consent or if parental consent was needed for participation. Participants completed a baseline and quarterly surveys over a year. Participants received gift cards after every completed survey. The study was approved by the Institutional Review Board of the University of California, San Francisco.

Measures

Dependent Variable

Given our interest in identifying factors associated with contraceptive non-use among youth who want to avoid pregnancy, and contraceptive use among those who are open to pregnancy, we examined contraceptive use stratified by Desire to Avoid Pregnancy (DAP) scores.

Specifically, the outcome variable was contraceptive use. A dichotomous variable was created for those using or not using a contraceptive. Contraceptive use included those participants using a barrier method (condoms), short acting reversible contraceptives (oral contraceptive pills, vaginal ring, transdermal patch, and medroxyprogesterone acetate injection), or long-acting reversible contraceptives (intrauterine devices and the subdermal implant). Use of emergency contraception, withdrawal, and natural family planning were included in the group not using a method. The small numbers of participants using these methods prevented analysis as a separate group. In order to ensure independent variables were measured prior to contraceptive use, we examined prior month contraceptive use at the subsequent quarterly survey.

We stratified analyses by pregnancy preferences (open to pregnancy vs. preference to avoid pregnancy). Pregnancy preferences were measured with the Desire to Avoid Pregnancy (DAP) scale, a 14-item self-report questionnaire that measures the feelings about a potential pregnancy within 3 months and having a child within a year. Three conceptual domains (cognitive, affective, and practical considerations) all fit into one construct (Rocca et al., 2019). Each item is scored on a 5-point scale (strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree) and averaged, resulting in a score between 0 to 4. Higher numbers represent a greater desire to avoid pregnancy.

DAP score was examined as a dichotomous variable, categorizing a higher DAP score as greater than 2 and a lower DAP score as less than or equal to 2. The DAP tool was not created with a specific cut-point for desired or undesired pregnancy, but we used the mid-point of the scale to determine two categories, one greater desire to avoid pregnancy (>2) and greater openness to pregnancy (≤2). Hall et al. (2023) found that using a cut-point of 2 on the 0-4 range of the DAP scale maximized the sensitivity and specificity of scale scores in terms of predicting pregnancy.

Independent Variables

Participants' characteristics (socio-contextual factors) were chosen as independent variables of interest based on previous research showing an association with contraceptive use and possible indicators of social inequities in health, including age, self-reported race and ethnicity, parity, relationship with main partner, frequent sexual intercourse, importance of religion, currently in school, and health insurance (Dehlendorf et al., 2014; Raine et al., 2011; Rocca et al., 2022; Samari et al., 2020; Upadhyay et al., 2016). Two other variables, food insecurity (a concern that food would run out or did run out) and mother's highest educational attainment, were also selected to represent economic status. Many young people do not know their household income so these variables were chosen as proxies. Frequency of sex and relationship with main partner were treated as time-varying and the rest were time invariant variables.

Analysis

To examine participant characteristics that potentially are associated with a discordant relationship between pregnancy preferences and contraceptive use, we fit two multivariable logistic regression models with contraceptive use as the outcome. One model included

observations at which participants reported a greater desire to avoid pregnancy (DAP >2), and the second model included observations at which participants were more open to pregnancy (DAP ≤2). Although we were interested specifically in non-use of contraceptives among youth with a high desire to avoid pregnancy, we compared contraceptive use as an outcome to be consistent between the two models (use of contraceptives among those with a DAP >2 and use of contraceptives among those with a DAP ≤2). Depending on the participants' DAP score over time, each person could contribute observations to one or both models.

This analysis included all ADAPT study participants 15 to 24 years old (N=1,020), each of whom responded to up to five cross-sectional surveys (baseline and four quarterly follow-up surveys) over the yearlong study period (n= 4,446). Because we examined contraceptive use at the survey following the one at which we measured independent variables, each participant could contribute up to four observations to the analysis (e.g., baseline DAP and independent variables, 3-month contraceptive use, n=2,569). In total, there were 1,760 observations in the high DAP score model and 809 observations in the low DAP score model. We included data from participants until they were lost-to-follow-up or experienced an incident pregnancy.

Results

Sample Characteristics

At baseline, 59% of participants identified as Hispanic/Latine, 20% as White, 7% as Black and 14% as another race or mixed. Seventy-eight percent were nulliparous, 70% were in a high-quality relationship with a partner, 62% had frequent sex in the past month (weekly or more), and 47% were currently in school (Table 4.1). Additionally, at baseline 69% of participants had a DAP score of greater than 2 (indicating a greater desire to avoid pregnancy), while 31% had a DAP score of less than or equal to two, indicating more openness to a possible

pregnancy. Using longitudinal data, we were able to observe DAP scores over time. Forty-nine percent of participants had a high DAP score (DAP > 2) across all of their observations, 22% a low DAP score (DAP≤2) across all observations, and 29% moved between the two groups.

Contraceptive use

Among those with desire to avoid pregnancy (DAP score > 2)

At seventy-eight percent of observations, when participants desired to avoid pregnancy, they used a contraceptive method. Participants in a high-quality relationship (compared to those not in a relationship) (82% vs 69%, aOR 1.91, 95% CI 1.14, 3.21) were significantly more likely to be using a contraceptive method. Participants in school (82% vs 73%, aOR 1.91, 95% CI 1.14, 3.21) were significantly more likely to be using a contraceptive method. For each year increase in age between 15 to 24, participants who wanted to avoid pregnancy became less likely to be using a contraceptive method (aOR 0.79 per year, 95% CI 0.67, 0.94) (Table 4.2).

Among those with lower desire to avoid pregnancy (DAP score ≤ 2)

Among participants who were more open to pregnancy, 57% were using a contraceptive. Those with two or more children (compared to none) were more likely to be using a contraceptive (68% vs 56%, aOR 4.87, 95% CI 1.02, 23.32). For each year increase in age, participants who were open to pregnancy, became less likely to be using a contraceptive (aOR 0.78, 95% CI 0.62, 0.97) (Table 4.2).

Discussion

Chapter 3 of this dissertation established that pregnancy preferences (measured with DAP score) were strongly associated with contraceptive use among adolescent and young adult participants. As DAP score increased (greater desire to avoid pregnancy) so did the likelihood of using a contraceptive. Our study, as well as previous research, demonstrated that pregnancy

preferences and contraceptive use do not always align. One such relationship is youth who do not desire pregnancy and are not using contraceptives (Bartz et al., 2007; Moreau et al., 2013; Rocca et al., 2010) or those who are more open to pregnancy and using contraceptives (Samari et al., 2020). In this novel study of youth, we examined which participants' characteristics were associated with discordance between pregnancy preferences and contraceptive use. Sociodemographic and economic factors, representing variables that can be indicative of social inequities in health, were for the most part not significantly associated with these discordant relationships. Perhaps for individuals for whom pregnancy preferences and contraceptive use do not align, these discrepancies are influenced by different structural factors such as access to health care, societal/cultural pressures around contraceptive use, or personal beliefs around either contraceptive method side effects or medical benefits beyond pregnancy prevention.

We did find a few characteristics that were associated with these discordant relationships. Our previous research (outlined in Chapter 3) demonstrated that older, compared to younger youth, were less likely to use contraceptives. Furthering this finding in this study we found that contraceptive use declined by increasing age for both those who want to prevent and those who do not want to prevent pregnancy. Perhaps older youth, more inclined to avoid pregnancy, also feel more adept or developmentally prepared if they do become pregnant and therefore are willing to risk not using contraceptives. At the same time, older youth more open to pregnancy, were also less likely to use contraceptives. Rocca et al. (2024) found that youth 15 to 19, compared to adult women (25 to 34) expressed less concerns related to side effects and safety of contraceptive use. Older participants, potentially with more experiences with various methods and undesired side effects, may feel less inclined to use contraceptives (Rocca et al., 2024).

Increased concerns with contraceptives, coupled with their developmental stage and calculations of the consequences of pregnancy, older youth were more willing to forgo contraceptives.

Investigating characteristics of youth who want to avoid pregnancy and are not using contraceptives, is an important contribution to clinical services so that counseling and provision of contraception can be better directed to those who may benefit. Among those with a greater desire to prevent pregnancy, participants who were not currently in school and not in a relationship were less likely to be using a contraceptive method. This finding is consistent with previous research in youth, those in good quality intimate relationships are more likely to use contraceptives, as they are more likely having regular sex (Harvey et al., 2018; Manlove et al., 2014). Participants in school, were also more likely to use contraceptives. Weitzman et al. (2017) found that youth (18-19 years old) with higher educational attainment were more likely to want to avoid pregnancy compared to those not enrolled in secondary school. Youth in school are likely motivated to avoid school disruption by preventing pregnancy with contraceptive use.

Consistent with previous research on women of reproductive age, we found that among youth open to pregnancy, many are also using contraceptives (Samari et al., 2020). In our study, multiparous, compared to nulliparous, youth were more likely to embody this seemingly disparate scenario. In a post-partum period, youth who have given birth may have more frequent interactions with the health care system, increasing opportunities to start a contraceptive method. Samari et al. (2020), in a study of women 15 to 45, found the opposite, that nulliparous participants, who were more open to pregnancy, were more likely to use contraceptives compared to parous women. However, Samari et al. (2020) defined a low preference to avoid pregnancy as DAP scores in the lowest quartile (compared to our analysis that used only one

cutoff of DAP ≤2), used cross sectional rather than longitudinal data, and included women of all reproductive ages.

In a qualitative study of young women aged 18 to 24, Downey et al. (2017) found that participants were often more open to contraceptive use after a pregnancy or childbirth. Youth expressed a willingness to use contraceptives because they felt the cost of a pregnancy (i.e., an inability to support another child) outweighed any perceived downside of using a method (Downey et al., 2017). Parous youth are overall more open to pregnancy (Chapter 2 and 3 analysis) and perhaps at the same time acutely understand the financial or emotional challenges of parenting, underscoring their willingness to use contraceptives to delay pregnancy. Additionally, individuals may choose to use contraceptives for the multiple benefits beyond pregnancy prevention, including risk reduction for certain cancers, and decreasing heavy or painful menstrual bleeding (Bahamondes et al., 2015).

While we have shown that pregnancy preferences strongly influence contraceptive use, contraceptive behavior is complex and a multitude of factors influence willingness to use a method. Youth may be influenced by many factors when considering contraceptive use including, sexual partners, contraceptive side effects, access, historical and current racism (Dehlendorf et al., 2014; Harvey et al., 2018; Jackson et al., 2016).

Strengths and Limitations

Strengths of this study include a focus on a youth population, using a validated, comprehensive tool to measure pregnancy preferences and a longitudinal study design. As pregnancy preferences and contraceptive use are fluid, use of longitudinal data strengthens the analysis. Limitations to generalizability may exist because all participants were recruited while accessing healthcare in the southwestern United States. The DAP tool is purposely intended to be

used as a continuous rather than dichotomous measure, to reflect the complexities and ambivalence around pregnancy desires. For this study, using a midway point (dichotomous measure) representing either more or less desire to avoid a pregnancy, may not capture the full spectrum of feelings on this topic. As our study lacked the power to perform an analysis with more categories, future studies could use three groups (low, middle and high desire to avoid pregnancy).

Conclusion

Consistent with previous literature we identified factors associated with having a discordant relationship between pregnancy preferences and contraceptive use (Moreau et al., 2013; Samari et al., 2020; Trussell et al., 1999). Our findings help to understand more about contraceptive decision-making and identify who might be at risk of not fulfilling their reproductive preferences. Both pregnancy preferences and contraceptive use are impacted by social and cultural factors (Dehlendorf et al., 2021). This exploratory study lays groundwork to further investigate other levers that impact both feelings around a potential pregnancy and behavior regarding contraceptive use, such as parental or partner influences, employment, geographic location, or experience using contraceptives. As pregnancy preferences change over time, identification of the factors that may impact these changing preferences will also be an important building block to providing patient-centered care to youth.

Identifying youth who may be more likely to have a mismatch between their pregnancy preferences and contraceptive use is a first step. Subsequent research should investigate why these discordant relationships emerge and how policy and/or clinical practice can intervene. Considering ecological factors, highlighting our findings that pregnancy preferences do not

universally predict contraceptive use, more work is needed to determine the best approach to meeting the reproductive needs of a diverse patient population.

Table 4.1
Baseline Characteristics, Youth Participants (aged 15-24 years) in the ADAPT Study by Pregnancy Preferences (Desire to Avoid Pregnancy Scale)

Variable	Total n (%)	DAP≤2 n (%)	DAP >2 n (%)
Desire to Avoid Pregnancy (DAP) scale score	2.5, mean (1.1 SD)	332 (33.6)	686 (67.4)
Age (15-24) (n= 1,020)	21.4, mean (2.1 SD)	21.8 (2.0)	21.2 (2.1)
Self-identified race/ethnicity (n=1,019)			
Hispanic/Latine	601 (59.0)	223 (67.2)	376 (54.9)
White	205 (20.1)	42 (12.7)	163 (23.8)
Black	75 (7.4)	25 (7.5)	50 (7.3)
Another race or mixed	138 (13.5)	42 (12.7)	96 (14.0)
Parity (n=1,017)			
0	789 (77.6)	221 (66.6)	566 (82.9)
1	152 (15.0)	79 (23.8)	73 (10.7)
2+	76 (7.5)	32 (9.6)	44 (6.4)
Relationship quality with main romantic partner (n=1,019)			
No main partner/don't know	207 (20.3)	43 (13.0)	163 (23.8)
Fair/poor/very poor	96 (9.4)	32 (9.6)	64 (9.3)
Very good/good	716 (70.3)	257 (77.4)	458 (66.9)
Frequent sexual activity (weekly or more) (n= 999)	618 (61.9)	228 (70.2)	389 (57.9)
Importance of religion in daily life (n= 1,012)			
No religion/not important	522 (51.6)	133 (40.2)	387 (57.0)
Somewhat important	285 (28.2)	103 (31.1)	182 (26.8)
Very important	205 (20.3)	95 (28.7)	110 (16.2)
Currently in school (n= 994)	463 (46.6)	100 (31.0)	36 (54.0)
Health insurance (n= 956)	649 (67.9)	223 (72.2)	425 (65.8)
Food insecurity[1] (n= 996)	373 (37.5)	127 (39.0)	246 (36.8)
Mother's highest educational attainment (n= 979)			
Less than high school	291 (29.7)	111 (35.1)	179 (27.1)
High school diploma/GED	285 (29.1)	101 (32.0)	184 (27.8)
Some college or higher	403 (41.2)	104 (32.9)	298 (45.1)

[1] Concern that food would run out or did run out of food and did not have money to buy more

Table 4.2

Multivariable Logistic Regression Models, Pregnancy Preferences and Contraceptive Use by Participants' Characteristics

	Contraceptive use			
	Among those with greater desire to avoid pregnancy (n= 1,760)		Among those more open to pregnancy (n= 809)	
Variable	Adjusted Odds Ratio	95% CI	Adjusted Odds Ratio	95% CI
Age, years	0.79**	0.67, 0.94	0.78*	0.62, 0.97
Race/ethnicity				
Hispanic/Latine (ref)				
White	0.49	0.21, 1.14	0.62	0.18, 2.13
Black	0.59	0.17, 2.04	0.27	0.05, 1.54
Another race or mixed	0.39	0.15, 1.00	0.48	0.12, 1.84
Parity				
0 (ref)				
1	1.17	0.43, 3.24	1.35	0.47, 3.87
2+	2.18	0.55, 8.69	4.87*	1.02, 23.32
Relationship quality with main partner				
No main partner/don't know (ref)				
Fair/poor/very poor	0.68	0.33, 1.40	1.05	0.33, 3.30
Good/very good	1.91*[a]	1.14, 3.21	1.67	0.70, 3.95
Frequent sexual activity (weekly or more)	1.43	0.91, 2.25	0.87	0.47, 1.61
Importance of religion in daily life				
No religion/not important (ref)				
Somewhat important	0.51	0.25, 1.07	1.17	0.43, 3.15
Very important	0.65	0.27, 1.58	1.74	0.62, 4.88
Currently in school	2.06*	1.03, 4.11	1.04	0.41, 2.66
Health insurance	1.04	0.52, 2.05	0.74	0.28, 1.95
Food insecurity	0.78	0.41, 1.48	0.59	0.25, 1.39
Mother's highest educational attainment				
< High school (ref)				
High school diploma/GED	1.13	0.49, 2.58	2.60	0.92, 7.39
Some college or higher	2.04	0.93, 4.49	1.75	0.64, 4.82

*p<0.05, **p<0.01, ***p<0.001

[a] Good/very good relationship differs from fair/poor/very poor relationship at p<0.05

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Chapter 5: Discussion

A growing body of research is redefining pregnancy intention as pregnancy preferences to better describe the ranges of feelings around pregnancy, whether these feelings are latent or strongly held beliefs. Use of prospective, validated tools that investigate the nuances and changing feelings around pregnancy allow for a better understanding of pregnancy preferences. In my dissertation, I contribute to the literature by conducting novel studies focusing on adolescents and young adults, exploring their pregnancy preferences, the socio-contextual factors that impact these preferences, and contraceptive use. In this chapter I synthesize the three aims of the dissertation study, discuss the significance of the findings, and highlight the implications for future research and policy.

Summary of Findings

Aim 1: This analysis to identify the demographic, contextual, reproductive, and economic factors associated with pregnancy preferences of assigned female at birth youth 15 to 24 years old illustrated that many of these socio-contextual factors were associated with pregnancy preferences. This study also illustrated that youth have a range of pregnancy preferences.

Aim 2: The pregnancy preferences of youth 15 to 24 years old were associated with contraceptive use, with those most desiring to avoid pregnancy being the most likely to use contraception. Contraceptive method type (SARC/LARC vs. condom) was not impacted by pregnancy preferences. Pregnancy preferences did not, for the most part, mediate the relationship between participants' characteristics and their contraceptive use. In two groups of youth, being in a high quality relationship and being religious, pregnancy preferences did act as a suppressing mediator, with contraceptive use being higher than expected considering their greater openness to pregnancy.

Aim 3: Discordant relationships between pregnancy preferences and contraceptive use, defined as contraceptive non-use among youth who do not desire pregnancy and contraceptive use among those open to pregnancy, were present among youth 15 to 24 years old. Socio-contextual factors considered in this study for the most part were not associated with having a discordant relationship between pregnancy preferences and contraceptive use. Notably however, contraceptive use declined by increasing age for both those in a group wanting to prevent pregnancy and those more open to pregnancy.

Synthesis of Findings

This dissertation presented three novel studies investigating youth, to understand their pregnancy preferences and the relationship of these preferences with socio-contextual factors and contraceptive use. An ecological frame informed the conceptualization of the research questions and the variables selected for analysis, by considering multiple social and personal factors that impact individual preferences and contraceptive behavior. However, as this is a secondary analysis I was limited by data collected in the existing surveys. My research did not represent all ecological factors, especially in the political sphere, that can influence pregnancy preference or contraceptive use.

My dissertation work did importantly recognize that feelings around a potential pregnancy are complex and influenced by personal lived experience and historical context. Economic, social and cultural factors influence perspectives on pregnancy and parenting as evidenced by my findings that multiple variables (White race vs Latine, depression, not having a main sexual partner, being in school, having a mother with higher educational attainment, nulliparity, and not being religious) were associated with a greater desire to avoid pregnancy. My research, outlining significant relationships between participants' characteristics and pregnancy

preferences, provided the groundwork for the subsequent investigation looking at if pregnancy preferences impact contraceptive use.

The strongest indicator for contraceptive use among youth was a desire to avoid pregnancy. Similar to previous research in women of all ages, I found that the type of contraceptive method used was not impacted by personal pregnancy preferences (Samari et al., 2020). While pregnancy preferences were an independent risk factor for contraceptive use, the differences seen in contraceptive use by socio-demographic factors were largely not explained by these pregnancy preferences. More research is needed to identify factors that do explain differences in contraceptive use patterns.

In the context of investigating pregnancy preferences and contraceptive use that did not align, several interesting patterns emerged. Youth who wanted to prevent a pregnancy, were less likely to use contraceptives if they were not in school or not in a serious relationship. Youth with two or more children (compared to none), who were more open to pregnancy, were more likely to use contraceptives. Regardless of being more or less open to pregnancy, older participants were less likely to use a contraceptive method. Older youth, perhaps as more experienced contraceptive users, have more concerns about its use compared to their younger counterparts (Rocca et al., 2024). Concerns about contraceptives are beyond the scope of this dissertation but are an important factor in contraceptive behavior that should be further explored in youth.

Significance of Findings

In the current environment in the United States, with some states eliminating abortion services, it is important to understand individual desires around pregnancy and contraceptive use to be able to meet the needs of a youth population. Pregnancy prevention, for those who desire to avoid childbearing, becomes more essential in states with restrictive access to abortion. Access to

contraceptive methods are an important part of providing care to a youth population. Removing barriers to access is only one piece, as there are many other factors impacting contraceptive use, including a preference to not use any.

While I found that pregnancy preferences are an important indicator of contraceptive use, behavior is impacted by a multitude of societal, cultural, and personal influences. Reinforcing that pregnancy intentions do not fully explain the factors influencing pregnancy preferences and contraceptive behavior, my dissertation work demonstrates a need to broaden the conversation away from intended vs unintended pregnancy. To promote reproductive autonomy and understand contraceptive need, healthcare providers and researchers should be engaging in questions that help to decrease barriers or provide resources to allow people to either avoid pregnancy or become pregnant if they desire.

Implications for Research

Research that utilizes validated measures like the DAP scale, that embody a more holistic perspective on pregnancy preferences, will continue to move the science forward. Future studies should continue to investigate the complex environmental layers that surround the young person. The policy environment for example may influence access to reproductive services or insurance coverage as well as influence familiar or community norms around sexual health. As my dissertation research found that pregnancy preferences did not largely explain differences in contraceptive use between different groups, more research is needed to identify factors that do mediate the relationship between socio-contextual factors and contraceptive use. Another important avenue to explore is why older youth are less likely to use contraceptives, regardless of their pregnancy preferences. The next step for research to help inform policy is to define interventions specifically targeted to increase contraceptive uptake in those who do not want to

be pregnant. For example, I found that youth, not wanting to be pregnant, who are out of school or not in a serious relationship, were less likely to use contraceptives. Directed counseling on pregnancy risk and reducing barriers to contraceptive provision would benefit this population.

Implications for Practice and Policy

An essential component of my dissertation research is to highlight the implications for both clinical practice and policy impacting youth populations. The range of pregnancy preferences in this population was varied and challenged the assumption that all youth pregnancies are unintended. I found that parous (compared to nulliparous), religious, and youth not in school were all groups that were more open to pregnancy. Approaching sexual reproductive health from a more patient-centered model should address the full spectrum of pregnancy preferences in a youth population. Additionally, part of facilitating reproductive autonomy is making contraceptives available to those that want to avoid pregnancy and remains an important goal in clinical care.

Findings from this dissertation contribute to the critique of current clinical approaches for determining contraceptive need. The common clinical practice of asking if a patient desires a pregnancy in the next year as a way to determine this need, is likely insufficient to fully understand the patient's preferences or reproductive goals (Stulberg et al., 2020). Inquiring only about pregnancy intent misses those who may desire a pregnancy within a year but want to use contraceptives in the short term or those with ambivalence (Geist et al., 2019; Wingo & Dehlendorf, 2023). Clinicians can engage with patients by asking directly if they want contraceptives rather than make assumptions based on pregnancy intention, thus recognizing the reproductive autonomy of every individual. Contraceptive counseling should then directly address any patient concerns or perceived barriers.

Dehlendorf et al. (2014) identified best practices for contraceptive counseling, which are fundamentally centered in a shared decision-making model. Patients are more satisfied with their contraceptive method of choice if they feel the provider did not push them into a specific method (Dehlendorf et al., 2017). The healthcare provider role is to give information and facilitate the identification of patient preferences rather than to prioritize provider preferences.

Patient centered care, prioritizing the patient's perspective, is an important component of improving sexual health care for youth. My findings, which found some surprising relationships, highlight this need to listen to the patient. Young people in high quality relationships were more open to pregnancy but had higher levels of contraceptive use than those not in a relationship. This higher level of contraceptive use in fact existed among both those open to pregnancy and wanting to avoid pregnancy. Asking directly about contraceptive desire, rather than pregnancy intent, will help clinicians provide contraception to those who want it.

Beyond recognition of patient preferences, policies that promote reproductive autonomy play a role. Adult discomfort with youth sexuality has perpetuated policies that do not support confidential, accessible, and comprehensive reproductive services, that are essential for youth to receive care (Brindis et al., 2020). Engaging youth in designing programs, policies, and clinical services will better meet the needs of this population and empower them to utilize services (Brindis et al., 2020).

Expanding contraceptive access for youth is one factor that may remove barriers to use. The newly approved over-the-counter contraceptive pill, remote internet based contraceptive services, or receiving contraceptives directly from pharmacists are initiatives that may improve access. A qualitative study of adolescents found that increased access to contraception was important and receiving it directly from the pharmacy was an appealing option as it was often

more geographically convenient and required less wait time (Meredith et al., 2020). Rezel-Potts et al. (2021), in a study of women in the United Kingdom, found that those who received oral contraceptive pills via an online service were more likely to continue the method compared to those who received contraceptives from a traditional clinic. However, removing geographic or logistic barriers may not be sufficient as a multitude of factors impact a young person's ability to receive sexual health services, including cultural acceptability or family/partner support of using contraceptives (Bennett & Delamater, 2020).

Having a deeper understanding of structural factors that impact individual behavior, may allow for decreasing barriers for individuals to receive the reproductive health care they desire. Importantly, this includes supporting youth who do not want to use contraceptives, regardless of whether or not they desire pregnancy.

Conclusion

Utilizing the DAP scale, that recognizes people's undefined or ambivalent feelings around pregnancy, allows for an analysis beyond intent as the defining hallmark of contraceptive behavior. My dissertation research demonstrates a need for continued exploration into factors that impact both pregnancy preferences and contraceptive use, such as access or personal contraceptive preferences. Use of an ecological framework allows for an analysis incorporating the myriad family, community, policy, and other socio-contextual factors that impact an individuals' pregnancy desires. Policy should be designed to help people realize these goals by reducing barriers and providing more resources to either prevent pregnancy or parent if they desire.

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