ABSTRACT

Title of Dissertation: WOMEN'S AUTONOMY AND REPRODUCTIVE AND PERINATAL HEALTH OUTCOMES IN AFGHANISTAN

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Studies show that women's autonomy (WA)--as measured by household decision making, healthcare decision making, and permission to go out--facilitates access to resources, including education, employment, and healthcare resources. In return, these resources determine maternal and child health. Prior studies, conducted in countries other than Afghanistan, have resulted in inconsistent findings because the degree and direction of the association between WA and health outcomes differ among countries based on their laws and cultural context. There is no research examining the impact of WA on reproductive and perinatal health outcomes in Afghanistan. Conducting this research in Afghanistan is critical given the country's unique political and socio-cultural environment that shape its population health. For instance, less than one in two of Afghan women make decisions about their healthcare, while 53% of them have experienced physical domestic violence. The 2021 ruling of the country by the Taliban has exacerbated the violation of women's rights in Afghanistan, making the examination of the impact of WA on reproductive health outcomes even more pertinent. My dissertation addresses these gaps in the literature by examining the association between women's autonomy and **1.** experience of domestic violence types (physical, sextual, and emotional), **2.** unintended pregnancy, and **3.** pregnancy loss. I also assess the moderating effect of education on the association of WA and domestic violence, and the mediating effect of domestic violence on the association of WA and unintended

pregnancy and pregnancy loss.

I used data from 19,098 married women aged 15-49, who completed the 2015 Afghanistan Demographic and Health Survey- the first and only national survey administered in the country. WA was measured across 5 domains (healthcare, visiting family, household purchases, spending, and contraceptive use). Adjusted odds ratios and 95% confidence intervals for the association between WA and the outcomes of interest were estimated using multiple logistic regression and adjusted for relevant confounders including age, ethnicity, education, wealth, residency, and parity. Additionally, to assess moderation and mediation, interaction terms and casual mediation models were used for each respective analysis.

I found that about one in two Afghan women did not have autonomy in making decisions and experienced domestic violence, and approximately one in ten women experienced unintended pregnancy and pregnancy loss. In Aim 1, in the adjusted Model 2 (adjusting for confounders), women's autonomy in healthcare decisions (Adjusted odds ratio [AOR]=0.70, CI: 0.60-0.81), spending (AOR=0.58, CI: 0.51-0.66), visiting families (AOR=0.69, CI: 0.60-0.80), household purchases (AOR=0.59, CI: 0.52-0.68), and not using contraception (AOR=0.66, CI: 0.46-0.93) were significantly associated with decreased experience of physical violence. In addition, women's autonomy in healthcare decisions (AOR = 0.51, 95% CI: 0.39-0.65), spending (AOR=0.62, CI: 0.48-0.80), and household purchases (AOR=0.56, CI: 0.43-0.72) were significantly associated with decreased experience of sexual violence. Lastly, women's autonomy in healthcare (AOR=0.82, CI: 0.72-0.94), spending (AOR=0.61, CI: 0.53-0.71), visiting families (AOR=0.79, CI: 0.70-0.88), and not using contraception (AOR=0.58, CI: 0.42-0.80) were significantly associated with decreased experience of emotional violence. We also found a greater protective effect of WA in visiting family among women with some education (vs. no education) across each domestic violence outcome.

In Aim 2, Model 2, women's autonomy in healthcare decisions (AOR=0.87, CI: 0.77 - 0.97) and spending (AOR=0.86, CI: 0.76 - 0.97) were significantly associated with decreased experience of unintended pregnancy. However, women's autonomy in visiting families (AOR=1.15, CI: 1.02 - 1.29) was associated with slightly increased experience of unintended pregnancy. This association was partially mediated by physical and sexual domestic violence (21% of total effect mediated by domestic violence) in that the reduction of violence with WA attenuated the effect of WA on unintended pregnancy. Lastly, in Aim 3, Model 2, women's autonomy in healthcare decisions (AOR=0.86, CI: 0.78 - 0.95), household purchases (AOR=0.87, CI: 0.79 - 0.97), and visiting families (AOR=0.90, CI: 0.82 - 1.00), were significantly associated with decreased experience of pregnancy loss. Some of the protective effects of autonomy in healthcare (18%) and household purchase (15%) on pregnancy loss were mediated through reduced experience of domestic violence during pregnancy.

Beyond filling the gap in the literature, this study provides evidence and brings awareness (about the impact of the lack of women's autonomy on adverse health outcomes) that is needed to urge policymakers and program implementers in targeting and improving women's autonomy and health outcomes in Afghanistan. The findings of this study can also be translated into Dari and Pashto and be shared with the general public in Afghanistan. Interventions that may improve women's autonomy and health outcomes in Afghanistan, such as establishing laws about women's rights, granting access to education, awareness campaigns, microfinancing, and community-based distribution programs, could foster gender equity and improve maternal and child health – moving to more sustainable development, consistent with Sustainable Development Goal (SDG) 3 and 5.

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Table of Contents

List of Tables

List of Figures

1. INTRODUCTION

1.1. Background and Significance

The literature offers various perspectives on women's autonomy.[1–4] One interpretation, relevant to this study, involves the ability of a woman to exert control or influence over decisions that impact her and shape her life.[1] Historically, unequal gender norms granted men more decision-making power than women.[5] For example, before 1800, in most countries, only men could vote in elections, inherit or own property, and decide on the number of children in the household.[5] While in the West, women's rights improved in general; for instance, women in most Western countries don't need permission from their husbands to visit their parents or a healthcare facility, in some other countries like Afghanistan, women still lack such decision-making autonomy.[6] As another example, education is considered a basic human right in the majority of countries, but in Afghanistan, women's decisions about getting an education are often determined by the father, the husband, or the government.[7,8]

In the context of this study, when we refer to women's autonomy, we do not claim for a woman to have more power than other household members in making decisions, especially about shared matters (e.g., family planning, household purchases). Instead, we are concerned about whether women have an equal right, for example, to decide about visiting their families as men do. Empirically, I measure women's autonomy as decision made by women or jointly with their husbands, and lack of autonomy is measured as women's decision made by their husband alone or someone else made the decision for them. Furthermore, it is important to mention that women's autonomy is distinct from women's empowerment in that women's empowerment is more complex and encamps not only autonomy (individual's decision-making power), but also women's attitude toward gender norms, and their power to influence resources and social change.[52] My research focuses on women's autonomy. Women's autonomy has different dimensions such as autonomy in financial matters, health care, use of contraception, and going to places. This and the literature on the history and measurement of women's autonomy is further discussed in Section 2.1. and 2.2 of this paper.

The prevalence of gender inequality and lack of women's autonomy is high in the world. A report by the United Nations shows that globally only 57% of women make decisions about sexual relations, contraceptive use, and reproductive health care.[9] Lack of women's autonomy is especially worse in low-income countries. In Afghanistan, only 5% of women make decisions alone about their health care and 44% of women's health care decisions are made by their husbands.[6] In general, women's autonomy facilitates access to social resources including education, power, and prestige,[10,11] material resources including job, land, and wealth,[10,12] and importantly, health care resources.[13–15] In return, greater access to resources can determine maternal and child health outcomes.[15,16] For instance, Mistry et al. found that women who had autonomy (decision-making autonomy, financial autonomy, and permission to go out) were more likely to use adequate antenatal care compared with women who did not have autonomy.[13] Accordingly, inadequate antenatal care is a major risk factor for a high rate of adverse birth outcomes[17–19] and maternal mortality in low-income countries.[16]

Studies show that higher women's autonomy is associated with an increased number of antenatal care visits,[13,14,20] increased use of contraception,[21,22] reduced experience of domestic violence,[23,24] decreased unintended pregnancy,[25] negative attitudes toward female genital cutting,[26] improved child nutrition,[27] increased children's immunizations,[28] and decreased maternal, infant and child mortality.[29–33] However, these findings are not always consistent across geographic regions or contexts with some studies finding women's autonomy to be associated with increased experience of violence[34,35] and increased unintended pregnancy.[36] These inconsistent findings exist because the degree and direction of the association between women's autonomy and health outcomes differ among countries based on their laws, social norm, and cultural context.[37] For example, in nations like Bangladesh[24] and Ghana[23] women's lack of autonomy is significantly associated with increased experience of intimate partner violence (IPV). In such cases, women, who lack financial autonomy and are dependent on their partner, may not have the option to leave abusive relationships, and therefore, continue to experience physical and/or sexual IPV.[24] On the contrary, in countries like the Philippines[34] and India[35] women's autonomy is associated with increased experience of domestic violence. In this case, women who reject the normalization of IPV and strive for autonomy may face further resistance and violence from their partners. When traditional gender norms of men being the dominant decision-makers are challenged, men may become violent to restore their dominance.[35] Therefore, women's autonomy may either ameliorate or exacerbate experience of violence depending on the unique situation of each country.

Given potential contextual differences and associations between women's autonomy and health outcomes, it is important to examine women's autonomy and reproductive and perinatal health outcomes in Afghanistan, specifically, given Afghanistan's unique political and socio-cultural environment shape its population health. For instance, Afghanistan has experienced continuous conflict and has the highest gender-unequal norms and prevalence of domestic violence (90%) in the world.[38] This has worsened with recent conflicts. The 2021 ruling of the country by the Taliban has exacerbated the violation of women's rights in Afghanistan.[39] The Taliban has removed the Elimination of Violence Against Women law that was established in 2009 by the United Nations Assistance Mission in Afghanistan (UNAMA).[39] The country's

Women, Peace, and Security (WPS) Index has decreased by 28% since 2017.[40] The Taliban has also eliminated the Ministry of Women's Affairs that protected women's rights by establishing and enforcing policies.[39] Women are not allowed to attend school or university; women cannot even step outside their house unless they are escorted by a male relative.[41] Afghanistan is also one of the developing countries with the highest rates of maternal mortality (701 per 100,000 live births) and neonatal mortality (41 per 1000 live births).[42,43]

Despite the alarming prevalence of reduced women's autonomy in Afghanistan and adverse reproductive health outcomes, there is no research investigating the link between women's autotomy to these outcomes in Afghanistan. Also, no previous study has looked at the moderating effect of education and the mediating effect of spousal violence on this association, of which the latter has been associated with adverse birth outcomes in Afghanistan.[44] A study in Ethiopia showed that women who had primary and secondary or above education were about two and four times more likely to have greater autonomy than women with no education.[45] Similarly, a study using a national representative sample from Bangladesh found that women with greater autonomy were more likely to have higher education level.[46] On another hand, education is inversely associated with domestic violence. Studies show that women's higher levels of education are associated with lower levels of domestic violence.[47] Specifically, a study in Ghana found that compared to women with no education, women with some education were less likely to experience physical or emotional violence from their partners.[23] Depending on the status of women's education, the effect of women's autonomy on their experience of domestic violence may differ.

One of the United Nations' top priorities is reducing gender inequalities and violence against women through the Sustainable Development Goal 5 (SDG 5).[48] Overall, SDG5 seeks to promote gender equality and empower women and girls to fully participate in all aspects of society, which has shown to have positive impacts on health.[49] Therefore, promoting gender equality and women's autonomy also help with achieving SDG 3, which "ensure healthy lives and promote well-being for all at all ages."[50] This research is essential in providing important insights on areas for intervention to inform efforts to address gender inequalities in the war-torn country (Sustainable Development Goal 3), and adverse health outcomes for mothers and their children (SDG Goal 5). This study will also raise awareness about the importance of women's autonomy in Afghanistan and advocate for policies that protects women's rights such as reestablishing the Elimination of Violence against Women (EVAW Law) and the Afghan Ministry of Women's Affairs, Human Rights Units.

1.2. Specific Aims & Hypotheses

This dissertation aims to address this literature gap using the 2015 Afghanistan Demographic and Health Survey (AfDHS) data. AfDHS is the first and only national survey conducted in Afghanistan as a part of the Demographic and Health Surveys (DHS) program.[6] DHS measures women's autonomy by asking women whether they make decisions themselves, jointly with their partner, or their partner alone about women's health care, visiting families, household purchases, and contraception use.[6] The data represents all 34 provinces, with a sample of 25,650 households (a response rate of 98%), making it generalizable to the country.[6] My research will aim to:

Aim 1: Examine the association between women's autonomy and experience of domestic violence (physical, sexual, and emotional) in the past 12 months, and whether this association is moderated by status of education.

Hypothesis a: There will be a significant increase in odds of domestic violence among women who lack autonomy compared to women who don't.

Hypothesis b: Those with higher education level will have a lower magnitude of association between women's autonomy and experience of domestic violence.

Aim 2: Evaluate the association between women's autonomy and unintended pregnancy, and whether the association is mediated by the experience of domestic physical or sexual violence in the past 12 months.

Hypothesis a: There will be a significant increase in odds of unintended pregnancy among women who lack autonomy compared to women who don't.

Hypothesis b: The association will be partially mediated by domestic physical or sexual violence combined in the past 12 months.

Aim 3: Evaluate the association between women's autonomy and pregnancy loss, and whether the association is mediated by ever experience of domestic physical violence during pregnancy.

Hypothesis a: There will be a significant increase in odds of pregnancy loss among women who lack autonomy compared to women who don't.

Hypothesis b: The association will be partially mediated by domestic physical violence during pregnancy.

1.3. Research Implications

Studying Afghan women's autonomy and its associated health risks is essential to continuing international efforts in addressing gender inequalities (Sustainable Development Goal 5) and improving the health of all (Sustainable Development Goal 3). Beyond filling the current gap in the existing public health literature, the study informs the world of the additional adverse outcomes that may be exacerbated by the Taliban party's policies, including eliminating the Ministry of Women's Affairs, suspending women's education, and banning women's freedom of movement in public unless they are escorted by a male relative.[39,41] In turn, if these relationships are shown to deleteriously affect maternal and child health, this may increase pressure to reintroduce previously rescinded women's rights to improve maternal and infant health outcomes. Considering the current women's condition under the Taliban administration, this research has significant relevance.

At the country level, the findings can be translated into Dari and Pashto and be shared with policymakers as well as the general public through media to aid in understanding the importance of women's autonomy and its impact on reproductive and perinatal outcomes. Men may not violate women's rights as frequently if they understand that their violence against women impacts their babies and not just merely their wives. Unfortunately, in some traditional families in Afghanistan, men marry not for love, but for reproducing a boy that could carry on the family name, a practice also common in some semi-urban regions of Nigeria.[51,52] The 2015 AfDHS data is the first and only survey ever conducted at the national level in Afghanistan. Although the data is from 2015 and the government has changed in Afghanistan, it is very likely that our findings are still relevant because women's living conditions have worsened in the country after the control of the Taliban in 2021.

2. LITERATURE REVIEW

2.1. Women’s Autonomy

Women’s autonomy is referred to as a woman's capacity to exercise control or influence over decisions that affect her and determine the course of her life.[1] However, there are nuanced differences and connections between women’s social status, women’s autonomy, and women empowerment. Autonomy refers to a woman’s ability to make decisions based on the resources available to her, while a woman’s status refers to her social class or prestige in society, influencing the extent of resources at her disposal.[21] Generally, women with higher social status are more likely to possess greater autonomy; however, in certain cultural contexts (e.g., Egypt), it is possible that women with high social status or wealth may experience lower autonomy in the household compared to women with low social status.[53] Nevertheless, autonomy and social status are both important factors of women’s empowerment; empowered women have both higher decision making autonomy and more access to resources.[54] Women's empowerment is a complex phenomenon, and its measurement differs from that of autonomy. The primary focus of my dissertation is on women’s autonomy.

In response to gender inequalities, women’s autonomy has become an important phenomenon among scholars especially in social demography and sociology for more than two decades.[55] In the 1980s, researchers started to investigate the implications of women’s autonomy in developing countries. They found that increased women’s autonomy was associated with improved child nutrition and education, reduced fertility, and a better standard of living for women in low-income countries such as India and Bangladesh.[56,57]

In 1995, the United Nations’ fourth World Conference on Women emphasized women’s autonomy and equal participation in society to be essential to human rights and dignity.[58] Since then, many new studies have assessed the determinants and impact of women's autonomy in different cultural contexts and countries.[37,59,60] Since women's autonomy is, in part, shaped by a country's political agenda, cultural norms, religion, etc., the degree and directionality of women's autonomy are distinct among different countries.[61] This is also a reason why findings in India cannot be applied to Afghanistan, and there is a need to study women's autonomy and its health outcomes in Afghan society.

Historically, unequal gender norms granted men more decision-making power than women.[5] For example, before 1800, in most countries, only men could vote in elections, inherit or own property, and decide on the number of children in the household.[5] While in the West, women's rights improved in general; for instance, women in most Western countries don't need permission from their husbands to visit their parents or a healthcare facility, in several other low-income countries like Afghanistan, women still lack such decision-making autonomy. For example, many Afghan women cannot visit a doctor if their husband without their husband's permission.[6] Therefore, the DHS continues to collect data in low- and middle-income countries on women's autonomy in visiting families, health care, use of contraception, household purchases, and spending to track how those countries are progressing toward more equal gender norms.[6] One reason for why DHS selects the mentioned autonomy elements is because earlier studies in 1980s showed that these variables, both independently and collectively, may be associated with health outcomes,[56,57] as discussed in the following paragraph.

In the literature, there are different aspect of women's autonomy, such as autonomy in financial matters, reproductive health, mobility, etc.[1] Although autonomy, in general, may have a protective effect on health, specific types of autonomy may have a stronger correlation with a specific health outcome. Therefore, some studies have investigated the association between a specific type of women's autonomy and a specific health outcome. For example a study in the Democratic Republic of the Congo assessed the association between women's autonomy in healthcare and use of modern contraception.[62] They found that autonomy in health care was significantly associated with increase used of contraception.[62] Theoretically, a women may be more informed about contraception and have better access to contraceptive methods if she has autonomy in healthcare and visiting a doctor.[62] In this case, autonomy in healthcare is more important and has higher correlation with use of contraception than it would have with autonomy in visiting families. Other studies have assessed the association between several types of autonomy (e.g., economic decision making, health care decision making, and visiting places) and specific maternal and child health outcomes.[20,21,23,63,64] For instance, Saaka investigated the association between four types of women's autonomy ('health care autonomy, maternal household decision-making autonomy, movement autonomy, and economic autonomy') and child feeding practices and postnatal growth.[63] He found a significant association between greater autonomy and better child feeding practices as well as optimal child growth.[63] As another example, Tenkorang studied the association between three types of women's autonomy (economic decision making, family planning decision making, and sexual autonomy) and intimate partner violence in Ghana.[23] He found that women with greater family planning decision making autonomy were less likely to experience any type of intimate partner violence compared with women with less autonomy, while women with greater economic-decision making were more likely to experience emotional violence.[23] This shows that different types of women's autonomy variables may have differing impact on specific health outcomes and, thus, should be taken into consideration based on the context of a country.

2.2. Measurement of Women's Autonomy

The measurement of women's autonomy is important to be valid, reliable, and culturally relevant. Previously, some scholars used indirect proxy measures of autonomy, such as level of education or labor force participation; however, such proxies cannot accurately capture or represent the concept of women's autonomy.[56] For example, when assessing the effect of autonomy on fertility using education as a proxy, we cannot be confident about whether a decrease in fertility from increased education is from the direct effects of education or education's effect on one's ability to make decisions regarding their health and healthcare.[65] Education may also moderate the effect of women's autonomy on fertility in that increased knowledge and awareness of contraception or ways to access fertility care could influence one's ability to make autonomous choices about their health. Furthermore, the use of education as a proxy for autonomy also obscures distinct dimensions of autonomy (e.g., economic decision making, family planning decision making, health care decision making, and decision to visit families or relatives), which may operate differently to affect health.[66]

In the past few years, research has refined and improved the measurement of women's autonomy, making it more accurate and dimensional.[3] Several studies that employed multiple dimensions of women's autonomy using different types of surveys, measured women's autonomy similarly, including the National Family Health Survey (a multi-round survey, which allows for longitudinal studies), Demographic and Health Surveys (DHS), and community-based surveys.[13,20,23] For example, women's decision making in health care and household purchases were measured across these data sources using the following questions: "Who usually makes decisions about health care for you? Who usually makes decisions about major household purchases?" The response options included: a) respondent (the woman); b) husband; c) jointly with husband; d) someone else e) other.[13,20,23]

Although survey questions and response options across the datasets were similar, some studies used slightly different statistical methods to combine questions or recategorize the response options based on their relevant outcome of interest. For example, Mistry et al.[13] examined women's autonomy and pregnancy care in rural India using the National Family Health Survey, and applied three dimensions of women's autonomy: healthcare decision-making, permission to go out, and financial decision making. These three dimensions were measured by asking participants "who makes the following decisions in [respondent's] household about: 1) obtaining health care for yourself; 2) purchasing jewelry or other major household items; and 3) you going and staying with parents or siblings?" Response options included: "a) respondent; b) husband; c) jointly with husband; d) other in household, or e) jointly with others in the household. A value of 1 is assigned if the response was (a), (c), or (e), 0 for (b) or (d), and the values were added resulting in a score from 0 to 3 (Cronbach's $\alpha = 0.7911$)" with a higher score corresponding to greater autonomy.[13]

As another example, Rahman et al.[20] studied the associations between antenatal care visits and decision-making autonomy in Afghanistan using DHS data. They measured the three dimensions of women's autonomy by the following questions that were asked from the participants: "Person who usually decides on respondent's health care, b) Person who usually decides on large household purchases, and c) Person who usually decides on visits to family or relatives." They coded "respondent and husband/partner" as 1, "respondent alone" as 2, and other responses such as "respondent and other person", "husband/partner alone", and "someone else" as 0, which provide more weight to fully autonomous decisions. "The summed score of three items ranged from 0 to 6, where a higher score referred to women's higher autonomy in the household decision-making process."[20] Although the questions and response options in both studies by Rahman et al. and Mistry et al. were similar, their methods of combining or recategorize the response options differed.

Demographic and Health Surveys (DHS) also considers cultural relevancy by coordinating with countries' agencies (e.g., their ministry of public health) and conducting a pilot survey.[6] The Afghanistan Demographic Health Survey (AfDHS) questionnaires, whose data I will use for my research, were pre-tested before the fieldwork to test the instrument validity and cultural relevancy and to maintain data quality.[6] Additionally, the CSPro software was used for data entry, and double entry was done for 100% verification to minimize data entry errors. Data collection happened through face-to-face interviews over eight months.[6]

2.3. Women's autonomy and domestic violence in the context of Afghanistan

Women's autonomy and domestic violence are indispensable issues in Afghanistan because Afghans have been experiencing a continuous war since 1973.[67] The war and instability of the country have created structural violence, defined as the indirect violence built into repressive social orders that can shape people's self-conceptions, behaviors, and practices.[68] War deprives people of opportunities for education and employment, leading to poverty, inequality, oppression, and stress- all of which can induce domestic violence and exacerbate patriarchy.[69] Men's diminished opportunities for employment and providing for their family may sabotage their self-evaluation as providers and sense of masculinity, causing stress and anxiety, which can be expressed in the form of spousal violence.[69] These factors and pathways are further explored and discussed under sections 2.3-2.5 of this paper. In this section, I focus on the relevant background and history of Afghanistan that has shaped women's experience of domestic violence and lack of autonomy in Afghan society.

In 1919, Afghanistan gained its full independence from the United Kingdom and established a national government.[67] The country was in peace and stability until the 1970s, and during that time, Afghan women had equal rights; they could dress like the women in western countries and had access to education and job opportunities.[70] The conflict began with a coup in 1973 and a communist counter-coup in 1978.[67] The Union of Soviet Socialist Republics (USSR) supported the Afghan Communist party and invaded Afghanistan in 1979, which led to a long and disastrous war. With support from the U.S., Mujahedin defeated the Soviets; however, a major civil war took place from 1992 to 1996, after which Kabul was occupied by the Taliban.[67] The Taliban ruled by their extremist model of religion, which was considered the most oppressive period for women in the country.[67] Schools were closed for women and girls in Afghanistan.[71] Women were also not allowed to step outside their homes without wearing the head-to-toe burqa and being escorted by a male relative.[70,72] In addition, playing music, singing, or having a TV was forbidden.[70] In response to the September 11, 2001 terrorist attacks by Al-Qaida in New York City, the U.S. invaded Afghanistan. After defeating the Taliban in November 2001, the U.S. assisted Afghanistan to establish a government.[67] Even though the Taliban were not ruling the country, they continued to attack schools and violate women's rights.[70]

The violation of women's rights and violence against women in Afghanistan has been recognized by several national and international organizations, including Afghanistan's previous Ministry of Public Health (AfMoPH),[6] Women for Women International (WfWI)[73], the World Health Organization (WHO),[38] and the United Nations Assistance Mission in Afghanistan (UNAMA).[74] Harmful traditional practices are endemic in Afghanistan.[75] These practices include early and forced marriage of girls, bride price, baad (girls being traded to settle disputes), badal (exchange of women and girls between families for marriage), and honor killings.[75] Because of the cultural and legal factors that deprive women of rights and privileges granted to men only,[76] the majority of Afghan women are unemployed and dependent on men.[6] This further constrains women's options for leaving abusive relationships. And those women who escape are considered immoral and accused of adultery regardless of whether there is any evidence or not.[75] If caught, women would be punished either in the hands of mobs in local informal gatherings or put in jail through the formal system.[75] Some women have endured abusive investigatory methods by the police, including 'virginity testing,' the unscientific and unfounded practice of determining whether a woman is virgin.[75] In virginity testing, "the examiner places two fingers inside a girl's vagina, checking for an intact hymen (tissue at the vaginal opening) and/or vaginal laxity (a "looseness" that could suggest sexual activity)."[77]

Since the end of the Taliban regime in 2001, both national and international agencies tried various interventions to mitigate the violence against women. Some agencies assisted in the establishment of laws and legal systems, including the creation of the Afghanistan Independent Human Rights Commission (AIHRC), the Afghan Ministry of Women's Affairs, Human Rights Units, Departments of Women's Affairs and Gender, and the passing of the Elimination of Violence against Women (EVAW Law) by the United Nations Assistance Mission in Afghanistan (UNAMA) in 2009.[78] Other agencies and organizations assisted through providing services. For instance, Women for Afghan Women (WAW), an organization headquartered in NY, provided humanitarian services to women with experience of domestic violence through WAW centers in 24 provinces of Afghanistan.[79] Women for Women International (WfWI) was another organization that provided training and financial support to Afghan women.[73]

Although previous interventions had some positive effects, their efficacy was limited. For example, in 2009, UNAMA assisted the Afghan government pass the Elimination of Violence Against Women Law (EVAWL) to eliminate violence against women and protect women's rights.[74] The EVAWL criminalized for the first time in Afghanistan 22 forms of violence against women including, "rape; burning or use of chemical substances; forcing a woman to commit self-immolation; beating; selling and buying women for the purpose of or under the pretext of marriage; baad (giving away a woman or girl to settle a dispute); forced marriage; marriage before the legal age; abuse; harassment or persecution; forced drug addiction; denial of the right to property; denial of the right to education, work and access to health services and other rights provided by law."[74] UNAMA did a study from March 2010 to September 2011 to examine the impact of EVAWL. They found that several crimes were prosecuted using the Sharia law or the Penal Code instead of the EVAW law.[74] Consequently, often perpetrators were exonerated or received lighter punishment, and women victims were accused of "moral crimes" such as not wearing hijab in public.[74] UNAMA found that of the 2,299 cases reported and defined as crimes under the EVAW law, the Afghan courts relied on the EVAW law in decisions for only 4% (101) of the cases.[74]

The 2021 overtake of the country by the Taliban has exacerbated the violation of women's rights in Afghanistan.[39] The Taliban has removed the EVAW law that was established by UNAMA.[39] The country's Women, Peace, and Security (WPS) Index has decreased by 28% since 2017.[40] The Taliban has also eliminated the Ministry of Women's Affairs, which protected women's rights by establishing and enforcing policies.[39] Furthermore, women are banned from getting an education or participating in government; women are not even allowed to step outside their homes without being accompanied by a male relative.[41] These policies limit women's autonomy and can potentially exacerbate adverse reproductive and perinatal health outcomes.

My research is important in providing evidence and bringing awareness about the impact of the lack of women's autonomy on adverse reproductive and perinatal health outcomes. Additionally, men may not violate women's rights as frequently if they understand that their violence against women impacts their babies and not just merely their wives.

2.4. Prevalence and factors associated with women's autonomy

Globally, the prevalence of gender inequality and lack of women's autonomy is high. According to the United Nations, only 1 in 2 women makes decisions about sexual relations, contraceptive use, and reproductive health care in the world.[9] 1 in 3 women have experienced domestic violence,[80] and 1 in 5 women aged 20-24 were married under age 18.[9] The statistics are particularly alarming in developing countries like Pakistan and Afghanistan. According to Afghanistan's 2015 Demographic Health Survey (AfDHS), the first and only national data, 61% of men believe that they are justified to beat their wives if their wives go out without telling them.[6] Additionally, about 51% of women reported getting permission to go to the doctor from their husbands was a problem in seeking medical advice or treatment.[6] Furthermore, the 2014 Afghan government report on violence against women revealed that about 90% of Afghan women had experienced at least one form of domestic violence.[38] The majority of women (88%) in Afghanistan are not employed and are financially dependent on men. Women experience reduced autonomy and more prevalent adverse health outcomes than their counterparts in more developed countries.[6]

Several factors are associated with women's autonomy including gender inequality and patriarchy,[37,81,82] religion,[81,83–87] perceived cultural norms around women's autonomy,[88,89] ethnicity,[11,90] rurality,[6,91] age,[61,92] education,[45,46] socioeconomic status,[46,93] and interpersonal[23,24] and structural violence.[94] Studies show that in regions with a more gender-stratified setting and patriarchal culture such as South Asia, women's autonomy (in terms of decision making, mobility, and control over economic resources) is significantly reduced.[37,81] Patriarchal cultures are described by a set of social norms where more power and resources are granted to men, making women vulnerable and dependent.[82] Additionally, perceived cultural norms, including gender socialization[97] around women's autonomy and domestic violence, also influence women's decision-making power. In societies with highly restrictive patriarchal cultures like Afghanistan, men and women from a young age develop their social identity through the internalization of familial and societal discourses that define the norm of men's domination and women's subordination.[89] According to a study, about 76% of Afghan men and 80% of Afghan women perceived domestic violence acceptable (i.e., wife-beating is justified in certain instances).[88] Afghans may perceive these injustices as normal because these inequalities are deeply implanted in society and construct people's social identity.

Furthermore, religion also plays a role in reinforcing gender roles[83] and male privileges.[84] In particular, some Islamic countries[85] and politicians' interpretation of Islamic laws tends to restrict women's autonomy.[86] A study in Ethiopia showed that Muslim women had less autonomy in refusing risky sex than Orthodox Christian women.[87] However, another study in Ghana showed no difference in women's autonomy among Christians vs. Muslims.[95] This is because nations and politicians have different interpretations of Islamic laws, and in some cases, religion is used to justify a political stance.[86] An example is the Taliban, who have justified the elimination of women's rights and autonomy by their interpretation of the Islamic Sharia Allah.[96]

According to the Taliban's interoperation of Islam, women should not get an education, be seen in public, or become involved in politics in Afghanistan.[96]

In addition to the factors discussed above, ethnicity, rurality, and age also play an important role in women's autonomy. For example, in Afghanistan, even though the majority of the population (99.7%),[98] including Pashtuns, Tajiks, and Hazaras ethnic groups are Muslim, the Pashtuns are more conservative about women's rights than the Tajiks and Hazaras. For instance, Pashtun has rigid family honor codes including seclusion of women (*purdah*)[90] and honor killing, which is the killing of a woman, who is perceived to have brought dishonor to the family (e.g., sex before marriage).[75] Additionally, in Afghanistan, women living in rural areas are more likely to have less decision-making autonomy than women in urban areas.[6] One reason is that in rural areas women are less educated than in urban areas,[6] and lower education has been associated with lower women's autonomy in some contexts.[45] A study in Ethiopia showed that women who had primary and secondary or above education were about two and four times more likely to have greater autonomy than women with no education.[45] Similarly, a study using a national representative sample from Bangladesh found that women with greater autonomy were more likely to have higher education level and wealth status.[46] In terms of age, there are contradictory findings due to regional differences. In Lebanon[92] women's autonomy is associated with older age, whereas in other countries, such as South Africa,[61] age is not associated with women's autonomy.

Finally, interpersonal and structural violence are significant predictors of women's autonomy. Structural violence is often engendered by a country's experience of war, and it is the indirect violence built into repressive social orders that can shape people's self-conceptions, behaviors, and practices.[68] Experiences of trauma in war are associated with men's perpetration of violence and women's experiences of gender-based violence.[69] In return, experience of domestic violence has been associated with reduced women's autonomy,[23,24] as described further in Section 2.5.

2.5. Role of women's autonomy in domestic violence and reproductive and perinatal health: mechanisms and pathways

Firstly, women's autonomy may either ameliorate or exacerbate experience of violence depending on the unique situation of each country. In countries like Bangladesh[24] and Ghana[23] women's lack of autonomy is significantly associated with increased experience of intimate partner violence. In such cases, women, who lack financial autonomy and are dependent on their partner, may not have the option to leave abusive relationships, and therefore, continue to experience physical and/or sexual IPV.[24] Also, in a patriarchal culture, where women's autonomy is diminished, women may think of IPV as "normal." A study by the WHO showed that more than 50% of women from South Asia and Africa thought that it was men's right to use violence if women refused sex or did not do housework properly.[99] However, in some other countries including Philippines[34] and India[35] women's autonomy is associated with increased experience of domestic violence. In this case, those women, who do not think of IPV as "normal" and fight for their autonomy, may encounter further resistance and violence from their partners. When traditional gender norms of men being the dominant decision-makers are challenged, men may become violent to restore their dominance.[35]

Secondly, women's lack of autonomy is hypothesized to influence unintended pregnancy through two pathways: 1) not using contraception and 2) experiencing physical and sexual violence. Studies in the Democratic Republic of Congo[22] and Bangladesh[21] showed that women who had autonomy were more likely to use contraception than women who did not have autonomy because autonomous women can negotiate family planning decision making and contraception use with their partners.[22] Women who have limited autonomy may not be able to challenge the power imbalance that exists between men vs. women regarding family planning decision making. In return, not using contraception is associated with unintended pregnancy.[100]

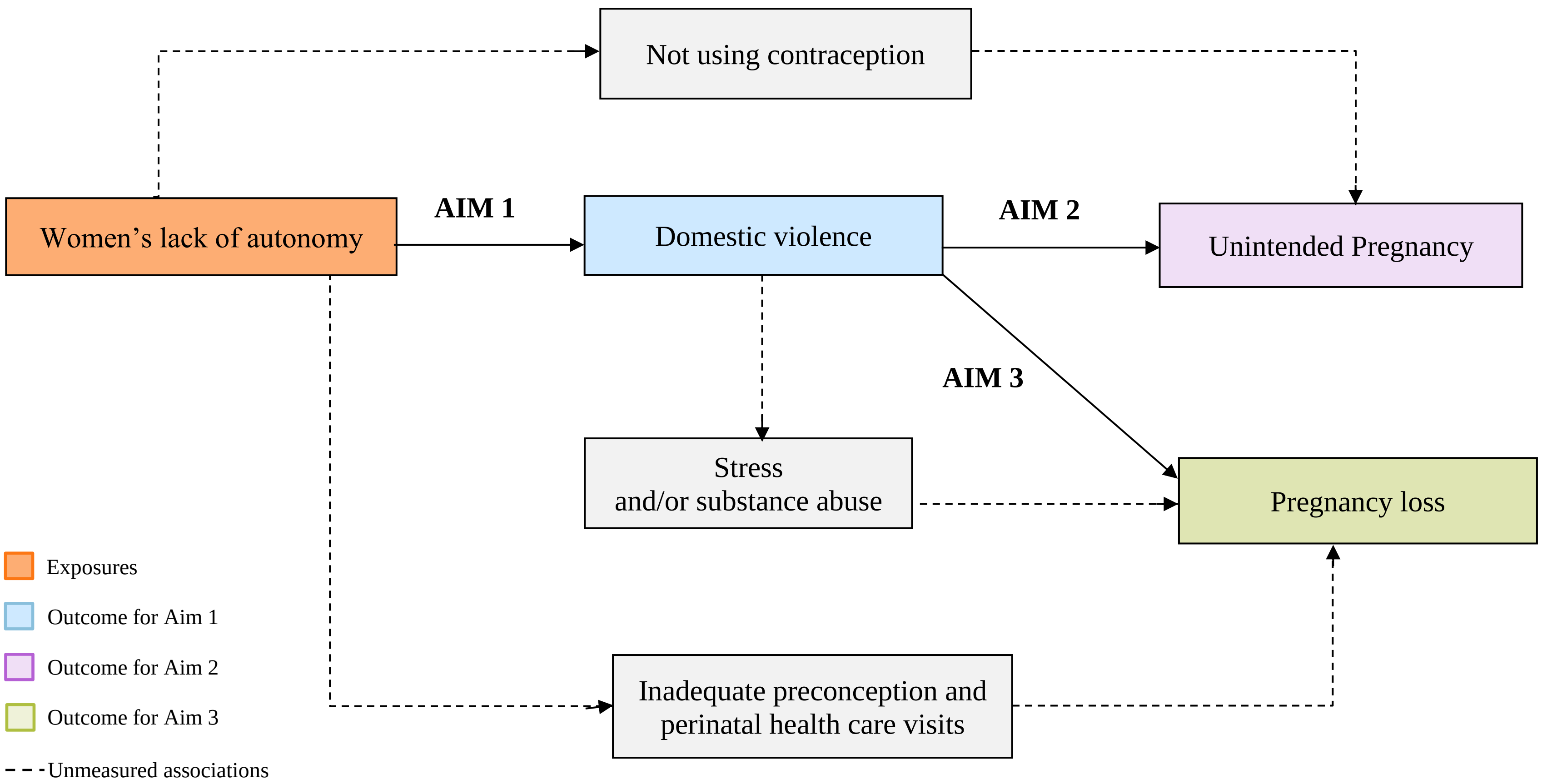
As mentioned before, lack of women's autonomy is also associated with increased experience of intimate partner violence,[23,24] and physical and sexual violence is associated with unintended pregnancy through reproductive control by their male partners.[101] IPV may lead to unintended pregnancy through forced intercourse and fear of getting physically hurt if women refuse sex and/or negotiate the use of contraception.[101] In abusive relationships, another mechanism by which women experience unintended pregnancy is reproductive coercion, which is defined as, "explicit male behaviors to promote pregnancy (unwanted by the woman)" through interference with contraception use.[101]

Thirdly, women's lack of autonomy is hypothesized to influence perinatal health outcomes through a) insufficient preconception and perinatal health care visits and b) experience of physical violence. Women with reduced autonomy are less likely to seek the right amount of antenatal care visits.[13,14] In return, low use of antenatal care (defined as the medical check-ins with a provider during pregnancy) is a major risk factor for the high rate of adverse birth outcomes.[17–19] In the case of pregnancy loss, a reduction in primary and reproductive health care more broadly may increase the risk of pregnancy loss if a woman were to become pregnant. Evidence from random clinical trials show that use of primary care-based preconception care (PCC) is significantly linked with reduced spontaneous pregnancy loss through receiving intensive education.[102] In addition, early pregnancy monitoring and support boost the chance of maintaining the pregnancy to a live birth.[103]

Furthermore, women's lack of autonomy may be associated with perinatal mortality through experience of physical violence during pregnancy. As discussed before, lack of women's autonomy is associated with increased experience of violence.[23,24] In return, physical violence in pregnancy is associated with pregnancy loss.[44] There are direct and indirect suggested pathways through which women with experience of physical violence endure adverse birth outcomes including pregnancy loss. The direct pathway includes getting hurt physically while a woman is pregnant (e.g., getting kicked into the abdomen), which may terminate pregnancy.[104] The indirect pathway is women's stress-related physiological response to violence, which can reduce weight gain during pregnancy, restrict intracrine growth, and worsen hypertension and infections, all of which may lead to adverse pregnancy outcomes.[105] Stressed and abused pregnant women may also use harmful coping mechanisms such as alcohol and substance abuse[106]- both of which are associated with adverse pregnancy outcomes.[107] **Figure 1** represents a simple schematic of the discussed associations and pathways.

APPENDIX

Figure 1: Schematic of the research aims.



2.6. Conceptual framework: The socioecological model (SEM)

The socioecological model (SEM) of health looks at the individual within society and emphasizes the complex linkages and interactions of factors at various levels, including at the individual, interpersonal, community, and societal level- all of which play a role in determining health.[97,108] Cecelia Ridgeway, a gender theorist, mapped on to social-ecological model to study unequal gender norms and how they persist in our society.[109] She argues that gender functions as a set of societal norms and practices that establish separate sex categories, allocate individuals to these categories, and structure interactions among people based on the distinctions associated with their sex category. [109] Considering this socioecological conceptual framework, several factors facilitate the association between women's autonomy and perinatal and reproductive health at each level of the socioecological model in Afghanistan. Implications of women's autonomy at the first level of SEM include factors related to individuals such as age,[61,92] ethnicity,[11,90] and perceived cultural norms[88,89,97]- all of which are associated with women's autonomy and their reproductive and perinatal health outcomes. According to a report by WHO (2015), 15% of Afghan girls were married before the age of 15 and 46% before the age of 18.[38] Marriage and pregnancy at a very young age deprive women of the opportunity to get an education, become financially independent, and have autonomy. Child marriage is also associated with adverse perinatal health outcomes.[110–112] Additionally, ethnicity and perceived cultural norms are also important factors in the context of Afghanistan because this country has a patriarchal culture and over 14 distinct ethnicities, most of which are traditional and conservative about women's rights.[90,98]

The second level of the SEM examines the relationships (family and peer network) that may deteriorate women's autonomy and health outcomes through unfavorable social relationships such as kinship and domestic violence. Studies show that women who reported experiencing abuse or violence were significantly more likely to have reduced autonomy[23,24] and adverse perinatal health outcomes[30–33] compared to those who did not experience violence. Afghanistan has the highest rate of domestic violence (90%) against women worldwide, and it is considered the worst region in the world for women to live in.[38,40]

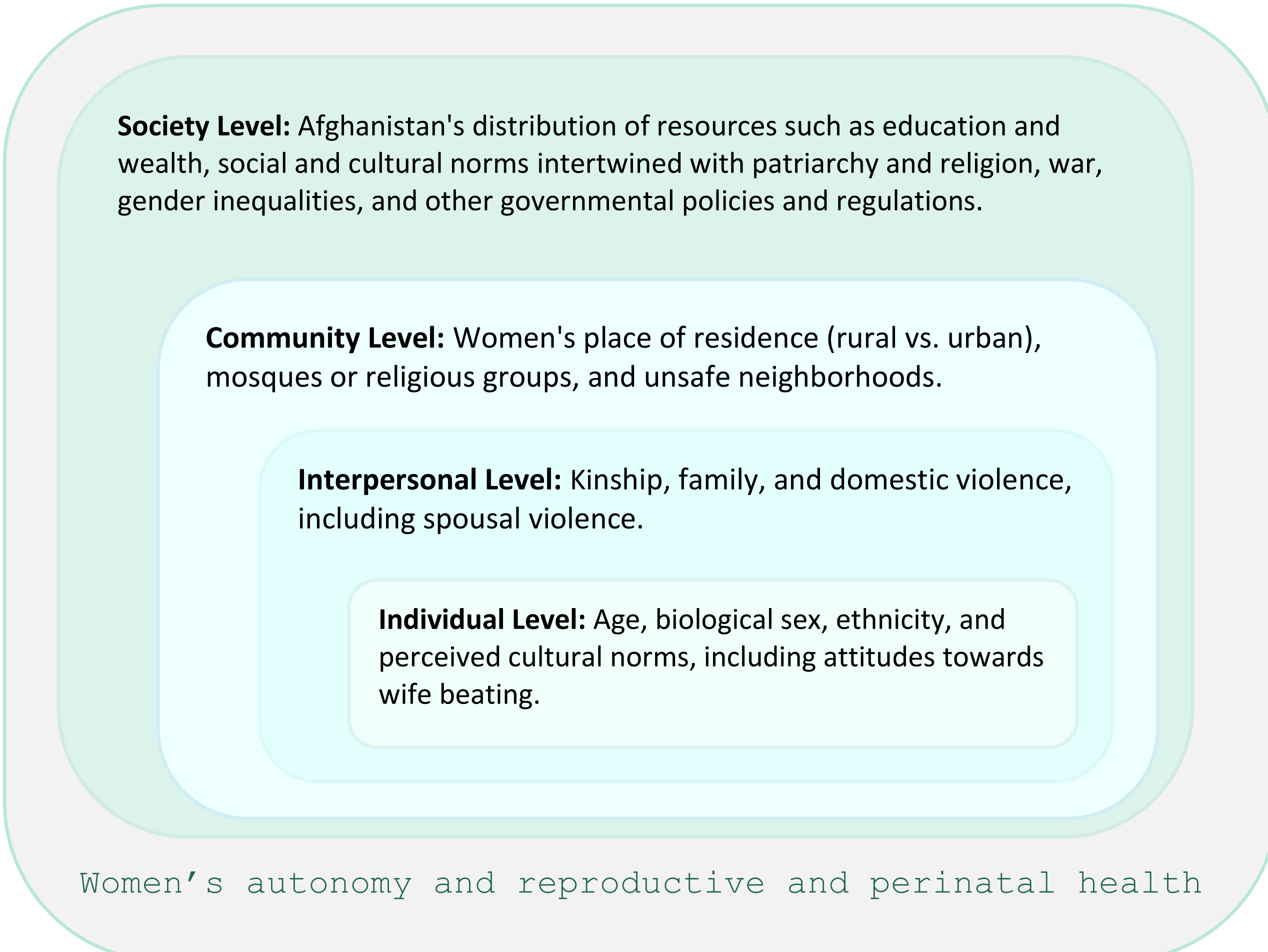
The third level of SEM (community level) looks at the broader setting, such as place of residence (rural vs. urban), neighborhood, mosques or religious groups, and community health clinics,[108] and how the characteristic of these settings may impact women's autonomy and their reproductive and perinatal health outcomes. Rurality is associated with both lack of women's autonomy[6,91] and poor reproductive and perinatal health outcomes.[44] About 74% of the Afghan population is rural, and rural areas also do not have an adequate number of community health clinics.[6] In Afghanistan the two dominant Muslim religious groups are Shia and Sunni.[98] In general, Sunni mosques and religious groups tend to be more conservative about women's rights than the Shia's.[90] Additionally, several neighborhoods are unsafe and stressful due to suicide attacks by extremists,[113] and stress is a major predictor of men's preparation of violence[69] and women's experience of adverse perinatal outcomes.[44] Therefore, beyond individual and interpersonal level risk factors, community and neighborhood settings play an important role in the health status and well-being of women and their infants.

The fourth level of SEM assesses societal factors[108] that can mitigate or exacerbate the risk of women's lack of autonomy and adverse reproductive and perinatal health outcomes. These associated societal factors include the distribution of resources such as education and wealth, social and cultural norms intertwined with patriarchy and religion, war, gender inequalities, and other governmental policies and regulations. In Afghanistan, particularly, the patriarchal culture and religion has played an important role in unequal gender norms and reduced women's autonomy, as previously discussed in Section 2.4., under factors associated with women's autonomy.

Furthermore, the continuous war in Afghanistan has contributed to increasing the gender inequality gap and domestic violence against women. According to the AfDHS 2015, more than 56% of ever-married Afghan women between the ages 15 to 49 years experienced domestic physical violence,[6] and this percentage is an underestimation because many women do not report violence due to safety and other issues. For example, the head of one of the provincial courts in Afghanistan stated, "Security concerns, strong or deep-rooted traditional customs and the psychological obstacles of shame and fear prevent women from bringing their cases to court."[74]

Individuals subject to structural violence are structurally vulnerable.[68] Structural vulnerability is an index of power imbalance and social inequality.[68] Afghans have become structurally vulnerable as a consequence of the Taliban's regime and the continued war. This vulnerability has induced gender inequality and poor health outcomes to this day. Understanding societal factors are essential because individuals and their families are nested within a community and society. Therefore, it is important to investigate the association between women's autonomy and reproductive and perinatal health outcomes in Afghanistan because of its unique cultural and political context. **Figure 2** is a socioecological model (SEM) that represents the determinants of women's autonomy and reproductive health at each level of SEM.

Figure 2: A socioecological model (SEM) that represents the determinants of women's autonomy and reproductive and perinatal health at each level of SEM in the context of Afghanistan.



3. METHODS

3.1. Data Sources and Population

This study used the data from the 2015 Afghanistan Demographic and Health Survey (AfDHS), which is the first and only cross-sectional national data collected in Afghanistan.[6] The Demographic and Health Surveys (DHS) program is sponsored by USAID, and the program assists with data collection in 90 countries across Africa, Asia, Latin America/Caribbean, and Eastern Europe.[114] Due to the continuous war in Afghanistan, AfDHS was conducted only once in 2015; neither AfDHS nor other national surveys took place in the years before or after 2015 because of security issues. The 2015 AfDHS national sample represented all 34 provinces of Afghanistan, interviewing Afghan civilian non-institutionalized population (women and men) ages 15-49, and provided up-to-date data on several subjects including demographics, fertility, family planning, maternal health care, infant and child mortality, nutrition of children and women, malaria, HIV/AIDS, women's empowerment, and domestic violence.[6] In this study, we used the modules on women's empowerment, domestic violence, infant and child mortality, and demographics that include the variables of interest. The data was obtained from DHS's official website. Although the data is from 2015 and there have been changes in the Afghan government, it is very likely that our findings are still relevant because women's conditions have not improved in the country.

AfDHS data collection was conducted through interviews from June 15, 2015, to February 23, 2016.[6] Interviewers also collect reproductive calendar data, which provides "a month-to-month history of a woman's reproductive events during the past five years. For every month of the calendar period, the calendar data document whether a woman gave birth, was pregnant or terminated a pregnancy."[115] The monthly record also shows the type of pregnancy termination, woman's union status, and whether women used certain types of contraceptive methods.[115] AfDHS questionnaires were pre-tested before the fieldwork to test the instrument validity and maintain data quality. Additionally, the CSPro software was used for data entry, and double entry was done for 100% verification to minimize data entry errors.[6]

3.1.1. Sampling Procedures

A stratified two-stage sampling design was used, and sampling weights were based on sampling probability, which was calculated for each sampling phase and cluster.[6] In the first stage, 950 clusters with enumeration areas were identified and selected. In the second stage, a systematic sampling of households was conducted, and about 27 households per cluster were selected, yielding 25,650 households, 24,395 of which were interviewed (a response rate of 98%).[6]

Heeding the World Health Organization (WHO) ethical guidelines, only one woman per household (a total of 21,342 women) were selected to answer the questions in the domestic violence module.[6] Interviewing multiple women in the same household may increase the risk of breaching confidentiality and exposing survivors to potential harm or retaliation. Some women (4%) could not be interviewed due to privacy issues and other reasons.[6] Other reasons included security challenges in some settings, such as collecting data in Badakhshan province, where the data collection team could only access these areas by meandering through the neighboring country, Tajikistan. The detailed methodology for AfDHS data can be found in AfDHS 2015 final report.[6]

3.2. Analytic Sample

In this study, the sample was restricted to currently married women (for *Aim 1,* n=19,098), currently married women who are in their first and only union and who gave birth in the last five years (for *Aim 2,* n=14,179), and currently married women who are in their first and only union (for Aim 3, n=18632)-- all of whom are aged 15-49 and completed the domestic violence module. The Inner-City Fund (ICF) Institutional Review Board (IRB) and Afghanistan's Ministry of Public Health approved data collection tools and procedures.[6] I also received IRB exemption from the University of Maryland IRB.

3.3. Measurement and Operationalization of Variables

3.3.1. Independent variable: Women's autonomy

Women's autonomy was measured by asking women if they usually made decisions a) alone, b) jointly with their husband, c) their husband alone, or d) someone else/other in the following five areas: 1) the woman's health care, 2) contraception use, 3) major household purchases, 4) spending household (husband's) earnings, and 5) visits to the woman's family or relatives.[6] For each area, response options (a) and (b) were coded as 1, indicating women's autonomy, and response options (d) and (c) were coded as 0, indicating women's lack of autonomy. There were several women who did not use contraception at all; therefore, contraception has a third category named, "not using" in order to use the complete analytic sample in the analyses.

3.3.2. Dependant Variables

Domestic Violence (Aim 1a)

In this study, we considered all three types of any experience of domestic violence: emotional or verbal, physical, and sexual violence in the past 12 months. According to the survey, for physical domestic violence, women were asked if, in the past 12 months, "any household members (i.e., current husband, former husband, mother/stepmother, father/stepfather, mother-in-law, father-in-law, or siblings) ever push you, shake you, or throw something at you; slap you; twist your arm or pull your hair; punch you with his fist or with something that could hurt you; kick you, drag you, or beat you up; try to choke you or burn you on purpose; or threaten or attack you with a knife, gun, or any other weapon."[6] For sexual domestic violence, women were asked if, in the past 12 months, any household members "ever physically force you to have sexual intercourse with them even when you did not want to; physically force you to perform any other sexual acts you did not want to; force you with threats or any other way to perform sexual acts that you did not want to do."[6] For emotional violence, women were asked if, in the past 12 months, any household members "ever say or do something to humiliate you in front of others; threaten to hurt or harm you or someone close to you; insult you or make you feel bad about yourself."[6] The above binary variables were defined as yes (coded as 1) if a woman reported experiencing any of the forms of violence and no (coded as 0) if they had not experienced these forms of violence within each respective category.

Unintended Pregnancy (Aim 2a)

To measure unintended pregnancy, I considered unwanted and mistimed most recent birth in the past five years. Women were asked, "whether their most recent birth was wanted at that time (planned birth), at a later time (mistimed birth), or not at all (unwanted birth)" within the past five years.[6] Unintended pregnancy was categorized into unintended (mistimed or unwanted) and intended (wanted at that time) pregnancy.

Birth outcomes (Aim 3a)

For perinatal and infant mortality, the data was collected as part of a retrospective birth and pregnancy history where parents listed all of the children, children's birth date, age at death, and survivorship status.[6] We used reported pregnancy losses, defined as fetal death before 7 months gestation, in the past five years as a binary variable.[44]

Domestic physical or sexual violence (Mediator for Aim 2)

For domestic physical or sexual violence as a mediator for *Aim 2*, I considered any experience of domestic physical or sexual violence in the past 12 months. According to the survey, for physical domestic violence, women were asked if “any household members (i.e., current husband, former husband, mother/stepmother, father/stepfather, mother-in-law, father-in-law, or siblings) ever push you, shake you, or throw something at you; slap you; twist your arm or pull your hair; punch you with his fist or with something that could hurt you; kick you, drag you, or beat you up; try to choke you or burn you on purpose; or threaten or attack you with a knife, gun, or any other weapon.”[6] For sexual domestic violence, women were asked if any household members “ever physically force you to have sexual intercourse with them even when you did not want to; physically force you to perform any other sexual acts you did not want to; force you with threats or any other way to perform sexual acts that you did not want to do.”[6]

A mediator is an intermediate variable on the causal pathway between an exposure and outcome that represents the mechanism through which the exposure influences the outcome.[116] Domestic violence was assessed as a mediator in the association between women’s autonomy and unintended pregnancy or pregnancy loss because some of the effects of lack of autonomy on reproductive and perinatal health outcomes may operate through domestic violence. Women with less autonomy are more likely to experience domestic violence,[23,24] and domestic violence is known to be associated with unintended pregnacy[25] and adverse birth outcomes.[29,33]

Domestic physical violence during pregnancy (Mediator for Aim 3)

For domestic physical violence as a mediator for *Aim 3*, I considered women’s ever experience of domestic violence during pregnancy. According to the survey, for physical domestic violence during pregnancy, women were asked if “any household members (i.e., current husband, former husband, mother/stepmother, father/stepfather, mother-in-law, father-in-law, or siblings) ever push you, shake you, or throw something at you; slap you; twist your arm or pull your hair; punch you with his fist or with something that could hurt you; kick you, drag you, or beat you up; try to choke you or burn you on purpose; or threaten or attack you with a knife, gun, or any other weapon during your pregnancy."[6]

Education (Moderator for Aim 1a, confounder for Aim 2 and 3)

Education was assessed as a possible moderator of the association between women's autonomy and domestic violence (Aim 1a). Educational attainment was measured by asking women if they ever attended school, and if yes, what was the number of years of schooling completed.[6] We grouped education into no education (never attended school), and some education (primary, secondary, or higher). We grouped primary, secondary, or higher education into one group because our preliminary analysis showed very little difference in moderation by primary vs. secondary or higher education groups.

3.3.3. Other Covariates

This research project considered the following additional covariates: age, ethnicity, wealth, residency (urban vs. rural), and parity. Age was categorized as 15–24, 25–34, and 35–49. Ethnicity included Pashtun, Tajik, Hazara, and other ethnicity groups. The wealth index was measued by calculating household scores based on household's possession of various consumer items such as television, bicycle, and car, as well as their housing features, including toilet facilities, flooring materials, and drinking water source.[6] The scores were determined through principal component analysis. To establish national wealth quintiles, household scores are allocated to all regular (de jure) members, and their rankings are based on the scores.[6] The wealth index was classified into rich, middle, and poor, and the place of residence was dichotomized as urban and rural. Parity was grouped as less than four (<4), or more children (≥5).

3.4. Analysis

3.4.1. Descriptive Analyses

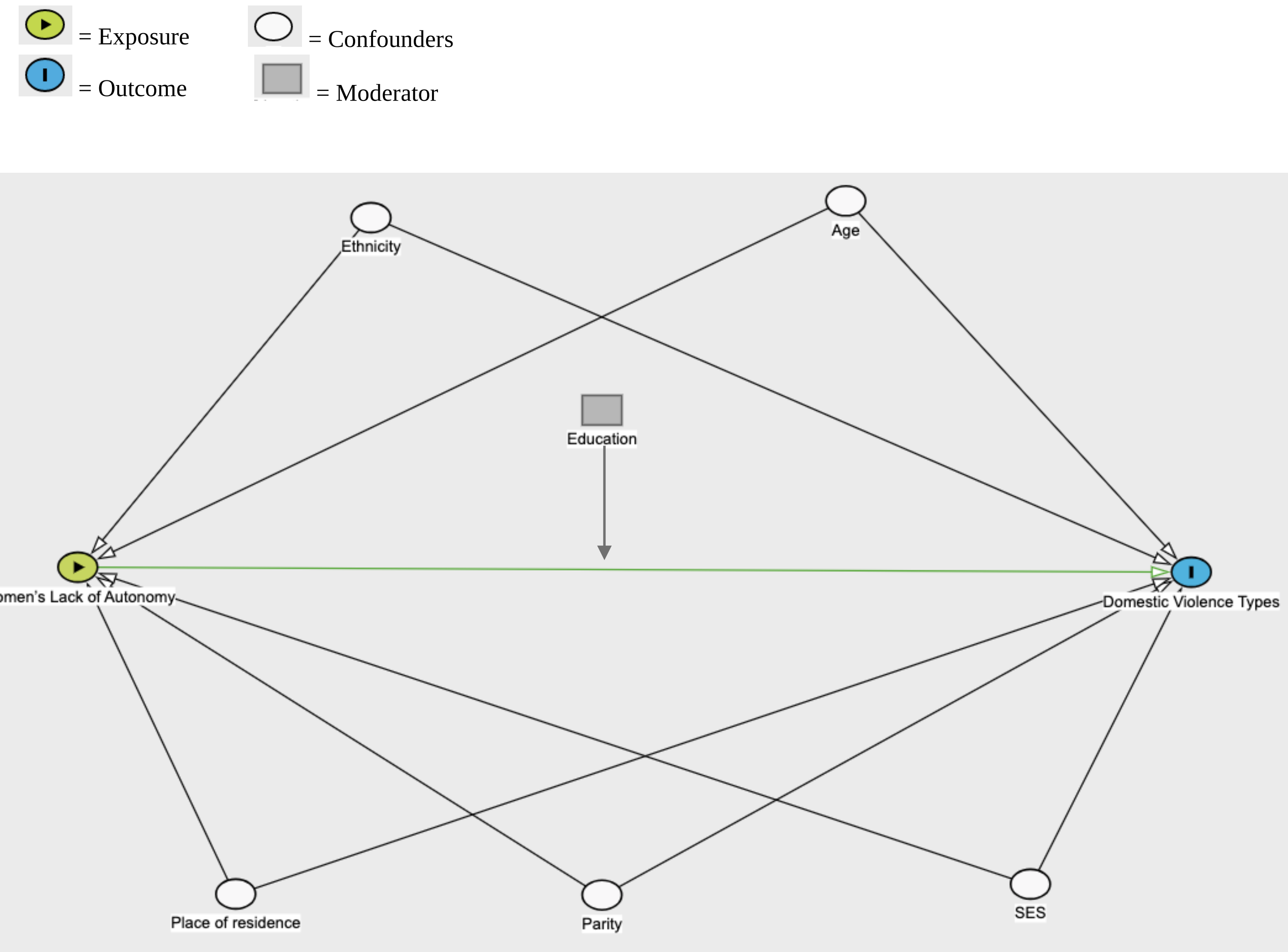
First, univariate statistics was conducted to evaluate the exposure, outcome, and covariate variables. Second, chi-squared tests were used to examine the bivariate relationships between women's autonomy and the three outcomes of interest: domestic violence (*Aim 1a*), unintended pregnancy (*Aim 2a*), and pregnancy loss (*Aim 3a*), as well as all the covariates. Analyses were conducted using Stata 17, and the complex survey sample design (e.g., sample weighting and other sample design elements) was accounted for using the svy Stata command.

3.4.2. Aim 1

Multiple logistic regression models was used to examine the association between women's autonomy categories and types of experience of domestic violence in the past 12 months. Model 1 are the unadjusted odds ratios, while Model 2 includes adjustment for relevant confounders including age, ethnicity, wealth, residency, and parity. In model 3, in addition to adjusting for the confounders, I adjusted for the five women's autonomy variables (decision making in healthcare, spending, household purchases, visiting family, and contraception) to assess whether autonomy in one domain was independent of autonomy in other domains. I examined multi-collinearity using variance inflation factors (VIF). I found small multicollinearity (VIF of 6) only with the contraception variable, which accounts for both autonomy in using contraception as well as non-use. Multicollinearity for all other autonomy variables was a VIF less than 3. Therefore, in addition to Model 2, we present Model 3, which shows the combined effects, to better understand how women's autonomy in certain key areas may continue to be associated independently of other areas. The results are presented as adjusted odds ratios with 95% confidence intervals, and all tests of hypothesis were 2-tailed with a type 1 error rate set at 5%.

Finally, the moderating effect of education on the association between women's autonomy categories and types of domestic violence was explored using interaction terms. This interaction assesses how, depending on the status of women's education, the effect of women's autonomy on their experience of domestic violence may differ. We hypothesized that while having some education may act as a buffer in the association, having no education may accentuate the effect of women's autonomy on their experience of domestic violence. **Figure 3** present a Directed Acyclic Graph (DAG) of variables conceptualized for the association between women's autonomy and experience of domestic violence, moderated by the status of education.

Figure 3: Directed Acyclic Graph (DAG) of variables conceptualized for the association between women's autonomy and experience of domestic violence, moderated by the status of education (Aim 1).



3.4.3. Aim 2

Multiple logistic regression was used to examine the association between women's autonomy and unintended pregnancy. In Model 1, I indicate unadjusted odds ratios, while in Model 2, I adjusted for relevant confounders including age, education, ethnicity, wealth, residency, and parity. Similar to Aim 1, in Model 3, in addition to adjusting for the confounders, I adjusted for the five women's autonomy variables (decision making in healthcare, spending, household purchases, visiting family, and contraception) to assess whether autonomy in one domain was independent of autonomy in other domains. The results are presented as adjusted odds ratios with 95% confidence intervals, and all tests of hypothesis were 2-tailed with a type 1 error rate set at 5%.

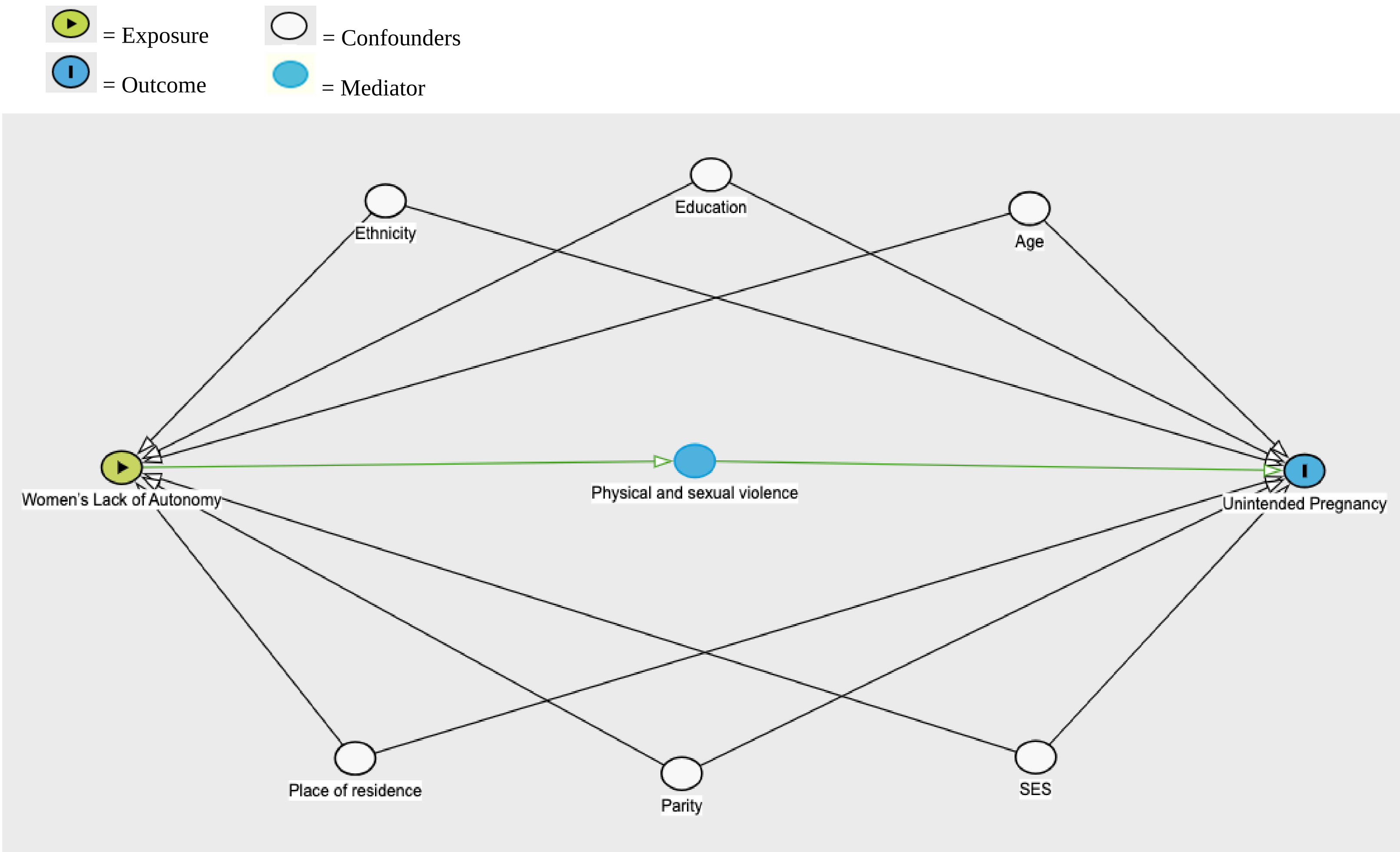
Additionally, given an association was found between women's autonomy and unintended pregnancy and an association between women's autonomy and domestic physical or sexual violence, we explored mediation by experience of domestic physical or sexual violence using a casual mediation analysis.[117] In Stata, "medeff" command was used to assess the percent of total effect mediated. This command assesses causal mediation using a counterfactual framework.[118] Previous methods of mediation analysis predominantly used structural equation modeling. These methods lacked a formal causal inference framework.[118] Moreover, extending these methods to nonlinear models (e.g., binary outcomes) was challenging.[118] The mediation package, used in this study, offers tools that allow us to perform various statistical models suited for binary dependent variables.[118]

The foundational theoretical principles upon which the mediation package is constructed establish the identification of causal mechanisms within the unified framework of potential outcomes.[118] This mediation analysis goes beyond the mere computation of average treatment effects, instead, it aims to quantify the impact of a treatment that operates through a specific mechanism. Denoting M_i (t) as the potential value of a mediator for unit *i* under treatment status T_i = t, and Y_i (t, m) as the potential outcome when treatment and mediating variables are set to t and m, respectively. We only observe one of the potential outcomes, with the observed outcome Y_i being Y_i {T_i, M_i (T_i)}, dependent on both the treatment status and the mediator's level under the observed treatment status.[118]

The mediation method computes the mean mediation and direct effects through simulating predicted values of the mediator or outcome variable, which are unobserved, and subsequently determining the relevant quantities of interest, including average causal mediation, direct effects, and total effects.

Figure 4 present a Directed acyclic graph (DAG) of variables conceptualized for the association between women's autonomy and experience of unintended pregnancy, mediated by experience of physical and sexual violence.

Figure 4: Directed acyclic graph (DAG) of variables conceptualized for the association between women's autonomy and experience of unintended pregnancy, mediated by experience of physical and sexual violence (Aim 2).

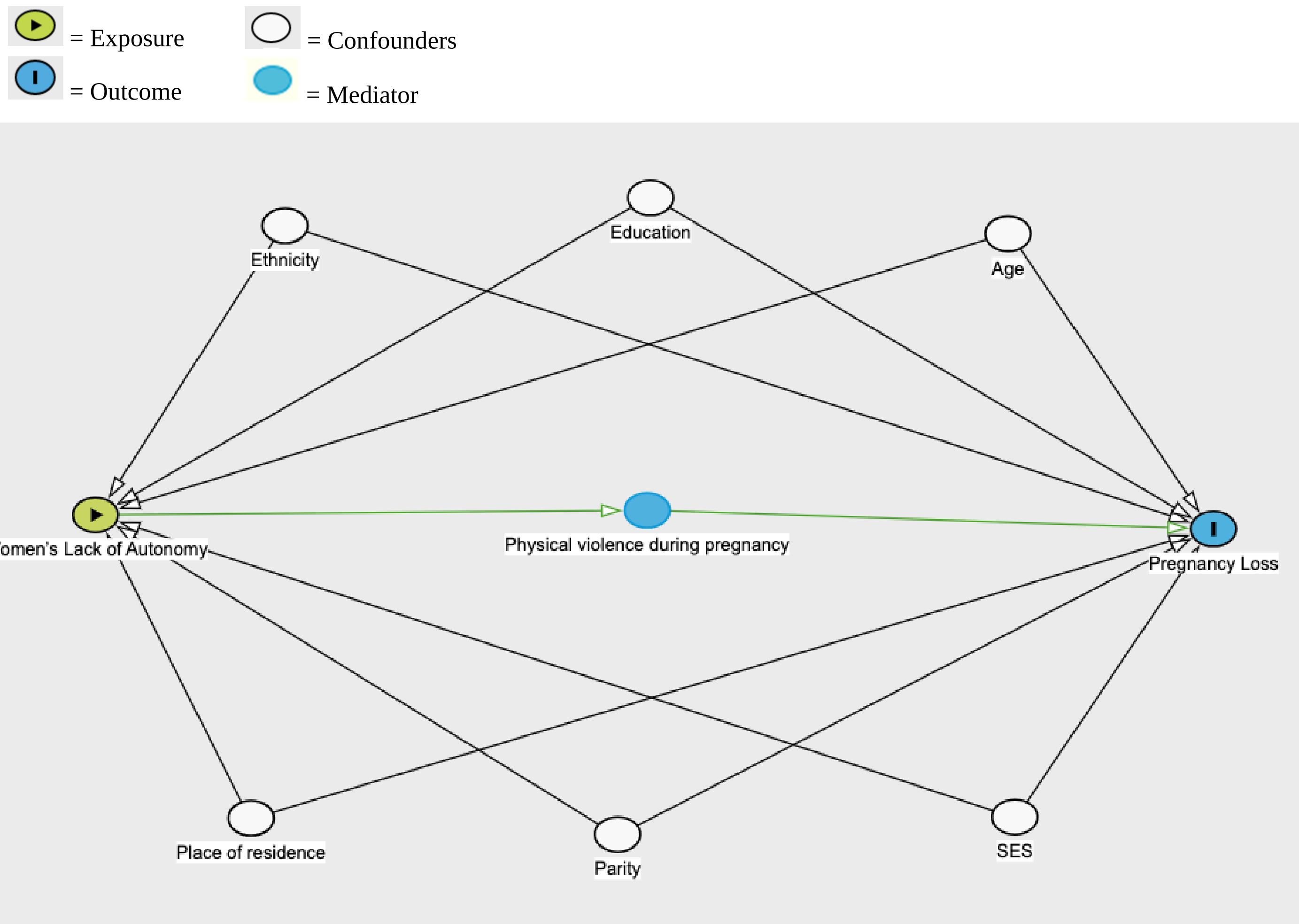


3.4.4. Aim 3

Multiple logistic regression was used to examine the association between women's autonomy and pregnancy loss. In Model 1, I indicate unadjusted odds ratios, while in Model 2, I adjusted for relevant confounders including age, education, ethnicity, wealth, residency, and parity. Similar to Aim 1 and 2, in Model 3, in addition to adjusting for the confounders, I adjusted for the five women's autonomy variables (decision making in healthcare, spending, household purchases, visiting family, and contraception) to assess whether autonomy in one domain was independent of autonomy in other domains. The results are presented as adjusted odds ratios with 95% confidence intervals, and all tests of hypothesis were 2-tailed with a type 1 error rate set at 5%.

In the second model, given an association was found between women's autonomy and pregnancy loss, mediation by experience of domestic physical violence during pregnancy was explored using a casual mediation analysis.[117] Similar to mediation analysis of Aim 2, described above, I used the "medeff" command in Stata to assess the percent of total effect mediated. **Figure 5** shows a Directed acyclic graph (DAG) of variables conceptualized for the association between women's autonomy and experience of pregnancy loss, mediated by experience of physical violence during pregnancy.

Figure 5: Directed acyclic graph (DAG) of variables conceptualized for the association between women's autonomy and experience of pregnancy loss, mediated by experience of physical violence during pregnancy.



4. RESULTS

4.1. Aim 1: Women's autonomy and experience of domestic violence

In our sample of 19,098 Afghan women, 45% (n=8,525) of women experienced physical violence, 30% (5,671) experienced emotional violence, and 7% (1,411) experienced sexual violence. Women's autonomy was 49% (4,324) in healthcare decision making, 38% (6,939) in spending, 47% (8,894) in household purchases, 58% (11,005) in visiting families, and 88.5% (3,749) in contraception use among those using contraception (**Table 1**). Additionally, the majority of women were uneducated (85.8%), poor (42.1%) and Rich (36.4%), Pashtun (39.0%) and Tajik (32.9%), lived in rural areas (75.1%), had more than five children (52.0%), and were between the ages 25-35 (40.6%) and ages 35-49 (39.9%).

In the bivariate analysis (Table 1), each of the women's autonomy categories was associated with types of domestic violence. Compared with those women with no autonomy in healthcare decision making, those with autonomy were less likely to experience physical violence (54.0% vs. 43.3%, $p < 0.000$), sexual violence (8.1% vs. 4.6%, $p < 0.000$), and emotional violence (54% vs. 43%, $p < 0.000$). Similarly, those with household purchase autonomy were less likely to experience physical violence (54.4% vs. 41.4%, $p < 0.000$), sexual violence (7.5% vs. 4.9%, $p < 0.000$), and emotional violence (39.9% vs. 32.3%, $p < 0.000$). There were also significant differences in experience of domestic violence among women with autonomy in visiting families vs. women with no autonomy. Those with autonomy in visiting families were less likely to experience physical violence (54.3% vs. 44.2%, $p < 0.000$), sexual violence (6.9% vs. 6.0%, $p < 0.000$), and emotional violence (39.4% vs. 33.3%, $p < 0.000$). In general, women with autonomy were more likely to be educated older, Tajik, have more than five children, and live in urban areas-- all with p-values of 0.000.

Table 1: Bivariate analysis between women's autonomy and selected characteristics of married women ages 15-49, Afghanistan DHS 2015.

Variables	Total N (%)	Healthcare n (%)		Spending n (%)		Household purchases n (%)		Visiting families n (%)		Contraception n (%)		
	19,098	No 9,758	Yes 9,324	No 11,506	Yes 6,939	No 10,184	Yes 8,894	No 8,076	Yes 11,005	No 489	Yes 3,749	Not using 14,641
Physical												
No	10,573 (55.4)	4844 (46.0)	5722 (56.7)	5678 (46.4)	4480 (59.7)	5081 (45.6)	5479 (58.6)	4091 (45.7)	6473 (55.8)	210 (43.5)	1935 (45.6)	8319 (53.2)
Yes	8,525 (44.6)	4914 (54.0)	3602 (43.3)	5828 (53.6)	2459 (40.4)	5103 (54.4)	3415 (41.4)	3985 (54.3)	4532 (44.2)	279 (56.5)	1814 (54.4)	6322 (46.8)
Sexual												
No	17,687 (92.6)	8778 (91.9)	8893 (95.5)	10428 (92.8)	6638 (94.8)	9216 (92.5)	8451 (95.1)	7409 (93.1)	10261[ns] (94.0)	459 (93.9)	3411 (92.8)	13618[ns] (93.8)
Yes	1,411 (7.4)	980 (8.1)	431 (4.6)	1078 (7.2)	301 (5.2)	968 (7.5)	443 (4.9)	667 (6.9)	744 (6.0)	30 (6.1)	338 (7.2)	1023 (6.2)
Emotional												
No	13,427 (70.3)	6550 (61.1)	6867 (66.9)	7637 (60.3)	5314 (70.5)	6857 (61.1)	5520 (67.7)	7897 (60.6)	261 (66.7)	2403 (52.2)	10616 (55.5)	6550 (66.8)
Yes	5,671 (29.7)	3208 (38.9)	2457 (33.1)	3869 (39.7)	1625 (29.5)	3327 (38.9)	2556 (32.3)	3108 (39.4)	228 (33.3)	1346 (47.8)	4025 (44.6)	3208 (33.2)
Age												
15-24	3,739 (19.6)	2,142 (24.8)	1,591 (19.8)	2,447 (23.7)	1,155 (19.9)	2,289 (25.3)	1,446 (18.4)	1,983 (28.3)	1,752 (17.4)	94 (21.3)	533 (18.1)	3,075 (23.6)
25-34	7,750 (40.6)	4,174 (40.2)	3,570 (36.6)	4,927 (39.4)	2,655 (37.6)	4,307 (39.3)	3,431 (37.2)	3,440 (39.2)	4,303 (37.8)	213 (36.0)	1,470 (36.2)	5,996 (39.4)
35-49	7,609 (39.8)	3,442 (35.1)	4,163 (43.6)	4,132 (36.8)	3,129 (42.5)	3,588 (35.3)	4,017 (44.4)	2,653 (32.5)	4,950 (44.8)	182 (42.6)	1,746 (45.7)	5,570 (37.0)
Ethnicity												
Pashtun	7,441 (39)	4,663 (50.3)	2,775 (28.4)	5,127 (44.4)	2,118 (31.3)	4,712 (47.0)	2,725 (29.9)	4,104 (53.2)	3,332 (28.5)	302 (50.5)	1,479 (38.5)	5,570 (39.4)
Tajik	6,277 (32.9)	2,821 (27.6)	3,445 (37.7)	3,472 (28.7)	2,609 (40.7)	2,973 (27.9)	3,296 (38.7)	2,167 (25.8)	4,100 (38.1)	173 (36.1)	1,494 (41.6)	4,569 (29.9)
Hazara	1,978 (10.4)	672 (7.5)	1,306 (11.2)	845 (7.0)	1,038 (13.4)	663 (6.8)	1,315 (12.7)	472 (6.2)	1,506 (11.9)	43 (6.8)	414 (8.6)	1,502 (9.7)
Uzbek	1,442 (7.6)	635 (7.8)	805 (15.1)	902 (12.3)	450 (8.4)	711 (10.8)	728 (12.0)	424 (8.1)	1,016 (13.9)	14 (4.0)	175 (7.3)	1,245 (12.7)
Others	1,931 (10.1)	950 (6.8)	981 (7.6)	1,138 (7.6)	718 (6.3)	1,107 (7.5)	819 (6.7)	897 (6.7)	1,034 (7.6)	15 (2.6)	185 (4.1)	1,728 (8.3)
Residency												
Urban	4,760 (24.9)	2,218 (20.4)	2,536 (24.8)	2,706 (20.9)	1,900 (26.1)	2,401[ns] (21.6)	2,355 (23.8)	1,811 (20.2)	2,946 (24.5)	162 (33.0)	1,363 (36.1)	3,186 (18.3)
Rural	14,338 (75.1)	7,540 (79.6)	6,788 (75.2)	8,800 (79.1)	5,039 (73.9)	7,783 (78.4)	6,539 (76.2)	6,265 (79.8)	8,059 (75.5)	327 (67.0)	2,386 (63.9)	11,455 (81.7)
Wealth												
Poor	8,083 (42.3)	3,989 (40.6)	4,090 (41.3)	4,785 (40.8)	2,984 (40.7)	4,116 (39.0)	3,961 (43.5)	3,204 (38.6)	4,874 (42.8)	140 (28.6)	1,173 (30.5)	6,671 (44.4)
Middle	4,076 (21.4)	2,289 (23.0)	1,783 (17.6)	2,649 (22.2)	1,294 (16.6)	2,326 (22.0)	1,745 (18.3)	1,959 (23.5)	2,113 (17.8)	98 (18.1)	697 (15.6)	3,230 (21.8)
Rich	6,939 (36.4)	3,480 (36.4)	3,451 (41.1)	4,072 (37.0)	2,661 (42.8)	3,742 (39.1)	3,188 (38.3)	2,913 (37.9)	4,018 (39.4)	251 (53.3)	1,879 (53.9)	4,740 (33.8)
Parity												
<4	9,166 (48)	4,956 (54.9)	4,201 (49.3)	5,792[ns] (53.4)	3,096 (50.4)	5,222 (55.2)	3,931 (48.1)	4,288 (57.5)	4,869 (47.8)	256 (54.7)	1,451 (42.2)	7,372 (55.1)
>=5	9,932 (52)	4,802 (45.1)	5,123 (50.7)	5,714 (46.6)	3,843 (49.6)	4,962 (44.8)	4,963 (51.9)	3,788 (42.5)	6,136 (52.2)	233 (45.3)	2,298 (57.8)	7,269 (44.9)

Footnote: P-values compare the violence measures and sociodemographic within each women's autonomy measure; all P-values were significant (>0.000) except for the comparisons noted by "ns." All percent values are weighted using svy commend. Missing values w <0.15% for contraception, ethnicity, household purchases, visiting families, and healthcare. Spending had 3.4% missingness.

Table 2 presents multiple logistic regression models for the association between types of violence and categories of women's autonomy. *In Model 1*, we indicate unadjusted odds ratios, while in *Model 2*, we adjust for relevant confounders including age, ethnicity, wealth, residency, and parity. After adjusting for confounders, women's autonomy in healthcare decisions (Adjusted odds ratio [AOR]=0.70, CI: 0.60-0.81, $p<0.000$), spending (AOR=0.58, CI: 0.51-0.66, $p<0.000$), visiting families (AOR=0.69, CI: 0.60-0.80, $p<0.000$), household purchases (AOR=0.59, CI: 0.52-0.68, $p<0.000$), and not using contraception (AOR=0.66, CI: 0.46-0.93, $p<0.01$) were significantly associated with decreased experience of physical violence. In addition, women's autonomy in healthcare decisions (AOR = 0.51, 95% CI: 0.39-0.65, $p<0.000$), spending (AOR=0.62, CI: 0.48-0.80, $p<0.000$), and household purchases (AOR=0.56, CI: 0.43-0.72, $p<0.000$) were significantly associated with decreased experience of sexual violence. Lastly, women's autonomy in healthcare (AOR=0.82, CI: 0.72-0.94, $p<0.001$), spending (AOR=0.61, CI: 0.53-0.71, $p<0.000$), visiting families (AOR=0.79, CI: 0.70-0.88, $p<0.000$), and not using contraception (AOR=0.58, CI: 0.42-0.80, $p<0.000$) were significantly associated with decreased experience of emotional violence.

In model 3, in addition to adjusting for the confounders, we adjust for the five women's autonomy variables (decision making in healthcare, spending, household purchases, visiting family, and contraception), which shows some women's autonomy variables are interrelated. We found that WA in spending (AOR=0.71, CI: 0.61-0.82, $p<0.000$) and household purchases (AOR=0.72, CI: 0.61-0.84, $p<0.000$) remained associated with physical violence, while WA in healthcare (AOR=0.55, CI: 0.41-0.73, $p<0.000$) and household purchases (AOR=0.69, CI: 0.49-0.98, $p<0.01$) remained associated with sexual violence. Lastly, WA in spending (AOR=0.62, CI:

0.50-0.78, *p<0.000*) and not using contraception (AOR=0.60, CI: 0.42-0.85, *p<0.001*) remained associated with emotional violence (Table 2).

Table 2: Multiple logistic regression models indicating unadjusted and adjusted odds ratios with [95% confidence intervals] for the association between types of violence and categories of women's autonomy (WA) among Afghan married Women ages 15-49, AfDHS 2015.

	M1: Unadjusted	**M2: M1+sociodem.**	**M3: M2+all WA**
Physical Violence			
Healthcare	0.65 [0.5-0.76]***	0.70 [0.60-0.81]***	1.02 [0.88-1.19]
Spending	0.59 [0.51-0.67]***	0.58 [0.51-0.66]***	0.71 [0.61-0.82]***
Household purchase	0.59 [0.51-0.68]***	0.59 [0.52-0.68]***	0.72 [0.61-0.84]***
Visiting family	0.68 [0.57-0.78]***	0.69 [0.60-0.80]***	0.97 [0.83-1.14]
Contraception	0.92 [0.64-1.33]	0.97 [0.68-1.38]	1.01 [0.69-1.47]
Not using	0.68 [0.47-0.97]*	0.66 [0.46-0.93]*	0.70 [0.48-1.02]
Sexual Violence			
Healthcare	0.54 [0.41-70]***	0.51 [0.39-0.65]***	0.55 [0.41-0.73]***
Spending	0.71 [0.54-0.92]*	0.62 [0.48-0.80]***	0.99 [0.76-1.30]
Household purchase	0.63 [0.49-0.80]***	0.56 [0.43-0.72]***	0.69 [0.49-0.98]*
Visiting family	0.86 [0.68-1.08]	0.78 [0.63-0.97]*	1.29 [0.94-1.77]
Contraception	1.07 [0.61-1.86]	1.14 [0.65-1.99]	1.22 [0.69-2.15]
Not using	0.91 [0.53-1.55]	0.98 [0.58-1.67]	0.50 [0.61-1.80]
Emotional Violence			
Healthcare	0.78 [0.68-0.89]**	0.82 [0.72-0.94]**	1.15 [0.95-1.39]
Spending	0.64 [0.55-0.74]***	0.61 [0.53-0.71]***	0.62 [0.50-0.78]***
Household purchase	0.75 [0.61-0.92]**	0.74 [0.60-0.91]**	0.89 [0.62-1.29]
Visiting family	0.77 [0.68-0.87]***	0.79 [0.70-0.88]***	0.95 [0.77-1.17]
Contraception	0.86 [0.61-1.21]	0.92 [0.66-1.29]	0.95 [0.67-1.35]
Not using	0.53 [0.38-0.74]***	0.58 [0.42-0.80]**	0.60 [0.42-0.85]**

Footnotes: Significance: <0.05*, 0.00**, 0.000***
M1: unadjusted odds ratios [95% confidence intervals]
M2: adjusted for age, residency, wealth, parity, and ethnicity
M3: adjusted for all the covariates including the five WA variables (decision making in healthcare, spending, household purchases, visiting family, and contraception), age, residency, wealth, parity, and ethnicity.

4.1.1. Analysis of education as a moderator (Aim 1)

Education was assessed as a possible moderator of the association between women's autonomy and domestic violence. We grouped primary, secondary, or higher education into one group because our preliminary analysis showed very little difference in moderation by primary vs. secondary or higher education groups (please refer to the supplemental table at the end of this document). In Afghanistan 86% of women have no education, only 6.7% of them have primary, 5.7% secondary, and 1.7% higher education. Because of this uneven distribution of data when we grouped it as primary, secondary, and higher, our moderation analysis showed very little difference.

Table 3 shows the association between categories of women's autonomy and domestic violence types stratified by education (any vs. none). After adjusting for all covariates including women's autonomy variables, we found that there was a greater protective effect of WA in visiting family among women with any education (vs. no education) across each domestic violence outcome-- physical violence: (AOR=0.44 vs. AOR=0.75, $p<0.001$), sexual violence: (AOR=0.39 vs. AOR=0.86, $p<0.039$), and emotional violence: (AOR=0.43 vs. AOR=0.88, $p<0.000$). There was no evidence of interaction between education and other WA variables.

Table 3: Interaction of education as a moderator of the association between categories of women's autonomy and domestic violence types among Afghan married Women ages 15-49, AfDHS 2015.

	Education Status				
Variables	**No education**		**Primary or higher**		**P- Value**
Physical Violence					
Healthcare	0.72	[0.61-0.85]***	0.61	[0.47-0.81]**	0.278
Spending	0.58	[0.50-0.67]***	0.64	[0.40-1.03]	0.693
Household purchase	0.62	[0.53-0.71]***	0.48	[0.34-0.67]***	0.203
Visiting family	0.75	[0.64-0.89]**	0.44	[0.35-0.57]***	**0.001**
Contraception	1.22	[0.84-1.76]	0.39	[0.15-1.06]	0.099
Not using	0.76	[0.53-1.10]	0.50	[0.18-1.41]	
Sexual Violence					
Healthcare	0.52	[0.40-0.69]***	0.48	[0.26-0.89]*	0.808
Spending	0.67	[0.51-0.88]**	0.42	[0.20-0.92]*	0.281
Household purchase	0.58	[0.44-0.77]***	0.43	[0.22-0.86]*	0.433
Visiting family	0.86	[0.67-1.11]	0.39	[0.21-0.75]**	**0.039**
Contraception	1.26	[0.70-2.27]	0.72	[0.13-4.07]	0.647
Not using	1.03	[0.59-1.77]	0.92	[0.19-4.49]	
Emotional Violence					
Healthcare	0.85	[0.73-0.98]**	0.74	[0.52-1.04]*	0.458
Spending	0.65	[0.56-0.75]***	0.47	[0.31-0.70]***	0.100
Household purchase	0.76	[0.65-0.90]***	0.67	[0.36-1.27]	0.655
Visiting family	0.88	[0.77-1.00]	0.43	[0.31-0.59]***	**0.000**
Contraception	1.05	[0.74-1.49]	0.58	[0.22-1.55]	0.179
Not using	0.60	[0.43-0.84]**	0.84	[0.34-2.1]	

Footnotes: Odds ratios [95% confidence intervals] adjusted for age, residency, wealth, parity, and ethnicity Significance: <0.05*, 0.00**, 0.000***. P- Values are for the interaction between each women's autonomy variable and education status.

4.2. Aim 2: Women's autonomy and unintended pregnancy

In our sample of 14,179 Afghan women, 10.6% (n=1,500) of women experienced unintended pregnancy. Women’s autonomy was 46.7% (6,621) in healthcare decision making, 35.5% (4,885) in spending, 44.3% (6,268) in household purchases, 55.0% (7,797) in visiting families, and 86.8% (2, 716) in contraception use among those using contraception (**Table 4**). Additionally, the majority of women were uneducated (84.5%), poor (41.7%) and Rich (36.5%), Pashtun (39.9%) and Tajik (32.1%), lived in rural areas (75.2%), had four or less children (54.4%), and were between the ages 25-35 (48.3%) and ages 35-49 (26.3%).

In the bivariate analysis (**Table 4**), each of the women’s autonomy categories was associated with unintended pregnancy, except for spending. Compared with those women with no autonomy in healthcare decision making, those with autonomy were slightly more likely to experience unintended pregnancy (11.1% vs. 10.1%, $p < 0.047$). Similarly, those with household purchase autonomy were more likely to experience unintended pregnancy (12.0%, vs. 9.5%, $p < 0.000$). There were also differences in experience of unintended pregnancy among women with autonomy in visiting families vs. women with no autonomy. Those with autonomy in visiting families were slightly more likely to experience unintended pregnancy (12.4% vs. 8.5%, $p < 0.000$). Finally, women with autonomy in contraception were more likely to experience unintended pregnancy (17.5 vs. 13.1, $p < 0.000$). In general, women with autonomy were more likely to be educated, older, Tajik, live in urban areas, and have more children-- all with p-values of 0.000.

Table 4: Bivariate analysis between women's autonomy and unintended pregnancy in the last five years and selected characteristics of currently married Afghan women, who are in their first and only union, ages 15-49, AfDHS 2015. N=14,179.

Variables	Total N (%)	Healthcare n (%)		Spending n (%)		Household purchases n (%)		Visiting families n (%)		Contraception n (%)		
	14,179	No 7,546	Yes 6,621	No 8,885	Yes 4,885	No 7,894	Yes 6,268	No 6,370	Yes 7,797	No 412	Yes 2,716	Not using 10,931
Unintended pregnancy												
No	12,658	6,777	5,871	7,957	4334[ns]	7,142	5,500	5,826	6,821	358	2,239	9,956
	89.4	89.9	88.9	89.7	88.9	90.5	88.0	91.6	87.7	86.9	82.5	91.2
Yes	1,500	762	736	918	541	746	753	538	961	54	474	957
	10.6	10.1	11.1	10.3	11.1	9.5	12.0	8.5	12.4	13.1	17.5	8.8
Age												
15-24	3,606	2,068	1,532	2,366	1,106	2,213	1,389	1,910	1,692	103	517	2,960
	25.4	27.4	23.1	26.6	22.6	28.0	22.2	30.0	21.7	25.0	19.0	27.1
25-34	6,844	3,727	3,111	4,388	2,307	3,838	2,994	3,056	3,781	205	1,286	5,303
	48.3	49.4	47.0	49.4	47.2	48.6	47.8	48.0	48.5	49.8	47.4	48.5
35-49	3,729	1,751	1,978	2,131	1,472	1,843	1,885	1,404	2,324	104	913	2,668
	26.3	23.2	29.9	24.0	30.1	23.4	30.1	22.0	29.8	25.2	33.6	24.4
Education												
None	11,985	6,680	5,296	7,796	3,859	6,899	5,073	5,634	6,342	352	2,127	9,400
	84.5	88.5	80.0	87.7	79.0	87.4	80.9	88.5	81.3	85.4	78.3	86.0
Primary+	2,194	866	1,325	1,089	1,026	995	1,195	736	1,455	60	589	1,531
	15.5	11.5	20.0	12.3	21.0	12.6	19.1	11.6	18.7	14.6	21.7	14.0
Ethnicity												
Pashtun	5,648	3,617	2,029	3,954	1,559	3,657	1,988	3,216	2,429	240	1,065	4,275
	39.9	48.0	30.7	44.6	31.9	46.4	31.8	50.6	31.2	58.3	39.2	39.2
Tajik	4,539	2,135	2,396	2,653	1,770	2,273	2,260	1,679	2,853	119	1,096	3,296
	32.1	28.4	36.2	29.9	36.3	28.9	36.1	26.4	36.6	28.9	40.4	30.2
Hazara	1,376	491	885	615	698	486	890	355	1,021	30	289	1,042
	9.7	6.5	13.4	6.9	14.3	6.2	14.2	5.6	13.1	7.3	10.7	9.6
Uzbek	1,076	483	591	694	332	540	533	327	747	10	132	928
	7.6	6.4	8.9	7.8	6.8	6.9	8.5	5.1	9.6	2.4	4.9	8.5
Others	1,519	806	713	952	523	923	591	782	737	13	132	1,371
	10.7	10.7	10.8	10.7	10.7	11.7	9.4	12.3	9.5	3.2	4.9	12.6
Residency												
Urban	3,511	1,709	1,797	2,072	1,348	1,836	1,672	1,407	2,102	126	984	2,375
	24.8	22.7	27.1	23.3	27.6	23.3	26.7	22.1	27.0	30.6	36.2	21.7
Rural	10,668	5,837	4,824	6,813	3,537	6,058	4,596	4,963	5,695	286	1,732	8,556
	75.2	77.4	72.9	76.7	72.4	76.7	73.3	77.9	73.0	69.4	63.8	78.3
Wealth												
Poor	5,911	3,085	2,823	3,715	2,008	3,199	2,706	2,542	3,365	120	849	4,888
	41.7	40.9	42.6	41.8	41.1	40.5	43.2	39.9	43.2	29.1	31.3	44.7
Middle	3,098	1,795	1,300	2,071	941	1,818	1,276	1,558	1,537	86	515	2,472
	21.9	23.8	19.6	23.3	19.3	23.0	20.4	24.5	19.7	20.9	19.0	22.6
Rich	5,170	2,666	2,498	3,099	1,936	2,877	2,286	2,270	2,895	206	1,352	3,571
	36.5	35.3	37.7	34.9	39.6	36.5	36.5	35.6	37.1	50.0	49.8	32.7
Parity												
<4	7,711	4,248	3,454	4,967	2,518	4,501	3,197	3,694	4,009	245	1,227	6,188
	54.4	56.3	52.2	55.9	51.6	57.0	51.0	58.0	51.4	59.5	45.2	56.6
>=5	6,468	3,298	3,167	3,918	2,367	3,393	3,071	2,676	3,788	167	1,489	4,743
	45.6	43.7	47.8	44.1	48.5	43.0	49.0	42.0	48.6	40.5	54.8	43.4

Footnote: P-values compare the violence measures and sociodemographic within each women's autonomy measure; all P-values were significant (>0.000) except for the comparisons noted by "ns." All percent values are weighted using svy commend. Missing values were only <0.15% for unintended pregnancy, contraception, ethnicity, household purchases, visiting families, and healthcare. Spending had 2.9% missingness.

Table 5 presents multiple logistic regression models for the association between types of violence and categories of women's autonomy. *In Model 1*, we indicate unadjusted odds ratios, and we found that each types of women's autonomy, (except for contraception), was associated with increased unintended pregnancy. In *Model 2*, we adjust for relevant confounders including age, education, ethnicity, wealth, residency, and parity. After adjusting for confounders, women's autonomy in healthcare decisions (Adjusted odds ratio [AOR]=0.87, CI: 0.77 - 0.97) and spending (AOR=0.86, CI: 0.76 - 0.97) were significantly associated with decreased experience of unintended pregnancy. However, women's autonomy in visiting families (AOR=1.15, CI: 1.02 - 1.29) was associated with slightly increased experience of unintended pregnancy. The association between women's autonomy and household purchases (AOR=1.03, CI: 0.92 - 1.15) and contraception (AOR=1.08, CI: 0.79 - 1.48) were not significant.

In model 3, in addition to adjusting for the confounders, we adjust for the five women's autonomy variables (decision making in healthcare, spending, household purchases, visiting family, and contraception). We found that WA in healthcare (AOR=0.74, CI: 0.62-0.88), spending (AOR=0.82, CI: 0.69-0.96), and visiting families (AOR=1.34, CI: 1.15-157), remained associated with unintended pregnancy. The association between women's autonomy in household purchases and unintended pregnancy also became significant (AOR=1.34, CI: 1.15-157), while the association between women's autonomy in contraception and unintended pregnancy (AOR=0.61, CI: 0.45-0.84) was not significant (Table 5).

Table 5: Multiple logistic regression models indicating unadjusted and adjusted odds ratios with [95% confidence intervals] for the association between women's autonomy (WA) and unintended pregnancy in the last five years among Afghan currently married women, who are in their first and only union, ages 15-49, AfDHS 2015. N=14,179.

Categories of WA	**M1: Unadjusted**		**M2: M1+Sociodem.**		**M3: M2+Other**	
			Unintended Pregnancy			
Healthcare	1.11	(1.00 - 1.24)*	0.87	(0.77 - 0.97)*	0.74	(0.62 – 0.88)**
Spending	1.08	(0.97 - 1.21)	0.86	(0.76 - 0.97)*	0.82	(0.69 – 0.96)*
Household purchase	1.31	(1.18 - 1.46)***	1.03	(0.92 - 1.15)	1.21	(1.03 – 1.43)*
Visiting family	1.53	(1.37 - 1.71)***	1.15	(1.02 - 1.29)*	1.34	(1.15 – 1.57)***
Contraception	1.40	(1.04 - 1.90)*	1.08	(0.79 - 1.48)	1.04	(0.76 – 1.44)
Not using	0.64	(0.48 - 0.85)**	0.64	(0.47 - 0.87)**	0.61	(0.45 – 0.84)**

Footnotes: Significance: <0.05*, 0.00**, 0.000***
M1: unadjusted odds ratios [95% confidence intervals]
M2: adjusted for age, education, ethnicity, residency, wealth, and parity
M3: adjusted for all the covariates including the five WA variables (decision making in healthcare, spending, household purchases, visiting family, and contraception), education, age, residency, wealth, parity, and ethnicity

4.2.1. Analysis of physical or sexual violence as a mediator

Table 6 shows the association between categories of women's autonomy and unintended pregnancy, mediated by experience of physical or sexual violence (any vs. none) in the past 12 months. We found that 38% of the total effect of healthcare autonomy (CI: 0.19 – 1.77) and 42% of the total effect of household purchases autonomy (CI: 0.22 – 1.88) on reduced likelihood of unintended pregnancy is mediated through not experiencing physical or sexual violence; however, they are not significant. Additionally, we found that autonomy in use of contraception 3% (CI: 0.03 – 0.06) as well as not using contraception 6% (CI: 0.05 – 0.09) were slightly associated with unintended pregnancy through not experiencing physical or sexual violence. Autonomy in visiting families -21% (CI: -0.82 – -0.11) as well as household purchases -63% (CI: -10.9 – -11.8) were slightly negatively associated with unintended pregnancy through experiencing physical or sexual violence, although the latter one was not significant (Table 9).

Table 6: Total effect mediated by experience of physical or sexual violence in the association between categories of women's autonomy and unintended pregnancy among currently married Afghan women, who are in their first and only union, ages 15-49, AfDHS 2015. N=14,179.

Categories of WA	**Unintended Pregnancy**	
Healthcare	0.38	(0.19 – 1.77)
Spending	0.42	(0.22 – 1.88)
Household purchase	-0.63	(-10.9 – 11.8)
Visiting family	-0.21	(-0.82 – -0.11)*
Contraception	0.12	(-1.48 – 1.84)
Not using	-0.17	(-1.38 – 1.64)

Footnote: Adjusted proportions [95% confidence intervals], mediated by experience of physical or sexual violence in the association between categories of women's autonomy and unintended pregnancy; adjusted for age, education, ethnicity, residency, wealth, and parity
*Shows significance

4.3. Aim 3: Women's autonomy and pregnancy loss

In our sample of 18,632 Afghan women, 10.1% (n=1,886) of women experienced pregnancy loss. Women’s autonomy was 49.0% (9,130) in healthcare decision making, 37.8% (6,797) in spending, 46.7% (8,689) in household purchases, 57.8% (10,753) in visiting families, and 87.2% (3,679) in contraception use among those using contraception (**Table 7**). Additionally, the majority of women were uneducated (85.8%), poor (42.1%) and Rich (36.5%), Pashtun (39.0%) and Tajik (33.0%), lived in rural areas (75%), had more than five children (52%), and were between the ages 25-35 (40.7%) and ages 35-49 (39.6%).

In the bivariate analysis (Table 7), each of the women’s autonomy categories was associated with pregnancy loss. Compared with those women with no autonomy in healthcare decision making, those with autonomy were less likely to experience pregnancy loss (11.0% vs. 9.2%, $p < 0.000$). Similarly, those with spending autonomy were less likely to experience pregnancy loss (10.6% vs. 9.5%, $p < 0.016$). Additionally, those with household purchase autonomy were less likely to experience pregnancy loss (10.8% vs. 9.3%, $p < 0.001$). There were also significant differences in experience of pregnancy loss among women with autonomy in visiting families vs. women with no autonomy. Those with autonomy in visiting families were less likely to experience pregnancy loss (10.9% vs. 9.5%, $p < 0.002$). In general, women with autonomy were more likely to be educated older, Tajik, have more than five children, and live in urban areas-- all with p-values of 0.000.

Table 7: Bivariate analysis between women's autonomy, pregnancy loss, and selected characteristics of currently married women, who are in their first and only union, ages 15-49, AfDHS 2015. N=18,632.

Variables	Total N (%)	Healthcare n (%)		Spending n (%)		Household purchases n (%)		Visiting families n (%)		Contraception n (%)		
	18,632	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Not using
		9,487	9,130	11,205	6,797	9,924	8,689	7,863	10,753	541	3,679	14,2525
Pregnancy loss												
No	16,746	8,447	8,286	10,018	6,153	8,850	7,881	7,006	9,727	492	3,385	12,719
	89.9	89.0	90.8	89.4	90.5	89.2	90.7	89.1	90.5	90.9	92.0	89.2
Yes	1,886	1,040	844	1,187	644	1,074	808	857	1,026	49	294	1,533
	10.1	11.0	9.2	10.6	9.5	10.8	9.3	10.9	9.5	9.1	8.0	10.8
Age												
15-24	3,666	2,096	1,564	2,396	1,135	2,243	1,419	1,937	1,725	104	526	3,010
	19.7	22.1	17.1	21.4	16.7	22.6	16.3	24.6	16.0	19.2	14.3	21.1
25-34	7,582	4,066	3,510	4,814	2,605	4,209	3,361	3,359	4,216	227	1,434	5,867
	40.7	42.9	38.4	43.0	38.3	42.4	38.7	42.7	39.2	42.0	39.0	41.2
35-49	7,384	3,325	4,056	3,995	3,057	3,472	3,909	2,567	4,812	210	1,719	5,375
	39.6	35.1	44.4	35.7	45.0	35.0	45.0	32.7	44.8	38.8	46.7	37.7
Education												
None	15,978	8,476	7,490	9,924	5,514	8,762	7,201	7,012	8,953	464	2,929	12,440
	85.8	89.3	82.0	88.6	81.1	88.3	82.9	89.2	83.3	85.8	79.6	87.3
Primary+	2,654	1,011	1,640	1,281	1,283	1,162	1,488	851	1,800	77	750	1,812
	14.2	10.7	18.0	11.4	18.9	11.7	17.1	10.8	16.7	14.2	20.4	12.7
Ethnicity												
Pashtun	7,257	4,520	2,735	4,979	2,087	4,573	2,681	3,976	3,277	299	1,444	5,425
	39.0	47.7	30.0	44.5	30.7	46.2	30.9	50.6	30.5	55.3	39.3	38.1
Tajik	6,130	2,748	3,371	3,390	2,551	2,904	3,218	2,121	3,999	172	1,473	4,444
	33.0	29.0	37.0	30.3	37.6	29.3	37.1	27.0	37.3	31.8	40.1	31.2
Hazara	1,915	650	1,265	818	1,006	645	1,270	459	1,456	41	406	1,449
	10.3	6.9	13.9	7.3	14.8	6.5	14.6	5.9	13.6	7.6	11.0	10.2
Uzbek	1,407	619	786	881	439	698	706	415	990	14	172	1,213
	7.6	6.5	8.6	7.9	6.5	7.1	8.1	5.3	9.2	2.6	4.7	8.5
Others	1,895	934	961	1,116	708	1,087	803	880	1,015	15	182	1,695
	10.2	9.9	10.5	10.0	10.4	11.0	9.3	11.2	9.5	2.8	5.0	11.9
Residency												
Urban	4,664	2,171	2,487	2,657	1,861	2,358	2,302	1,778	2,883	174	1,338	3,115
	25.0	22.9	27.2	23.7	27.4	23.8	26.5	22.6	26.8	32.2	36.4	21.9
Rural	13,968	7,316	6,643	8,548	4,936	7,566	6,387	6,085	7,870	367	2,341	11,137
	75.0	77.1	72.8	76.3	72.6	76.2	73.5	77.4	73.2	67.8	63.6	78.1
Wealth												
Poor	7,852	3,860	3,988	4,639	2,910	3,993	3,853	3,107	4,740	162	1,149	6,467
	42.1	40.7	43.7	41.4	42.8	40.2	44.3	39.5	44.1	29.9	31.2	45.4
Middle	3,979	2,228	1,748	2,581	1,272	2,262	1,713	1,905	2,071	113	686	3,146
	21.4	23.5	19.2	23.0	18.7	22.8	19.7	24.2	19.3	20.9	18.7	22.1
Rich	6,801	3,399	3,394	3,985	2,615	3,669	3,123	2,851	3,942	266	1,844	4,639
	36.5	35.8	37.2	35.6	38.5	37.0	35.9	36.3	36.7	49.2	50.1	32.6
Parity												
<4	8,936	4,819	4,108	5,645	3,024	5,088	3,835	4,175	4,752	285	1,422	7,174
	48.0	50.8	45.0	50.4	44.5	51.3	44.1	53.1	44.2	52.7	38.7	50.3
>=5	9,696	4,668	5,022	5,560	3,773	4,836	4,854	3,688	6,001	256	2,257	7,078
	52.0	49.2	55.0	49.6	55.5	48.7	55.9	46.9	55.8	47.3	61.4	49.7

Footnote: P-values compare the violence measures and sociodemographic within each women's autonomy measure; all P-values were significant (>0.000) except for the comparisons noted by "ns." All percent values are weighted using svy commend. Missing values were only <0.15% for contraception, ethnicity, household purchases, visiting families, and healthcare. Spending had 3.4% missingness.

Table 8 presents multiple logistic regression models for the association between pregnancy loss and categories of women's autonomy. *In Model 1*, we indicate unadjusted odds ratios, and we found that each type of women's autonomy, (except for contraception), was associated with decreased pregnancy loss. In *Model 2*, we adjust for relevant confounders including age, education, ethnicity, wealth, residency, and parity. After adjusting for confounders, women's autonomy in healthcare decisions (Adjusted odds ratio [AOR]=0.86, CI: 0.78 - 0.95), household purchases (AOR=0.87, CI: 0.79 - 0.97), and visiting families (AOR=0.90, CI: 0.82 - 1.00), were significantly associated with decreased experience of pregnancy loss. However, the association between women's autonomy and spending (AOR=0.92, CI: 0.83 - 1.02) and contraception (AOR=0.91, CI: 0.66 - 1.25) were not significant.

In model 3, in addition to adjusting for the confounders, we adjust for the five women's autonomy variables (decision making in healthcare, spending, household purchases, visiting family, and contraception). We found no significant associaton after controlling for the five women's autonomy variables (Table 8).

Table 8: Multiple logistic regression models indicating unadjusted and adjusted odds ratios with [95% confidence intervals] for the association between categories of women's autonomy (WA) and pregnancy loss among Afghan currently married women, who are in their first and only union, ages 15-49, AfDHS 2015. N=18,632.

Categories of WA	**M1: Unadjusted**		**M2: M1+sociodem.**		**M3: M2+Other**	
			Pregnancy loss			
Healthcare	0.83	(0.75 - 0.91)***	0.86	(0.78 - 0.95)**	0.88	(0.76 – 1.03)
Spending	0.88	(0.80 - 0.98)*	0.92	(0.83 - 1.02)	1.04	(0.89 – 1.20)
Household purchase	0.84	(0.77 - 0.93)**	0.87	(0.79 - 0.97)**	0.93	(0.80 – 1.08)
Visiting family	0.86	(0.78 - 0.95)**	0.90	(0.82 - 1.00)*	0.99	(0.87 – 1.14)
Contraception	0.87	(0.64 - 1.20)	0.91	(0.66 - 1.25)	0.93	(0.67 – 1.28)
Not using	1.21	(0.90 - 1.63)	1.24	(0.91 - 1.67)	1.25	(0.93 – 1.70)

Footnotes: Significance: <0.05*, 0.00**, 0.000***
M1: unadjusted odds ratios [95% confidence intervals]
M2: adjusted for age, education, ethnicity, residency, wealth, and parity
M3: adjusted for all the covariates including the five WA variables (decision making in healthcare, spending, household purchases, visiting family, and contraception), education, age, residency, wealth, parity, and ethnicity

4.3.1. Analysis of physical violence during pregnancy as a mediator

Table 9 shows the association between categories of women's autonomy and pregnancy loss, mediated by experience of physical violence during pregnancy (any vs. none). We found that 18% of the total effect of healthcare autonomy (CI: 0.11 – 0.53) and 15% of the total effect of household purchases autonomy (CI: 0.09 – 0.58) on reduced likelihood of pregnancy loss is mediated through not experiencing physical violence during pregnancy. Additionally, we found that autonomy in use of contraception -3% (CI: -0.05 – -0.02) as well as not using contraception -6% (CI: -0.09 – -0.04) were slightly negatively associated with pregnancy loss through experiencing physical violence during pregnancy. There was no mediation effect of physical violence during pregnancy in the association between visiting families and pregnancy loss (Table 9).

Table 9: Total effect mediated by experience of physical violence during pregnancy in the association between categories of women's autonomy and pregnancy loss among currently married Afghan who are in their first and only union, ages 15-49, AfDHS 2015.

Categories of WA	**Pregnancy Loss**	
Healthcare	0.18	(0.11 – 0.53)*
Spending	0.46	(-2.23 – 3.49)
Household purchase	0.15	(0.09 – 0.58)*
Visiting family	0.00	(0.00 – 0.01)
Contraception	-0.12	(-2.92 – 2.44)
Not using	0.12	(0.07 – 0.38)*

Footnote: Adjusted proportions [95% confidence intervals], mediated by experience of physical or sexual violence in the association between categories of women's autonomy and unintended pregnancy; adjusted for age, education, ethnicity, residency, wealth, and parity
*Shows significance

4. DISCUSSION

5.1. Aim 1: Women's autonomy and experience of domestic violence

In the context of this country with a high prevalence of violence and low women’s autonomy, we found that about one in two Afghan women did not have autonomy in making decisions about spending, household purchases, and visiting family, and more than half of the sample did not have autonomy in making decisions about their healthcare. Additionally, almost one in two women experienced physical violence, and one in three experienced emotional violence.

Almost all aspects of women’s autonomy were significantly associated with less domestic violence; however, the association with contraception was not significant. These associations changed little after adjustment of sociodemographic factors; even after controlling for confounders, including age, education, ethnicity, wealth, place of residence, and parity, these associations remained significant. However, when all covariates, including women’s autonomy variables, were added together in the model, only a few women’s autonomy domains remained significant, suggesting these factors are interrelated. The factors that remained significant were most often related to healthcare as well as spending and household purchases. A potential explanation is that women, who lack financial autonomy and are dependent on their partner, may not have the option to leave abusive relationships, and therefore, continue to experience physical and/or sexual violence.[24] Additionally, women who have autonomy in visiting healthcare facilities may be more likely to be informed by providers and others in the society about their rights; consequently, they are less likely to perceive women's experience of violence as normal and more likely to stand up for themselves. Overall, our results are consistent with earlier investigations carried out in Bangladesh[24] and Ghana,[23] which found a significant association between women's autonomy and decreased experience of physical and sexual violence.

We also found that women who had the autonomy to visit families were less likely to experience physical, sexual, or emotional violence if they had at least some education (vs. no education). An explanation for these findings is might be that educated women have a better ability to navigate travel by themselves and negotiate decision making with their partners. Previous studies show that, compared to women with no education, women with some education are more likely to have decision making autonomy[45,46] and less likely to experience physical or emotional violence.[23] Unfortunately, the 2015 demographic health survey shows that 86% of women have no education,[6] and this number continues to increase with the recent ban on women's education by the Taliban.[39,40]

Without autonomy and education, Afghan women may be more susceptible to experiencing domestic violence. This not only has an impact on the health of women but has also been linked to other reproductive and perinatal health outcomes[16-25] and could have generational implications. Interventions at each level of the socioecological model is necessary to improve women's autonomy and mitigate violence against women. At the country level, the United Nations may negotiate with the Taliban and reestablish Elimination of Violence Against Women Law (EVAWL) as they did with the previous Afghan government in 2009.[74] Policies and programs that can grant Afghan women access to an education is also essential since education is associated with women's autonomy.[45,46] Currently, there are some online education programs such as Eagle Online Academy, which aims to empower women by providing online education, where girls and women can join from their homes.[119] A panel of experts, brought together by NYU Steinhardt, the Afghanistan General Consulate of New York, and NYU Wagner, emphasized that supporting such programs can play a crucial role in ensuring access to education for Afghan women during the Taliban regime.[120]

Moreover, at the community level, awareness programs and campaigns are needed to educate the Afghan people about women's rights as a fundamental part of human rights. Taliban have justified the elimination of women's rights and autonomy by their interpretation of the Islamic Sharia Allah.[96] Previous reports show that in Afghanistan, uneducated individuals are more likely to be manipulated by extremists and follow misinterpreted rules in the name of religion.[121] In addition to 86% Afghan women never receiving any education, more than 44% of Afghan men aged 25-29 and 52% of men aged 30-34 have no education.[6] Therefore, in several regions of Afghanistan, the majority of people do not know the true principles of Islam.[122] According to a report by International Development Law Organization (IDLO) that carried a Violence Against Women Awareness Campaign in Afghanistan in 2018, a local leader, who participated in the seminars led by the campaign staff, said, "For the last 25 years, I have been mediating in my community using traditional practices or religious guidance." He continued to assert, "I would never have imagined that any of those mediations were wrong until I participated in these six seminars. I learned a lot about law, rights, and religion. God, bless you."[122] Local leaders and Mullahs or Imams (clergyman) play an important role because often Afghans refer to them for advice.[123] Mullahs also preach to communities about morality during Friday prayers.[123] Violence Against Women Awareness Campaign is an example of an inclusive community-based intervention that is currently needed in all provinces across the country to educate people and fight against misinformation about women's rights, perpetuated by the Taliban.

Furthermore, microfinancing programs may help Afghan women become financially independent as we found autonomy in spending and household purchases is associated with reduced risk of experiencing violence. Microfinancing is a financial service that provides small-scale loans, savings, and other basic financial products to individuals, especially those in low-income communities and developing countries who have limited access to traditional banking services.[124] The primary goal of microfinance is to empower individuals to become financially independent by offering them the means to start small businesses, generate income, and build financial stability.[124] A randomized controlled trial study involving women participating in a microfinance loan program in Tanzania showed that women who were enrolled in the microfinance program were significantly less likely to experience intimate partner violence.[125] Women's financial independence can influence the power dynamics within a household. As women contribute economically, they may gain more say in decision-making processes, including those related to family finances and personal matters. This shift in power dynamics may reduce experience of domestic violence.[126] Future studies should explore the impact of these programs within the Afghan context.

The types of interventions discussed above are necessary at different levels of the socio-ecological model to improve women's autonomy and health outcomes in Afghanistan. My study may inform these programs and help with advocacy towards women's rights and policies that would mitigate prevalence of violence against women in Afghanistan.

5.2. Aim 2: Women's autonomy and unintended pregnancy

Among currently married Afghan women, who were in their first and only union and gave birth in the last five years, about one in two of them did not have autonomy in making decisions about their healthcare, household purchases, and visiting family. Additionally, about two thirds of the women did not have autonomy in making decisions about spending and 13.2% lacked autonomy in contraception use. Women's experience of unintended pregnancy was about 10.6%.

Almost all aspects of women's autonomy were associated with increased risk of unintended pregnancy (with the exception of spending). After controlling for confounding factors, women's autonomy in making decisions about their healthcare and spending were significantly associated with a lower odd of unintended pregnancy. This may be due to women's autonomy to visit healthcare facilities and learn about their reproductive health as well as use of contraception. Research has shown that women's autonomy is associated with increased use of health services.[127] In return, maternal healthcare utilization, including use of antenatal, delivery, and postnatal healthcare services, is associated with decreased unintended pregnancy.[128] Our finding is aligned with previous studies that show autonomy in healthcare, including reproductive health, is associated with reduced risk of unintended pregnancy[129,130]

However, we found that women's autonomy in visiting families was statistically significantly associated with a slightly higher odds of unintended pregnancy. Particularly in Model 3, after controlling for the effect of all covariates, including categories of women's autonomy, we observed that women's autonomy in visiting families and household purchases was associated with an increased risk of unintended pregnancy. This association was partially mediated by physical and sexual domestic violence (21% of total effect mediated by domestic violence) in that the reduction of violence with WA attenuated the effect of WA on unintended pregnancy.

These mixed findings regarding the association between women's autonomy and unintended pregnancy have also been shown in other studies.[131,132] A study in Indonesia found that women's autonomy in visiting families and household purchases was associated with increased odds of unintended pregnancy.[132] These mixed findings may be attributed to several factors. Firstly, given that our data is retrospective, it is possible that some autonomous women, initially desiring pregnancy, changed their opinion after giving birth, leading them to report the last birth as unintended.[133] This phenomenon is especially relevant in the context of Afghanistan, where there is strong evidence that the majority of Afghan people prefer sons over daughters, and therefore women are pressured by families to produce a son.[134,135] Consequently, a woman may initially aim to get pregnant but after visiting families and being influenced by the idea of preferably giving birth to a son, she may report the birth as unwanted upon discovering it is a girl. Sons are regarded as carriers of family name and ensure the family’s economic stability.[134,135]

Another reason may be that women with autonomy in visiting families and household purchases may be more inclined to characterize a previous pregnancy as unwanted due to lower fertility aspirations as traveling and visiting families may be challenging while having to care for infant and children. Additionally, having more children may mean an increase in household purchase, and some women may prefer financial stability over having more children. Furthermore, religious beliefs may play a stronger role in unintended pregnancy regardless of women's autonomy status. Previous studies show that religious people are less likely to use contraception methods and more likely to experience unintended pregnancy.[136–139] Pregnancy intentions may be more difficult to measure, as there may not be a specific intention for the pregnancy, contributing to mixed findings on the role of different WA variables. Therefore, instead of solely focusing on women's autonomy, it may be more effective to educate women about the health risks associated with unintended pregnancy. Studies demonstrate that community-based education on family planning is associated with an increased use of contraception and a reduced risk of unintended pregnancy among women in Africa.[140,141]

Currently, in Afghanistan, the risk of unintended pregnancy is higher than ever because the Taliban government do not support the supply and use of contraceptive services.[142] Nonprofit organizations and other foreign donors should focus on supporting Community-Based Distribution (CBD) programs for family planning.[140,141] In these programs, community members are trained to serve as advocates and providers of family planning services, including home visit services.[140,141] This is especially crucial for Afghan women who do not have access to reproductive healthcare services.

Furthermore, we found women's autonomy in use of contraception to be associated with slightly higher odds of unintended pregnancy; however, this association was not significant. This finding may be due to inconsistent use of contraception. The survey question asked if women made decisions themselves or with their husband about use of contraception; it's not clear whether the decision is about using contraception consistently or not. Additionally, there may be other reasons for use of contraception, such as preventing sexually transmitted infections and HIV.

5.3. Aim 3: Women's autonomy and pregnancy loss

Among currently married Afghan women, who were in their first and only union, about one in two of them did not have autonomy in making decisions about their healthcare, household purchases, and visiting family. Additionally, about two third of the women did not have autonomy in making decisions about spending and 12.8% lacked autonomy in contraception use. Women's experience of pregnancy loss was about 10%.

The results of my study suggest that women who had autonomy in making decisions about their healthcare, spending, household purchases, and visiting family were significantly less likely to experience pregnancy loss. After controlling for the effects of sociodemographic factors, only the associations of women's autonomy in in healthcare and household purchase remained significant. Some of the protective effects of autonomy in healthcare (18% mediated) and household purchase (15% mediated) on pregnancy loss could be partially explained by a a reduction in the experience of domestic violence during pregnancy, which is aligned with previous evidence that show lack of women's autonomy to be associated with an increased experience of violence.[23,24] In return, physical violence in pregnancy is associated with pregnancy loss.[44]

One reason that explains our finding regarding the protective effect of women's healthcare decision making autonomy on pregnancy outcome is that women with reduced autonomy in healthcare are less likely to seek the right amount of antenatal care visits.[13,14] In return, low use of antenatal care is a major risk factor for the high rate of adverse birth outcomes,[17–19] including pregnancy loss.[102]

Additionally, women who have autonomy in visiting families may be more likely to receive moral support from families, which is associated with reduced adverse birth outcomes.[143] Furthermore, autonomy in household purchases may allow women to fulfil their needs, including nutrition, which is associated with reduced risk of adverse pregnancy outcomes.[144] Overall, our results are consistent with earlier investigations carried out in India and Bangladesh, which found a significant association between women's lack of autonomy and increased risk of adverse birth outcomes.

There is growing evidence that shows more women and infants in low-income countries experience adverse health outcomes not just due to biomedical complications but because of social barriers and unequal gender norms.[145,146,147] For example, a study in Zambia showed that the lack of autonomy in making decisions within the household was linked to increased maternal health risks.[145] This underscores the crucial need to adopt maternal and child health programs and policies that incorporate a gender perspective.

In other countries, community-based health education programs have been useful in improving birth outcomes by empowering and educating women about maternal health, including the importance of antenatal and postnatal care, family planning, and nutrition.[148,149] However, in Afghanistan, such health education programs need to be tailored towards both men and women because, without their husbands' permission, Afghan women are limited in their decision-making.[6] According to the 2015 Afghanistan Demographic and Health Survey (AfDHS), 51% of Afghan women reported that they needed to get permission from their husbands to go to the doctor and that getting permission from their husband was a problem in seeking medical advice or treatment. As a result, only 59% of Afghan women who gave birth in the five years prior to the survey received antennal care from a skilled provider.[6] While the World Health Organization recommends at least four ANC visits, only 18% of Afghan women had four ANC visits.[6] Under the current Taliban administration, women are not even allowed to travel alone.[41] These policies limit women's ability to access healthcare and can potentially exacerbate adverse maternal and pregnancy outcomes. Given these challenges, interventions are necessary at both the country, community, and individual levels. At the country level, initiatives should involve discussions with the Taliban to address policy issues and the drafting of new laws that grant women the right to mobility and education. Concurrently, individual and community-level interventions, particularly through health education programs, are essential. My study sheds light to the status of women's autonomy and its associated health risks in Afghanistan. My study aims to shed light on the status of women's autonomy and its associated health risks in Afghanistan. By raising awareness, it seeks to inform program and policy makers, providing valuable insights for targeted interventions.

5.4 Strengths & Limitations

My study is the first to assess the adverse reproductive and perinatal health outcomes of women's lack of autonomy in Afghanistan, and the first study in the literature to look at the moderating effect of education and the mediating effect of domestic violence on this association. Since my study sample is from a nationally representative dataset, my findings will be generalizable to Afghanistan. Furthermore, we looked at multiple components of WA and multiple types of violence, whereas, other studies have grouped them together – this allows an understanding of types of autonomy and how each type of WA might remain associated with the health outcomes under study. As noted from the findings, some WA variables have differing impact on health outcomes and, thus, should be taken into consideration in the development of programs to address WA. Additionally, we looked at domestic violence, rather than just intimate partner violence, as the contextual factors around WA may affect violence more broadly in the household or through in-laws and relatives rather than just a partner. This study provides evidence and brings awareness (about the impact of the lack of women's autonomy on adverse reproductive and perinatal health outcomes) that is needed to urge policymakers and program implementers in targeting and improving women's autonomy in Afghanistan.

Our study also has some limitations, including the potential for social desirability bias regarding reporting of domestic violence. This bias was somewhat minimized by asking women about domestic violence privately in the absence of their husbands in order for women to feel safe and give accurate information. In addition, concerns over temporality may be an issue in cross-sectional studies. In this study it is likely that reporting on women's autonomy reflects experiences throughout the course of the relationship because women's autonomy is intertwined with the patriarchal cultural and political norms in Afghanistan.[150] For instance, due to the Taliban regime, women's autonomy to get an education is restricted, and therefore, 86% of women have no education.[6]

For Aim 1, I restricted the outcome to domestic violence experienced in the past 12 months to ensure the outcome occurred recently relative to the interview period to better ensure the exposure preceded the outcome. For Aim 2, report of unintended pregnancy was retrospective and it is possible that some women, initially desiring pregnancy, might change their opinion after giving birth, leading them to report the last birth as unintended or vice versa. Additionally, the belief and notion that family planning is 'up to God' may dilute the association between women's autonomy and unintended pregnancy. Regardless of women's autonomy status, some women may believe that pregnancy is not her decision but of Allah's (God's) will.[151] Consequently, some women may be less likely to report a pregnancy as unintended. These religious and cultural contexts make it more challenging to interpret results and make accurate inferences.

In terms of ever experience of domestic physical violence during pregnancy (a mediator in Aim 3), it may unclear if experience of domestic physical violence during pregnancy occurred before or within the past five years when women endured pregnancy losses. However, this variable provided a more direct assessment of experience of violence during pregnancy, which would likely have a greater impact on pregnancy loss and, given no partner change in the analysis, likely to represent an experience across multiple pregnancies.

Furthermore, there may be response bias and/or underreporting of experiences of different types of violence, unintended pregnancies, and pregnancy loss. Domestic violence is a sensitive topic, and some women may be afraid to report it, even when ensuring confidentiality. Unintended pregnancies may be underreported due to the belief that pregnancy is God's will. Additionally, pregnancy loss in the early months of gestation may be difficult to notice for some women, especially when they are uneducated, do not visit healthcare facilities, and lack understanding of their reproductive biology. Furthermore, we did not account for the husband's education, which may impact the association between women's autonomy and health outcomes. Previous studies show that women with educated husbands are less likely to experience domestic violence.[152] In the context of Afghanistan, since most of Afghan men are uneducated,[6] controlling for husband's education may attenuate the association between Afghan women's autonomy and their experience of domestic violence. Other suggested factors to control for include husband's drinking behavior or drug abuse. However, the data on these variables were limited because drinking alcohol is illegal in Afghanistan since it is an Islamic country.

Lastly, although the data was collected in 2015 and there have been changes in the Afghan government since then, our discoveries are likely still pertinent because the circumstances of women in the country have not improved and have, likely, gotten worse in the country in recent years.[41]

5.5. Conclusion and Implications

This study aimed to address existing gaps in the literature about health outcomes linked to women's autonomy in Afghanistan. Despite high rates of domestic violence and violation of women's rights in the country, there is limited research on this subject. I investigated the association between Afghan women's autonomy and their experience of violence, unintended pregnancy, and pregnancy loss. My findings show a high prevalence of domestic violence and low autonomy in Afghanistan. About one in two Afghan women did not have autonomy in making decisions and experienced domestic violence, and approximately one in ten women experienced unintended pregnancy and pregnancy loss.

Almost all aspects of women's autonomy were associated with reduced experience of domestic violence and pregnancy loss, which are aligned with previous studies conducted in other low-income countries. We also found that women who had the autonomy to visit families were less likely to experience physical, sexual, or emotional violence if they had at least primary education (vs. no education). Our findings regarding women's autonomy and unintended pregnancy were mixed; while autonomy in healthcare and spending were significantly associated with less likelihood of unintended pregnancy, autonomy in visiting families and household purchases were associated with increased risk of unintended pregnancy. These mixed findings regarding the association of women's autonomy and unintended pregnancy maybe due to religiosity and retrospective reporting. In all three aims, after controlling for sociodemographic, I found that women's autonomy in healthcare was significantly associated with reduced experiences of domestic violence, unintended pregnancy, and pregnancy loss. This indicates that in the context of Afghanistan, among the categories of women's autonomy, WA in healthcare is one of the most important determinants of the reproductive health outcomes assessed in this study. The second Afghan women's autonomy variable that was associated across all three health outcomes was autonomy in visiting families. Autonomy in healthcare and visiting families are more important and meaningful in the context of Afghanistan because culturally, it has been the norm in the country for women to not have the autonomy in making decisions about going out or visiting a healthcare facility without the permission of their husband.[6] According to Afghanistan's 2015 Demographic Health Survey (AfDHS), 61% of men believe that they are justified to beat their wives if their wives go out without telling them.[6] Additionally, about 51% of women reported getting permission to go to the doctor from their husbands was a problem in seeking medical advice or treatment.[6] These findings are important for tailored intervention and understanding which categories of women's autonomy to target first in Afghanistan.

This study provides evidence and brings awareness (about the impact of the lack of women's autonomy on adverse health outcomes) that is needed to urge policymakers and program implementers in targeting and improving women's autonomy and health outcomes in Afghanistan. Some international health entities are already recognizing the significance of women's autonomy and gender equality as a pivotal approach to enhance the well-being of both women and their offspring. An example of this is evident in the United States Agency for International Development that emphasis gender equality.[153] Similarly, UNAIDS and UNICEF incorporate a gender-focused approach to protect the health and overall welfare of women and children.[154] Interventions that may improve women's autonomy health outcomes in Afghanistan, as discussed under Aim 1, 2, and 3, include establishing laws about women's rights, granting access to education, awareness campaigns, microfinancing, and community-based distribution programs.

Furthermore, interventions may be more effective if they are led in cooperation with other affluent and liberal Islamic countries that value women's rights. There is a tendency to resist foreign interventions from non-Islamic Western countries.[155] Many conservative Afghans misunderstand the humanitarian activities led by Western organizations; those Afghans fear that Western countries might bring their ideology and undermine the local religion and culture.[156] This fear may be mitigated by collaborating with other Islamic countries that respect and support women's rights, including Tunisia and Albania.

Considering the current women's condition under the Taliban administration, this research has significant relevance. Beyond filling the current gap in the existing public health literature, this has implications for understanding the potential adverse outcomes that may be exacerbated by the Taliban party's policies, including eliminating the Ministry of Women's Affairs, suspending women's education, and banning women's freedom of movement in public unless they are escorted by a male relative.[39,41] Additionally, this study provides important insights into areas for intervention aimed at addressing gender inequalities and improving maternal and child health outcomes, aligning with the goals set by the United Nations in Sustainable Development Goal 3 and 5.

Future research should use prospective mixed methods study design to better understand the association between women's autonomy and unintended pregnancy. A prospective study on this subject may improve temporality and reduce recall bias in women's reports of unintended pregnancy and pregnancy loss.[133] Additionally, mixed methods may allow for a more comprehensive understanding of this issue by incorporating in-depth interviews to better explore the reasons for why women's autonomy in certain areas (such as use of health care and spending) are associated with decreased risk of unintended pregnancy and others (such as visiting families) are associated with increased risk of unintended pregnancy. The study may also examine other socio-cultural issues surrounding women's autonomy and health outcomes in Afghanistan, such as the role of child marriage and family dynamics. Subsequent research endeavors should also investigate the impact of community-based programs and campaigns in advocating for women's rights and improving health outcomes. Community-based programs and campaigns have been shown to be effective in other low income countries such as the African region.[140,141] Since collaborating with the current Afghan government is challenging, programs working directly with Afghan communities and future studies evaluating the impact of such programs may shed light on further solutions that could improve women's conditions in Afghanistan.

Supplemental Tables

Table 1: Interaction of level of education as a moderator of the association between categories of women's autonomy and domestic violence types among Afghan married Women ages 15-49, AfDHS 2015.

Variables	Level of Education: None		Primary		Secondary+		Prob > F
Physical Violence							
Healthcare	0.72	[0.61-0.85]***	0.65	[0.42-1.01]	0.60	[0.42-0.87]**	0.615
Spending	0.58	[0.50-0.67]***	0.63	[0.32-1.23]	0.67	[0.46-0.98]*	0.790
Household purchase	0.62	[0.53-0.71]***	0.40	[0.22-0.72]**	0.60	[0.42-0.86]**	0.417
Visiting family	0.75	[0.64-0.89]**	0.30	[0.19-0.48]***	0.68	[0.39-1.18]	0.001
Contraception	1.22	[0.84-1.76]	0.69	[0.22-2.17]	0.27	[0.07-1.03]	0.296
Not using	0.76	[0.53-1.10]	0.75	[0.24-2.41]	0.38	[0.11-1.37]	
Sexual Violence							
Healthcare	0.52	[0.40-0.69]***	0.43	[0.21-0.88]*	0.58	[0.20-1.70]	0.877
Spending	0.67	[0.51-0.88]**	0.36	[0.16-0.82]*	0.55	[0.16-1.81]	0.396
Household purchase	0.58	[0.44-0.77]***	0.67	[0.33-1.34]	0.25	[0.06-1.08]*	0.481
Visiting family	0.86	[0.67-1.11]	0.31	[0.15-0.66]**	0.56	[0.20-1.62]	0.045
Contraception	1.26	[0.70-2.27]	1.70	[0.80-3.62]	0.19	[0.03-1.21]	0.066
Not using	1.03	[0.59-1.77]	1.26	[0.70-2.27]	0.58	[0.12-2.78]	
Emotional Violence							
Healthcare	0.85	[0.73-0.98]*	0.64	[0.34-1.19]	0.85	[0.50-1.43]	0.664
Spending	0.65	[0.57-0.75]***	0.49	[0.25-0.97]*	0.44	[0.27-0.73]**	0.216
Household purchase	0.76	[0.65-0.90]**	0.40	[0.23-0.70]	1.05	[0.44-2.47]	0.046
Visiting family	0.88	[0.77-1.00]	0.50	[0.30-0.84]**	0.37	[0.19-0.69]**	0.001
Contraception	1.05	[0.74-1.49]	1.15	[0.49-2.68]	0.37	[0.09-1.47]	0.253
Not using	0.60	[0.43-0.84]**	1.00	[0.43-2.33]	0.84	[0.23-3.04]	

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