Maternal Fetal Attachment, Locus of Control and Adherence to STI/HIV Prevention and Prenatal Care Promotion Behaviors in Urban Women

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Abstract—Young women of childbearing age are disproportionately affected by sexually transmitted infections (STIs) including HIV. In particular, young women have more frequent and more serious health problems from STI or HIV infection than men, and among women, African American women have especially high rates of infection. Pregnancy is an important time for beginning or continued STI and HIV prevention behaviors as discontinuing condom use when the contraceptive motivation is gone puts women and their fetuses at risk for contraction of STIs and HIV if they remain sexually active. There are many personal attributes that predict adherence to STI risk reduction behaviors including health related locus of control. The current study surveyed a group of 100 low-income, urban dwelling minority women during their pregnancies to determine whether maternal-fetal attachment, a characteristic specific to pregnancy, favorably influences pregnant women’s health related locus of control such that women might be more inclined to engage in preventative STI/HIV risk reduction behaviors. Our findings revealed that while our sample has very high levels of MFA despite the high rate of unplanned pregnancy, condom use is not the method used to reduce the risk of contracting STIs/HIV. Rather, women are more likely to limit their number of sexual partners during pregnancy. While this is beneficial, pregnant women in non-monogamous relationships may discount the importance of condom use during pregnancy. Prenatal care providers can provide education about condom use as a beneficial prenatal care behavior similar to taking prenatal vitamins.

Keywords — Health Promotion, HIV/STI Prevention, Maternal Fetal Attachment, Pregnancy, Prenatal care

I. INTRODUCTION

Young women of childbearing age are disproportionately affected by HIV and other sexually transmitted infections (STIs). In particular, young women have more frequent and more serious health problems from HIV or STI infection than men, and among women, African American women have especially high rates of infection. The majority of these women contract STIs, including HIV, from their male partners. Pregnancy is an important time for beginning or continued STI and HIV prevention behaviors as discontinuing condom use when the contraceptive motivation is gone puts women and their fetuses at risk for contraction of STIs and HIV if they remain sexually active. There are many personal attributes that predict adherence to STI risk reduction behaviors including health related locus of control. The current study investigated whether maternal-fetal attachment, a characteristic specific to pregnancy, favorably influences pregnant women’s health related locus of control such that women might be more inclined to engage in preventative HIV risk reduction behaviors.

STI and HIV Epidemiology

STIs and HIV are extremely prevalent among young, minority women ages 15-34 and it has been estimated that as many as 1 in 4 sexually active females has an STI such as chlamydia or human papillomavirus (HPV)1. In 2010, the last year for which data are available, the highest number of new HIV infections occurred in individuals ages 25-34 (31%), followed by individuals aged 13-24 (26%)2. While rates of new HIV infections in women overall have decreased 21% between 2008 to 2010, minority women specifically, continue to be disproportionately affected by heterosexual transmission of HIV. In 2010, 87% of black/African American women with new HIV infections were infected by heterosexual contact. Similarly, while new infection rates for whites and African Americans are decreasing, new infections among Hispanic/Latina women have remained stable since 2008. The rate of new HIV infections among Hispanic/Latina women are 4.2 times the rate for white females. Although rates of the 8 major STIs (gonorrhea, chlamydia, syphilis, HSV-2, HPV, hepatitis B, trichomoniasis, HIV) vary in prevalence over the years 2000-2008, young people bear the burden of infection. In the United States, over half of the estimated 19 million annual new STI infections occur in young women ages 15-243.

Heterosexual Transmission

Women are twenty times more likely than men to become infected with STIs and HIV through penile-vaginal contact. Among women, heterosexual transmission is the most common cause of new HIV infections. Of the estimated 123,000 women living with AIDS, 71% were determined to
have been heterosexually exposed to the virus as opposed to 13% of the 332,500 infected adult and adolescent males. It has been well documented that the receptive partner during sexual intercourse is at greater risk for disease infection than the insertive partner regardless of the sex of the individuals involved.

**Women as a Vulnerable Population**

Social factors including poverty, unemployment, gender inequities, cultural practices, and lack of information and services are known to greatly increase the vulnerability of women, young people, and other minority groups to HIV infection. Poverty is especially important in assessing an individual’s vulnerability as many studies have noted that low-income women are at increased risk for HIV/STI infection and unintended pregnancy. Finer and Henshaw report that the unintended pregnancy rate is highest among young (18-24 year old), low-income, minority women. Consequences of living in poverty such as unemployment, lack of education, domestic violence, and little or no access to basic health care often increase the risk for STI and HIV infection.

Black and Latina women are among those who are most likely to be living in poverty and are at the highest risk for new HIV infections among women overall. Hobfoll and colleagues suggest that minority women and inner-city women in general are at increased risk for heterosexual HIV/AIDS infection due to the rate of exposure among those they are likely to have as sexual partners and because of the higher than average prevalence of intra-venous drug users in the inner city.

**Pregnant Women**

Pregnant women are not exempt from participation in high-risk sexual behaviors and contracting STI infection both during and following pregnancy. Empirical findings indicate that most young adults use condoms primarily for pregnancy prevention as opposed to STI prevention. With contraception motivation removed, condom use is often abandoned once a pregnancy is established. Research by our group found that among a sample of 67 pregnant women, self-reported frequency of condom use decreased significantly from 59% in the 3 months prior to becoming pregnant to only 23% during pregnancy. Young pregnant women are an important and unique group because pregnancy is known to be a stressful transition period for the mother-to-be as well as her partner. The stressors of pregnancy can strain a relationship, which may influence sexual risk behavior. One of these stressors may be the unplanned nature of the pregnancy itself. Finer and Henshaw found that in 2001, the rate of unplanned pregnancy was highest among young (aged 18-24), unmarried, low-income, and minority women. In an earlier study of young, low-income, urban-dwelling, minority women, our group found that 78% of the women surveyed in a prenatal clinic waiting room had not planned their pregnancies.

In order to study continued condom use during pregnancy and STI/HIV prevention practices in general, one must consider how these behaviors are influenced. Often, individual personality attributes or feelings that become important given a certain unique event such as pregnancy can account for more behavior change than education campaigns in a given environment. The specific attributes examined in this study are health related locus of control (HLOC) and maternal fetal attachment (MFA).

**Health Related Locus of Control**

The concept of locus of control is a function of two issues; the extent to which the individual believes the behavior will lead to a particular reinforcement and the extent to which the reinforcement is valued by the individual. From this, individuals can be divided into two categories: internal and external. ‘Internals’ are more likely to attribute consequences of events to their own actions, while ‘externals’ believe that these events are outside of their own control.

The Multidimensional Health Locus of Control Scale (MHLOCs) applied this theory specifically to health related behaviors. Norman and colleagues predicted that individuals with strong internal health related locus of control beliefs would be more likely to engage in health promoting activities and behaviors while those with external loci of control will be less likely to do so. Individuals who engaged in more health behaviors (not smoking; using alcohol within recommended limits; exercising more than 20 minutes per day, 3 times per week; and eating fruit 6-7 days per week) were more likely to score higher on the internal dimension and lower on the external dimension. These authors also found evidence suggesting that the value one places on his or her own health may moderate the relationship between health locus of control and engagement in health behaviors. This is relevant to the current study as pregnant women may place a higher value on their own health in an attempt to secure the health of their unborn child. In the current study, value on health is measured as the extent to which the pregnant woman values the pregnancy (i.e., attachment and attitude towards the pregnancy).

In 1990, when AIDS infection was becoming an epidemic in gay male communities, Kelly and colleagues revised Wallston’s original MHLOC scale to be more relevant to HIV/AIDS as a health risk. Nine items representing the original three dimensions (self, powerful others, fate/chance) were tailored to make them pertinent to HIV/AIDS. Their findings indicated that gay men who used barrier protection during intercourse were less likely to attribute AIDS risk to external factors such as chance, luck, or fate. More recently, Burns and Dillon used Kelly and colleagues’ AIDS MHLOC scale in a sample of 106 African-American undergraduate students and found that AIDS related locus of control did not significantly predict condom use. Authors have concluded that perhaps AIDS health locus of control is too global a construct to predict the specific behavior of condom use.

Low-income pregnant women present with unique life circumstances, different from the previously studied groups (i.e. gay males, undergraduate students). Given the health of the mother and her offspring could be at risk, it is imperative to investigate the relationships between AIDS related locus of control and behavior change in pregnant populations.

**Maternal Fetal Attachment**

MFA is a term used to describe the developing relationship between a pregnant woman and her fetus and describes “the extent to which women engage in behaviors that represent an affiliation and interaction with their unborn child.” MFA increases as the pregnancy progresses and
mothers with higher levels of MFA initially are more likely to score higher on the subsequent measures of infant attachment. MFA has also been shown to have a positive relationship with prenatal health promotion behaviors such as obtaining prenatal care, abstaining from smoking, alcohol and illicit drug use, appropriate weight gain, establishing good sleep and exercise patterns, and learning about pregnancy and childbirth. Sandbrook and Adamson-Macedo expanded the conceptualization of MFA with their finding that among pregnant mothers a desire to protect the fetus was more salient than feelings of love. These authors concluded, “the protective instinct promotes behavioural changes to ensure a favorable intra-uterine environment”. Specifically, women who are more attached to their fetuses are thought to be more interested and invested in caring for themselves during pregnancy in an attempt to improve the health outcomes for their future child.

The majority of studies of MFA have included mainly white, well-educated, married women with normal pregnancies. Few studies have been conducted on how MFA influences women from a lower SES, minority ethnicity, or lower educational level. One study of MFA and pregnancy-related health practices found no differences in MFA between a group of inner-city pregnant women and a comparable group of women living in the Midwest, although inner-city women engaged in significantly fewer prenatal health practices. In the inner-city, women with low MFA scores were found to engage in fewer prenatal care behaviors than women with higher MFA.

The current study hypothesizes that pregnant women with higher levels of MFA (i.e., positive attitudes towards the pregnancy and the baby) are more likely to have an internal AIDS HLOC compared to women with lower levels of MFA who may be more likely to have an external LOC. As mentioned previously, MFA is significantly associated with engagement in positive health promotion behaviors during pregnancy. Also, internal AIDS HLOC is more closely linked to positive HIV/AIDS preventative behaviors among gay men, but not among black undergraduate students. Earlier research found that “poor black women” were highly external; however this research was conducted with a non-pregnant sample. To date, no research has been conducted regarding how MFA influences HLOC in a sample of minority pregnant women living in poverty.

We also hypothesized that MFA moderates the relationship between HLOC and engagement in HIV risk reduction behaviors, as measured by both condom use during pregnancy as well as engagement in positive prenatal care behaviors.

II. METHODS

Recruitment Procedures and Inclusion/Exclusion Criteria

All female patients between 18-35 years old and at least 20 weeks pregnant were approached by study personnel in the waiting room of an urban prenatal clinic mainly serving low-income women following referral from clinic staff. Study recruitment took place over one calendar year (Jan-Dec 2009) and research assistants were recruiting participants on 2-3 half-day clinic sessions per week. Participants were fluent English speakers (at a 6th grade reading level or above). All participants were required to be sexually active with a male partner during pregnancy, have a history of condom use within the past year, and test HIV negative. Pregnant women over the age of 35 were excluded from the current study as women of advanced maternal age may be at higher risk for complications during pregnancy and may therefore be otherwise motivated to preserve the health of the fetus. Similarly, women with pregnancy complications including gestational diabetes, hypertension, or other conditions, which were considered high-risk were excluded from participation.

One hundred women were enrolled, giving written informed consent for this study that was approved by the Drexel University College of Medicine investigational review board. All 100 women fully completed the interview and all questionnaires, requiring on average 25 minutes. Participants were recruited, consented, and administered the interview by the PI (SLK) or one of two female research assistants. All measures were administered in interview format to increase participant understanding and to avoid skipped or missed items.

Measures

Maternal Antenatal Attachment Scale (MAAS) The MAAS focuses on the thoughts and feelings about the baby and consists of two factors, quality and intensity. Quality describes the affective experiences the mothers reported including closeness/distance, tenderness/irritation, positive/negative, joyful/unpleasant anticipation, and a vivid/vague internalized representation of the fetus as a real person. Intensity refers to the amount of time the mother spends thinking about, talking to, dreaming about, or tactilely interacting with the fetus. This instrument contains 19 items scored on a 1-5 Likert scale and ranges from 19 (lowest score, low attachment) to 95 (highest score, high attachment) and has a high internal consistency with alpha equal to .82.

Health Practices in Pregnancy Questionnaire-II (HPQ-II)

The HPQ-II is a 34-item scale that addresses adequacy of health practices in the following areas: balance of rest and exercise, safety measures, nutrition, avoiding use of harmful substances, obtaining health care, and obtaining information. Each item is rated on a 5-point Likert scale ranging from 1 (never) to 5 (always, daily, or frequently). Higher scores indicate a higher quality of health practices important to pregnancy outcomes. The potential scale range is 34-170. The measure has an alpha coefficient of .81 and was significantly correlated with the Health Promoting Lifestyle Profile (r = .54).

AIDS Multidimensional Health Locus of Control Scale (AIDS MHLOC) The AIDS MHLOC Scale is used to assess AIDS related health locus of control and is an adaptation by Kelly and colleagues of the original HLOC Scale. Kelly modified nine items to make the scale pertinent to HIV/AIDS. These items reflected the original measures’ three dimensions: Internal Control, Chance/Luck External Control, and Powerful-Others External Control. All items are arranged on a six point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). The MHLOC has an internal consistency of alpha = .77 and a test-retest reliability at two weeks apart of .86. The reliability for the individual subscales was measured at alpha = .75, .57,
and .55 on the Internal Control, Chance/Luck External Control, and Powerful-Others External Control subscales respectively. Due to the low reliability among the External subscales of the AIDS MHLOC Scale, these items were reverse scored and summed with the internal items to create a total score. Higher scores reflect higher levels of an internal locus of control. The reliability for this summated scale was determined to be acceptable (alpha = .69).21, 22
Condom Use was assessed by a single item question asking participants to retrospectively report the number of occasions during which they had engaged in any vaginal, anal, or oral sexual activity both in the 6 months prior to confirming their pregnancy and then again in the time since they had confirmed their pregnancy. The PI and research assistants administering the interviews assisted women with this retrospective task by asking about frequency of sexual contact per day, per week, or per month, and inquiring about any special occasions when sexual activity might have been more or less frequent (e.g., during menses or holidays and vacations). Participants were then asked to report how many times they had used condoms out of the total number of sexual contacts reported both prior to and since the pregnancy had been confirmed.

Data Analytic Plan

We predicted that pregnant women with higher levels of MFA are more likely to have an internal AIDS HLOC compared with women with lower levels of MFA who may be more likely to have an external LOC. This hypothesis was examined using a bivariate linear regression that aimed to fit these two variables into a best fit line. Variables representing total scores from the MAAS and the AMHLOC were entered into SPSS, version 17, as the dependent and independent variables respectively.

We also examined the moderating effect of MFA on the relationship between health related LOC and engagement in positive prenatal health behaviors as measured by the HPQ and HIV risk reduction behaviors, namely condom use. Parity was controlled for as a covariate as correlation analyses revealed a significant relationships between parity and the dependent variable (r(98)=-.273, p<.01). In order to appropriately analyze the data to show a moderating effect of MFA, a series of multiple regressions were used to first analyze main effects and then the interaction effects. Both MFA and health related LOC were run in separate bivariate regressions as predictors against the outcome variables prenatal health behaviors (PHQ) and condom use. An interaction variable was created by multiplying the centered data from each of the two independent variables entered into a regression against the dependent variables, prenatal health behaviors and condom use. Data were centered in order to increase the ease of interpretation and to avoid problems with multicollinearity.35, 36

III. RESULTS

Two hundred and thirty women were approached in the waiting room of an urban, university-affiliated prenatal clinic and were found to be eligible for study enrollment. More than half (n=130, 56%) declined to participate citing a lack of interest (58%) or time (42%). Those who did not have time were scheduled for ultrasound appointments immediately following their visit with the obstetrician, which interfered with their availability. One hundred women comprised the current sample.

Participant Sociodemographics

| TABLE 1: PARTICIPANTS’ DEMOGRAPHIC CHARACTERISTICS |
|-----------------|-----------------|-----------------|
| Age             | Mean            | %               |
| Maternal Age    | 23.5 years      | 30.5 weeks      |
| Gestational Age |                 |                 |
| Ethnicity       |                 |                 |
| Non-Hispanic Black | 81             |                |
| Non-Hispanic White | 5              |                |
| Hispanic Black  | 4               |                |
| Hispanic White  | 4               |                |
| Non-Hispanic Biracial | 4             |                |
| Hispanic Biracial | 2              |                |
| Marital Status  |                 |                 |
| Never Married   | 48              |                |
| Living with Partner | 43           |                |
| Married         | 9               |                |

Participant characteristics are summarized in Table 1. The participants’ average age was 24 years old with an average gestational age of 30 weeks. The vast majority (81%) identified themselves as African American and not married.

| TABLE 2: PARTICIPANTS’ REPRODUCTIVE HISTORY |
|-----------------|-----------------|-----------------|
| Number of children | %               |                 |
| 0               | 41              |                |
| 1               | 33              |                |
| 2               | 14              |                |
| 3+              | 12              |                |
| Hx of elective abortion | 49             |                |
| Hx of spontaneous loss | 31             |                |
| Unintended pregnancy (current) | 82          |                |

Of the 82 (82%) women who reported that their pregnancy was unplanned, 17% indicated that they had not wanted the current pregnancy or any future pregnancies in their lifetime. Using bivariate linear regression in SPSS 17 we found a significant association between MFA and AMHLOC (R²=0.057, F(1,98) =6.9, p=.010; β=.258, t(98)=-2.646, p<.01), as predicted. This suggests that mothers with higher levels of fetal attachment are more likely to have a higher internal LOC regarding HIV-related health risks. MFA also explains a significant proportion of the variance in LOC scores.

There was a significant main effect of the relationship between MFA and positive prenatal health behaviors as measured using the HPQ (R²=.369, F(1,98)=20.324, p<.01; β=.603, t(98)= 7.068, p<.01). Similar to HIV-related prevention behaviors, women with higher levels of MFA are more likely to engage in more positive prenatal health behaviors. There was a trend for HLOC and to be associated
with positive prenatal behaviors ($R^2=.187$, $F(1,98)=3.272$, $p=.074$; $\beta=-.180$, $t(98)=-1.809$, $p=.074$). The analysis of the interaction variable confirmed our hypothesis; there exists a significant moderating effect of MFA on the relationship between HLOC and engagement in positive prenatal health behaviors as seen in Figure 1 ($R^2=.043$, $F(3,96)=5.421$, $p<.05$; $\beta=.229$, $t=2.32$, $p=.02$). This indicates that higher levels of MFA combined with a more internal HLOC contributes to higher levels of engagement in positive prenatal health behaviors, while subsequent combinations of lower levels of each of these variables are associated with lower adherence to positive health behaviors during the prenatal period. Despite the fact that the moderating effect of MFA is significant, it should be interpreted carefully as the effect size ($f^2 = .045$) indicates that the interaction only accounts for a small amount of the variance in the relationship. Conversely, the effect size of MFA ($f^2 = .585$) suggests that this is the driving variable in the regression.

**TABLE 3: MAIN OUTCOME SCORES**

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMHLOC</td>
<td>17</td>
<td>39</td>
<td>26.54</td>
<td>.41</td>
</tr>
<tr>
<td>HPQ</td>
<td>93</td>
<td>167</td>
<td>138.96</td>
<td>12.72</td>
</tr>
<tr>
<td>MFA</td>
<td>62</td>
<td>95</td>
<td>81.95</td>
<td>8.12</td>
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Initial hypotheses proposed that we would find significant relationships between MFA and LOC on the outcome variable of condom use during pregnancy. The variables MFA, HLOC, and the interaction variable MFA*LOC were entered into the regression analysis against rate of condom use during pregnancy as the dependent variable. Neither MFA, nor AIDS related health LOC were associated with condom use during pregnancy ($R^2=.030$, $F(3,96)=.044$, $p=.988$; (LOC)$\beta=-.032$, $t(97)=-.303$, $p=.763$; (MFA) $\beta=.013$, $t(97)=.120$, $p=.905$). Further analysis of the interaction effect also yielded non-significant results indicating that there is no moderating effect of MFA on the relationship between AIDS related health LOC and condom use during pregnancy ($R^2=.030$, $F(3,96)=.044$; $\beta=-.002$, $t(97)=-.020$, $p=.984$).

**IV. DISCUSSION**

A sample of women generally determined to be at high risk for STI and HIV acquisition was targeted for this study by recruiting participants from the waiting room of an urban Philadelphia prenatal clinic which serves predominantly young, low-income, minority women carrying unplanned pregnancies. Collectively, they are representative of the young, low-income, minority women who currently comprise the most at-risk individuals for diagnosis of new cases of STIs and the fastest growing group of individuals being diagnosed with new cases of HIV in the United States. Despite the high prevalence of unplanned and even unwanted pregnancies in this sample, these women scored higher than normed samples on measures examining their levels of maternal fetal attachment. While this could be due to a social desirability effect as the questionnaire was administered in an interview format, it has been noted in other literature that once the initial shock of an unexpected pregnancy wears off, future mothers are generally satisfied with their pregnant status.

Results of this study found that MFA is significantly associated with an internal AIDS-related LOC. This finding suggests that as the mother’s attachment to the fetus increases she feels more strongly that her own actions can influence her health related outcomes, especially her risk of contracting HIV/AIDS. Because MFA is a construct that is solely relevant during the unique prenatal period in a woman’s life, it is possible that as the reality of the pregnancy becomes apparent, a woman begins to better appreciate the connections between her own behaviors and their consequences (e.g., that her unprotected sexual activity prior to pregnancy resulted in becoming pregnant) and this leads to a greater understanding that her own actions can lead to different outcomes. As attachment to the fetus grows, so too does the belief that the pregnant woman’s own behaviors will have an effect on her ability to remain free of STIs and HIV, also known as an internal locus of control.

These results add to the findings that “poor black women” are highly external, meaning that they did not believe that their own actions necessarily contributed to their health outcomes. The current study, largely comprised of a sample similar to Fisch’s, however, finds that pregnancy and the resultant attachment that develops in the mother for her unborn child may influence a woman to realize that her own actions can have an impact on what happens to her health. This shift from external to internal HLOC may be due to the fact that the pregnant women in this study were receiving prenatal care and may have been influenced towards this mode of thinking by their prenatal care medical providers. Evidence against this is that women with lower levels of MFA also tended to show a more external bias in HIV/AIDS related LOC suggesting that it was not solely the intervention of the medical provider, but rather some quality unique to pregnancy or MFA that results in a general change from external to internal LOC. In other words, if a medical provider was able to influence pregnant women to have a more internal locus of control then this might be evident among all women regardless of their level of attachment to the fetus. Because the level of internal HLOC varies by level of MFA, it appears likely that level of attachment, is more responsible for the change in cognitive style than an educational intervention by the prenatal care provider.

As predicted, we found a moderating effect of MFA on the relationship between LOC and healthy prenatal behaviors. In examining the main effects of this hypothesis, the current study confirms Lindgren’s findings that MFA significantly predicts adherence to positive prenatal health behaviors as measured by the Health Practices in Pregnancy Questionnaire-II. Just as Norman found evidence to suggest that the value one places on one’s health moderates the relationship between HLOC and living a healthy lifestyle, the current study finds that among pregnant women, the level of attachment to the fetus acts as a proxy for the value one places on one’s own health. Interestingly, with no main effect of HLOC on healthy prenatal behaviors, it can be concluded that an internal HLOC alone does not necessarily prompt an individual into action for health related behavior change. However, when combined with the
attachment towards the developing child, those with an internal HLOC are most likely to engage in more frequent adherence to healthy behaviors during the prenatal period. This finding could be due to the fact that many individuals are not motivated to maintain their own health even though they know what to do and how to do it. This is common among medical patients diagnosed with diabetes as well as other chronic conditions including HIV/AIDS. It is often easy to justify not taking proper care of oneself as there is a perception that it is the individual alone who will suffer as a result. In the case of pregnancy, an expectant mother can no longer assume that she alone will bear the consequences. Simply because a woman has the knowledge that her own actions can control her health outcomes (i.e., internal LOC) does not mean that she will take part in proper self-care. However, understanding and caring that her actions may adversely affect her future child may initiate the motivation needed to engage in positive prenatal health behaviors.

The results of this moderator analysis also shed light on an unexpected finding. Among women with a low MFA, a high internal HLOC is less likely to be associated with engagement in prenatal health care behaviors than a low internal (i.e., external) LOC. Because the HPQ-II was not designed to measure constructs other than overall prenatal health behaviors, it was not possible to look at different types of prenatal health behaviors in order to draw conclusions about whether women with a high vs. low MFA may be more likely to engage in certain types of prenatal care behaviors. Had a measure been chosen that differentiated between self-oriented and fetus-oriented prenatal health behaviors it may have been possible to do some additional statistical analyses to investigate this curious finding. It is possible that among women with a low level of MFA, those who have a low internal (i.e., external) LOC engage in more health behaviors because they may be more compliant with instructions from a medical provider.

Alternatively it is possible that women with a low MFA and a high internal LOC may be those who are depressed or distressed over their (unplanned) pregnancy status because they recognize the extent to which their own actions are responsible for their present situation. In these cases, the neglect of prenatal health care behaviors could reflect the low level of attachment that has developed between the mother and child. The above information is solely speculation. What can be definitively said is that it appears that MFA is the driving variable in the interaction and that the low level of MFA is likely more responsible for low levels of engagement in prenatal care behaviors than the internal locus of control among women with those combination of traits.

When we analyzed condom use during pregnancy as an outcome, there were no significant relationships between any of the predicted variables. These findings are surprising because other researchers have written about condom use as a health promotion/disease prevention behavior. Given that the participants in this study were generally motivated to engage in healthy prenatal behaviors (not including condom use) depending on their levels of MFA, and HLOC, it would have seemed likely that condom use may have been a logical addition to prenatal care behaviors such as smoking cessation and healthy eating. While past research has shown that knowledge does not necessarily translate to behavior, it appears likely that among this sample the women may not have even considered condom use as a prenatal care behavior that was pertinent to maintaining fetal health. This becomes concerning due to the fact that the majority of the women in the study reported that they were not in committed relationships with the father of their child and either had been or were currently engaging in sexual activity with other partners. This can increase the risk of STI acquisition or HIV infection and subsequent transmission to the fetus. Despite this, it appears that women were not motivated to use condoms as a means of ensuring their unborn child’s health. It is possible, however that the women in this study were not aware of how their sexual behaviors may influence the health of the pregnancy and the baby. Whereas relatively few women reported increased condom use during pregnancy, and in fact overall rates of condom use decreased once knowledge of the pregnancy was confirmed, the majority of the participants actually decreased the number of sexual partners with whom they had contact after confirming the pregnancy. For the purpose of this study, condom use was used as a measure of STI and HIV prevention behavior. However, it appears that even if women in this study discontinued condom use once they became aware of the pregnancy, they were still aware of and engaging in other specific behaviors designed to limit their STI and HIV exposure. Prenatal care providers can ensure that women understand the benefits, not only to the pregnant woman herself, but also to her fetus, of continuing or initiating condom use in pregnancy in order to limit potential transmission of dangerous STIs or HIV to the future child.
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