



# The Effect of Partner Serostatus and Relationship Duration on HIV Medication Adherence

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## Abstract

High adherence rates to antiretroviral medications are necessary for people living with HIV/AIDS. The current study focuses on relationship-level predictors of HIV medication adherence by testing whether adherence rates differ by dyadic serostatus (seroconcordant vs. serodiscordant couples) among individuals with HIV in romantic relationships. Results showed a significant interaction between dyadic serostatus and relationship duration on adherence, such that individuals in long-term serodiscordant relationships reported better adherence than short-term serodiscordant relationships or seroconcordant partners in long-term relationships. Future research is needed to understand what relationship dynamics explain differences in adherence rates based on dyadic serostatus.

**Keywords** HIV · Serostatus · Medication adherence · Couples · Romantic relationships

## Introduction

Although people living with HIV/AIDS (PLWHA) are living longer, higher quality lives due to the emergence of effective treatments for HIV, viral suppression depends on sustained adherence to medication regimens [1]. There is a growing recognition of the importance of relationship-level predictors of health behaviors among PLWHA [2]. In the current study, we examine the question of whether partner serostatus as HIV positive or negative exerts an influence on medication adherence.

Research on dyadic serostatus (i.e., seroconcordant versus serodiscordant) has focused primarily on the influence of dyadic serostatus on sexual behavior, where the salience of risks associated with condomless sex and motivation to use condoms are elevated for serodiscordant couples (e.g., [3]). Dyadic serostatus may influence other health behaviors, including adherence to antiretroviral medications, though findings to date have been equivocal [4–6]. For example, two studies did not find a significant difference in antiretroviral adherence between PLWHA in seroconcordant versus serodiscordant relationships [4, 6]; however, Knowlton et al.

[5] found that adherence was lower for women with HIV in seroconcordant relationships compared to women with HIV without a romantic partner or in serodiscordant relationships [5]. Whereas dyadic serostatus is not inherently a psychological construct, it likely influences a number of social and psychological dynamics relevant to adherence, including perceptions of risk, acceptance, and perceived social support [7]. A greater understanding of how these processes unfold may yield information regarding the impact of dyadic serostatus on medication adherence. For example, due to their shared HIV status, partners in seroconcordant relationships may have reduced HIV-related concerns (e.g., concerns about HIV reinfection, consequences of engaging in condomless sex), which may reduce their commitment to condom-protected sex and, possibly, contribute to lapses in medication adherence [8–11]. Thus, seroconcordant couples may be vulnerable to lapses in medication adherence, particularly in long-term relationships in which HIV-related concern has diminished.

Individuals in serodiscordant relationships may also face unique challenges to medication adherence. PLWHA are often hesitant to disclose their HIV status to discordant partners for fear of stigma, rejection, and lack of empathy [12], and sometimes lie to their romantic partners about their medication to avoid disclosure [13]. However, the longer a relationship lasts, the more likely PLWHA are to disclose their serostatus to their primary relationship partners, even if

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their partner does not have HIV (e.g., [14, 15]). This process is in line with expectations about how self-disclosure and trust develop in close relationships [16]. Thus, although disclosure concerns may present a barrier to medication adherence early in a serodiscordant relationship, disclosure and the opportunity for support for adherence from one's partner may improve as the relationship progresses. For example, qualitative findings indicate that medication adherence is viewed as important for individuals in serodiscordant relationships, not just for one's own benefit, but to protect the uninfected partner from deleterious consequences (e.g., HIV infection; [7]). In that way, consistent medication adherence in discordant relationships may increase as relationship duration increases, as adherence is as a sign of commitment to the partner without HIV [7].

## The Current Study

We sought to clarify the nature of the relationship between partner serostatus, relationship duration, and HIV medication adherence in a sample of men and women living with HIV and their close sexual partners who were recruited during outpatient care. We hypothesize that the association between dyadic serostatus and medication adherence among PLWHA will be moderated by relationship duration: PLWHA in new, serodiscordant relationships will adhere to their medication regimens at a worse rate than will serodiscordant PLWHA with longer relationship durations or those in seroconcordant relationships.

## Method

### Participants

Individuals with HIV who self-identified as being in close, sexual relationships and whose partner was also willing to participate were recruited from an outpatient infectious disease (ID) clinic affiliated with a major research university ( $N=50$  dyads). This ID clinic is a Designated AIDS Care center providing outpatient and inpatient medical care for HIV infected people from the surrounding area, with an active outpatient census of approximately 1200 patients with HIV. During a routine visit to the clinic, individuals with HIV were asked by the receptionist if they wanted to speak with a member of our study staff regarding a research study. Those who agreed were provided with more information about the study and screened while they waited for their appointment. Eligible participants were scheduled at a time when they could come to our lab with their partner.

Patients were eligible if they were: (a) receiving outpatient care for HIV at the ID Clinic or if they were a close,

sexual relationship partner of someone who is; (b) being involved in a close, sexual or romantic relationship (in which the partner is willing to participate and meets all eligibility requirements); (c) 18 years or older; (d) medically able to participate (i.e., not experiencing acute illness or declining health status when it is determined by a treatment provider that research participation is contraindicated); and (e) able to understand spoken English. If both members of the dyad were deemed eligible, they were invited to come to our laboratory, a medical facility office with private rooms for data collection, for the questionnaire session. All individuals participated at the same time as their close, sexual partner and completed all questionnaires in separate rooms.

### Procedure and Measures

All procedures were approved by the Syracuse University Institutional Review Board prior to beginning recruitment. All participants indicated their consent via written consent form, after which they were directed to a computer to complete our questionnaires via Audio Computer Assisted Self-Interview (ACASI). Questionnaires included descriptive information about the individuals (e.g., age, race, sexual orientation, income), the relationship (i.e., relationship status, duration), and their HIV (e.g., HIV viral load from the most recent clinic visit, dyadic serostatus, symptoms experienced as a result of their HIV; [17]). These measures were used primarily to describe the sample, with the exception of relationship duration and dyadic serostatus which were the primary predictors of interest. The primary outcome of interest was adherence: Respondents were asked to report their adherence to their antiretroviral regimen (self-reported percentage from 0 to 100% of prescribed medicine taken over the past month). Upon completion of the questionnaires, participants were debriefed about the study and received \$20 each for their time.

## Results

### Sample Characteristics

Fifty dyads (100 participants) agreed to participate in our study. Of these 50 dyads, 22 of the dyads were seroconcordant, and the remaining 28 were serodiscordant. Primary participants (i.e., the patient recruited from the ID clinic) were 33 men and 17 women ( $N=50$ ) with an average age of 45.5 years ( $SD=11.7$ ; range 23–63). The majority indicated that they were white (52%; with 34% black, 4% mixed; and 10% other). Roughly half of the sample was involved in a heterosexual relationship ( $n=28$  dyads), whereas the rest were in a same-sex relationship ( $n=22$  dyads). These relationships had endured, on average, 104 months ( $SD=100.4$ ;

range 1–360). Viral loads of the participants ranged from 0 (undetectable) to 45,000 ( $M = 5585$ ,  $SD = 13,929$ ). Demographic characteristics did not differ as a function of dyadic serostatus. Only 45 of our primary participants had medication regimens to follow, so only they were retained for subsequent analyses. Among these 45, adherence was moderately high over the preceding month ( $M = 79.2\%$ ;  $SD = 37.1\%$ ; range 0–100%).

### Adherence by Dyadic Serostatus

Prior to hypothesis testing, we examined whether adherence predicted important health outcomes. As expected, adherence was significantly correlated with viral load ( $r = -0.34$ ,  $p < 0.05$ ) and HIV symptoms ( $r = -0.33$ ,  $p < 0.05$ ). We then conducted an independent samples  $t$  test to compare the adherence rates of patients with HIV in seroconcordant ( $M = 84.2\%$ ,  $SD = 33.5\%$ ) and serodiscordant ( $M = 75.7\%$ ,  $SD = 39.8\%$ ) relationships. As expected based on previous work comparing the two groups, there was not a significant difference ( $t(43) = 0.75$ ,  $p = 0.44$ ).

### Hypothesis Testing

The study hypothesis was tested using multiple linear regression. All main effects were entered at step 1, followed by the interaction between relationship duration and dyadic serostatus on adherence. Analyses showed that the interaction term was significantly different from zero ( $F(1, 41) = 5.06$ ,  $b = 0.249$ ,  $p < 0.05$ ,  $R^2 = 0.13$ ). Probing this interaction via the method recommended by Preacher, Curran, and Bauer [18], results indicated that for those in serodiscordant relationships, adherence trended toward improving the longer the relationship remained intact ( $t(24) = 1.85$ ,  $p = 0.07$ ,  $R^2 = 0.12$ ), whereas for those in seroconcordant relationships, adherence trended toward worsening the longer the relationship remained intact ( $t(17) = -1.48$ ,  $p = 0.16$ ,  $R^2 = 0.11$ ). See Fig. 1.

### Discussion

Different relationship dynamics based on dyadic serostatus suggest that rates of adherence may differ between serodiscordant and seroconcordant couples, yet previous studies have reported similar rates of adherence regardless of dyadic serostatus [4, 6]. In this study, we tested whether relationship duration moderated the dyadic serostatus-adherence association, hypothesizing that adherence by serostatus differences would emerge as relationships unfold. We found support for our hypothesis: there was a significant interaction between relationship duration and dyadic serostatus on adherence. Specifically, adherence rates for individuals with

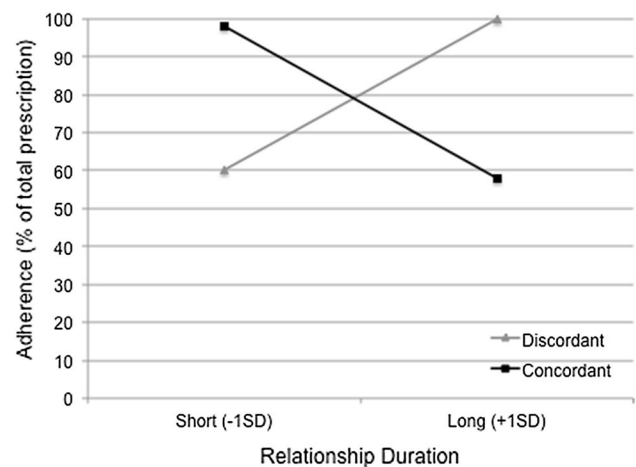


Fig. 1 Interaction of dyadic serostatus and relationship duration on medication adherence

HIV in serodiscordant relationships trended toward increasing the longer the relationship endured. In contrast, for those in seroconcordant relationships, adherence trended toward worsening as relationship duration increased. In both cases, despite a significant interaction effect, these trends were statistically non-significant, although this may be due to our relatively small sample size. At a minimum, this finding adds to a growing literature examining differences based on dyadic serostatus by providing evidence that differences between serodiscordant and seroconcordant couples can have a notable impact on adherence rates.

Future research should identify and explain what social and psychological relationship dynamics contribute to different trajectories of adherence over the course of close, sexual relationships among PLWHA. For example, one study found that ratings of partner intimacy differentially affected sexual risk (condomless anal insertive intercourse) based on the serostatus of the partner; individuals with HIV reported greater sexual risk in serodiscordant relationships rated high in intimacy versus those low in intimacy, whereas intimacy was unrelated to sexual risk for individuals with HIV in seroconcordant relationships [19]. This finding reflects how relationship characteristics may differentially affect important health outcomes for seroconcordant versus serodiscordant relationships. Furthermore, different health outcomes may be differentially affected by relationship status and dyadic serostatus. For example, recent work by Tan and colleagues [20] found that men with HIV in seroconcordant or serodiscordant relationships were more likely than single men to have a current healthcare provider and be engaged in HIV care. However, single men were more likely than men in seroconcordant or serodiscordant relationships to be currently receiving antiretroviral medications [20]. Additionally, men in serodiscordant relationships trended

toward having higher adherence than men in seroconcordant relationships [20]. Overall, future work should seek to further explain and address differences in important health outcomes, such as HIV medication adherence, that emerge between serodiscordant and seroconcordant couples.

Although the current analyses cannot speak to why adherence rates were differentially impacted by relationship duration in serodiscordant versus seroconcordant couples, our results suggest that adherence-promoting interventions should be sensitive to the serostatus of the dyad in order to address adherence barriers unique to each couple. For example, individuals with HIV in a new romantic relationship with a partner without HIV (serodiscordant couples) may benefit from problem-solving skills related to navigating disclosure of HIV status (e.g., how and when to tell one's partner). Additionally, such individuals may benefit from discussing the structure and timing of one's medication regimen to prevent lapses in adherence due to the presence of one's romantic partner, especially when the relationship is new and the fear of inadvertently disclosing one's HIV status is high. Individuals in seroconcordant relationships, on the other hand, may benefit from information on drug-resistant HIV and HIV reinfection due to inconsistent medication adherence. This information may be especially relevant in seroconcordant relationships where one or both partners' HIV-related concern has diminished. Additionally, individuals in seroconcordant relationships may be more vulnerable to lapses in medication adherence when their partner is experiencing medication difficulties or low motivation to adhere [16]; thus, enhancing an individual's ability to adhere even when one's partner does not may be a unique intervention target for seroconcordant couples.

This study's results should be considered in light of its limitations. Our sample size was small, and participants self-reported their medication adherence. In addition, to be eligible for our study, both members of the dyad had to be willing to participate. As such, our sample may not generalize to dyads in which one partner is unwilling to participate or does not know the partner's HIV status. Nevertheless, our study adds to a growing body of research that focuses on the close, sexual relationship partners of individuals with HIV (e.g., [2, 21]). Our results suggest that adherence rates may be differentially affected by relationship dynamics that are unique to the HIV status of an individual's romantic partner (e.g., as a seroconcordant or serodiscordant dyad), although previous findings have been equivocal [4–6]. Specifically, the current study found that dyadic serostatus may have effects on adherence over the duration of close, romantic relationships that differ by dyad serostatus. Future research is needed to explicate why adherence rates in longer-term relationships were better for individuals in serodiscordant versus seroconcordant relationships. Understanding the unique dynamics that unfold in serodiscordant and seroconcordant

relationships, and how these dynamics impact rates of adherence, can help us to better tailor interventions to promote optimal medication adherence.

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## Compliance with Ethical Standards

**Conflict of interest** All authors declare that they have no conflict of interest.

**Ethical Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the Syracuse University research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed Consent** Informed consent was obtained from all individual participants included in the study.

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