Patient-Provider Communication and Information, Motivation, and Behavioral Skills in HIV-Positive Adults Initiating Antiretroviral Therapy in Haiti

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Abstract

While Haiti has scaled up use of antiretroviral therapy (ART), current studies suggest sub-optimal adherence threatens long-term viral suppression in this understudied setting. Patient-provider communication (PPC) and information, motivation, and behavioral skills (IMB) have been implicated in ART adherence globally. However, no studies have examined their relevance in Haiti. The present mixed-methods study utilized cross-sectional survey data from 128 ART-initiating patients at 2 large HIV treatment sites in Haiti, as well as observational data from 12 clinic visits, to document associations between adherence-related PPC and IMB. Multivariate regression analyses suggested that PPC is associated with IMB constructs. At the bivariate level, more effective PPC was associated with higher levels of adherence-related information and motivation, but not behavioral skills. Observational findings indicate infrequent and non-collaborative adherence support. Taken together, findings lay the groundwork for additional research in the area of PPC, IMB, and ART adherence in Haiti.

Keywords

patient-provider communication, information motivation behavior skills theory, antiretroviral therapy, ART adherence, HIV/AIDS, Haiti

The global scale-up of antiretroviral therapy (ART) has contributed to a 34% decline in deaths from AIDS-related illness, from a peak of 1.9 million in 2005 to 940,000 in 2017, highlighting the importance of ART in reducing morbidity and mortality and success in increasing ART coverage among persons living with HIV (PLWH).[1] The Joint United Nations Programme on HIV/AIDS (UNAIDS) estimates that 77% of diagnosed PLWH are accessing ART, and 82% of PLWH on ART have suppressed viral loads.[2] In order to achieve the UNAIDS 90-90-90 goals (i.e., diagnosing 90% of PLWH, delivering ART to 90% of diagnosed PLWH, and achieving 90% viral suppression) for ART uptake and viral load suppression,[3] continued progress at the global level is essential.

Despite widespread poverty and limited infrastructure, Haiti has made important strides in addressing the HIV epidemic.[4] Between 1993 and 2017, the national HIV prevalence decreased from a high of 6.2% to 2.0%.[5] In 2016, Haiti adopted the "Test and Start" strategy,[3] which led to an increase in HIV testing and ART initiation. The U.S. President's Emergency Plan for AIDS Relief (PEPFAR) estimates that, in 2016, 62% of Haitian PLWH were accessing ART, of whom 64% had a suppressed viral load.[6] ART is available in every medical department due to international funding and national political commitment to stemming the epidemic.[4]

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What Do We Already Know About This Topic?

Patient-provider communication (PPC) and information, motivation, and behavioral skills (IMB) independently influence effective adherence to antiretroviral therapy (ART) medication in Western settings.

How Does Your Research Contribute to the Field?

The current study advances our understanding of PPC and IMB in a resource-poor, low-income setting with inadequate adherence to ART.

What Are Your Research's Implications Toward Theory, Practice, or Policy?

The current study refines our understanding of the interplay between adherence-related PPC and IMB in the Haitian context, which can inform adherence-related intervention development in this population.

Although Haiti has scaled up ART use, studies suggest adherence to ART in Haiti remains suboptimal and threatens both long-term viral suppression and the efficacy of first-line regimens.[7,8] Multiple studies have documented variable but low adherence rates throughout the country. In one longitudinal study using comprehensive patient monitoring data, only 19% of patients who initiated ART continued its use between 2005 and 2015.[9] A similar study across 11 national HIV facilities found that expansion of HIV services across Haiti has been successful, with increasing numbers of patients initiating ART and decreasing 12-month mortality rates, but with no improvement in overall retention.[8] Studies that examine factors promoting ART adherence are crucial to achieving viral suppression, positive health outcomes, and the continued overall success of Haiti's HIV response.[10]

Fostering effective patient-provider communication (PPC) may be a significant pathway to increasing ART adherence in Haiti. Among PLWH in low- and middle-income countries (LMIC), poor health provider communication is a consistent reason for not initiating ART.[11-13]

In prior, novel interventions (e.g., those using electronic monitoring) that failed to produce a substantial impact on adherence, few providers used evidence based, problem-solving communication.[14] Furthermore, patient perceptions of physician communication behaviors are positively associated with patient's adherence to treatment (including ART), and training physicians to communicate more effectively can enhance patients' adherence.[15-17] Like ART adherence, however, provider communication about adherence is often suboptimal. One meta-analysis found that nonadherence to a variety of treatments is more than 1.47 times greater among individuals whose physician is a poor communicator (i.e., had deficits in specific communication behaviors such as demonstrating empathy, asking questions, building rapport, and

providing health-related information) and the odds of a patient adhering are 2.16 times better if their physician is a skilled communicator.[15] Growing evidence also highlights the negative impact of poor PPC on adherence in ethnic and racial minority populations in the United States.[18,19]

One potential conceptual pathway through which PPC may increase ART adherence is through generating improvements in information, motivation, and behavioral skills (IMB).[20] According to the IMB model, adequate adherence-related information is a prerequisite for adherence, but is not sufficient in isolation to change behavior. Instead, individuals who have adequate adherence-related information and motivation are more likely to implement behavioral skills that promote ART adherence. Such skilled behaviors, when implemented adequately and consistently, can ensure ART adherence.[21] Due to its theoretical simplicity, the IMB model been viewed as an efficient means of both understanding and intervening with respect to barriers to ART adherence in low-resource, global settings.[22-24]

There is limited information on the interplay between adherence-related PPC and IMB in the Haitian context. Thus, the objective of this mixed-methods study was to examine associations between adherence-related PPC and IMB among PLWH in Haiti, with the downstream goal of reducing the incidence of in-country ART treatment failure.

Methods

Study Setting and Participant Recruitment

The study occurred at 2 large public tertiary teaching hospitals in Haiti: the National University Hospital (HUEH) in Port-au-Prince and Justinien University Hospital (HUJ) in Cap-Haitien. Data were part of a trial using Haiti's electronic medical record system, *iSanté*, to deploy an alert for those at risk of ART treatment failure based on poor adherence, coupled with a problem-solving approach for counseling patients to improve adherence.[25]

Participants were purposively recruited through medical staff at the hospital, in the community, and via flyers from October 2017 to February 2018. The study sample size ($N = 128$) was deemed sufficient to estimate the feasibility and acceptability of the *iSanté* intervention and not powered for inference testing. At the hospital site, clinic staff identified eligible patients when they presented for routine clinic visits and referred participants to a study coordinator for enrollment. Eligible patients were 18-75 years of age and had initiated ART within 6 months prior to enrollment. Individuals with severe cognitive impairments (via informal observation by study coordinators during the informed consent process) or who anticipated being unavailable for follow-up in the next 9 months were excluded from the study. Study staff obtained informed consent from all eligible patients and providers.

Survey Procedures and Measures

Self-report questionnaires were administered by local Haitian researchers at the time of enrollment in the study. Questionnaires consisted of several widely used scales as well as

Table 1. Descriptive Data on Mean Variables Among Haitians Initiating Antiretrovial Medication (N = 128).

Scale	Sample item	Number of items	Crohnbach's alpha	Mean score (1-5)
	Patient-Provider Communication			
Overall Communication	How is the doctor who takes care of your HIV at understanding your health worries and concerns?	5	0.83	2.61
HIV-Specific Information	How is the doctor who takes care of your HIV at talking about your sex life?	4	0.84	2.65
Adherence Dialogue	How is the doctor who takes care of your HIV at understanding the problems you have taking your ARVs?	3	0.82	2.64
Participatory Decision-Making	If there is a choice between treatments, would the doctor who takes care of your HIV infection ask you to help make the decision?	7	0.86	3.22
Overall Satisfaction	How would you rate the doctor who takes care of your HIV infection in technical skills?	4	0.90	2.57
Willingness to Recommend	Do you plan to recommend the doctor who takes care of your HIV infection to others	2	0.20	0.58
Trust in Provider	My doctor cares as much as I do about my health	5	0.66	2.36
	Information, Motivation, & Behavioral Skills			
Information	I understand how each of my HIV medications works in my body to fight HIV	9	0.48	4.05
Motivation	I don't like taking my HIV medications because they remind me I am HIV positive	10	0.73	3.52
Behavior	How hard or easy is it for you to make your HIV medications part of your daily life?	14	0.87	3.71

Note: Lower PPC scores indicate greater endorsement of positive PPC constructs. Higher IMB scores indicate greater endorsement of positive IMB constructs.

specific items developed specifically for to the Haitian context. All items were translated from English to French Haitian Créole using a professional translator. Translated versions were then reviewed for accuracy by a tri-lingual Haitian assistant (fluent in French, Haitian Creole, and English), who made minor adjustments based on item comprehensibility. Translated questionnaires were subsequently reviewed by 3 members of the research team in a collective meeting to ensure the adjustments maintained fidelity to the meaning or the original instruments. Questionnaires were administered using the Research Electronic Data Capture (REDCap) mobile app loaded onto tablets. Participants were paid USD $6 for completing the survey, which averaged 30-40 minutes in length.

Patient-provider communication. The 30-item patient-provider communication (PPC) questionnaire[16] assesses the quality of 7 specific dimensions of the physician-patient relationship: (1) overall communication (PPC-*Overall*); (2) provision of HIV-specific information (PPC-*HIV Information*); (3) quality of adherence dialogue (PPC-*Adherence*); (4) participatory decision-making style (PPC-*Participatory*); (5) overall satisfaction with care (PPC-*Satisfaction*); (6) willingness to recommend the physician to others (PPC-*Recommend*); and (7) physician trust (PPC-*Trust*). Items consist of Likert-type response options that vary based on the subscale, with scores ranging from 1 (*excellent, very often, all of the time, definitely will, or strongly agree*) to 5 (*poor, never, none of the time, definitely will not, or strongly disagree*). Items were summed using continuous ratings to

provide total subscale scores, with lower scores indicating greater endorsement of positive PPC constructs. Negative items were reverse-scored prior to summation. Table 1 provides representative sub-scale items.

Information, motivation, and behavioral skills. The LifeWindows Information-Motivation-Behavioral Skills ART Adherence Questionnaire[26] is a 33-item measure of barriers to ART adherence in clinical care settings. The questionnaire consists of 3 subscales that map onto IMB constructs: (1) information related to adherence (IMB-*Information*) (2) adherence-related motivation (IMB-*Motivation*); and (3) behavioral skills required for adherence (IMB-*Behaviors*). Likert-type responses range from 1 (*strongly agree* or *very easy)* to 5 (*strongly disagree* or *very hard),* with higher scores indicating strengths in IMB constructs. Items in the IMB-*Information* subscale were recoded dichotomously (i.e., a score of 5 was re-coded as 1, and all other scores recoded as 0) and then summed. Items in the IMB-*Motivation* and IMB-*Behavior* subscales were summed to obtain subscale-specific total scores. Negative items were reverse-scored prior to summation. Table 1 includes representative sub-scale items.

Observational Data Collection

To describe interaction and communication patterns between patients and providers during routine adherence counseling sessions, observational data were collected over 12 individual visits. Visits took place at the 2 study sites between April and June of 2017, and included an additional 12 ART patients who did not complete self-report

questionnaires. Observational data was collected prior to self-report questionnaires in a formative research phase. Inclusion criteria for participants were: between 18-75 years of age, HIV-positive and treated at the clinic, and ART-initiated within the prior 12 months. One visit was observed for each of the 12 patients.

A study team member shadowed recruited patients through their visits and documented qualitative observations during and after the visits with the assistant of a semi-structured documentation tool. Study staff recorded the duration of each step in the visit (registration, clinical evaluation, pharmacy, and laboratory visits) and specific counseling behaviors (e.g., asked patient about self-reported adherence level, gave instructions about ART, assessed barriers to ART use) provided. The accompanying data collection form included check boxes to record observations of interactions and communication between the provider and patient related to adherence (i.e., counted tablets, asked patient level of adherence, gave patient instructions about antiretrovirals (ARVs), checked for understanding, assessed barriers, solved problems, and other). Study staff also recorded impressions of patient-provider communication techniques (e.g., use of open-ended questions and active listening). Notes were translated from French to English using publicly available online translation tools.

Analysis

Survey data. To facilitate score comparison across scales, total median scores were transformed to a 0-to-100 scale. A high rating was interpreted as a total transformed score above 75%, and a low rating below 50%. Cutoffs were determined on a practical basis, after reviewing the wording used in Likert-type responses (e.g., a transformed score of 75% roughly corresponded to an "excellent" or "very good" participant rating, while a transformed score of below 50% indicated a less than "good" rating).

Pearson correlations were used to conduct bivariate analyses. For multivariate analyses, the primary model used the mean score of the 7 PPC subscales. Separate linear regression models were also constructed for each of the 7 subscales for each of the 5 outcome measures, with a Holm correction for multiple comparisons.[27] Adjusted models were used to account for potential confounding by socio-economic status (SES), age, and sex. Missing values were omitted from the analysis on a case-wise basis.

Observational data. Thematic content analysis of patient-provider communication about ART adherence was conducted by coding semi-structured observation recordings. Descriptive statistics were used to examine the amount of time spent on adherence communication and the types of adherence-related communication and related activities during clinical visits.

Ethical Approval and Informed Consent

The study was reviewed and approved by the University of Washington Human Subjects Division and the Haiti Ministry of Health National Bioethics Committee. Written informed consent was obtained for all study participants.

Results

Participants

The 128 participants (57% female) averaged 37.9 years of age, with 29% scoring in the bottom quintile of the EquityTool for Haiti wealth index (e.g., only 21% reported owning a refrigerator).[28] On average, they had been on ART 2.3 months.

Measure Reliability

Scale reliability (See Table 1) for the majority of self-report instruments was acceptable (Crohnbach's alpha ≥ 0.7). There was, however, low reliability for IMB-*Information* (= 0.48), but this was consistent with its use in the LifeWindows Project (= 0.59) and interpreted as reflecting that information about diverse aspects of one's ART regimen may not be inter-related.[29] Reliability for the PPC-*Recommend* was also expectedly low (= 0.2), likely due to inclusion of only 2 items.[30] Reliability for the PPC-*Trust* subscale was moderate (= 0.66).

Patient-Provider Communication

See Table 1 for mean values of PPC items. PPC subscales with low median ratings (below 50%) included participatory decision-making style, HIV-specific information, and quality of adherence dialogue. Despite these low ratings, however, patients endorsed a high willingness to recommend their providers to others (80% median rating). Areas of low endorsement were concentrated in PPC-*Participatory* subscale items (See Appendix A), highlighting a lack of collaborative and/or egalitarian decision-making regarding ART.

Information, Motivation, & Behavioral Skills

Table 1 includes IMB descriptive statistics, and Appendix B includes item-level endorsements for the full measure. The IMB-*Information* scale had high total median ratings (78%). In particular, there was high endorsement of participant knowledge of side effects and longevity of life linked to ART use (see Appendix B).

The IMB-*Motivation* scale received a moderate median total score (67%), signaling room for improvement. There was agreement that physicians took into account patient needs when recommending HIV medication. Seven participants also reported that individuals they cared about had knowledge of their HIV status, potentially pointing to a lack of disclosure in close relationships.

Table 2. Association between PPC and Information, Motivation, Behavioral Skills Among 128 Patients on ART, Adjusted Multivariate Regression Models.

Predictor	Standardized Beta Coefficient	95% CI (Low)	95% CI (High)	p-value
IMB Information	0.76	0.35	1.16	<0.01
IMB Motivation	0.84	1.02	2.04	<0.01
IMB Behavioral Skills	0.42	0.04	1.28	<0.05

Note: Regression models included SES, age, and sex as covariates.

Table 3. Bivariate Associations Between Study Subscales (N = 128).

Patient Provider Communication Scale (Predictor)	IMB Information	IMB Motivation	IMB Behavioral Skills
Overall Communication	+ (0.28)	+ (0.16)	+ (0.14)
HIV-Specific Information	+ (0.29)	+ (0.22)	O (0.15)
Adherence dialogue	+ (0.22)	+ (0.18)	O (0.15)
Participatory Decision-Making	O (0.10)	O (0.11)	O (0.10)
Overall Satisfaction	O (0.12)	O (0.12)	O (0.11)
Willingness to recommend	+ (0.31)	+ (0.23)	O (0.18)
Trust in provider	+ (0.28)	+ (0.26)	O (0.15)

Note: + = p < 0.05, O = N.S.; Numbers in parentheses indicate R-squared values.

The IMB-*Behavior* subscale had high total median ratings (86%). A majority of participants typically reported high endorsement (i.e., a score of 4 or 5) of adherence-related information, motivation, and behaviors (See Appendix B).

Bivariate and Multivariate Regression Results

Table 2 includes results from the initial multivariate regression model (adjusted for age, sex, and SES, and including an effect modification by SES) with total PPC score as the outcome, and individual IMB subscales included as predictors (adjusted $R^2 = 0.28$). Positive and statistically significant associations were found between PPC and all 3 subscales.

Separate bivariate regression models were conducted with PPC subscales predicting IMB constructs, with age, sex and SES included as covariates (Table 3). Strong positive associations were found between 5 of the patient-provider communication subscales and IMB-*Information* and IMB-*Motivation*. Only the PPC-*Overall* subscale significantly predicted IMB-*Behavior* scores. PPC-*Overall* significantly predicted score increases across all 3 IMB constructs. There were, however, no significant relationships between PPC-*Participatory* scores and IMB constructs.

Observational Results

Patients ($n = 12$) followed spent an average of 2 hours and 42 minutes during a routine visit, which often included interactions with clinic staff (in reception and triage), a nurse or doctor (during one-on-one clinical evaluations), pharmacists, laboratory technicians, psychologists, and social workers. They spent an average of 22 minutes in clinical evaluation. Most providers ($n = 11$) (Table 4) directly inquired about the patient's level of adherence and provided accompanying instructions. However, only during two visits did they count tablets and or help problem-solve adherence barriers.

Types of adherence-related questions were time of day when the patient takes medication, if they ever forget to take medication, and how they remind themselves (e.g., through use of a phone alarm or asking a friend for reminders). There was frequent discussion of side effects and missed doses, though lab tests and viral load data were rarely explained. Some providers utilized a poster with stylized images of a body with versus without viral suppression as an instructional tool t highlight the importance of adherence.

Discussion

The current mixed-methods study utilized self-report and observational data to investigate relationships between patient-provider communication (PPC) and information, motivation, and behavioral skills (IMB) among 128 patients initiating antiretroviral therapy (ART) in Haiti, a low-income country with low rates of ART adherence among PLWH. Effective PPC may have downstream impacts on ART adherence in the Haitian context, in part by generating improvements in IMB constructs. To our knowledge, ours is the first to intentionally explore interrelations between IMB and PPC in a LMIC setting.

We found high mean ratings for PPC subscale items regarding participants' willingness to recommend their provider (80%). However, participants reported low total ratings for PPC-*Participatory* and PPC-*Adherence* items, indicating a potential lack of collaboration between patients and providers with regard to selecting and implementing HIV treatment strategies, as well as identifying and problem-solving barriers to treatment adherence. These self-report findings were consistent with clinic visit observations, which showed one-sided communication about adherence that consisted of mostly close-ended questions and infrequent checks for understanding, assessing, or managing adherence-related issues.

Results show high median ratings for IMB-*Information* (78%) and IMB-*Behavior* (86%) constructs, indicating existing strengths in adherence-related knowledge and associated behaviors among PLWH in this region. A majority of participants (57%) also agreed that physicians considered patient needs when recommending HIV medications, which may bolster adherence to ART by increasing patient motivation. These findings run counter to low documented median rating for PPC-*Adherence* and PPC-*Participatory* scale items. This discrepancy may potentially be the result of faulty assessment measures that do not adequately match the Haitian context. The

Table 4. Observed Instances of Adherence-Related Communication During Routine Care Visits ($n = 12$).

	Count tablets	Inquire about adherence	Give instructions on ART use	Check understanding	Assess barriers	Solve problems
Registration/Reception	0	0	0	0	0	0
Triage	0	0	0	0	0	0
Clinical Evaluation	1	11	11	6	4	2
Pharmacy	1	2	5	0	0	0
Lab	0	0	0	0	0	0
Psychosocial services	0	1	1	1	1	0
Support services	0	1	1	1	0	0
Total for all patients across all services (of possible 84 opportunities)	2	15	18	8	5	2

PPC, for instance, includes items that directly inquire about level of control over HIV treatment decisions, which may not be a reality at participating facilities and may lead to participant confusion. The LifeWindows IMB questionnaire also includes reverse-scored items, which may perform poorly in LMIC settings due to high cognitive load associated with use of double negatives.[31] Further scale refinement and psychometric analysis may be justified as a next step in this research setting.

Despite the lack of shared decision-making, however, participants expressed high willingness to recommend their providers to other patients. This is a strength, as there is evidence to support the idea that trusting provider relationships promotes higher levels of adherence.[32] Further empirical investigation is necessary to determine whether this is a function of the respect that medical professionals hold in Haiti or the perceived quality of the individual-level patient-provider relationship based on interactions.

Our findings both converge and diverge from existing data on IMB and PPC among PLWH. In LMIC, a number studies have documented similarly low levels of collaborative and/or participatory decision-making behaviors among HIV care providers,[11,33] as well as a desire for more of these behaviors.[34] One global study also found low levels of adherence-related dialogue between providers and patients (similar to those measured by the PPC-*Adherence* subscale).[35] A pattern of low scores in these areas may reflect differences in cultural norms and values surrounding communication (e.g., a preference toward paternalistic, unidirectional dialogue), but may also signify the presence of a skills deficit that could be addressed through targeted provider training. In-depth qualitative research may aid in further exploration of these themes. Other studies in LMIC have found similarly high rates of IMB-*Behavior* endorsement relative to other subscales, but also higher levels of IMB-*Motivation* compared to the current study.[36,37] Future studies examining mechanistic interrelations between information, motivation, behavior, and adherence may aid in disentangling these observed differences.

Multivariate regression analyses suggested that patient-provider communication is associated with all IMB constructs. Bivariate regressions also indicated that a number of PPC subscales significantly and positively predicted IMB-*Information* and IMB-*Motivation* subscale scores, in line with our theoretical model that patient-provider communication may potentially support ART adherence by increasing adherence-related knowledge acquisition and motivation. Yet, PPC-*Participatory* and PPC-*Satisfaction* scores were not significantly associated with IMB scores. One explanation for this finding could be the relatively new nature of the patient-provider relationship in recently-initiated ART patients. At the clinics, patients see any available provider for their HIV care, and would have had only about 3 or 4 provider visits in the average amount of time that participants reported being on ART (2.3 months). Thus, it may have been difficult for ART-initiating participants to accurately and comprehensively answer PPC items. Follow-up questionnaires may be useful in determining these relationships persist over time. Another explanation for this non-association may be lack of cultural responsiveness of questionnaires in the current study, which were linguistically translated but not yet culturally validated in either Haiti or in Haitian Creole.

Although a causal relationship cannot yet be assumed, these preliminary findings may suggest that researchers consider the utility of developing or improving provider-based interventions for strengthening ART adherence among patients initiating ART in Haiti. Study findings may also point to specific potential targets for developing provider interventions in this population. For instance, our data indicate relatively depressed scores on the IMB-*Motivation* subscale and PPC-*HIV Information*, PPC-*Adherence*, and PPC-*Participatory* subscales. Given that IMB is known to be associated with ART adherence[20] and current study findings link PPC constructs with IMB-*Motivation*, provider-based interventions that increase HIV- and adherence-related knowledge and are collaborative in nature may be a potential and preliminary starting point.

The data used in this study was part of a longitudinal study that aimed to assess relationships between patient-provider communication and information, motivation, and behavioral skills related to adherence. It is important to note that communication between provider and patient is only one piece of the adherence puzzle. Broader structural issues such as HIV stigma and poverty may also significantly impact HIV patients' ability to adhere to ART but were not formally tested in the current study. Other limitations include the cross-sectional and self-report nature of the survey, which prevent causal interpretations and increase study bias (e.g., by increasing the potential for socially desirable responses). Additionally, other p value

adjustments for multiple comparisons may have increased the risk of Type II errors. Although the low reliability of particular subscales (e.g., IMB-*Information* and PPC-*Recommend*) may be due to the small number of items, the potential for measurement error diminishes confidence in study findings. The lack of direct adherence data also weakens the rationale that PPC and IMB overlap with (and impact) ART adherence in this population. Due to the relatively small sample size and unique sociocultural and economic environment within Haiti, our ability to generalize our results beyond the current context is also limited.

Despite these limitations, current study findings lay the groundwork for future research in assessing and improving ART-related adherence in Haiti. Additional replication and further rigorous assessment of PPC and IMB (e.g., using objective and/or real-time measures in a longitudinal study design, as well as collecting additional qualitative data) is a viable next step in this setting. Examining developmental variability within and between PPC and IMB constructs in Haiti may also lead to identification of culturally tailored and developmentally appropriate behavioral strategies for promoting optimal adherence. Combined, future lines of research in this arena can provide invaluable guidance for novel adherence intervention development at the provider level in Haiti.

Appendix A. Item-Level Endorsements for Patient-Provider Communication ($N = 128$).

	Score = 1 (All the Time or Excellent) n (%)	Score = 2 (Most of the Time or Very Good) n (%)	Score = 3 (Sometimes or Good) n (%)	Score = 4 (A Little of the Time or Fair) n (%)	Score = 5 (None of the Time or Poor) n (%)
PPC-Overall Communication					
Explained tests results in a way you understand	7 (5.5)	42 (32.8)	68 (53.1)	10 (7.8)	1 (0.8)
Gave information on risks and benefits	5 (3.9)	47 (36.7)	68 (53.1)	5 (3.9)	3 (2.3)
Told you what to do if problems occur	7 (5.5)	44 (34.4)	67 (52.3)	8 (6.3)	1 (0.8)
Showed care, compassion, and understanding	8 (6.3)	49 (38.3)	62 (48.4)	9 (7.0)	0 (0.0)
Understood your concerns	9 (7.0)	45 (35.2)	63 (49.2)	7 (5.5)	3 (2.3)
PPC-Quality of Adherence Dialogue					
Gave info on appropriate way to take ARVs	12 (9.4)	52 (40.6)	58 (45.3)	6 (4.7)	0 (0.0)
Understood problems related to taking ARVs	8 (6.3)	46 (35.9)	62 (48.4)	11 (8.6)	1 (0.8)
Helped solve problems related to taking ARVs before leaving the clinic	6 (4.7)	33 (25.8)	70 (54.7)	12 (9.4)	7 (5.5)
PPC-Satisfaction with Care					
Was gentle, respectful, sensitive, and friendly	9 (7.0)	49 (38.3)	62 (48.4)	7 (5.5)	1 (0.8)
Listened carefully, asked and answered questions	9 (7.0)	51 (39.8)	61 (47.7)	7 (5.5)	0 (0.0)
Had appropriate technical knowledge	8 (6.3)	44 (34.4)	68 (53.1)	8 (6.3)	0 (0.0)
Healthcare team took appropriate charge	8 (6.3)	42 (32.8)	67 (52.3)	11 (8.6)	0 (0.0)
PPC-HIV Information					
Asked you about your sexual life	7 (5.5)	41 (32.0)	72 (56.3)	7 (5.5)	1 (0.8)
Asked you about HIV-related stress	6 (4.7)	40 (31.3)	70 (54.7)	9 (7.0)	3 (2.3)
Asked about alcohol use	6 (4.7)	39 (30.5)	71 (55.5)	5 (3.9)	2 (1.6)
Asked about other substance use	8 (6.3)	38 (29.7)	69 (53.9)	6 (4.7)	2 (1.6)
PPC-Participatory Decision-Making					
Asked you to take some responsibility for your treatment	10 (7.8)	57 (44.5)	36 (28.1)	5 (3.9)	20 (15.6)
Asked you to make a decision if there was a treatment-related choice	37 (28.9)	14 (10.9)	63 (49.2)	7 (5.5)	7 (5.5)
Made an effort to give you decision-related control about treatment	6 (4.7)	38 (29.7)	49 (38.3)	7 (5.5)	28 (21.9)
Let you choose your medical care	4 (3.1)	18 (14.1)	49 (38.3)	9 (7.0)	48 (37.5)
Told you about the benefits and drawbacks of your choice	7 (5.5)	31 (24.2)	41 (32.0)	7 (5.5)	41 (32.0)
Let you tell them what decisions or options you prefer	4 (3.1)	19 (14.8)	46 (35.9)	10 (7.8)	49 (38.3)
Took your preferences into account when making decisions	3 (2.3)	16 (12.5)	51 (39.8)	8 (6.3)	50 (39.1)

Appendix A. (continued)

	Score = 1 (All the Time or Excellent) n (%)	Score = 2 (Most of the Time or Very Good) n (%)	Score = 3 (Sometimes or Good) n (%)	Score = 4 (A Little of the Time or Fair) n (%)	Score = 5 (None of the Time or Poor) n (%)
PPC-Willingness to Recommend					
Plan to see doctor in the future	128 (100)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Plan to recommend doctors to others	47 (36.7)	22 (17.2)	56 (43.8)	0 (0.0)	3 (2.3)
PPC-Physician Trust					
Can tell my healthcare team anything	51 (39.8)	66 (51.6)	5 (3.9)	5 (3.9)	0 (0.0)
Healthcare team is willing to incur expenses if I'm in an emergency	4 (3.1)	33 (25.8)	54 (42.2)	23 (18.0)	14 (11.0)
Healthcare team cares about my health	49 (38.3)	71 (55.5)	5 (3.9)	3 (2.3)	0 (0.0)
Doctor would try to hide treatment mistakes*	2 (1.6)	32 (25.0)	59 (46.1)	26 (20.3)	9 (7.0)

Note: * indicates a reverse-scored item.

Appendix B. Item-Level Endorsements for Information, Motivation, and Behavioral Skills (N = 128).

	Score = 5 (Strongly Agree or Very Easy) n (%)	Score = 4 (Somewhat Agree or Easy) n (%)	Score = 3 (Neither Agree/ Disagree or Sometimes) n (%)	Score = 2 (Somewhat Disagree or Hard) n (%)	Score = 1 (Strongly Disagree or Very Hard) n (%)
IMB-Information					
Know how my HIV medication is to be taken	64 (50.0)	46 (35.9)	1 (0.8)	10 (7.8)	7 (5.5)
Know what to do if I miss an HIV medication dose	32 (25.0)	62 (48.4)	3 (2.3)	14 (10.9)	17 (13.3)
Skipping HIV medication sometimes is not harmful*	1 (0.8)	50 (39.1)	4 (3.1)	7 (5.5)	66 (51.6)
Know side effects of HIV medication	65 (50.8)	56 (43.8)	1 (0.8)	4 (3.1)	2 (1.6)
Missing HIV medication sometimes is okay, if feeling healthy*	1 (0.8)	40 (31.3)	9 (7.0)	4 (3.1)	74 (57.8)
Know how HIV medication works to fight the virus	63 (49.2)	52 (40.6)	5 (3.9)	7 (5.5)	1 (0.8)
Know HIV medication may not work in the future if not taken as prescribed	57 (44.5)	51 (39.8)	8 (6.3)	6 (4.7)	6 (4.7)
Will live longer if take HIV medication correctly	71 (55.5)	52 (40.6)	4 (3.1)	1 (0.8)	0 (0.0)
Know how HIV medication interacts with drugs and alcohol	46 (36.0)	56 (43.8)	1 (0.8)	2 (1.6)	23 (18.0)
IMB-Motivation					
Worried others will discover my status if seen taking HIV medication*	59 (46.1)	21 (16.4)	1 (0.8)	4 (3.1)	43 (33.6)
Frustrated because have to plan life around HIV medication*	10 (7.8)	33 (25.8)	6 (4.7)	12 (9.4)	67 (52.3)
Don't like taking HIV medication because reminds me of my status*	4 (3.1)	28 (21.9)	7 (5.5)	6 (4.7)	83 (64.9)
Physician takes my needs into account when recommending HIV medication	73 (57.0)	51 (39.9)	2 (1.6)	1 (0.8)	1 (0.8)
Most people who know my status support taking HIV medication	15 (12.4)	26 (21.5)	2 (1.7)	15 (12.4)	63 (52.1)
Physician doesn't support me enough* in taking HIV medication as prescribed	20 (15.6)	55 (43.0)	5 (3.9)	14 (10.9)	34 (26.6)
Frustrated to know I have to take HIV medication forever*	8 (6.3)	39 (30.5)	12 (9.4)	5 (3.9)	64 (50.0)
Worried HIV medication will hurt my health*	6 (4.7)	20 (15.6)	19 (14.8)	6 (4.7)	77 (60.2)
Upset that HIV medication can change how I look*	9 (7.0)	29 (22.7)	18 (14.1)	20 (15.6)	52 (40.6)
Upset that HIV medication has side effects*	12 (9.4)	35 (27.3)	15 (11.7)	35 (27.3)	12 (9.4)
IMB-Behaviors					
Sometimes hard to take HIV medication when used alcohol or drugs*	13 (10.2)	41 (32.0)	1 (0.8)	7 (5.5)	66 (51.6)
How hard or easy to stay informed about HIV treatment?	9 (7.0)	101 (78.9)	12 (9.4)	5 (3.9)	0 (0.0)
How hard or easy to get HIV medication support from others?	4 (3.1)	63 (49.2)	25 (19.5)	30 (23.4)	6 (4.7)
How hard or easy to get HIV medication refills?	8 (6.3)	103 (80.5)	14 (10.9)	2 (1.6)	1 (0.8)
How hard or easy to take HIV medication when wrapped up ins something?	8 (6.3)	98 (76.6)	19 (14.8)	2 (1.6)	1 (0.8)
How hard or easy to manage HIV medication side effects?	6 (4.7)	89 (69.5)	21 (16.4)	7 (5.5)	5 (3.9)
How hard or easy to remember to take HIV medication?	12 (9.4)	94 (73.4)	17 (13.3)	5 (3.9)	0 (0.0)

Appendix B. (continued)

	Score = 5 (Strongly Agree or Very Easy) n (%)	Score = 4 (Somewhat Agree or Easy) n (%)	Score = 3 (Neither Agree/ Disagree or Sometimes) n (%)	Score = 2 (Somewhat Disagree or Hard) n (%)	Score = 1 (Strongly Disagree or Very Hard) n (%)
How hard or easy to take medication due to side effects?	7 (5.5)	101 (78.9)	11 (85.9)	7 (5.5)	2 (1.6)
How hard or easy to make HIV medication part of your daily life?	9 (7.0)	95 (74.2)	18 (14.1)	5 (3.9)	1 (0.8)
How hard or easy to take HIV medication when your usual routine changes?	6 (4.7)	90 (70.3)	15 (11.7)	13 (10.2)	4 (3.1)
How hard or easy to take HIV medication when you don't feel emotionally good?	4 (3.1)	99 (77.3)	15 (11.7)	7 (5.5)	2 (1.6)
How hard or easy to take HIV medication when feeling physically good?	9 (7.0)	106 (82.8)	7 (5.5)	3 (2.3)	1 (0.8)
How hard or easy to take HIV medication when not feeling physically good?	11 (8.6)	104 (81.3)	6 (4.7)	6 (4.7)	1 (0.8)
How hard or easy to talk to your physician about HIV medication?	13 (10.2)	107 (83.6)	5 (3.9)	2 (1.6)	1 (0.8)

Note: * indicates a reverse-scored item.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Disclosures

The authors report no real or perceived vested interests related to this article that could be construed as a conflict of interest.

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