Antiretroviral Therapy: Planned Behavior & Adherence

Authored by

mohammed looti

November 12, 2025

Introduction to the Theory of Planned Behavior in ART Adherence

The Theory of Planned Behavior (TPB), initially developed by Icek Ajzen, stands as one of the most robust and widely applied social psychological models used to predict specific human behaviors, particularly in the realm of health psychology. Applied to the context of Antiretroviral Therapy (ART), the TPB provides a critical framework for understanding, predicting, and ultimately influencing the complex adherence behaviors required of individuals living with Human Immunodeficiency Virus (HIV). ART adherence is not merely an act of compliance but a continuous, demanding behavioral process involving daily medication schedules, lifestyle adjustments, and consistent medical monitoring, making high adherence rates essential for achieving viral suppression, preventing drug resistance, and improving long-term health outcomes for the individual, while simultaneously reducing the risk of transmission. The TPB posits that behavioral intention is the most immediate determinant of action, and this intention is, in turn, predicted by three core psychological constructs: **attitude toward the behavior**, **subjective norms**, and **perceived behavioral control (PBC)**. Understanding how these factors interact within the unique challenges posed by chronic ART management is fundamental to designing effective interventions that move beyond simple educational campaigns towards truly personalized behavioral support strategies.

Adherence to ART is defined as taking at least 95% of prescribed doses on time, a threshold necessary to maintain therapeutic drug levels and prevent the selection of drug-resistant viral strains. Failure to meet this rigorous standard compromises treatment efficacy and has significant public health implications, transforming what is otherwise a manageable chronic condition into a potentially life-threatening illness. Given the voluntary nature of daily medication intake--an action that requires conscious effort, memory, and resource management--the TPB offers a theoretical lens to dissect the cognitive antecedents driving consistent adherence behavior. Unlike simpler models of behavior change, the TPB explicitly addresses non-volitional factors through the inclusion of PBC, acknowledging that even strong intentions can be derailed by perceived or actual barriers. This comprehensive approach ensures that adherence interventions are not solely focused on motivation, but also address the practical, social, and structural determinants that facilitate or impede the successful integration of ART into a patient's daily life.

The relevance of the TPB in this specialized area stems from its focus on reasoned action; it assumes that individuals make systematic use of the information available to them when deciding whether to engage in a specific behavior. For ART management, this involves weighing the perceived benefits (e.g., better health, longer life) against the perceived costs and difficulties (e.g., side effects, stigma, inconvenience). This entry will explore each TPB construct in detail as it relates specifically to the daily requirements of living with and managing HIV through ART, highlighting the psychological mechanisms that translate beliefs into behavioral intentions and subsequent observable adherence outcomes. Furthermore, it will address how the model accounts

for the critical distinction between merely intending to adhere and possessing the necessary skills and resources, or **perceived behavioral control**, to successfully execute that intention over months and years of chronic treatment.

Core Constructs of the Theory of Planned Behavior

The operational foundation of the Theory of Planned Behavior rests upon three interrelated constructs that combine to predict a person's **behavioral intention**, which is the immediate precursor to the actual behavior. The first construct, **Attitude toward the behavior**, refers to the degree to which a person holds a favorable or unfavorable evaluation of the behavior in question, which, in this context, is the consistent taking of ART medication. This attitude is derived from the individual's salient beliefs about the likely outcomes of performing the behavior (behavioral beliefs) and the value they place on those outcomes (outcome evaluations). For example, if a patient strongly believes that consistent ART adherence will lead to undetectable viral loads (a positive outcome) and highly values maintaining good health, their attitude toward adherence will be strongly positive. Conversely, if they believe adherence will inevitably lead to severe side effects or toxicity, their attitude will likely be negative, regardless of the ultimate health benefit.

The second key construct is **Subjective Norms**, which captures the perceived social pressure to engage or not engage in the behavior. This is based on two components: normative beliefs and motivation to comply. Normative beliefs involve the perceived expectations of important reference groups or individuals--such as partners, family members, healthcare providers, or close friends--regarding whether the individual should adhere to ART. Motivation to comply reflects the extent to which the individual is willing to follow those perceived expectations. If a patient believes their physician strongly expects 100% adherence and they are highly motivated to please or obey their physician, the subjective norm will exert a strong positive influence on their intention to adhere. In the context of HIV, subjective norms are particularly complex due to issues of disclosure and stigma; if a patient has not disclosed their status, the perceived norms of their immediate social circle (who are unaware of the necessity of the behavior) may inadvertently pressure them towards non-adherence or inconsistent behavior to maintain secrecy.

The third and arguably most critical construct for chronic disease management is **Perceived Behavioral Control (PBC)**. PBC refers to the perceived ease or difficulty of performing the behavior, reflecting both past experiences and anticipated impediments. It is determined by control beliefs--the individual's beliefs about the presence of factors that may facilitate or impede performance--and the perceived power of those factors. PBC serves a dual role in the TPB: it predicts behavioral intention alongside attitude and subjective norms, and, crucially, it can directly predict the actual behavior, especially when control over the behavior is incomplete. In the ART context, high PBC means the patient believes they have the necessary skills, resources (e.g., money for transport, stable housing, access to medication), and environmental stability to take their

pills precisely as prescribed, every day. Low PBC, stemming from factors like poor memory, chaotic schedules, or substance use, acts as a significant barrier, even if the patient has a strong positive attitude and high subjective norms supporting adherence.

Application of TPB to Antiretroviral Therapy Adherence

Applying the Theory of Planned Behavior to ART adherence allows researchers and clinicians to move beyond simple correlational studies and develop targeted interventions based on the modifiable cognitive and social factors that underlie medication-taking behavior. The complexity of ART adherence lies in its requirement for long-term consistency and precision, where even minor deviations can have profound clinical consequences. The TPB provides the necessary structure to map the cognitive landscape of adherence. For example, a patient's intention to adhere is the central focus, representing their commitment to the behavior. This intention is often strong immediately following diagnosis and initiation of treatment, driven by a fear of mortality and strong physician recommendations. However, maintaining this intention requires continuous reinforcement across all three TPB domains as treatment becomes normalized over time.

Interventions based on the TPB must therefore address the specific determinants of intention and control. To modify **attitude**, educational programs must clearly link adherence to beneficial outcomes (viral suppression, reduced opportunistic infections) while providing realistic coping strategies for managing common side effects, thereby neutralizing negative behavioral beliefs. To leverage **subjective norms**, interventions might involve peer support groups or counseling sessions that actively engage partners and family members, ensuring that the patient perceives a strong, unified social expectation of adherence. Furthermore, addressing the pervasive issue of HIV-related stigma is crucial, as internalized stigma can lead patients to isolate themselves, diminishing the positive influence of supportive subjective norms and leading to intentional non-adherence to avoid disclosure.

The most practical utility of the TPB in ART management often lies in the domain of **Perceived Behavioral Control**. While attitude and norms reflect motivational aspects, PBC reflects the perceived feasibility. For many patients, especially those facing socioeconomic challenges, adherence is genuinely difficult due to external constraints. TPB-based interventions must therefore focus heavily on enhancing self-efficacy and removing structural barriers. This involves teaching specific behavioral skills (e.g., using pillboxes, setting alarms, linking medication intake to established routines) and ensuring access to supportive resources, such as transportation assistance to clinics or reminder technologies. By increasing a patient's belief that they have control over the necessary actions, PBC becomes a powerful mechanism for closing the intention-behavior gap--the common phenomenon where a patient genuinely intends to adhere but fails to do so due to unforeseen or poorly managed obstacles.

The Role of Attitude towards ART Adherence

Attitude toward ART adherence is fundamentally shaped by the individual's assessment of the consequences of taking the medication versus the consequences of missing doses. This assessment is multifaceted, encompassing beliefs about clinical efficacy, potential adverse effects, and the psychological burden associated with lifelong medication. A positive attitude is strongly correlated with a belief in the inherent effectiveness of the treatment--that ART will successfully control the virus, prevent illness progression, and allow for a near-normal lifespan. This belief must be continually reinforced by clear, accessible medical information and positive feedback from healthcare providers, especially when patients achieve milestones like undetectable viral loads, which serves as tangible proof of the treatment's success and validates their adherence efforts.

Conversely, negative attitudes often arise from salient beliefs regarding the immediate, often unpleasant, aspects of treatment. Side effects, such as nausea, fatigue, or lipodystrophy (changes in body fat distribution), can significantly erode a positive attitude, particularly early in treatment. Furthermore, the act of taking pills daily serves as a constant, tangible reminder of the patient's HIV status, which can foster psychological distress and lead to a negative affective attitude toward the medication itself. To counteract this, interventions must not only manage side effects clinically but also address the psychological meaning of the medication. Counseling that reframes the medication from a symbol of illness to a symbol of control and health maintenance is essential for sustaining a favorable long-term attitude.

Another critical component of attitude in the ART context involves weighing the effort required against the perceived benefit. ART regimens, while simplified over the years, still demand significant discipline. If a patient perceives the effort of adherence (e.g., strict timing, dietary restrictions, remembering refills) to outweigh the immediate, often invisible, benefit, their attitude will become less favorable. Healthcare providers must continuously engage patients in dialogue about their specific behavioral beliefs, identifying and challenging irrational or misinformed expectations (e.g., believing that occasional missed doses don't matter) and reinforcing the immediate and delayed positive consequences of perfect adherence. This active management of behavioral beliefs is crucial for maintaining the motivational force required to sustain chronic adherence.

Subjective Norms and Social Influence in ART Management

Subjective norms play a powerful, yet often subtle, role in shaping ART adherence intentions, particularly because HIV management occurs within a complex social matrix characterized by potential stigma and the need for selective disclosure. Normative beliefs about adherence stem from two primary sources: the expectations of professional referents (physicians, nurses, pharmacists) and the expectations of personal referents (family, partners, friends, peer support

groups). When a patient perceives that their entire care team and their trusted loved ones unanimously expect and support perfect adherence, the subjective norm component is highly positive, reinforcing their intention. The perceived expectation of the physician, in particular, often carries significant weight due to the patient's reliance on the provider for life-saving treatment and guidance.

However, the influence of subjective norms is complicated by HIV-related stigma. If a patient decides not to disclose their status to their social network, they may perceive pressure from those unaware individuals to engage in activities or schedules that conflict with medication timing, such as spontaneous travel or late-night socialization, which can inadvertently reinforce non-adherence. In these cases, the subjective norm shifts from a supportive force to a conflicting one, as the patient must choose between adhering to the perceived norm of secrecy (and risking non-adherence) and adhering to the medical norm (and risking disclosure). Interventions must address this conflict by helping patients navigate disclosure safely or by providing discreet adherence aids that allow them to maintain privacy while sustaining their regimen.

Furthermore, the concept of descriptive norms--the perception of what others actually do--also influences adherence. If a patient is part of a peer group where non-adherence is common or tolerated, they may perceive that missing doses is acceptable, even if their physician explicitly advises against it. Conversely, strong peer support groups that model successful, long-term adherence can establish a powerful, positive descriptive norm. Effective TPB-based interventions utilize this social influence by facilitating access to successful peers, thereby normalizing high adherence rates and ensuring that the social environment actively supports the rigorous demands of ART management, rather than undermining them.

Perceived Behavioral Control and Self-Efficacy

Perceived Behavioral Control (PBC) is arguably the most salient predictor of actual adherence behavior, often exceeding the predictive power of attitude and subjective norms when the behavior is complex and subject to external constraints, as is the case with ART. PBC encompasses the patient's confidence in their ability to overcome barriers (self-efficacy) and their perception of the availability of resources and opportunities necessary for performance (controllability). For ART, the control beliefs are wide-ranging, covering internal factors like memory, motivation, and coping skills, and external factors like access, financial stability, and environmental chaos. A patient may have a perfect attitude and strong social support, but if they lack reliable housing or cannot afford consistent transportation to the pharmacy, their PBC will be low, leading to poor adherence outcomes despite strong intention.

Enhancing PBC requires a dual approach: building self-efficacy and reducing structural barriers. Self-efficacy, the belief in one's capability to execute the necessary course of action, can be built

through successful mastery experiences (e.g., starting with a short period of perfect adherence), vicarious experiences (observing successful peers), verbal persuasion (encouragement from providers), and managing physiological states (reducing anxiety about side effects). Interventions focused on self-efficacy often involve behavioral skills training, teaching patients specific strategies for integrating medication into their existing routines, thereby simplifying the cognitive load associated with daily adherence. For instance, techniques like "habit stacking" or "if-then" planning (e.g., "If I wake up, then I will immediately take my pill") are tangible ways to increase a patient's sense of mastery over the behavior.

Addressing controllability involves systematically identifying and mitigating structural constraints. This is where TPB moves into resource management and public health policy. If a patient's PBC is low because they frequently run out of pills, the intervention must focus on improving pharmacy access, reducing costs, or implementing refill reminder systems. If chaotic lifestyles or substance use impede control, specialized support addressing those underlying issues becomes a prerequisite for enhancing PBC related to medication adherence. By directly targeting control beliefs and enhancing self-efficacy, interventions can empower patients, transforming the perception of ART adherence from an overwhelming burden into a manageable, controlled component of their daily self-care routine.

Behavioral Intention and Actual Adherence Outcomes

The central tenet of the Theory of Planned Behavior is that **Behavioral Intention** is the most immediate antecedent of actual behavior. Intention represents the patient's readiness or motivation to perform the adherence behavior. In the ART context, a strong intention means the patient is highly committed to taking their medication precisely as prescribed. This intention is synthesized from the weighted contributions of attitude, subjective norms, and perceived behavioral control. For intention to be robust and stable, all three predictors should ideally align: the patient must feel positively about the outcome (attitude), perceive social support (subjective norms), and believe they are capable (PBC).

While intention is a strong predictor, the relationship between intention and actual behavior is imperfect, a phenomenon known as the **intention-behavior gap**. This gap is particularly relevant in chronic illness management where behavior must be sustained over decades. The TPB accounts for this gap primarily through the direct influence of PBC on behavior. Even if intention is high, low PBC--due to unexpected life events, resource depletion, or poor self-regulatory skills--can prevent the intended action from being carried out. Therefore, measuring intention alone is insufficient; successful interventions must ensure that the patient possesses the requisite skills and environmental support to translate that intention into action.

Ultimately, the success of the TPB framework is measured by its ability to predict and influence

objective clinical outcomes. Perfect ART adherence leads directly to measurable improvements in **viral load suppression** (the primary clinical goal) and increased **CD4+ T-cell counts** (indicating immune restoration). Research consistently demonstrates that the TPB constructs, especially PBC, are significant predictors of these clinical markers. By quantifying the strength of a patient's attitude, norms, and control beliefs, clinicians can proactively identify patients at high risk for non-adherence and deploy targeted resources, demonstrating the model's powerful utility as a diagnostic and prescriptive tool in the ongoing management of HIV.

Limitations and Future Directions of the TPB Framework in ART

Despite its predictive strength, the Theory of Planned Behavior has several recognized limitations when applied to the complex, long-term behavior of ART adherence. A primary critique is that the model is overly rational and cognitive, potentially underestimating the significant impact of **affective and emotional factors** on health behavior. For patients living with HIV, adherence decisions are often influenced by powerful emotions such as depression, anxiety, fear, and internalized stigma, which may bypass the reasoned decision-making process central to the TPB. For instance, an episode of severe depression might lead to missed doses, regardless of a strong positive attitude or high PBC, simply because the emotional state diminishes the capacity for self-regulation and motivation.

Another limitation is the TPB's difficulty in fully accounting for **non-volitional factors** that are external to the individual, such as systemic poverty, structural violence, or institutional discrimination, which profoundly limit control and access. While PBC attempts to address controllability, it primarily measures the *perception* of control, which may not accurately reflect severe external barriers. In resource-limited settings or among marginalized populations, adherence failure may be almost entirely structural, requiring macro-level policy changes rather than individual-level cognitive interventions suggested by the core TPB model. Future applications often recommend integrating TPB with broader socio-ecological models to fully capture these structural determinants of health behavior.

To address these shortcomings, future research directions often involve extending the TPB model. One popular extension is the incorporation of **moral norms** (the perceived moral obligation to perform the behavior) and **self-identity** (the extent to which the behavior aligns with one's self-concept as a healthy individual). Additionally, integrating TPB with stage models, such as the Transtheoretical Model, allows researchers to tailor TPB constructs based on where the patient is in their readiness to change or maintain behavior. Ultimately, the TPB remains an indispensable foundation, but its maximal utility in the demanding field of ART adherence lies in its dynamic modification and integration with other psychological and sociological frameworks that account for the full spectrum of human experience, including emotion, habit formation, and structural inequality.