

The utility of theory of planned behavior in predicting consistent condom use intention of HIV patients on ART in North Shoa Zone health facilities, Ethiopia, 2011

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Abstract

Background: The theory of planned behavior (TPB) explains behavioral intention and it is a better theoretical model helping predict intentions for consistent condom use, which is believed to reduce the long term impacts of HIV disease.

Objective: To examine the utility of theory of planned behavior in predicting consistent condom use intention of HIV patients who are currently on antiretroviral treatment.

Methods: A cross sectional study was conducted among randomly selected 337 HIV/AIDS patients taking ART from 3 Hospitals and 4 health centers between March and April 2011 in North Shoa Zone of Ethiopia. Data were collected using the theory of planned behavior construct and socio-demographic characteristics. Analysis was done using Cronbach's alpha reliability test, partial correlation, and linear regressions in order to know the predictors of intention to consistent condom use.

Results: 56% of the respondents were females with the median age of 32.00±9.66 years. All components of the theory of planned behavior model, attitude ($r=0.31$; $p\leq 0.001$), subjective norm ($r=0.39$; $P\leq 0.001$), perceived behavioral control ($r= 0.36$; $P\leq 0.001$) were correlated significantly and positively with intention to consistent condom use. All components of the model were significant predictors of consistent condom use intentions. Based on multiple linear regression, the standardized regression coefficient was ($\beta_{\text{attitude}}=0.21$; $P\leq 0.005$), ($\beta_{\text{subjective norm}}= 0.26$; $P\leq 0.001$) and ($\beta_{\text{perceived behavioral control}}=0.28$; $P\leq 0.001$).

Conclusion: The study showed that the theory of planned behavior as explaining 29.1% of variation in intentions for consistent condom use of HIV/AIDS patients taking ART, suggesting that the model is applicable and effective in the prevention of new infections, re-infection as well as drug resistance. [*Ethiop. J Health Dev.* 2013;27;(1):40-47]

Introduction

HIV/AIDS has been widespread since 1986 thereby rendering Ethiopia one of the largest affected sub-Saharan African countries. The estimated total number of people living with HIV in Ethiopia was 1.2 million as of 2010 (1). Various factors are attributed to the alarming level of the disease in Ethiopia as well as in many African countries (2, 3). Although behavioral change is documented as a high impact intervention for curbing the disease, it is not well emphasized probably because of insufficient studies substantiating the targeting of sexual behavior as an effective HIV/AIDS prevention strategy in Ethiopia (4, 5). As a result, studies have shown that condom use is low among the vulnerable segments of the population (6-9). Based on a study done in Uganda among patients taking ART, risky sexual behavior was reduced by 70% among the rural community (10), while in Masaka (an urban community) the risky behavior increased showing some conflicting findings within the same country (11). Kezal et al. also demonstrated that significant number of patients taking ART practiced unsafe sex (12) and raised the concern for future management of HIV patients (4, 10, 12).

Although AIDS deaths in Ethiopia declined by 41% in 2010 as a result of ART intervention, the coverage by

optimal behavioral improvements including condom use, counseling and testing is still low, only 13.0% the eligible accessing ART (2). It is a well known fact that ART is not yet a warranty against HIV transmission; it rather reduces plasma viral load and keeps people alive longer and improves the quality of life (13, 14). People's perception of the severity of HIV has reduced and it is the other factors that increase the spread of the disease, indicating the importance of perception as one of the factors to consider in the prevention of the disease (15). Targeting behavioral change will therefore be an important strategy that contributes to effective HIV transmission prevention, since it addresses the social circumstances and norms that influence individual behavior (16, 17). The theory of planned behavior (TPB) is one of the common theories used for understanding a particular behavior and its determinants (18, 19). It is a modified form of the theory of reasoned action (TRA) (18) that includes non-volitional factors of behavior. Perceived behavioral control (PBC) is the component of TPB that was later added from TRA. TPB is developed based on three main constructs: beliefs about the likely outcomes of the behavior and the evaluations of these outcomes (behavioral beliefs), beliefs about the normative expectations of others and motivation to comply with these expectations (normative beliefs), and

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beliefs about the presence of factors that may facilitate or impede performance of the behavior and the perceived power of these factors (control beliefs). In their respective aggregates: behavioral beliefs produce attitude, normative beliefs develop subjective norms, and control beliefs give perceived behavioral control. When combined, attitude towards behavior, subjective norm, and perception of behavioral control, give behavioral intention (18). Behavioral intention is the proximal determinant of behaviors and it is one's readiness and willingness to perform a certain behavior (20). According to some longitudinal studies done in Ethiopia at different times, TPB explained 36.0% of the variance in intention to use condoms (21) and 29.0% of variance in intention to use contraceptives among adolescents (22), while a meta-analytic study in the UK showed a little higher (39%) intention (23) than the aforementioned Ethiopian studies. In other studies, the theory reported 46.1% of nurses' intentions as being explained by subjective norms (24-25), making subjective norms as better predictors of intention than attitudes. On the other hand, other studies have demonstrated attitude as being the most significant predictor for intention in HIV/AIDS health promotion programs (26). Still in another study, even though attitude, subjective norm and perceived behavioral control explained 62.0% of the variance in intentions, attitude was found to be the strongest predictor (27). These suggest that variations exist in the TPB in terms of explaining the intention for a certain behavior.

According to a study in Harari Region, all the components of TPB were correlated significantly with behavioral intention to use VCT among teachers (28). In another study in Addis Ababa, TPB explained 9.2% and 16.4% of the variance in intention to undergo HIV testing among antenatal attendees from public and private health care facilities respectively (29), while another UK study documented that the theory is a useful tool in predicting intentions to use condoms (30). Nonetheless, there is scarcity of such theory-based studies in Ethiopia that can contribute towards better HIV intervention programs. For underlining the need for HIV prevention intervention programs, it will be helpful to look at the factors that influence consistent condom use by HIV patients so as to prevent new infections and re-infections as well as evaluate the applicability of TPB for condom use intentions on HIV patients who are on antiretroviral treatment. The objective of this study was, therefore, to examine the applicability of the TPB in predicting intentions for consistent condom use among HIV/AIDS patients taking ART.

Methods

Design: A cross-sectional study was conducted in North Shoa Zone during the period of March to April 2011. The Zone has three hospitals and twenty three health centers providing ART services. All the three hospitals and four

health centers were purposively (those that had large client flows) selected and included in the study. The total number of ART attendees at the time of the study was 2096 in the selected facilities.

Sample Size:

The required sample size was determined based on the assumption of prevalence of 63.1 % (31) with a precision of 5%, a confidence level of 95%, and a non-response rate of 10%. Based on this, the sample size was determined to be 337 patients with regular follow up. To select the sampled patients, the number was allocated proportionately to the study facilities and every sixth patient was selected by systematic random sampling during visits to ART clinics until the required sample size was reached.

Study Tools:

A questionnaire was developed based on the literature review and using the constructs of the theory of planned behavior. The questionnaire included information on socio-demographic (age, sex, education, ethnicity, marital status, occupation, income, religion) as well as different behavioral (such as consistent condom use intention, attitude, subjective norm, and perceived behavioral control) factors of the respondents.

Attitude was assessed through belief about consistent use of condom and evaluation of consistent condom use. Subjective norm was determined through normative belief towards consistent condom use and motivation for compliance with consistent condom use, while perceived behavioral control information was assessed through belief in control of consistent condom use and power of control of consistent condom use. A five-point Likert scale (ranging from strongly agree to strongly disagree) was used for measuring each variable of the theory of planned behavior model.

Intention to use condoms: Respondents' plan to use condoms in the near future during sexual interaction was measured through three questionnaire items. Responses to each of the three questionnaire items ranged from 1=not likely at all to 5=very likely, resulting in summation scores for intention that range from three to fifteen.

Belief about the use of condoms: The extent to which an individual thinks that s/he is using condoms consistently was measured through four questionnaire items. Responses to each of these items ranged from 1=strongly disagree to 5=strongly agree, resulting in summation scores of that range between four and 20.

Evaluation of condom use belief: Individuals' evaluation of the salient consequences of using condoms consistently in the near future was measured through four

questionnaire items. Responses to each of these items ranged from 1=extremely undesirable to 5=extremely desirable, resulting in summation scores that range between four and 20.

Attitude towards the use of condoms: An individual's predisposition to respond in favorable or otherwise was constructed from items of behavioral belief and evaluation of belief. Attitude score was, therefore, derived by multiplying each of the items in belief about use of condoms with the corresponding items in evaluation of condom use.

Normative belief towards condom use: The perception held by an individual whether significant others think that s/he should use condoms consistently was constructed through five questionnaire items. Responses to each of these items ranged from 1=strongly disagree to 5=strongly agree, resulting in summation scores that range from five to 25.

Motivation to comply with normative beliefs: Individual's motivation to comply with referents' wishes about using condom was measured through five questionnaire items. Responses to each of these items ranged from 1=strongly disagree to 5=strongly agree, resulting in summation scores that range from five to 25.

Subjective norm of condom use: Individual's perception that significant others think her/him to use condoms as a normative action was constructed from items of normative belief and motivation to comply. Subjective norm score was, therefore, derived by multiplying each of the items in normative belief with the corresponding items in motivation to comply.

Belief in control of use of condoms: Ones belief about the presence of factors that might hinder or facilitate the use of condoms was measured through four questionnaire items. Responses to each of these items ranged from 1=very unlikely to 5=very likely, resulting in summation scores that range from four to 20.

Power of control of condom use belief: Perceived ability of individuals to control the factors that might hinder the use of condom consistently was measured through four questionnaire items. The responses to each of these items ranged from 1=completely uncertain to 5=completely certain, resulting in summation scores that range from four to 20.

Perceived control of the use of condoms (perceived behavioral control): The perceived easiness or difficulty

associated with the use of condoms was constructed by multiplying each items in belief in control of use of condoms with the power of control of condom use belief.

Ethical Considerations:

The study was ethically cleared from the Institutional Review Board of the College of Health Sciences, Addis Ababa University. Clearance was also obtained at each health facility. Written informed consent was obtained from the study participants after the nature of the study was explained to them in their native language. The right of the participants to withdraw at anytime during the study was respected. All the interviews were conducted in private rooms to maintain confidentiality.

Data Collection Procedures:

Various socio-demographic and other important variables of the model were collected by seven experienced clinical nurses within the selected health facilities that also serve as HIV/AIDS counselors. All the data collectors were trained for two days on the detail procedures of the tasks before the data collection. The data collection process was supervised throughout the study period by the principal investigator to maintain the data quality.

The collected data were initially manually cleaned and later computerized using EPI Info Version 3.5.1 software and then transferred to SPSS Version 16 software for data analysis. Partial correlation was used to assess the applicability of the TPB model; as well as linear regression analysis between the outcome variable (intention for consistent condom use) and the various predictor variables (socio-demographic factors, attitude, subjective norm and perceived behavioral control). Cronbach's alpha was used to measure the internal consistency of the items used before constructing a scale.

Results

All of the eligible study participants enrolled were interviewed and responded to the entire questionnaire with non-response for few items of sensitive nature.

Table 1 shows the socio-demographic characteristics of the respondents. More than half (56.2%) of them were females with a median age of 32±9.66 years and about half (46%) were in the age group of 25-34 years. About three-fourth (77.1%) were Christians and the majority (83.20%) were of Amhara ethnicity. Most (43.9%) of them were married and slightly over one-third (35.1%) were unable to read and write. The average monthly income for about one-third (31.2%) of the respondents was less than Eth birr 500.

Table 1: Socio demographic characteristics of HIV/AIDS patients who are on ART by gender in North Shoa Zone health facilities, 2011.

Variables	Male Percentage (%)	Female Percentage (%)	Total Percentage (%)
Age category (years)			
18-24	5.4	16.4	11.6
25-34	40.1	50.8	46.1
35-44	30.6	18.0	23.5
>45	23.8	14.8	18.8
Religion			
Christian	79.6	75.1	77.1
Muslim	20.4	24.9	22.9
Ethnicity			
Amhara	81.6	84.5	83.2
Oromo	9.5	5.9	7.5
Others	8.9	9.6	9.3
Current marital status			
Single	25.9	25.0	25.4
Married	51.7	37.8	43.9
Divorce	8.2	17.6	13.4
Widowed	14.3	19.7	17.3
Educational status			
Unable to write and read	27.6	77.0	35.1
Write and read	21.4	15.4	18.0
≤6	14.5	14.9	14.7
7-12	26.9	23.4	24.9
> 12	9.7	5.3	7.2
Average monthly income			
Have no own income	6.4	17.0	12.2
Don't know	27.9	29.2	28.6
≤ 500 birr	27.9	33.9	31.2
501 – 999 birr	25.0	17.0	20.6
≥ 1000 birr	12.9	2.9	7.4
Current occupation			
Government employee	17.8	5.8	11.0
Private employee	30.1	19.6	24.2
Housewife	0.0	21.7	12.2
Daily laborer	15.1	16.4	15.8
Merchant	8.9	15.3	12.5
Farmer	19.2	8.5	13.1
Other	8.9	12.7	21.6

Table 2 shows the descriptive statistics for the TPB constructs. Almost two-third (66.7%) of the respondents' behavioral beliefs were favorable and 61.7% of the outcome evaluations were desirable towards intention to use condom. Over half (55.7%) perceived positively what significant others think and more than half (57.5%) had good motivation to comply. Nearly half (47.8%) of them had beliefs about the presence of factors that facilitate the use of condoms, and about half (53.0%) were able to control the hindering factors against condom use intention while over half (55.8%) showed good intention and 54.2% had good attitude towards consistent condom use. Regarding the social pressure, 53.4% of them were giving high value to what significant others say to have a favorable intention to use condoms while 60.2% of them perceived ease for intention to consistent condom use.

The partial correlation coefficients between attitude, subjective norm, perceived behavioral control, intention to consistent condom use, educational status, average monthly income, and history of condom use are displayed in Table 3. Each of the constructs was significantly and positively correlated with intention to consistent condom use, which was the dependent variable. Among the constructs, subjective norm was with highest Pearson's correlation ($r= 0.41$, $p<0.001$) followed by perceived behavioral control ($r=0.38$, $p<0.001$) and attitude ($r= 0.33$, $p<0.001$). These positive Pearson's correlations among the variables show that whenever there is an increase in TPB constructs, there is increase in the behavioral intentions to use condom consistently. The Cronbach's alphas of attitude, subjective norm, perceived behavioral control, and consistent condom use intention were 0.62, 0.74, 0.76, and 0.98, respectively.

Table 2: **Descriptive statistics of TPB constructs of ART patients taking ART in North Shoa Zone health facilities, 2011.**

Variables	Frequency (in percentage)	Mean	SD	Min	Max
Behavioral Belief					
Favorable	66.7%	4.25	0.58	1.75	5
Unfavorable	33.3%				
Outcome evaluation					
Desirable	61.7%	4.38	0.86	1	5
Undesirable	38.3%				
Normative belief					
Perceived positively	55.7%	3.71	0.85	1	5
Perceived negatively	44.3%				
Motivation to comply					
Good	57.5%	3.70	0.89	1	5
Bad	42.5%				
Control belief strength					
Facilitating	47.8%	3.78	0.74	1	5
Hindering	52.2%				
Control belief power					
Above the mean	53.0%	3.74	1.04	1	5
Below the mean	47.0%				
Intention to consistent condom use					
Good	55.8%	3.78	1.23	1	5
Bad	44.2%				
Attitude					
Good	54.2%	74.62	17.59	17	100
Bad	45.8%				
Subjective norm					
High value to social pressure	53.4%	74.36	28.19	9	125
Low value to social pressure	46.6%				
Perceived behavioral control					
Perceived easy	60.2%	60.12	22.66	8	100
Perceived difficulty	39.8%				

Table 3: **Partial correlation of HIV patients taking ART with TPB constructs and some other important variables in North Shoa Zone health facilities, 2011.**

Variable	1	2	3	4	5	6
1. Attitude	0.62					
2. Subjective norm	0.312**	0.74				
3. PBC	0.194*	0.309**	0.76			
4. Average Income ^A	-0.023	0.000	-0.091	-		
5. Condom use ^B	0.029	-0.073	-0.059	-0.077	-	
6. Intention ^I	0.309**	0.394**	0.356**	-0.025	0.045	0.98
Mean	74.62	74.36	60.12			3.78
SD	17.59	28.19	22.66			1.23

PBC= Perceived behavioral control; A= Average monthly income; B= Condom use history before tested HIV; SD= Standard Deviation; Significant at ** $p \leq 0.001$, * $p \leq 0.05$, controlled for age, educational status, sex and marital status; I= Intention to consistent condom use;

Cronbach's alpha is written diagonally for each theory of planned behavior constructs.

Table 4 shows the results of the linear regression analysis between the outcome variable (intention to consistent condom use) and with various predictor variables (socio-demographic variables, attitude, subjective norm and perceived behavioral control). In the linear regression (LR) analysis, primarily all the socio-demographic variables were entered and the LR explained 5.6% of the variance in intention to use condoms consistently. Subsequently each construct of the theory were entered independently to see the individual effect of the variables. When LR was performed for each of the constructs one by one, the largest proportion of intention

for consistent condom use was explained by subjective norm (19.0%) followed by perceived behavioral control (14.6%) and attitude (8.6%). Nevertheless, when the constructs were analyzed in combination to determine their contribution towards intention for consistent condom use, attitude and subjective norm explained 23.6% of the variance. When perceived behavioral control is added with attitude and subjective norm, there was additional 3.9% variance in the intention and the model explained 29.1% of the variance in consistent condom use.

Table 4: Linear regression analysis of socio-demographic variables and TPB constructs of HIV patients who are on ART with intention to use condom in North Shoa Zone health facilities, 2011.

Variable Entered	R	R ²	Adj. R ²	R ² Change	F-Change	p-value	Standard beta coefficient		
							β _A	β _{SN}	β _{PBC}
Demog ^D	0.242	0.059	0.56	0.059	19.119	0.001			
At.	0.297	0.086	0.86	0.088	32.331	0.001	0.297*		
SN	0.442	0.190	0.910	0.195	42.177	0.001		0.442*	
PBC	0.386	0.146	0.145	0.149	56.903	0.001			0.386*
At. + SN	0.494	0.236	0.236	0.051	11.663	0.001	0.239*	0.362*	
At.+SN+PBC	0.551	0.291	0.291	0.039	9.1117	0.003	0.209**	0.261*	0.284*

*p-value significant at ≤ 0.001 , ** P-value significant at ≤ 0.005 ; Demog=Demography; At= attitude; SN=Subjective norm; PBC= perceived behavioral control; D= socio demographic variable including sex, age, educational status, average monthly income, religion, marital status.

Based on the standardized beta coefficient in the last multiple regression model, the strongest predictor of intention for consistent condom use was perceived behavioral control ($\beta=0.284$, $P<0.001$) followed by subjective norm ($\beta=0.261$, $p<0.001$) and attitude ($\beta=0.209$, $p<0.005$). But in the simple linear regression, the strongest predictor was subjective norm ($\beta=0.442$, $p<0.001$) followed by perceived behavioral control ($\beta=0.386$, $p<0.001$) and attitude ($\beta=0.297$, $p<0.001$).

Discussion

The present study attempted to show the utility of the theory of planned behavior (TBP) for predicting the intention for consistent condom use among HIV patients currently taking ART. The theory helps to explain determinants for a certain behavior to be enacted or avoided by an individual. In addition, the theory explains that intention to perform a desired behavior is a function of attitudes toward engaging in that behavior, perceived normative pressure to perform the behavior and perceived behavioral control.

The present study revealed that more than half of the respondents in each construct were having desirable beliefs or were in control of their beliefs in terms of the intention for consistent condom use. The fact that the TPB explained more than a quarter of the intention for condom use in the present study also concurs with the results of other studies such as the one conducted by Fekadu (TPB explained 39% variation in the intention for

use of contraceptive) (22), the UK meta-analysis study (TPB explained 39% variation in the intention for condom use) (23) and by that of Ronald et al. (where the theory explained about two-thirds of the variance in intention for physical activities) (27). A slightly lower result was also reported by Molla et al. among Ethiopian female adolescents in terms of intention for contraceptives use (21).

Each of the model constructs was positively correlated with the intention for consistent condom use in the present study, and this is consistent with the results of another study done to predict intention to use VCT services (28). Subjective norm was the first strong positively correlated variable ($r= 0.394$: $p= <0.001$) followed by perceived behavioral control ($r= 0.356$: $p=<0.001$) and attitude ($r= 0.309$: $p=<0.001$). This suggests that each variable explained the variation in intention for consistent condom use, and the observed findings can help in terms of identifying the variables of focus in intervention programs designed to bring about the desired outcome.

The largest variance of intention for consistent condom use in the present study was explained by subjective norms (19.0%), and this is in conformity with the findings documented by Molla et al. (21). The present findings also show that social pressure from significant others and self control are the most important drivers for intention for consistent condom use. Although attitude (8.6%) had less contribution in the intention for

consistent condom use compared with other constructs of this study, it still has significant contribution that deserves consideration during counseling and other intervention programs.

Attitude and subjective norm explained 23.6% of the variance in the intention for condom use which is less than the findings of the study done on documentation behavior of nurses (24) probably because of the low contribution of attitude observed in the present study.

The other area of focus in the present was looking at standard beta coefficient of the TPB constructs and socio-demographic characteristics. The strongest positive predictor of intention to use condom based on simple linear regression was subjective norm about condom use and this finding concurs with those of previous studies on attitude (25) where the second most important positive predictor was perceived behavioral control. Furthermore, according to a study conducted in South Africa, attitude was found to be the most significant predictor, followed by perceived behavioral control, for intention for condom use (26). When we see the multiple linear regression of the constructs in the present study, the most strong predictor of intention to use condom was perceived behavioral control ($\beta=0.284$; $p \leq 0.001$). This finding suggests that interventions to improve intention for consistent condom use should also target on improving the beliefs of relevant others and that the total set of accessible control belief on condom use are more useful than planning to attempt only changing behavioral beliefs and attitudes towards condoms use.

In conclusion, even though the present study has limitations that include the absence of qualitative component that could have uncovered more information on sensitive issues, the findings have shown that the TPB fairly explains the process of intention for consistent condom use among HIV patients who are on ART. Each of the TPB constructs was positively associated with the intention for consistent condom use and perceived behavioral control was found to be the main predictor for the outcome variable, followed by subjective norms. Therefore, the model is helpful and can be recommended for application in programs designed to prevent new infections as well as re-infections and drug resistance through directing HIV/AIDS counseling and education to be focused on social norms and perceived behavioral control. In addition, further studies are required to link the actual behavior of consistent condom use with intention and to look for their correlations with impacts in the prevention and control of the disease.

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