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## Anti-Retroviral Therapy Adherence among Women Living with HIV in Coimbatore District of Tamil Nadu, India

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### **Abstract:**

*Adherence to ART is a highly personalized patient related behavior which may need several adjustments in routine way of living, diet etc. Non adherence has been shown to be due to lack of better information of disease process, coping with side effects, cultural barriers, stigma associated with HIV etc. Accurate information about one's ART regimen and about what constitutes adequate adherence, high levels of adherence-related motivation and strong adherence- related behavioral skills are posited to underlie optimal adherence. Adherence levels were measured in 30 Women living with HIV/AIDS, in Coimbatore district, Tamilnadu, India. The Scores in the 3 domains of Information--Motivation--Behavioral Skills (IMB) model of adherence were calculated using the 'The Life Windows Information Motivation Behavioral Skills ART Adherence Questionnaire (LW-IMB-AAQ)' scale. The overall mean score for the three areas of IMB was above 50%, with highest score for behavioral skills followed by information and motivation. Scores in each domain were split into three levels - low, moderate and high and the percentage of patients in each level was calculated. Most of the patients had good information related to adherence. Majority of the patients had low total behavior score which is influenced by the low motivation and moderate adherence related behavioral skills. Correlation of the demographic variables showed that age had significant negative relationship with education and occupation was positively correlated with the period of infection.*

**Keywords:** Adherence, ART, Coimbatore, HIV, women

### **1. Introduction**

The National Aids Control Organization (NACO), Govt. of India guidelines has recommended that adherence to Antiretroviral treatment (ART) should be greater than 95% to avoid development of Antiretroviral (ARV) drug resistance. This means that missing greater than 3 doses per month is associated with an increased risk of drug resistance and failure of treatment<sup>1</sup>. Studies in different regions in India have reported about 50-70% of the study population had less than 95% adherence<sup>2</sup>. The risk of mortality was found to be fourfold higher among individuals who were non-adherent to ART than who were adherent<sup>2</sup>. Initially cost of ART was considered as the main factor for non adherence and since 2004 free ART centers have been set up by gov. of India and at present free ART is available for all<sup>3</sup>. Strategies are needed to improve quality of comprehensive adherence support services coupled with vigilant monitoring of adherence measurement to achieve optimal adherence to ART treatment<sup>4</sup>.

Adherence to ART is a highly personalized patient related behavior which may need several adjustments in routine way of living, diet etc<sup>3</sup>. Non adherence has been shown to be due to lack of better information of disease process, coping with side effects, cultural barriers, stigma associated with HIV etc. Accurate information about one's ART regimen and about what constitutes adequate adherence, high levels of adherence-related motivation and strong adherence- related behavioral skills are posited to underlie optimal adherence<sup>5</sup>. India with its various diversities, large population and high prevalence of HIV needs several individual regional assessments of the reasons for non adherence so as to attain the goal of 95% adherence. Hence this study was done to quantitatively assess levels of ART-related information, motivation, and behavioral skills among HIV positive women in Coimbatore district, India, using the Life Windows Information-- Motivation -- Behavioral Skills ART Adherence Questionnaire (LW-IMB-AAQ)<sup>6</sup>.

## 2. Methods & Materials

This is a descriptive survey that measured the antiretroviral therapy (ART) adherence following the constructs identified in the Information--Motivation--Behavioral Skills (IMB) model of adherence and identified the barriers to adherence among HIV positive women living in Coimbatore district. A purposive sample of 30 women living with HIV/AIDS, aged 29-59 years and residing in the town of Coimbatore in the state of Tamil Nadu were recruited through the Coimbatore Network for Positive Persons (CNP+), a support network for HIV-positive individuals. The study was described to the women affiliated with the network. Informed consent was obtained from all the women. Literate participants read the consent form themselves, while the interviewer read it out to those who were non-literate. The interviewer administered the questionnaires as a face-to-face interview. The study was done with the approval of Coimbatore district program officer, Tamil Nadu Aids Control Society (TANSACS).

Socio-demographic proforma comprised of baseline information regarding age, marital status, education, marital status, occupational status, number of children, type of family and period of infection. Items from the *'The Life Windows Information Motivation Behavioral Skills ART Adherence Questionnaire (LW-IMB-AAQ)'* were used to assess levels of ART-related information, motivation, and behavioral skills. This 33-item survey was originally developed for use in a software package that assesses adherence barriers and provides targeted intervention activities. Each LW-IMB-AAQ item represents a barrier primarily falling within the 'I' (Information), 'M' (Motivation), or 'B' (Behavioural Skills) constructs.

For purposes of the current study, items from the LW-IMB-AAQ were evaluated and two of the items (I know how my HIV medications interact with alcohol or street drugs & There are times when it is hard for me to take my HIV medications when I drink alcohol or use street drugs) were not included. The survey was conducted using 31 items. Adherence information (I) was assessed with eight items, adherence motivation (M) was assessed with ten items and behavioral skills (B) were assessed with thirteen items. According to the scoring instructions provided in the questionnaire; for each item, a response on the extreme end of a 5-point "strongly disagree" to "strongly agree" scale in the direction of 'correct' was assigned a value of '1', while other response options were scored '0'. Thus for each participant score '1' for each item indicates a response towards adherence and score '0' indicates the item as a barrier. The items were translated into Tamil. No changes were made to question phrasing. The average time required to administer the scale was 15–25 minutes.

Statistical analysis was done using SPSS-16. The mean scores of each of the three subscales were determined. Higher the score the better the adherence and lesser is the level of barrier. Scores for each domain of IMB (Information--Motivation--Behavioral Skills) were split into three levels - low, moderate and high and the percentage of patients in each level was calculated. Correlations of the total adherence score with the subscales were determined. Pearson's correlation coefficients were computed for outcome measures.

## 3. Results

The mean age of the female respondents was 40 years and 75% were between 29 to 40 years. 97% women were currently married while 3% women were widowed. Most of the respondents 60% were living in joint families and 40% had nuclear families. The group was predominantly literate, with 86% of the respondents having undergone primary to middle school education. Nearly 60% of the women were working. 80% of the women had children. Period of infection ranged from 5 to 13 years. All of them belonged to very low socioeconomic group. Mean score for the three areas of IMB was above 50%, with highest score for behavioral skills followed by information and motivation. (TABLE-1).

Subscale domain (score: least-highest)	Minimum score	Maximum score	Mean $\pm$ SD
Information(0-8)	3	8	5.7857 $\pm$ 1.5953
Motivation (0-10)	1	9	4.3214 $\pm$ 2.0914
Behavioral skills (0-13)	2	12	9.1429 $\pm$ 2.1894
Total score (0-31)	15	25	19.2500 $\pm$ 2.7971

Table 1: Mean scores of adherence in the three domains of IMB for women with HIV

Frequency distribution of patients in low, moderate and high adherence levels showed the total adherence level was low 18(60%) in majority of the patients, 10(33%) had moderate adherence and only 2(6%) had high level of adherence (TABLE 2). The number of patients in high level for information was 13(43%), with motivation and behavioral skills levels being 3(10%), 8(27%) respectively.

Correlation analysis of individual domain scale with total scale showed that there was significant positive correlation of total score with information (0.718,  $p < .01$ ) & motivation (0.556,  $p < 0.01$ ) and significant positive correlation of motivation with information (0.443,  $p < 0.05$ ). Correlation of the demographic variables showed that age had significant negative relationship with education and occupation was positively correlated with the period of infection and however they demonstrated no significant relation to adherence.

Subscale domain	Score level	Score value	Frequency (%) N=30
Information	Low	< 3	3(10%)
	Moderate	4 - 6	14(47%)
	High	7, 8	13(43%)
Motivation	Low	<4	18(60%)
	Moderate	5- 7	9(30%)
	High	8 – 10	3(10)
Behavioral skills	Low	<5	1(3%)
	Moderate	6 - 9	21(70%)
	High	10- 13	8(27%)
Total adherence behavior	Low	15-19	18(60%)
	Moderate	20- 24	10(33%)
	High	25- 31	2(6%)

Table 2: Frequency distribution of patients in low, moderate and high adherence levels

#### 4. Discussion

This study was done to assess levels of ART adherence in terms of ART-related information, motivation, and behavioral skills among women living with HIV in Coimbatore district of Tamil Nadu using the 'Life Windows Information Motivation Behavioral Skills ART Adherence Questionnaire' (LW-IMB-AAQ).

The IMB model of ART adherence is one of the few models of ART adherence in the literature that is based on a well-validated theory of health behavior change<sup>7</sup>. The model also specifies that the relations between adherence-related information and motivation and adherence behavior are mediated by adherence-related behavioral skills. In this study, patients had good information (moderate 47% & high 43%) related to adherence. Majority of the patients (60%) in this study had low total behavior score which is influenced by the low motivation in 60% of the patients and moderate adherence related behavioral skills in 70% of the patients.

In a study done by the NGO Asha on adherence to ART among village women in India, the average ART compliance for the sample was 48.3 at baseline. This low compliance rate may have resulted from the fact that the women perceived benefits to taking ART, such as feeling more energetic, having a better appetite, or being more able to care for their children. It is possible that when psychological support is offered and facilitated, major barriers for seeking and accepting care are lifted<sup>8</sup>.

In a study conducted in a private clinic in Mumbai, 73% of patients who paid for their ART had 95% adherence in the past four days; however, only 46% showed viral suppression, indicating poor long-term adherence<sup>9</sup>. Likewise, in a longitudinal assessment of a large hospital located in New Delhi, at 3-year follow-up, only about half (344) of the initial 631 enrolled HIV-positive patients were still seeking ART<sup>10</sup>. Participants who reported low (AOR: 3.58 [95% CI: 1.20-10.66]; p ¼ 0.021) and intermediate (AOR: 3.32 [95% CI: 1.28-8.63]; p ¼ 0.014) general health perceptions were over three times more likely to be non adherent compared to participants who reported high general health perceptions<sup>2</sup>.

##### 4.1. Limitations of the Study

Limitations of this study include the small sample; in addition, this study was conducted in only one center in Coimbatore district of Tamil Nadu, and cannot be generalized to other settings. Future research should assess the IMB model using multiple measures of ART adherence. Further research can be done using clinic-based interventions to enhance adherence based on the IMB model.

#### 5. Conclusion

The complexity of adherence and the importance of the factors related to the patient, medications, environment, and patient-provider relationship make adherence a phenomenon that is challenging to address. The range of barriers identified through this study is at the personal level and are influenced by the motivation and behavioral skills of the patients. Counseling should address these issues for optimal ART adherence.

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