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Factors affecting adherence to ART regimens among HIV-infected/AIDS-patients at Taksin Hospital

Thidarat Sujipittham[1], Vithaya Kulsomboon[2] and Usawadee Maleewong[3]

[1] *Master's degree Candidate, Graduate Program in Social and Administrative Pharmacy (International), Faculty of Pharmaceutical Science, Chulalongkorn University.*
[2] *Ph.D. Social and Administrative Pharmacy Department, Faculty of Pharmaceutical Sciences, Chulalongkorn University.*
[3] *Ph.D. Health Consumer Protection Program, Faculty of Pharmaceutical Sciences, Chulalongkorn University.*

Corresponding Author: Vithaya Kulsomboon. Email: sujipittham@hotmail.com
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Abstract

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This study was conducted to assess the adherence to ART medication regimens among HIV-infected/AIDS patients by using multiple adherence measurements, and to determine the relationships between study factors and patients' adherence to ART medication regimens. Data collection was conducted for a total of 200 patients through interviews using structured questionnaires in March, 2010, at the HIV/AIDS outpatient clinic, TAKSIN Hospital.

The study revealed that the majority of patients were male (53%), with an average age of 38.20 years. Most subjects were married (43.5%) and had completed primary school (35.5%). Fully 58.5% of the subjects were employed full-time or part-time in the private sector with incomes of less than 5,000 baht/month (42%). The average duration of treatment was 36.84 months. In all, 81.5% of the subjects suffered no adverse effects from taking ART, and 70.5% took ART medications twice a day. Multi-method adherence assessment consisting of self-report, the visual analogue scale, the pill identification test and pill count found that the majority showed good adherence (70%). Multivariate logistic regression analysis showed that sex, self-efficacy and patient-health care provider relationship were associated with adherence to ART regimens. In conclusion, being female, demonstrating self-efficacy and having good patient-provider relationships may increase adherence to ART regimens.

Keywords: adherence, HIV-infected, AIDS patients

Introduction

The Bureau of Epidemiology and the Department of Disease Control[1] (updated on 31 October 2009) reported that there were 358,260 people living with HIV/AIDS (PLWHA) and that 95,983 deaths from HIV/AIDS had occurred in Thailand. In this country, AIDS is the most important problem in public health because most PLWHA become infected between the ages of 15 and 59 years.1 They are mainly teenagers and working adults and they are an integral part of the economic labor pool of the country.

Presently, the standard regimen for treatment for the HIV-infected and those with AIDS is antiretroviral therapy consisting of three or more drugs in combination, which is called "highly active antiretroviral therapy" (HAART).[2,3] This combined antiretroviral therapy has demonstrated efficacy in improving the immune function, reducing the HIV virus in plasma to an undetectable level, reducing opportunistic drug resistance, improving quality of life, and reducing HIV-related morbidity and mortality.[2,4-7] In Thailand, PLWHA can have access to antiretroviral therapy (ART).1 They receive GPO-vir as the first treatment. GPO-vir is the standard regimen, which consists of Stavudine (d4T), lamivudine (3TC), and Nevirapine (NVP). In the case of those who cannot take GPO-vir, a physician will consider another regimen for antiretroviral therapy.

Several studies have found that adherence to antiretroviral regimens is essential for suppression of the viral load, strengthening the immune system, and reducing drug resistance.[3,4-7] Paterson et al. (2000) found that an adherence of more than 95 % is necessary for HIV viral suppression. They also examined the relationship between adherence and viral load (VL); they found that when adherence decreases, the viral load (VL) will increase in a dose-response effect.[8]

Punsrniramon (2006)[9] found that knowledge regarding the disease and antiretroviral therapy was associated with adherence to antiretroviral therapy. Golin et al.[10] found that self-efficacy in taking antiretroviral medicine would increase adherence. Schneider et al.[11] found that a good physician-patient relationship improved adherence. Punsrniramon found that good social support was associated with adherence.

However, previous research results are questionable because those research efforts used only one tool to measure adherence and thus those research findings may not be valid and may not have a high degree of accuracy. At TAKSIN Hospital, there were 1,080 new HIV-infected/AIDS patients between January, 2009, and December, 2009. Adherence data for TAKSIN Hospital collected in 2009 revealed that 99.3% of patients completed the adherence questionnaire and they had an adherence rate more than or equal to 95%. However, these results came only from an interview by nurses. A previous study of behavior and adherence to antiretroviral therapy using the simplified medication adherence questionnaire (SMAQ) of Knobel et al. (2002)[5] revealed that, in 48 cases involving HIV/AIDS patients, there were 26 cases (54%) of adherence (≥ 95%). There is no gold standard in the measurement of adherence[1] and the WHO in its 2003 recommended the use of multi-method measurement of patient adherence; the WHO recommends that accurate assessment of adherence is necessary for effective and efficient treatment planning. Assessing adherence via only one tool may not be valid and may not have a high level of accuracy.

The objectives of this research were to assess the adherence to ART medication regimens among HIV-infected/AIDS patients at TAKSIN hospital by using multiple adherence measurements, and to determine the factors affecting patient adherence to ART medication regimens.

Methods

This study was a cross–sectional study. This study focused on 200 HIV-infected/AIDS outpatients undergoing antiretroviral therapy at TAKSIN Hospital. A random sampling method was used. For multivariate analysis,13 the sample size calculation is 15 observations for each predictor variable or independent variable. Therefore, the sample size (n) was calculated as follows:

n=15* (number of independent variables)

This study was approved by the Ethics Committee of the Bangkok Metropolitan Administration for research involving human subjects. Data collection was conducted in March, 2010, through interviews, using structured questionnaires. The questionnaires were translated from English to Thai and back-translated to allow experts to check for content validity before the questionnaires were used.

The first questionnaire consists of demographic and treatment data and a self-efficacy scale translated from a study by Smith et al.[14]. Cronbach's alpha was equal to 0.76. Twelve items in the questionnaire asked patients to assess their self-efficacy in taking medicine in different situations. The questions consisted of statements using a Likert scale with the responses varying from "least self-efficacy" (1 point) to "highest self-efficacy" (5 points). Responses to these items led to the division of respondents into three groups using cut-off points at the 25th and 75th percentiles, as follows: (0.00-43.99) = low level, (44.00-57.99) = moderate level, (58.00-60.00) = high level.

Knowledge of the disease and of the medicine in a study by Suttinee Tunpongjaroen[15] had a Kuder-Richardson 20 rating of 0.71. The knowledge questionnaire used for the present study has 15 items; patients responded true, false, or unsure to each item. This study classified respondents into three groups with cutoff points at the 25th and 75th percentiles, as follows: (0.00-10.24) = low level, (10.25-12.99) = moderate level, (13.00-15.00) = high level.

The physician-patient relationship quality scale was translated from a study by Schneider et al.[16]. It has a Kuder-Richardson 20 score of 0.70. The questionnaire used 15 items to assess the relationship between health care providers and patients. The questions were graded by means a Likert scale and responses ranged from "poor" = 1 point to "excellent" = 5 points. Reponses were divided into three using cutoff points at the 25th and 75th percentiles, as follows: (0.00-51.99) = low level, (52.00-70.74) = moderate level, (70.75-75.00) = high level.

The MOS social support survey from the Medical Outcomes Study is translated from a study by Sherbourne[17]. The Cronbach's alpha for the questionnaire used in the study was 0.91; the questionnaire consists of 10 items which ask patients about social support. The questions were graded using a Likert scale and responses ranged from "None" (1 point) to "All of the time" (5 points). Reponses were classified into three groups using cutoff points at the 25th and 75th percentiles, as follows: (0.00-31.99) = low level, (32.00-47.99) = moderate level, (48.00-50.00) = high level.

Adherence to ART in this study was assessed by multiple adherence measurements consisting of self-report, the visual analogue scale (VAS), the pill identification test (PIT) and pill count[12]. The study analyzed the relationship between adherence and the factors affecting patient adherence to ART medication regimens by using the chi-square test and multivariate logistic regression analysis.

Table 1 illustrates how to interpret adherence to ART regimens when using the multiple adherence measurements.

Table 1 Interpretation of adherence to ART regimens using multiple adherence measurements

Self-report	No to all questions	Yes to 1 question	Yes to 2 or more questions
VAS	95% or more	75-94%	Less than 75 %
PIT-patient knows the…	Dose, time, and instructions	Dose and time	Dose only or confused
Pill count	95% or more	75%-94%	Less than 75%
Overall adherence	High	Moderate	Low

1. If the results appear in the same column, e.g. if responses to all self-report items is "no"; the VAS score is 95% or more, the respondent knows the dose, time and instructions (PIT) and the pill count is 95% or more accurate, then the overall level of adherence is "High".

2. If the results do not all line up in a single vertical column, i.e. when the results are spread over two columns, the adherence level of the right-hand column is taken as the estimated adherence, e.g. if self-report responses are "yes" to two or more questions, the VAS score is 75%-94 %, the PIT is correct for dose and time only and the pill count is 95% or more accurate, then the overall level of adherence is "Low".

3. If the results are spread over three columns, then the middle level of adherence is used, e.g. if self report responses give "yes" to one question, the VAS score is less than 75%, the PIT is accurate for dose and time only and the pill count is 95% or more accurate, then the overall level of adherence is "Moderate".

In this study, responses for the dependent variables (Y) were binary (0, 1), as follows: 0 = non-adherence, 1 = adherence; therefore: if the overall adherence score is high, it is rated as "Adherence" and if the overall adherence score is moderate or low, it is rated as " Non-adherence".

Results

Demographic data and treatment data The majority of subjects were male (53%), with an average age of 38.20 years. Of the total number, 43.5% were married and 35.5% had completed primary school. Only 58.5% were employed, and 42% had an income of less than 5,000 baht. The average duration of treatment was 36.84 months. Fully 81.5% of the subjects suffered no adverse events from undergoing ART, and 70.5% took ART medicine twice a day (Table 2.)

Table 2 Demographic and treatment data

Demographic data	No. of Patients	Percentage
Gender		
Male	106	53.0
Female	94	47.0
Status		
Single	82	41.0
Married	87	43.5
Widowed/ divorced / separated	31	15.5
Education		
No schooling	4	2.0
Primary school	71	35.5
Secondary school	57	28.5
High school	34	17.0
Diploma	8	4.0
Bachelor's degree	26	13.0
Occupation		
Unemployed	17	8.5
Day laborer / private sector employee	117	58.5
Head of family/ housekeeper	19	9.5
Government official / state enterprise	2	1.0
Storekeeper	45	22.5
Income		
< 5,000 Baht	84	42.0
5,000-10,000 Baht	75	37.5
10,001-15,000 Baht	20	10.0
15,001>20,000 Baht	21	10.5
Adverse events		
Adverse events	37	18.5
No adverse events	163	81.5
Dose frequency		
One time/day	53	26.5
Two times/day	141	70.5
Three times/day	6	3.0

Knowledge of disease and medicine Patients had an average knowledge score of 11.89, with a maximum score of 15, and a minimum score of 6. The item which stated, "You have to take medicine on time according to physicians' instructions" was answered correctly by the largest number of respondents (99%), while the lowest number of respondents (50.5%) correctly responded to the prompt, "If, when you take medicine, you have a mild rash and itching, you should stop taking the medicine ".

Self-efficacy in taking antiretrovirals Patients had an average self-efficacy score of 49.47, with a maximum score of 60, and a minimum score of 16. The item with the highest self–efficacy ART response, with a score of 4.58, was item 1 "when you are at home", and lowest average score of 3.68 was for item 5 "when the medicine causes mild side effects".

Social support Patients had an average social support score of 38.49, with a maximum score of 50, and a minimum score of 10. The highest average score in social support (4.05) was for item 7, "You have someone who loves you", and the lowest average score (3.59) was for item 6, "You have someone accompany you to see the doctor if you need it".

Physician-patient relationship Patients had an average physician-patient relationship score of 60.25, with a maximum score of 75 and a minimum score of 18. The highest average score among the patient-provider relationship responses was for item 15, "You trust your health care provider in his/her treatment", and the lowest average score was for item 9, "Your healthcare provider gets you to participate in selecting the medicine that you prefer".

Adherence to ART regimen: It was found though the use of multiple methods that the majority (70%) of HIV-infected/AIDS patients adhered; 30% of them were non-adherent, as can be seen in Table 3.

Table 3 Adherence to ART regimens

Adherence	No. of Patients	Percent
Non-adherence	60	30.0
Adherence	140	70.0

Relationship between study factors and patient adherence to ART medication regimen Gender, self-efficacy in taking ART medicines and patient-health care provider relationships were significantly associated with adherence to ART medicine regimens ($p<0.05$) as shown by the chi-square test and multivariate logistic regression, displayed in Table 4.

Table 4 Results of Chi-square tests and multivariate logistic regression

	p-value of Chi-square test	Adjusted Odds Ratio	95 % C.I. for OR		p-value
			Lower	Upper	
Gender	0.026*				
Male		1.000			
Female	2.501	1.244	5.031	0.010*	
Self-efficacy	0.001*				
Low self-efficacy		1.000			
Moderate self-efficacy		2.656	0.794	8.884	0.113
High self-efficacy		4.126	1.444	11.789	0.008*
Patient-provider relationship	0.001*				
Low patient-provider relationship		1.000			
Moderate patient-provider relationship		4.367	1.485	12.846	0.007*
High patient-provider relationship		1.699	0.652	4.425	0.278
Constant		0.045			<0.001*

* Significant at p-value < 0.05

Discussion

This study shows that the majority of HIV-infected/AIDS patients did not know what to do when they suffer a mild adverse event due to ART medicine. They usually stop taking medicine when experiencing a mild adverse event. This situation can increase drug resistance and lead to treatment failure in the future. Therefore, healthcare providers should provide the important information that when faced with a mild adverse event they should go back to see the doctor. These results show that the majority of HIV-infected/AIDS patients demonstrated the least self-efficacy in taking ART medicine when the medicine was causing mild side effects. This situation can increase drug resistance and lead to treatment failure in the future. Therefore, healthcare providers should counsel patients faced with an adverse event from antiretroviral treatment to keep taking ART regularly and on time regularly. The majority of HIV-infected/AIDS patients did not have someone accompanying them to see the doctor. Therefore, health care providers have to advise patients regarding the positive social support of patients receive from such people as parents, siblings, relatives, friends and boyfriend/girlfriend so that the

caregiver is able to provide support to patients. This will increase the effectiveness of patients' treatment. In addition, healthcare providers have to create the best relationship between patient and healthcare providers. For example, healthcare providers should be friendly, helping the patient to solve problems in taking ART medicines, asking the patient about stress that may affect health, and ascertaining that their treatment of the patient is effective.

Adherence of HIV-infected/AIDS patients to ART medicine regimens must be calculated by using multi-methods such as self-report, the visual analogue scale (VAS), the pill identification test (PIT) and pill count, according to the recommendations of the WHO. The WHO also recommended that accurate assessment adherence was necessary for effective and efficient treatment planning by using many tools as referenced in the study of Steel et al.[12]. A clear majority (70 percent—140 cases) of HIV-infected/AIDS adhered well to their ART regimen. This study shows that the majority of HIV-infected/AIDS patients had adherence rates equal to or more than 95%. This study found that sex, self-efficacy in taking ART medicine and good patient-health care provider relationships were significantly associated with increased adherence to ART regimens. Female gender was associated with increased adherence to the ART regimen, which is similar to findings in a study by Littlewood et al.,[18] which found that women displayed increased adherence. Self-efficacy was associated with increased adherence to ART regimens, which is similar to the results found by Golin et al.,[10] showing that self-efficacy had an effect on adherence. The patient-healthcare provider relationship was associated with increased adherence to the ART regimen, which is similar to results in a study by Schneider et al.[17]. Therefore, health care providers should administer the programs in such a way as to enhance the self-efficacy of the HIV/AIDS patients and also further establish a good relationship between patients and providers in order to increase the adherence level. This will ultimately improve the effectiveness of treatment for HIV/AIDS patients.

Recommendations

1. A multi-method study is more effective in establishing adherence than the use of only one method because it increases accuracy and validity for assessment of adherence.

2. This study measured adherence to the ART regimen at only one time. Therefore, further studies should be designed to measure adherence to ART regimens every three months or every six months to analyze adherence to ART regimens over time.

3. A pharmacist should be one member of the health care team taking care of HIV-infected/AIDS patients in order to give information about the ART medications that they take. They can give advice to patients regarding antiretroviral therapy side effects in order to improve the provider-patient relationship and help to create perceptions that influence patients' adherence to ART regimens.

4. Healthcare providers should consider providing a private room for HIV-infected/AIDS patient consultations. This room can also be used for patient activities with their friends. Healthcare providers should be friendly, helping patients to solve problems in taking ART medicines and asking patients about stress that may affect their health so as to enhance self-efficacy in taking medicine and increase adherence

to ART regimens. It helps create a better relationship between patients and healthcare providers, for example, enhancing the patient's ability to confide in healthcare providers without fear and enabling them to ask any questions about problems in taking medicine or the adverse effects of the medicine or any other worries.

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