

สมรรถนะแห่งตนในผู้ป่วยเอดส์ที่ได้รับการรักษาด้วยยาต้านไวรัสเอดส์

Self-Efficacy of AIDS Patients Receiving Antiretroviral Therapy

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การศึกษาวิจัยครั้งนี้ มีวัตถุประสงค์เพื่อประเมินสมรรถนะแห่งตนของผู้ป่วยเอดส์ที่ได้รับยาต้านไวรัสเอดส์ และปัจจัยพยากรณ์สมรรถนะแห่งตนของผู้ป่วยเอดส์ที่ได้รับการรักษาด้วยยาต้านไวรัสเอดส์

กลุ่มตัวอย่าง เป็นผู้ป่วยเอดส์ทุกรายที่ได้รับการรักษาด้วยยาต้านไวรัสเอดส์อย่างน้อย 6 เดือนที่มารับการรักษาที่คลินิกโรคติดเชื้อในระหว่างช่วงทำการศึกษ จำนวน 177 ราย เก็บข้อมูลโดยใช้แบบสัมภาษณ์สมรรถนะแห่งตนของผู้ป่วยเอดส์ที่ได้รับยาต้านไวรัสเอดส์ และแบบสอบถามความวิตกกังวล และความซึมเศร้าฉบับภาษาไทย วิเคราะห์ปัจจัยการทำนายสมรรถนะแห่งตน ด้วยสถิติ Multiple regression

ผลการศึกษาพบว่าสมรรถนะแห่งตนของผู้ป่วยเอดส์ที่ได้รับยาต้านไวรัสเอดส์โดยรวมอยู่ในระดับสูง ($\bar{X} = 3.27 \pm 0.37$) และมีสมรรถนะแห่งตนทุกด้านอยู่ในระดับสูง ในด้านความรับผิดชอบต่อสุขภาพ ($\bar{X} = 3.39 \pm 0.38$) ด้านการพัฒนาจิตวิญญาณ ($\bar{X} = 3.30 \pm 0.57$) ด้านการมีสัมพันธภาพระหว่างบุคคล ($\bar{X} = 3.23 \pm 0.57$) ด้านการจัดการกับความเครียด ($\bar{X} = 3.18 \pm 0.57$) ด้านโภชนาการ ($\bar{X} = 3.12 \pm 0.58$) และด้านการทำกิจกรรมและการออกกำลังกาย ($\bar{X} = 2.94 \pm 0.64$) ส่วนปัจจัยพยากรณ์สมรรถนะแห่งตนของผู้ป่วยเอดส์ที่ได้รับยาต้านไวรัสเอดส์ ได้แก่ ผู้ป่วยที่มีสถานภาพสมรสคู่จะมีสมรรถนะแห่งตนต่ำกว่าผู้ที่โสด ($b = -3.40, p = 0.04$) ความวิตกกังวลที่เพิ่มขึ้นจะทำให้สมรรถนะแห่งตนลดลง ($b = -0.66, p < 0.01$) เช่นกัน และความซึมเศร้าที่เพิ่มขึ้นจะทำให้สมรรถนะแห่งตนลดลง ($b = -0.84, p < 0.01$) โดยมีอำนาจการทำนายความแปรปรวนสมรรถนะแห่งตนของผู้ป่วยเอดส์ที่ได้รับการรักษาด้วยยาต้านไวรัสเอดส์ได้ ร้อยละ 24

คำสำคัญ: สมรรถนะแห่งตน ผู้ป่วยเอดส์ที่ได้รับการรักษาด้วยยาต้านไวรัสเอดส์

Abstract:

The purpose of this study was to assess the level of self-efficacy in AIDS patients receiving ART and to determine predictive factors affecting self-efficacy in AIDS patients. Our sample of 177 AIDS patients were all AIDS patients who had been receiving ART for at least 6 months and had visited our infectious clinic during the study period. Data were collected using: The Perceived Self-Efficacy for Receiving Antiretroviral Therapy Scale (PSEARTS) and Thai Hospital Anxiety and Depression Scale (Thai HADS). The multiple regression was used to identify factors relating to self-efficacy.

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The findings indicated that the level of self-efficacy of AIDS patients receiving ART was high (\bar{X} = 3.27, S.D. = 0.37), as were all other individual aspects including health responsibility (\bar{X} = 3.39, S.D. = 0.38), spiritual development (\bar{X} = 3.30, S.D. = 0.57), interpersonal relationships (\bar{X} = 3.23, S.D. = 0.57), stress management (\bar{X} = 3.18, S.D. = 0.57), nutrition (\bar{X} = 3.12, S.D. = 0.58) and physical activity and exercise (\bar{X} = 2.94, S.D. = 0.64). Factors predicting self-efficacy of AIDS patients receiving ART were marital status, anxiety and depression. AIDS patients who were married had lower self-efficacy than single patients (b = -3.40, p = 0.04), as did those who had high anxiety levels (b = -0.66, p < 0.01). Patients with high depression scores also had lower levels of self-efficacy (b = -0.84, p < 0.01). The prediction ability of self-efficacy to AIDS patients receiving antiretroviral therapy was 24%.

keywords: self-efficacy, AIDS patients receiving antiretroviral therapy

Background:

Antiretroviral therapy (ART) has helped reduce the mortality rate of people living with AIDS (PLWA), as well as to help reduce symptoms and improve their quality of life (QOL)^{1,2}. In the year 2000, the Access to Care (ATC) program began administering ART nationwide in Thailand³. It was expanded into the National Access to ARVs for People Living with HIV/AIDS (NAPHA) in 2004 and subsequently integrated into the Universal Coverage (UC) system⁴. While international experience had previously demonstrated the difficulties with adhering to burdensome pill taking regimens involved in early ART⁵ (With many of those early regimens having more than 20 pills that were divided up into 3 daily doses⁶), the Thai GPO, the main supplier of generic ARV's in Thailand, was able to manufacture a fixed-dose pill containing 3 ARV agents (d4T/3TC/NVP) called GPO-VIR^{7,8}. This vastly simplified the burden of adhering to a daily drug regimen.

As treatment has expanded in Thailand for PLWA after the release of GPO-VIR, there has been concern about the possibility that people with low levels of adherence could become resistant to the new ART⁹. Rates of drug resistance in Thailand have gone up from

< 1% in 2003 to 5.2% in 2006¹⁰. Modeling has also shown that after 10 years of universal ART, without monitoring of treatment failure and optimizing therapy, approximately 24% of new infections could include drug resistant mutations¹¹. In light of this, adherence to ART has become extremely important in low and middle-income countries, primarily because of the expense of second-line therapies that would be needed if first-line therapies fail and the loss of life due to inadequate medicines. Thus, factors involved in maintaining a high level of adherence are crucially important. High levels of self-efficacy (the belief that an individual can accomplish a task) are very important when individuals are taking an ART. The relationship between AIDS patient's self-efficacy and factors affecting self-efficacy is a vital component for AIDS patients receiving ART and for teams of health personnel who care for them. These ideas are influenced by the fact that many AIDS patients suffer from a disease caused by engaging in inappropriate behaviors¹². Moreover, the chronic and incurable nature of AIDS creates numerous physical, emotional, social, and economic problems. They may often occur simultaneously and many of which could be eased through the strengthening of patients' self-efficacy. Their adherence to and

practice of a model of self-efficacy promotion, as such formulated by Bandura¹³ as a long term goal, are vital. It is important for the AIDS patient to understand that knowing one's own efficacy is an important element leading to alterations in personal behavior.

Objective:

The purpose of this research was to assess the level of self-efficacy in AIDS patients receiving ART and study the factors that affected self-efficacy of AIDS patients at Khon Kaen Hospital in Khon Kaen, Thailand. As well as to provide information to officers on the hospital health team so that they could help those patients with low self-efficacy to become better able to remain adherent to their daily drug regimen.

Methods:

Descriptive research, approved by the Khon Kaen University Ethics Committee in Human Research (KKUEC) was used to study self-efficacy and the factors that affect self-efficacy of AIDS patients taking AIDS antiviral drugs. The sample of 117 AIDS patients between 15–60 years of age, included old and new patients that were taking AIDS antiretroviral drugs for at least 6 months and visited the infectious clinic at Khon Kaen Hospital during the study period. The data was collected to evaluate the self-efficacy of AIDS patients who had been taking AIDS antiretroviral drugs. The data was collected using the Perceived Self-Efficacy for Receiving Antiretroviral Therapy Scale (PSEARTS) questionnaire, which had been tested for content validity by 9 experts and tested for reliability by using Cronbach's alpha coefficient, which was 0.94 in this study. The questionnaire used a 4 level Likert's scale, and consisted of 26 questions. Scores between, 3.50–4.0 meant having very high self-

efficacy; 2.5–3.49 high self-efficacy; 1.50–2.49 medium self-efficacy and 1.0–1.49 meant having low self-efficacy. The evaluation of anxiety and depression was done by using the Hospital Anxiety and Depression Scale (Thai HADS), which had previously been translated into Thai by Nilchaikovit et al.¹⁵ and showed good reliability and validity of anxiety and depression. The Cronbach's alpha coefficient for the anxiety sub-scale and depression sub-scale in that study were 0.86 and 0.83 respectively. The Cronbach's alpha coefficient for anxiety sub-scale and depression sub-scale were 0.74 and 0.78 respectively in this study. The validity of the anxiety sub-scale and the depression sub-scale showed sensitivity and specificity of 100% and 86.0% respectively for the anxiety sub-scale and 85.7% and 91.3% respectively for the depression sub-scale at the cut of point of >11. The Thai HADS consists of 14 items, where odd numbered questions are for anxiety, and even numbered questions relate to depression, each item uses a Likert's 4 level scoring system from 0 to 3. The total sub-score range is from 0 to 21, higher scores mean higher levels of anxiety and depression.

The demographic information and data related to self-efficacy of the sample group was analyzed using descriptive statistics. The information concerning gender, age, marital status, education, income, anxiety, and depression was analyzed using multiple regression analysis. The analysis was used to predict the self-efficacy of AIDS patients, who had been receiving ART.

Results:

The demographics of the sample group of 177 AIDS patients, who had been receiving ART, were such that the majority was female (55.4%). The average age was 36.7 7.01 years old. Almost half (44.6%)

of the AIDS patients taking AIDS antiretroviral drugs finished primary school. 52% were married, and 42.9% were employed. The patients had an average income of 5,000 baht per month, everyone in the sample group was Buddhist, and most of them (81.9%) were from Khon Kaen Province. We found that 81.4% had been infected through heterosexual intercourse. According to the doctor's diagnosis, the length of infection was between 3 months and 20 years (median = 5 years). 62.7% had been taking AIDS drugs longer than 12 months, and 73.4% were taking GPO-VIR. The vast majority (98.9%), had been taking drugs correctly more than 95% of the time (medication adherence).

Furthermore, most of them (54.2%) had never changed their drug formula. For the patients (45.8%) that had changed their drug formula, it was found that the most common reason (27.7%) was severe side-effects. There were statistically significant changes of all important health indicators of AIDS patients before and after receiving ART ($p < 0.001$). The mean difference of CD4 cell count was 260.78 cells/mm³ (95% CI = 224.67 to 296.87), similarly the mean difference of body weight was 6.76 kg (95% CI = 5.64 to 7.88). The BMI's mean difference was 2.62 kg/mm² (95% CI = 2.18 to 3.07) and those of Karnofsky's score was 29.04 (95% CI = 25.43 to 32.63). All important health indicators indicated the improvement of the health status of the AIDS patients receiving ART (see Table 1).

Table 1 The Changes of health indicators of the AIDS patients before and after receiving ART (n=117)

Variables	Before After Receiving ART		Mean difference of Health Indicator before and after receiving ART	95%CI	p-value
	Mean (SD)	Mean (SD)			
CD ₄ cell count (cells/ mm ³)	87.43 (92.18)	348.21 (187.33)	260.78	224.67, 296.87	<0.001
Body weight (Kg)	48.84 (9.54)	55.60 (9.44)	6.76	5.64, 7.88	<0.001
BMI (kg/mm ²)	19.01 (3.48)	21.63 (3.06)	2.62	2.18, 3.07	<0.001
Karnofsky's score (0-100 score)	65.34 (25.76)	94.38 (9.77)	29.04	25.43, 32.63	<0.001

It was found that 53.1% of AIDS patients, who had been receiving ART, had rather good relationships with family members, and 54.2% had very good relationships with friends and colleagues. 43.5% of AIDS patients were aware that society rarely accepted their infection status, and 27.1% were highly uncomfortable about revealing this status.

It was also found that the AIDS patients in the study had high self-efficacy (\bar{X} = 3.27, SD = 0.37), and that the self-efficacy in the subcategories of responsibility toward health (\bar{X} = 3.39, SD = 0.38), spirituality improvement (\bar{X} = 3.30, SD = 0.57), interpersonal relationships (\bar{X} = 3.23, SD = 0.57),

stress management (\bar{X} = 3.18, SD = 0.57), nutrition (\bar{X} = 3.12, SD = 0.58), and activities and exercise (\bar{X} = 2.94, SD = 0.64) were all at a high level.

To predict the self-efficacy of AIDS patients in this study, information involving gender, age, marital status, education, income, anxiety, and depression was analyzed. It was found that married AIDS patients had lower self-efficacy than single patients (b = -3.40, p = 0.04). AIDS patients who had increased anxiety levels, had lower self-efficacy (b = -0.66, p < 0.01), and AIDS patients with higher levels of depression had reduced self-efficacy (b = -0.84, p < 0.01). This model had 24% ability for prediction, as shown in Table 2.

Table 2 The relationship between predicting factors and the self – efficacy among AIDS patients

Variable	N	Mean (SD)	b	95% CI	p-value	R ²
Marital status						0.24
Single	34	83.79(9.73)	-			
Married	92	80.02(8.76)	-3.40	-6.65, -0.16	0.04	
Widow/divorced/ separated	51	83.29(9.52)	-1.13	-4.72, 2.44	0.531	
Anxiety	177	5.24(3.43)	-0.66	-1.12, -0.20	<0.01	
Depression	177	2.88(2.88)	-0.84	-1.39, -0.29	<0.01	

Discussion:

The demographics of the 177 people in the sample group were similar to previous data involving AIDS patients in Thailand^{16,17}. Furthermore, it was found that the AIDS patients in this study had an average income of 5,000 baht per month. This suggests that these AIDS patients, by and large did not have economic problems, had better health and could

support themselves^{18,19,20}. Their income was higher than the per capita income of the population in the northeast region of Thailand²¹. All the subjects in this study were Buddhist, and they were all from Khon Kaen Province or from other provinces in the northeast region. It is possible that the patients became infected while working in other areas and then returned to their hometowns after having become sick^{22,23}.

The majority (81.4%) of AIDS patients in this study were infected from having heterosexual intercourse. Other studies in Thailand have also found that the patients became infected in the same manner^{16,17}. Most (73.4%) of the patients were using GPO-VIR. Almost half of the sample group (45.8%) changed to a different ART drug, the most common reason (27.7%) being the drug's side-effects. This coincided with studies domestically and abroad, where it has been found that doctors had to modify drug formulas for patients who had side-effects^{24,25,26,27}. Fortunately, we found that patients had good relationships with their families, as well as good relationships with friends and colleagues (53.1 and 54.2%, respectively). However, in terms of social acceptance, 43.5% of the AIDS patients in this study thought that society still did not accept them much. More than one-quarter (27.1%) were uncomfortable revealing their infection status. This was similar to a 1999 study from Imane and Pongsajjai, who found that if the family relationship was good, the patients would get love and compassion from the family²⁸. Acceptance from the village and anyone outside the family was different and varied, and this caused the patients difficulty in adjusting physically and mentally. This caused the patients to feel uncomfortable about revealing their infection status. Patients from a 2003 Saengsuwan study felt similarly. Saengsuwan found that the most significant problem in taking care of HIV-infected patients at home or in society in general, in the northeast region of Thailand, was social acceptance²⁹. Social acceptance was also a problem in another study among HIV-infected and AIDS patients when staying at home³⁰.

We found that the patient's average self-efficacy was high. This was the case for all items measured among the sample group, which were all high to very

high. In addition, this research found that important indicators such as CD4 cell count, body weight, BMI, and Karnofsky's Score were all related to self-efficacy. In this study, self-efficacy predicted the behaviors of individuals, which has also been shown in several studies in the past^{14,31,32,33,34,35,36,37}.

Because self-efficacy of AIDS patients in this study was high, this indicated that the patients believed and had confidence in complying with health behaviors that would lead to positive results. The vast majority of patients (98.9%), had been taking drugs correctly more than 95% of the time which may have led to the improvement of patients' health status (Table 1), which has been reported before^{13,14}. However, the rate of overall drug resistance in Thailand has gone up 10. The body of knowledge provides explicit guidelines for how to structure psychological programs to produce widespread changes in health habits and how to restructure medical services to enhance their effectiveness and social impact. Moreover, the lessons learnt from past experiences in regards to behaviorally transmitted diseases should not be lost. The history of efforts to control diseases transmitted by one's behavior underscores the need for a multifaceted approach combining medical measures with psychosocial preventive programs. For example, with the development of a simple treatment for venereal disease, support for psychosocial control programs were curtailed, which resulted in a rise in infection rates³⁸.

We found that gender and age were not factors that affected the self-efficacy of AIDS patients, who had been receiving ART. Being infected with a chronic disease affects the body, psychosocial, personal, economic and social status of an individual³⁹. In addition, regardless of gender or age, being infected with AIDS affects a person's self-worth more

than the sickness involved with AIDS itself⁴⁰. Other studies from Pongsomboon, Wongchoo, and Bintajit, respectively, have found this also^{41,42,43}. Those studies found that gender and age did not have any relationship with self-care behaviors and health behaviors among HIV-infected patients.

Furthermore, our research also found that education and income did not have any relationship with the self-efficacy of AIDS patients. Perhaps it was because AIDS patients had been through medical consultations and had received information from healthcare personnel. The information included how to get the best quality ART treatment according to the health centers from each hospital before taking antiviral drugs (DOH, 2007). Previous studies^{14,41,42} as well as Bintajit's study also confirmed the lack of correlation between education, and self-efficacy⁴³. Currently, antiretroviral therapy is supported by the government without expense to the patient, and patients are able to receive ART easily from the government's project for ART⁴⁴. Hence, income did not have any relationship with the self-efficacy of AIDS patients in our study. This coincided with other studies which stated that income did not have any relationship with health behaviors or self-care behaviors of HIV-infected patients^{41,42,43}.

In terms of marital status, it was found that marital status did have a relationship with self-efficacy in this research. It was revealed that married AIDS patients had a tendency to have lower self-efficacy than the patients that were single. It was possible that the single patients had to help themselves when sick more than patients who were married. This may have been because married patients had their spouses helping and taking care of them. Therefore, married patients had a tendency to have lower self-efficacy than that of single

patients. The results from our research were different from a study done by Chaicharearn in 2000, where it was shown that married patients had better support from society than single patients and had higher self-efficacy⁴⁵.

In terms of anxiety and depression we found that patients with higher levels of anxiety and depression had lower self-efficacy. It has been found that anxiety and depression can be caused by mental disorders which have been found in HIV-infected patients⁴⁶. Anxiety and depression not only cause changes in emotions they also can affect the body and impact the immune system⁴⁷. In order to treat HIV-infected patients, who had been receiving ART, it is important to consider mental problems. A 1997 study by Sarakarn in Thailand, found that the anxiety levels of HIV-infected patients in Chaing Mai Province, who had received medical consultation, tended to be less than the patients who had never been consulted⁴⁸. In addition, previous research has shown that anxiety among HIV-infected patients, who had been treated at Samutsakorn Hospital was prevalent in 17.3% of the patients⁴⁹. Results from Pinkaew's study in 2008 showed that HIV-infected and AIDS patients from Nonsaard Hospital in Udonthani Province, had lower overall mental health than the general population⁵⁰. Having anxiety and depression affected patients' self-efficacy in our study, and when AIDS patients were anxious and depressed they took antiretroviral medicine incorrectly, incompletely and inconsistently. As a result patients may become resistant to the medicine, and this is not good for the patient, or society. The officers in this study's hospital were encouraged to pay more attention to the analysis on anxiety and depression among AIDS patients. This included providing help to improve self-efficacy. As a result of studying self-efficacy in this research, it was found that self-efficacy among the sample group was

already high. Therefore, it was recommended that there be a proactive plan to maintain high self-efficacy and increase self-efficacy when necessary. This will help the patients with medication adherence and may reduce the resistance to ART drugs in the future. Nevertheless, there are some limitations to this study. This research involved studying self-efficacy among patients within the same hospital in the northeast region of Thailand, and it does not represent the Thai population as a whole.

According to this research, it may be concluded that self-efficacy is an important factor when considering the care of AIDS patients. The healthcare personnel from the Department of Health (DOH), who has been involved in work related to AIDS, has recommended analyzing and providing support to AIDS patients so to lessen their anxiety and depression. Acknowledgement

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References:

1. Rakrungtam K. Research on AIDS preventive medicine with effectiveness measured in clinical research. In: Rakrungtam K, Editor, The evaluation and synthesis on the knowledge regarding AIDS: Clinical research. Bangkok: Chonpim; 1998. p. 219-65.
2. Casseb J, et al. AIDS incidence and mortality in a hospital-based cohort of HIV - 1 - seropositive patients receiving highly active antiretroviral therapy in Sao Paulo, Brazil. *AIDS Patients Care and STDs* 2003; 17(9): 447-52.
3. Chasombat S, McConnell MS, Siangphoe, U, Yuktanont P, Jirawattanapisal T, Pinyopornpanich S. National expansion of antiretroviral treatment in Thailand, 2000-2007: Program scale-up and patient outcomes. *J Acquir Immune Defic Syndr* 2009; 50(5): 506-12.
4. Le Coeur S, Collins IJ, Pannetier J, Leievre E. Gender and access to HIV testing and antiretroviral treatments in Thailand: Why do women have more and earlier access? *Soc Sci Med* 2009; 69: 846-53.
5. Ainsworth M, Beyrer C, Soucat A. AIDS and public policy: The lessons and challenges of 'success' in Thailand. *Health Policy* 2003; 64: 13-37.
6. Bangsberg DR, Ragland K, Monk A, Deeks SG. A single tablet regimen is associated with higher adherence and viral suppression than multiple tablet regimens in HIV+ homeless and marginally housed people. *AIDS* 2010; 24: 2835-40.
7. Sungkanuparph S, Manosuthi W, Kiertiburanakul S, Piyavong B, Chumpathat N, Chantratita W. Options for a second-line antiretroviral regimen for HIV type-1-infected patients whose initial regimen of a fixed-dose combination of Stavudine, Lamivudine, and Nevirapine fails. *Clin Infect Dis* 2007; 44(1): 447-52.
8. Tantivess S, Walt G. The role of state and non-state actors in the policy process: The contribution of policy networks to the scale-up of antiretroviral therapy in Thailand. *Health Policy and Planning* 2008; 23:328-38.
9. Li L, Lee S-J, Wen Y, Lin C, Wan D, Jiraphongsa C. Antiretroviral therapy adherence among patients living with HIV/AIDS in Thailand. *Nurs Health Sci* 2010; 12:212-30.

10. Apisarnthanarak A, Jirayasethpong T, Sa-nguansilp C, Thongprapai H, Kittihanukul C. Antiretroviral drug resistance among antiretroviral-naïve persons with recent HIV infection in Thailand. *HIV Med* 2008; 9:322–25.
11. Hoare A, Kerr SJ, Ruxrungtham K, Ananworanich J, Law MG, Wilson DP. Hidden drug resistant HIV to emerge in the era of universal treatment access in Southeast Asia. *PLoS ONE* 2010; 5(6):1–8.
12. Glanz K, Rimer KB, Lewis MF (Eds). *Health Behavior and Health Education: Theory, Research and Practice*. (3rd Ed.). Foreword by Noreen. San Francisco: Jossey-Bass A Wiley Imprint; 2002
13. Bandura A. *Self-efficacy: The exercise of control*. New York: W.H. Freeman & Company; 1997.
14. Boonyaleepan S. A Causal model of health behaviors of AIDS patients receiving antiretroviral therapy [dissertation]. Khon Kaen: Khon Kaen Univ.; 2007.
15. Nilchaikovit T, Lortrakool M, Paisalsutidet U. The development of the questionnaire on Hospital Anxiety and depression scale in cancer patients, Thai version. *The Journal of The Psychiatric Association of Thailand* 1996; 41(1): 18–30.
16. Bureau of Epidemiology, Department of Disease Control, Department of Health. Situations with AIDS patients on 30 April 2008; 2008 (copies).
17. Bureau of Epidemiology, Department of Disease Control, Department of Health. Situations with AIDS patients on 30 April 2009; 2009 (copies).
18. Ward WJ, Drotman PD. Epidemiology of HIV and AIDS. In: Wormser, PG, editor, *AIDS and other manifestations of HIV infection*. 3rd ed. New York: Lippincott-Raven; 1998. p.1–14.
19. Silvestri G, Feinberg BM. Immune intervention in AIDS. In: Kaufman HES, Sher A, Ahmed R, editors, *Immunology of infectious diseases*. Washington, D.C.: AMS Press; 2002. p.453–47.
20. Raychaudhuri PS, Kundu-Raychaudhuri. Human immunodeficiency virus infection: Potential therapies for immunological reconstitution. In: Lichtenstein ML, Busse WW, Geha SR, editors, *Current therapy in allergy, immunology, and rheumatology*. 6th ed. Philadelphia: Mosby; 2004. p.372–85.
21. Office of the National Economic and Social Development Board. Prime Minister's Office. Per capita income in each area, 2004–2008. [online] 2008 [cited 2009 October 30] Available from: http://service.nso.go.th/nso/nso_center/project/table/file_form.jsp?pro_code=0101200&year=2551.
22. Ungchusak K et al. Survey result on the prevalence of HIV infection in Thailand, 13th round (June 1995). *AIDS* 1995;7(4): 177 – 89.
23. Coordinating Committee of NGO Development for North East Rural Area. *NGOs North East area: Alternatives for power of change*. Bangkok: Pimdee; 1997.
24. Sangkanupab S et al. editors. *Methods to take care of HIV infected and AIDS patients in Thailand, 2006/2007*. Bangkok: The Agricultural Co-operative Federation of Thailand; 2007.
25. Sritalanuk, V. The Pharmaceutical care of AIDS patients using triple antiretroviral therapy in Surin Hospital. *Journal of Si Saket, Surin & Buri Rum Hospital* 2002; 17(1), 1–17 [in Thai].

26. Hammer MS, Squires EK, Hughes DM, Grimes MJ, Demeter ML, Currier SJ, Eron JJ et al. A controlled trial of two nucleoside analogues plus Indinavir in persons with Human Immunodeficiency virus infection and CD4 cell counts of 200 per cubic millimeter or Less. *New England J Med* 1997; 337(11): 725-33.
27. Wormser PG, Horowitz WH. Care of the adult patient with HIV infection. In: Wormser PG, editor, *AIDS and other manifestations of HIV infection*. 3rd ed. New York: Lippincott-Raven Publishers; 1998. p.289-348.
28. Imae V, Pongsajjai S. Resource allocation and responses from the families toward illness with AIDS. Nakornpatom: Mahidol Univ.; 1999.
29. Saengsuwan J et al. Research on Development of the continuum care for HIV/AIDS patients at home in Northeastern communities. Khon Kaen: Faculty of Nursing, Khon Kaen Univ.; 2003.
30. Laohasiriwong W, Sangsuwan J, Boonyaleepun S, Sangchaisuriya P, and Siripakarn P. Research on The Study of health care system for HIV/AIDS patients at home in Northeastern communities. *KKU Research Journal* 2003;10(3): 250-63.
31. Kaarsen S, Vaagham DR, Walter JH. Self – efficacy for AIDS prevention behaviors among tenth grade students. *Health Educ Q* 1992; 19(2): 187-202.
32. Hale JP, Trumbetta LS. Women’s self– efficacy and sexually transmitted disease preventive behaviors. *Res Nurs & Health* 1996; 19: 101-10.
33. Chetawan N. Awareness of self-efficacy for self- care and depression in HIV-infected patients. [Nursing Master Degree Thesis]. Chaing Mai: Chaing Mai Univ.; 2000.
34. Sanudomchok P. Result of consultation according to problem behavior theory on the level of awareness of self-efficacy and self- care behavior of HIV-infected and AIDS patients. [Nursing Master Degree Thesis]. Bangkok: Ramkhamhaeng Univ.; 2001.
35. Keawsaard O. Result of self competency promotion toward health behavior from patients with coronary artery disease. [Nursing Master Degree Thesis]. Chaing Mai: Chaing Mai Univ.; 2001.
36. Hongrojanapak R. Awareness of self-efficacy and the practice on weight control in middle age women. [Nursing Master Degree Thesis]. Chaing Mai: Chaing Mai Univ.; 2002.
37. Pender JN, Murdaugh LC, Parsons AM. *Health promotion in nursing practice*. 4th ed. New Jersey : Prentice Hall; 2002.
38. Culter C.J, Arnold RC. Venereal disease control by Health Department in the past : Lesson for the present. *Am J Public Health* 1988; 78 (4): 372-6.
39. Curtin M, Lubkin ML. What is chronicity? In: Lubkin ML, Larson DP, editors, *Chronic illness: Impact and intervention*. Toronto: Jone & Bartiett Publishers International; 1998. p. 3-5.
40. Saylor C, Yoder M. Stigma. In: Lubkin, M.L. & Larson, DP, editors, *Chronic illness: Impact and intervention*. Toronto: Jone & Bartiett Publishers International; 1998. p.103-21.
41. Pongsomboon J. Factors that affected the behavior to support health of HIV-infected patients. [Thesis Master of Science Program]. Nakornpatom: Mahidol Univ.; 1996.

42. Wongchoo K. The relationship between self-concept, personal and family fundamental factors, and self-care behavior of infected and AIDS patients. [Nursing Master Degree Thesis]. Khon Kaen: Khon Kaen Univ.; 1998.
43. Bintajit P. Study on the behavior that supports the health among HIV-infected patients.[Nursing Master Degree Thesis]. Nakornpatom: Mahidol Univ.; 2001.
44. National Health Security Office. Management manual on how to take care HIV-infected and AIDS patients for health insurance system, 2007-08. Bangkok: Rungsin Publisher; 2007.
45. Chaicharearn K. The relationship between health awareness, social support, and behavior to support health among AIDS-infected patients. [Master of Science Thesis]. Nakornpatom: Mahidol Univ.; 2000.
46. Basu S, Chwastiak AL, Bruce DR. Clinical management of depression and anxiety in HIV-infected adults. *AIDS* 2005; (19):2057-67.
47. Green GR, Green LM. Relaxation increases salivary immunoglobulin A1. *Psychol Reports* 1987; 61: 623-9.
48. Sarakarn P. Statistical analysis on stress and behavior to support self health among AIDS-infected patients in Chaing Mai. [Master of Science Thesis]. Chaing Mai: Chaing Mai Univ.; 1997.
49. Prakinkij S. Prevalence of stress among HIV-infected patients admitted for treatment in Sam-utsakorn Hospital. *AIDS* 2008; 21(1):11-20.
50. Pinkaew S. Mental health of HIV-infected and AIDS patients in Nonsaard Hospital, Nonsaard District, Udonrtani Province. *Chon Buri Hospital's J* 2008; 3(3): 347-52.