Substance-Dependence Rehab Treatment in Thailand: A Meta Analysis

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Objective: To synthesize the substance-dependence researches focusing on rehab treatment phase.

Material and Method: Several criteria were used to select studies for meta analysis. Firstly, the research must have focused on the rehab period on the substance-dependence treatment, secondly, only quantitative researches that used statistics to calculate effect sizes were selected, and thirdly, all researches were from Thai libraries and were done during 1997-2006. The instrument used for data collection was comprised of two sets. The first used to collect the general information of studies including the crucial statistics and test statistics. The second was used to assess the quality of studies.

Results: Results from synthesizing 32 separate studies found that 323 effect sizes were computed in terms of the correlation coefficient "r". The psychology approach rehab program was higher in effect size than the network approach ($p < 0.05$). Additionally, Quasi-experimental studies were higher in effect size than correlation studies ($p < 0.05$). Among the quasi-experimental studies it was found that TCs revealed the highest effect size ($r = 0.76$) Among the correlation studies, it was found that the motivation program revealed the highest effect size ($r = 0.84$).

Conclusion: The substance-use rehab treatment programs in Thailand which revealed the high effect size should be adjusted to the current program. However, the narcotic studies which focus on the rehab phase should be synthesized every 5-10 years in order to integrate new concept into the development of future the substance-dependence rehab treatment program, especially those at the research unit of the Drug Dependence Treatment Institute/Centers in Thailand.

Keywords: Narcotic, Drug addict, Substance-dependence, Rehab treatment program, Meta analysis

Substance dependence is a treatable disorder. Through treatment that is tailored to individual needs, patients can learn to control their drug problems and live normal, productive lives[1]. The process of substance-dependence treatment is more multistage and varies depending on the situation and varying levels of social acceptance. There are four stages of drug treatment[2]: (1) Pre-Admission is a preparatory process in which both patients and their families participate, (2) Detoxification is a physical treatment which ensures drug withdrawal, (3) Rehabilitation is the main process of treatment which focuses on the patients psychological and behavioral rehabilitative capabilities and includes relapse prevention and strategies for users. This is the most difficult stage of drug treatment, (4) Follow-up/ After-care is used to monitor patient progress. That stage rebuilds a patients and its goal is relapse prevention.

The rehabilitation treatment phase is the main phase of all drug treatment processes and many previous studies have focused on rehabilitation programs. Previous narcotic research synthesis has

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also been conducted. The individual studies of which focused on drug program research undertaken between 1997 and 2001. These included 136 studies on drug use prevention programs and 7 studies on rehabilitation programs[3]. In addition, the one other drug synthesis study has been conducted, the individual studies of which were researched between 2002 and 2005. There were also 82 studies on therapeutic programs[4]. Research synthesis can help the researcher explore and resolve apparent contradictions in research findings from different studies with the use of statistical analysis. Currently, Meta-analysis is the widely accepted research tool used for synthesizing research findings as it encompasses a more precise and thorough approach[5].

Since 2001, there had been several new knowledge on drug-patient rehabilitation. Thus, the studies on rehab treatment program of the substance-dependence patients had to be synthesized to obtain more clear knowledge from integrating the knowledge and effectively utilizing the previous research findings. The present aimed to synthesize the substance-dependence researches focused on rehab treatment phase, which were completed between 1997 and 2006, by using the Meta-analysis method. There were to compare the estimates of effect sizes among (1) characteristics of research, *e.g.* type of study, area of study, research design, and quality of study and (2) approaches of rehab treatment program. Finally, the knowledge management concerning the substance-dependence rehabilitation treatment will be received to elevate the quality of life among patients in the future.

Material and Method
Study inclusion
Three criteria were used to select studies for inclusion in this synthesis. Firstly, the studies needed to have focused on the rehabilitation phase, secondly, only quantitative research reports that sufficiently used statistics to calculate effect sizes were selected, finally, the studies needed to have been completed between 1997 and 2006 (inclusive).

Literature search
A literature search was conducted to locate appropriate studies. First was a title research reports were located in the following Thai libraries: Fourteen such the Office of National Research Council of Thailand, Kasetsart University, Mahidol University, Srinakharinwirot University, Ramkhamhang University, Chulalongkorn University, Thanyarak Institute, and

also in drug dependence treatment centers in Chiang Mai, Lumpang, Meahongson, Khon Kaen, Udonthani, Songkha, and Pattani. Following this, a participant search of the substance-dependence case (n = 106) and a bibliographic search of quantitative reviews on the rehabilitation phase (n = 55) was done. Finally, a wild raring research check was undertaken to locate research papers that used statistics to calculate effect sizes. The Final meta-analytic samples were comprised of 32 research reports.

Measures and data gathering
The instrument for data collection was comprised of two sets. The first set collected details in regards to typing, researcher, research methodology, and content as well as crucial statistics including test statistics. The second set assessed the quality of the study by using 15 items with a rubric score 4-point rating scale. Based on the assessment of the quality of the studies, the conclusion was reached that 53.1% of studies were of high quality (48-60 scores) while the remaining studies (46.9%) were of moderate quality (36-47 scores).

For data collection process, each study was read by researcher at least 2 times. The first reading was done to understand the details of the study and assess the quality its content. The second reading was done to record both the characteristics and the results of the study. All the data was then verified. Any Missing information was retired and also verified.

Effect size calculation
Standard indices were adjusted from the statistics of each individual study into a standardized score. In the quasi-experimental study, standard indices for both continuous dependent variables and discrete dependent variables were calculated in terms of their effect size (d-it indicating the quantities effect of a manipulated variable toward a dependent variable). For Correlation study, a correlation coefficient was used to calculate standard indices (r-it indicating the size of covariance between the two variables).

The standard indices were calculated using Glass's method. The Glass's method consists of 3 approaches: (1) effect size estimation from different experimental research design, (2) adjusting formulae for other correlation coefficients into Pearson's correlation coefficient, and (3) two methods for standard indices calculation: (i) direct estimation from statistical value and (ii) estimation from the results of hypotheses testing such as t, F, Chi-square, and U, etc.

In order to combine the standard indices across the collection of studies, one effect size must convert into another. For the present, effect sizes "d" were converted to "r" using the following formula[7]:

$$r = d \sqrt{\frac{n}{nd^2 + 4n - 8}} \quad n = \text{combined sample size}$$

Understanding the interpretation of effect size (r) using Cohen's criteria; a standardized effect size of 0.10 means a small change, 0.243 a medium change, and 0.371 a large change[8].

Results
Sample descriptive
The samples for this meta-analysis consisted of 32 reports of rehabilitation phase substance-use treatment and were completed between 1997 and 2006. Of these studies, 78.1% were conducted as dissertations from Thai universities and 21.9% were conducted at drug dependence treatment centers, institutes or hospitals. The majority of studies were conducted in the health science area (65.6%), while others were in the fields of social sciences such as psychology, education, economics, and the behavioral science. Additionally, several concepts or theories of rehab treatment programs were trialed using the Psychological approach (40.6%, n = 13), (*e.g.* counseling, motivation, adjustment, life skill, EQ, health belief model, and religion). Others used the activity approach (40.6%, n = 13), (*e.g.* group activity, military-camp, and sport), or the psycho-social approach (12.5%, n = 4), (*e.g.* matrix program, FAST Model, therapeutic community-TCs), and used the Network approach (6.3%, n = 2) such as *e.g.* anti-drug community network.

The majority of studies used a quasi-experimental design (56.3%). Other studies (43.7%) used correlation designs (*e.g.* 31.3% survey design, 6.2% program evaluation, and 6.2% R&D). The participants who were diagnosed with substance-use disorders were classified into three age groups; 25 or less (youth-43.7%), over 25 (adult-12.6%), and unidentified (43.7%). The median sample size was 35 participants whilst mode was 30 subjects (Min = 10, Max = 318). The treatment targets were: drugs (n = 29), alcohol (n = 3). The instrument of each study was tested for reliability. 46.9% of the instruments revealed a high degree of reliability 0.80 or higher, and 31.2% of instruments revealed a moderate degree of reliability, 0.40-0.80, but 21.9% of the instruments were not report the reliability of measure.

The grouped statistics from the collection of studies were separated into two types of statistics *i.e.* parametric and non-parametric statistics. 43 studies used parametric statistics: 51% t-test (n = 25), 16.3% correlation (n = 8), 16.3% one-way/repeated measure ANOVA (n = 8), 2% Z-test (n = 1), 2% path analysis (n = 1), and 2% multiple regression (n = 1). The other 5 studies used non-parametric statistics: 4.1% Chi-square (n = 2), 2% Mann-Whitney U-test (n = 1), 2% Wilcoxon matched pairs signed-rank test (n = 1), and 2% Kruskal Wallis (n = 1).

Effect size analysis
This study synthesized the results of 32 separate studies, 18 of which were quasi-experimental studies and 14 were correlation studies. In all, 323 effect sizes were computed in terms of the correlation coefficient "r". Some effect sizes "r" were converted from 82 effect sizes "d". Based on the distribution of "r", they were of medium size, high distribution, and negative skew (Min = 0, Max = 0.99, Median = 0.32, Mean = 0.34, SD = 0.20, Skew = 0.79, Kurt = 0.71).

Effect sizes were analyzed by the characteristics of each study, *e.g.* type of study, area of study, research design, and quality of study. It was found that quasi-experimental studies had higher effect sizes than correlation studies (mean difference = 0.07, 95% CI = 0.02-0.14, p < 0.05). However, another characteristics had a negligible difference on effect size (p > 0.05) (Table 1).

Once the effect sizes were compared according to the rehab program approach, *e.g.* psycho-social, activity, psychology, and network, statistically significant difference was found (p < 0.05). The descriptive statistics show that the psychology oriented rehab program revealed the greatest effect size (0.39), followed by activity, psycho-social, and network oriented (ES = 0.33, 0.32, and 0.32 respectively). The Scheffe method employed to investigate the mean differences between approaches found that the psychology oriented rehab program had higher effect sizes than the network oriented (mean difference = 0.07, 95% CI = 0.01-0.18, p < 0.05) (Table 2).

The effect sizes separated by rehab program approach are present in Table 3. Counseling revealed the greatest effect size, followed by motivation, group activity, and TCs (ES = 0.68, 0.60, 0.44, and 0.41 respectively). After the effect sizes of rehab program were separated by research design, it was found that TCs revealed the greatest effect size in the quasi-experimental studies, followed by counseling, group

Table 1. A comparison of effect size (r) by characteristics of research

Characteristics	n	Min	Max	Mean ± SD	95% CI of diff	p-value
Type of research						
Dissertation	298	0.00	0.99	0.33 ± 0.20	-0.16-0.06	0.345
Research	25	0.02	0.91	0.38 ± 0.26		
Area of study						
Health Science	233	0.00	0.99	0.34 ± 0.19	-0.05-0.06	0.733
Other area	90	0.00	0.99	0.33 ± 0.23		
Research design						
Quasi-experiment	82	0.00	0.99	0.39 ± 0.26	0.02-0.14	0.014
Non-experiment	241	0.00	0.99	0.32 ± 0.18		
Quality of study						
High	235	0.00	0.99	0.34 ± 0.17	-0.06-0.06	0.940
Moderate	88	0.00	0.99	0.34 ± 0.28		

Table 2. A comparison of effect size (r) by approach of rehab program

Approach	n	Min	Max	Mean ± SD	95% CI for mean	p-value
Psychology	59	0.00	0.99	0.41 ± 0.28[a]	0.34-0.48	0.020
Activity	65	0.00	0.97	0.33 ± 0.27[b]	0.26-0.40	
Psycho-social	57	0.00	0.71	0.32 ± 0.22[c]	0.26-0.38	
Network	142	0.12	0.54	0.32 ± 0.09[d]	0.30-0.36	

Post Hoc Tests; a-b = 0.01, a-c = 0.09, a-d = 0.00, b-c = 0.08, b-d = 0.13, c-d = 0.09* (95% CI = 0.01-0.18)
* $p < 0.05$

Table 3. The effect sizes (r) of each rehab program by research design

Rehab program	Quasi-experimental		Correlation		Total	
	r	n	r	n	r	n
Psychology approach						
Motivation	0.38	9	0.84	8	0.60	17
EQ	0.39	5	0.07	3	0.27	8
Counseling	0.68	4	-	-	0.68	4
Religion	0.32	5	-	-	0.33	5
Life skills	0.30	23	-	-	0.30	23
Adjustment/Personality	-	-	0.34	1	0.34	1
Health belief model	-	-	0.32	1	0.32	1
Activity approach						
Therapeutic community	0.76	5	0.21	9	0.41	14
Group activity	0.44	25	-	-	0.44	25
Military-camp	-	0	0.20	20	0.20	20
Sport	0.15	6	-	-	0.15	6
Psycho-social approach						
Matrix program	-	-	0.33	22	0.33	22
FAST model	-	-	0.31	35	0.31	35
Network approach						
Community network	-	-	0.32	142	0.32	142

activity, EQ, motivation, religion, and lift skills (ES = 0.76, 0.68, 0.44, 0.39, 0.38, 0.32, and 0.30 respectively). In the correlation studies, motivation revealed the greatest effect size, followed by adjustment, matrix program, HBM, anti-drug community network, and FAST model (ES = 0.84, 0.34, 0.33, 0.32, 0.32, and 0.31 respectively). When the effect sizes were separated by outcomes (Table 4) it was found that self care revealed the greatest effect size among the patients, followed by patient behaviour, post-treatment regulation, decision making, and drug rejection and self protection skills (ES = 0.56, 0.43, 0.43, 0.40, and 0.40 respectively). In regards to staff outcomes, it was that found utilizing training knowledge revealed the greatest effect size, followed by media management and their stakeholder participation (ES = 0.47, 0.34, and 0.26 respectively).

After separating the effect size of outcomes according rehab program approach, post-treatment regulation revealed the greatest effect size (0.57) among the patients of the psycho-social approach group. This was followed by the health promotion group (0.39). Additionally, in the staff group, utilizing of training knowledge was found to have effect size of 0.43. In the psychological approach, self efficacy revealed the greatest effect size (0.75) among patients, followed by coping/self control and patient behaviour (ES = 0.64 and 0.45 respectively), while staff outcome showed that there was only one variable which was studied with the effect size of 0.16. In the activity approach, treatment acceptance revealed the greatest effect size (0.92) among patients followed by self care and decision making (ES = 0.74 and 0.50 respectively). For

Table 4. The effect sizes (r) of each outcome by approach of rehab program

Outcomes	Psycho-social		Psychology		Activity		Network		Total	
	r	n	r	n	r	n	r	n	r	n
Substance-use case										
Self efficacy	0.23	3	0.75	2	0.26	4	-	-	0.36	9
Coping/self control	0.15	5	0.64	2	0.42	4	-	-	0.34	11
Patient behavior	-	-	0.45	13	0.44	3	0.27	1	0.43	17
Follow Tx. regulation	0.57	7	-	-	0.37	15	-	-	0.43	22
Tx. acceptance	0.08	7	-	-	0.92	3	-	-	0.33	10
Self esteem	0.27	3	0.29	6	0.41	4	-	-	0.32	13
EQ	-	-	0.26	1	0.28	9	-	-	0.28	10
Substance knowledge	0.29	6	-	-	0.1	4	-	-	0.28	10
Attitude into substance	0.25	3	0.05	1	0.1	4	-	-	0.20	11
Self-awareness	-	-		0	0.2	2	-	-	0.2	2
Decision making	-	-	0.36	3	0.5	1	-	-	0.4	4
Drug rejection & self protection skills	-	-	0.39	1	0.4	6	-	-	0.4	7
Critical thinking	-	-	0.34	3		0	-	-	0.34	3
Self care	-	-	0.34	5	0.74	6	-	-	0.56	11
Health promotion	0.39	20	-	-	-	-	-	-	0.39	20
Life skill	-	-	0.06	1	-	-	0.36	12	0.34	13
Participation in program	-	-	-	-	-	-	0.36	12	0.36	12
Attitude to program	-	-	0.26	13	-	-	-	-	0.26	13
Perceiving & utilizing information	-	-	-	-	-	-	0.31	44	0.31	44
Empowerment	-	-	-	-	-	-	0.31	12	0.31	12
Family relationship	0.23	1	-	-	-	-	-	-	0.23	1
Readiness to a drug free life	-	-	0.17	5	-	-	-	-	0.17	5
Staff										
Media management	-	-	-	-	-	-	0.34	23	0.34	23
Utilization of training knowledge	0.43	2	-	-	-	-	0.55	1	0.47	3
Attitude to program	-	-	0.16	3	-	-	-	-	0.16	3
Participation of stakeholder	-	-	-	-	-	-	0.26	13	0.26	13
Anti-drug community network	-	-	-	-	-	-	0.3	24	0.3	24

the network approach, both life skills and participation in the program revealed an equal high effect size (0.36) among patients, while the utilizing training knowledge revealed the greatest effect size (0.55) in the staff outcome category.

Discussion

The study yielded 323 independent effect sizes "r" representing the substance-dependence treatment focused on the rehabilitation phase. The average effect size was equal to 0.34 which was medium size as defined by the conventional value assessment from Cohen's criteria[8]. However, many statisticians have suggested that the sample size of the study is of concern because the effect size was affected by the sample size of the study[9]. For present, the median sample size was equal to 35 (which was small size)[10]. Based on the current research findings, the conclusion was reached that the selected studies had high statistical power. The most of the effect sizes ranged from medium to high. The concept of study of substance-dependence treatment focused on the rehabilitation phase can either endorse or reduce patients' behaviors to a statistically significant degree. This means that the substance-dependence rehab treatment programs in Thailand were satisfactory.

The finding indicated that the quasi-experimental studies had a higher effect size than the correlation design. This is congruent with the principle of research design. The researchers advised that experimental research designs tend to get higher effect sizes than other research designs. Because the experimental design can manipulate the sample in order to see the real difference between the experiment and control groups, their statistical values can more effectively show high effect sizes[9]. This is not congruent with the study finding of Barnaby CR et al[11] who also found no difference in effect sizes between RCTs and Observational studies (*e.g.* cohort study, case control study). However, the present mean different among research design was low. There are three observations in this finding. Firstly, the quasi-experimental design was used to conduct the study for this rehab program because the researcher was unable to control the effects of intervention factors in true-experimental research and also, its effect sizes were low different from the correlation design. Secondly, some causes may affect the internal consistency of the study during the cause of the experiment such as history, experimental mortality, and statistical regression, etc[13]. Thirdly, the lower statistical power

seems to be found in quasi-experimental studies more to equally than in correlation studies because the correlation sample sizes were comparatively small. That is, the smaller sample size, the smaller effect size.

Conversely, these research findings should be used with some caution. In addition, there are some interesting issues regarding research design and the approach of this rehab program. The first issue is the psychological approach which had a higher average effect size than the other approach. Based on these findings, the psychological approach seems to be an important concept for the rehabilitation treatment program particularly in regards to "motivation" which was a concept used to study both the experimental and correlation studies. Its effect size in the correlation study was very large, but of medium size in the quasi-experimental design. The "counseling" revealed the greatest effect size in the quasi-experimental design. This is congruent with the study of Kittipichai W et al[3] found that the counseling approach revealed the highest level of effectiveness in rehabilitation programs. Among the patients, several causes of drug addiction were found. Accordingly, counseling is then an important technique in creating patient trust in order for patients to accept and confront their problems without substance-use. If they can accept their problems, they can rehabilitate and exist in the community in a normal way. The second issue was that TCs revealed the highest and the greatest effect size in the quasi-experimental study but it revealed only a medium effect size in the correlation study. The third issue was that TCs revealed the highest effect size in the therapeutic program of the public sector units *e.g.* hospital, Thunyarak institute, and the drug dependence treatment centers, and including the Military project, followed by the matrix program, the FAST Model, and the military-camp program.

The findings seem to be useful for therapists in that the findings can be used for policy planning and further rehab treatment program. Since 2002, the number of drug addicted patients has increased because Thai Government policy recommends that people who are dependent on drugs be "treated as patients and not criminals[11]". Consequently, since, the number of drug addicted patients has increased so too have number of studies exploring the methods for substance-dependence rehab treatment.

The findings of the rehab program approach should be of concern because the substance-dependence rehab treatment period is a long, important and difficult process. If patients can be drug-free in the

long-term, there is a reduced chance of relapse. Thus, rehab programs should vary[2]. Presently, medical practitioners can select the most appropriate theoretical concept for their specific goal.

For example, the goal of the therapeutic approach is to have patients accept treatment and self care. The therapists should then use the concept of activity oriented, especially during group activities when patients can talk and share their experiences with one another. This process is by nature therapeutic. In addition, the therapists should encourage the patient's self efficacy and confidence in terms of a "drug-free consciousness". Both the self control and escalating coping skill in terms of problems and stress management should use the psychological approach as the program main concept. The development of targeting outcomes has a positive effect on a rehab program and prepares the patients for life as drug free person.

Caused by there are fast moving in various fields, the synthesis of narcotic studies focused on rehab treatment phase should be synthesized in every 5-10 years in order to get the new concept for developing the substance–dependence treatment and rehabilitation in the future especially the research unit of the Drug Dependence Treatment Institute/Centers in Thailand.

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การฟื้นฟูสมรรถภาพผู้ติดสารเสพติดในประเทศไทย: การวิเคราะห์อภิมาน

วิโรจน์ วีรชัย, วิริณธิ์ กิตติพิชัย, สุวภัทร คงหอม, ล่ำซำ ลักขณาภิชนชัช, ณรงค์ ศิลปะสคราญ, นิภา กิมสูงเนิน, ประเชิญ ฤกษ์อรุณ, อมาวสี ดวงนิมิตร

วัตถุประสงค์: *เพื่อสังเคราะห์งานวิจัยด้านสารเสพติดในระยะของการฟื้นฟูสมรรถภาพ*

วัสดุและวิธีการ: *เกณฑ์การคัดเลือกงานวิจัยเพื่อการวิเคราะห์อภิมานมี 3 ประการ คือ (1) เป็นการศึกษาที่เกี่ยวข้อง กับการบำบัดรักษาผู้ติดสารเสพติดในระยะการฟื้นฟูสมรรถภาพ (2) เป็นงานวิจัยเชิงปริมาณและมีค่าสถิติที่สามารถ นำไปคำนวณหาค่าขนาดอิทธิพลได้ (3) เป็นงานวิจัยที่ดำเนินการแล้วเสร็จในช่วงปี พ.ศ. 2540 – 2549 และมีตัวเล่ม อยู่ในห้องสมุด 14 แห่ง ในประเทศไทย เครื่องมือที่ใช้ในการเก็บข้อมูลมี 2 ชุด คือ แบบบันทึกคุณลักษณะงานวิจัย และข้อมูลทางสถิติ และแบบประเมินคุณภาพงานวิจัย*

ผลการศึกษา: *การสังเคราะห์งานวิจัยนี้มีงานวิจัยจำนวน 32 เรื่อง และมีขนาดอิทธิพล จำนวน 323 ค่า ที่แสดงอยู่ใน รูปของค่าประสิทธิ์สหสัมพันธ์ (r) โดยงานวิจัยที่ใช้รูปแบบการฟื้นฟูสมรรถภาพที่มีแนวคิดทางจิตวิทยาให้ค่าขนาด อิทธิพลสูงกว่างานวิจัยที่ใช้แนวคิดด้านเครือข่าย (p < 0.05) นอกจากนี้ยังพบว่า งานวิจัยที่ใช้รูปแบบวิจัยแบบกึ่งทดลอง ให้ค่าขนาดอิทธิพลสูงกว่างานวิจัยเชิงสหสัมพันธ์ (p < 0.05) ในกลุ่มงานวิจัยกึ่งทดลองพบว่า การบำบัดฟื้นฟูด้วย วิธีชุมชนบำบัด (TCs) ให้ค่าขนาดอิทธิพลสูงสุด (r = 0.76) สำหรับในกลุ่มงานวิจัยเชิงสหสัมพันธ์ พบว่าโปรแกรม การจูงใจและให้กำลังใจ ให้ค่าขนาดอิทธิพลสูงสุด (r = 0.84)*

สรุป: *รูปแบบการฟื้นฟูสมรรถภาพผู้ติดสารเสพติดในประเทศไทยเป็นรูปแบบที่มีขนาดอิทธิพลสูง ดังนั้นจึงควรรูปแบบ ดังกล่าวมาปรับใช้ในการบำบัดและฟื้นฟูผู้ติดสารเสพติดตามความเหมาะสม และควรมีการสังเคราะห์งานวิจัยด้าน สารเสพติดในทุก 5-10 ปี เพื่อที่จะได้นำแนวคิดใหม่มาใช้ในการพัฒนาวิธีการบำบัดและฟื้นฟูผู้ติดสารเสพติดต่อไป ในอนาคต โดยเฉพาะในหน่วยวิจัยของสถาบันและศูนย์บำบัดรักษาผู้ติดยาเสพติดในประเทศไทย*