

Chinese Medicine Treatment for Cannabis Drug Abuse --- An Early Exploration

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ABSTRACT

Background: Being one of the freely used psychoactive substances worldwide, cannabis has not only undeniable addictive effects, but may also leads to cognitive impairments and risks of mental disturbances. To date, there is yet no effective agent for treating cannabis abuse disorders. Traditional Chinese medicine intervention may provide opportunities to alleviate withdrawal symptoms and improve the miserable quality of life.

Methods: 50 eligible cannabis users were recruited on voluntary basis for a clinical trial using Chinese Medicine for a period of 14+14 days. Assessments included Quality of life (SF-36), Hospital Anxiety and Depression Scale (HADS), Patient Health Questionnaire (PHQ-9). Cannabis consumption were evaluated before treatment (visit 1), during treatment (visit 2), extend treatment (visit 3), and post treatment (visit 4). 15 with good compliance was put on an extended course of treatment.

Results: The average age of participants was 23.3 years, with the youngest being 14 years and oldest 47 years. After taking the herbal medicine, both the total participants and subgroups experienced an over 60 percent reduction in the consumption of cannabis ($p < 0.001$). Anxiety (HADS) and mental health (PHQ-9, SF-36) states were improved.

Conclusion: The study herbal formula might be beneficial for cannabis abusers determined to withdraw. Their anxiety and mental health improved. Their craving for cannabis decreased.

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Introduction

Currently cannabis has become the most frequently used misused stimulant substance in the world. In 2018, the United Nations estimated that 192 million people or 3.9% of the global adult population, had used cannabis in the previous year [1]. Affected by the legalization of cannabis in many affluent Western countries and the increasing abuse of synthetic cannabis, teenagers are at greater risks of exposure to and abuse of cannabis related substances. Being one of the popular psychoactive substances worldwide, cannabis has not only undeniable addictive effects, but May also cause cognitive impairments and higher risks of mental illnesses [2, 3].

Adverse effects of cannabis abuse: cognitive, psychosocial, psychiatric, physical symptoms are generally more pronounced

among those who start using at young ages. Long termed use of cannabis, especially from adolescence, will lead to cognitive impairments [4] and higher risks of other types of substance abuse related and mental illnesses [5].

To date, there are yet no effective medications for cannabis disorder [6]. Traditional Chinese medicine intervention may help to alleviate withdrawal symptoms and improve the quality of life of users.

Materials and Methods

1) Study herbal formula

The herbal formula composed of 3 herbs including Buddaleja officialis, Rhizoma Corydalis, Common Chrysanthemum, and 2 well known nutrients (creatine for muscle and collagen for bone metabolism).

Innovative Herbal Formula created for the research study: A Herbal Tonifying Energizer (Shuanghua Yanli Granules)

Table 1: Composition of a Herbal Formula for Tonifying and Energizing

Product Name	Supplier	Concentration ratio	Formulation prescription (%)	Content per packet (g)
Buddaleja officinalis	PuraPharm	5	17.39	2
Rhizoma Corydalis	PuraPharm	5	17.39	2
Common Chrysanthemum	PuraPharm	5	17.39	2
Creatine	Sichuan Huatang Jurui Biotechnology Co., Ltd	NA	39.13	4.5
Collagen	Wuhan Bojuxin Biotechnology Co., Ltd	NA	8.7	1
Total			100	11.5

2) Hypothesis

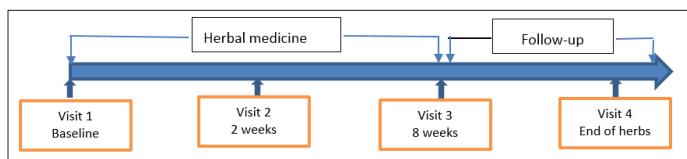
To provide better motivation and reduce restlessness for cannabis addicts, determined to withdraw. To enhance their declining vitality, reduce the addictive usage, and to reduce the relapse rates

3) Primary Aims

To reduce the consumption of cannabis
 To improve the withdrawal symptoms of depression and anxiety, and
 To improve the quality of life throughout the process

4) Study Design

This study was designed as a self-control study to compare pre- and post-treatment of herbal medication. 50 eligible cannabis users (among them about 15 with good compliance will be put on an extended course of treatment) for a total of 14+14 days. Quality of life (SF-36), Hospital Anxiety and Depression Scale (HADS), Patient Health Questionnaire (PHQ-9), and cannabis consumption were recorded before treatment (visit 1), during treatment (visit 2), extend treatment (visit 3), and post treatment (visit 4)



5) Study Sample Size

Target sample size: 50
 Recruited sample: 80
 Reported sample: 43 (completed 2 visits)

6) Participants

Participants aged 14 years to 47, were cannabis users under the care of a special free service provided by the Evangelical Lutheran Church Social Service-Hong Kong. They were cannabis users seeking withdrawal treatment. Participants included students, dancers, housewives, musicians, and laborers. In terms of race, besides Chinese, there were Indians, Nepalese, Pakistanis and Thais working in Hong Kong.

7) Data collection

The study was conducted at the Drug Rehabilitation Section, Evangelical Lutheran Church Social Service, Enlighten Centre, Hong Kong. One unique feature of the Enlighten Centre was that a special Chinese Medicine (CM) clinic with full time Chinese Medicine practitioners was installed. Social workers and CM practitioners gave caring services to the participants. The CM expert checked their general health and distributed the study herbs. Social workers took care of the questionnaires. A total of 4 visits were conducted during the study period, and participants were assessed by the CM practitioners and social workers at every visit.

8) Assessment:

Before and after taking the herbal medicine, the participants were carefully assessed using the following instruments/questionnaires:
 SF-36 Vitality and Mental Health
 Hospital Anxiety and Depression Scale (HADS)
 PHQ-9
 Cannabis Craving Chart

The evaluation methods chosen were those approved as standard indices for the assessments of changes in mental (PHQ-9) [7], craving for cannabis, Anxiety (HADS)[8, 9] and quality of life (SF-36)[10].

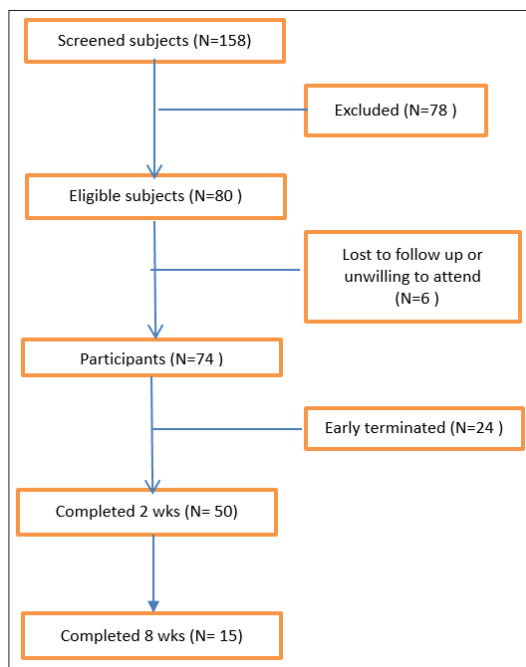
9) Study Sites

The Evangelical Lutheran Church Social Service Enlighten Centre, including served customers who use cannabis the special CM Clinic.

10) Statistical methods

Data were analyzed using the SPSS software (version 29, SPSS Inc.). Characteristics were presented as descriptive statistics (frequency (%) or mean, standard deviation (SD), minimum and maximum). Mean values and SD for each questionnaire were calculated, Repeated measurement analysis, Multivariate and Paired t-tests were performed for the three visit comparisons. Chi Square Test was used to compare the frequencies and proportion. Significance level was defined as a=0.05.

Figure 1: Flowchart of subjects



Results

1) Characteristics of study participants

Table 2: Subject characteristics: gender and age

	Male(n=65)			Female(n=9)			Total(74)		
	Mean	SD	N	Mean	SD	N	Mean	SD	N
Age	23.1	7.3	65	24.6	8.3	9	23.3	7.3	74
BW(kg)	65.0	10.2		52.4	9.9		63.5	10.9	

Total subject no. = 74; minimum age: 14 years old, maximum age: 47 years old

The average age of participants was 23.3 years, with a minimum age of 14 years and a maximum age of 47 years. (Table 2)

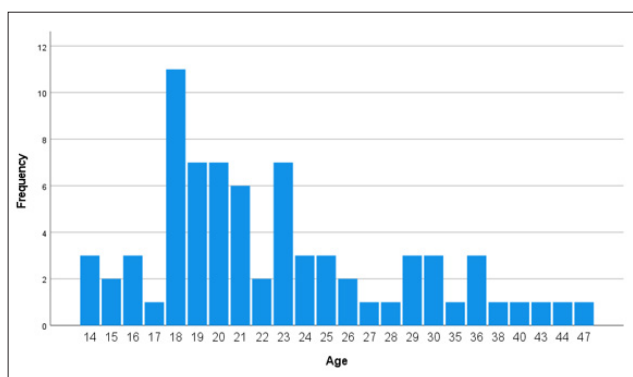


Figure 2: Age Distribution

This study found that individuals aged 14 to 20 accounted for 45% of the total number of participants.

Note: The World Health Organization has determined that human adolescence is between the ages of 10 and 19. Adolescence is a stage of human growth and development that occurs after childhood

and before adulthood. People in this age group are referred to as adolescents. Adolescence undergoes significant growth and changes in both physiological and psychological aspects. During this period, neural development maintains great potential and is more susceptible to external environmental influences, making it a high-risk period for exposure to psychoactive substances.

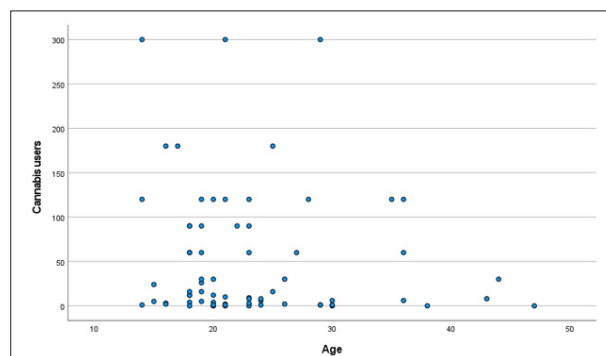


Figure 3: Age distribution of Cannabis consumption

It can be seen from Figure 3 that the peak age of Cannabis using is around 20 years old.

3) Average usage of cannabis and other drugs before and after treatment (times)

Table 3: Average drug frequency in the past month

Have you used in the past 30 days	Visit 1	Visit 2
Cannabis	51.3	15.3
Heroin	0.2	0
MDMA	0.3	0.1
Ketamine	0.4	0.1
Methamphetamine	0	0
Methaqualone	0	0
Nimetazepam	0	0
Midazolam	0	0
Zopiclone	0	0.1
Cocaine	10.6	0.5
Cough potion	0	0.1
Thinner	0	0
Others	0.2	0.1
Mean	63	16.2 (↓74.3%)
P value	<0.001	

Wilcoxon Signed Ranks Test

Table 4: Comparison of the average number of cannabis use in the past 30 days among subjects pre- and post-treatment

	Visit 1	Visit 2	P value
Chinese (n=56)	49.2	15.5(↓68.5%)	<0.001
Indians/Pakistanis (n=13)	62.0	13.8(↓77.7%)	0.043
Age<20(n=32)	52.3	20.7(↓60.4%)	0.020
Age>20(n=37)	51.1	10.6(↓79.3%)	0.002
Total(n=69)	51.3	15.3(↓70.2%)	<0.001

After taking the herbal medicine, total participants or subgroups had more than 60 percent less the frequency of cannabis use as well as other drug use than before taking the herbal medicine (p<0.001). (Table 3, 4)

Table 5: Comparison of the cannabis consumption among students

Sub. No	Visit 1	Visit 2
CS007	90	0
SK166	12	0
WW163	120	30

Table 6: Comparison of the cannabis consumption among dancers

Sub. No	Visit 1	Visit 2
CK134	0	0
KW131	300	3
MH132	2	2
SY136	6	10
WH137	6	10
YS135	1	0

The dancers did not have full-time professional status; 3 claimed studentship and 6 were probably professional. Due to the limited number of cases, further statistical analysis could not be conducted. Only statistical descriptions could be provided. Table 5 shows that in the second week after taking the herbal medication, the frequency of using cannabis among the three students remarkably decreased, while the frequency claimed by the professionals appeared variable (Table 6).

Table 7: Comparison of the cannabis consumption among creative group

		Frequency of cannabis abuse		
		sub_no	Visit 1	Visit 2
Creative group	1	LC122	.	.
	2	PC162	.	.
	3	TK121	.	.
	4	CA161	120	120
	5	CC118	0	.
	6	CK134	0	0
	7	CM114	16	30
	8	CS117	6	2
	9	CW168	0	.
	10	HC112	8	.
	11	KW131	300	3
	12	LS116	0	.
	13	LS164	10	.
	14	LY115	26	.
	15	LY167	1	.
	16	MH132	2	2
	17	NT133	2	2
	18	SK166	12	0
	19	SY136	6	10
	20	TK169	1	.
	21	WH113	1	.
	22	WH137	6	10
	23	WW163	120	30
	24	YS135	1	0
	25	CL165	30	.
Total N		25	22	12
Mean			30.36	17.42(↓42.8%)
Std. Deviation			69.274	34.087
P value		0.398		

Although the use of cannabis in the creative group decreased by an average of 42.8% after 2 weeks of medication, there was no statistically significant difference (p=0.398) (Table 7).

4) Hospital Anxiety and Depression Scale (HADS)

The Hospital Anxiety and Depression Scale (HADS) is a self-assessment questionnaire, which has seven items each for depression and anxiety subscales calculating the respective measurement scores using the Likert scale of 0-3 points, and

the total scores of the two scales are 21 points respectively. A total score of 0-7 indicates normal, 8-10 indicates mild anxiety or depression, and a score greater than 11 indicates highly certain anxiety. (Table 8)

Table 8: HADS Anxiety score

HADS score	Anxiety
8-10	Mild
11-14	Moderate
15-21	Severe

Table 9: HADS anxiety and PHQ-9 depression score

	Baseline (v1) n=69	Visit 2 N=43	Visit 3 N=15	Visit 4 N=9
HADS anxiety	7.67±4.19	5.79±3.86	5.20±3.26	5.22±3.03
P value*		<0.001	0.059	0.121
PHQ-9	10.26±4.82	7.53±4.90	6.80±8.04	6.11±5.44
P value*		<0.001	0.016	0.035

* Compared with baseline (visit 1)

After 2 weeks of herbal medication, the anxiety score decreased from 7.67 to 5.79, indicating a significant improvement in anxiety symptoms (p<0.001). (Table 9)

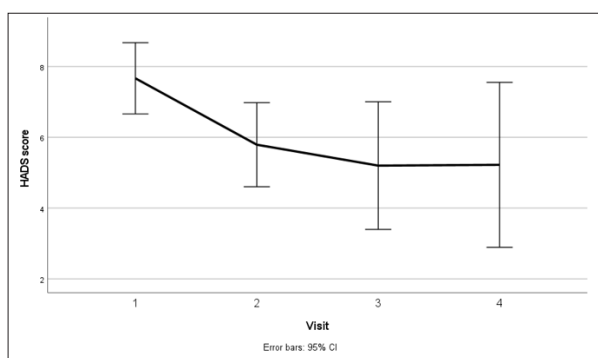


Figure 4: HADS score changes at each visit

From Figure 4 it can be seen that the HADS score shows a downward trend, indicating an improvement in anxiety symptoms.

Table 10: Severity of HADS Anxiety

	Visit 1	Visit 2	Visit 3	Visit 4	P value
Normal (0-7)	31	30	11	8	0.153
Mild (8-10)	21	8	3	1	
Moderate (11-14)	13	4	1	0	
Severe (15-21)	4	1	0	0	
Total	69	43	15	9	

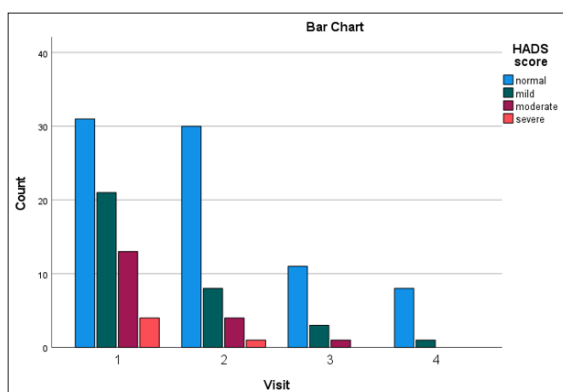


Figure 5: Severity of HADS Anxiety at each visit

After taking herbal medicine, the number of subjects with moderate to severe anxiety decreased from 17 to 5 after 2 weeks, but did not reach statistical significance ($p=0.153$). (Table 10; Figure 5)

5) Emotional assessment

Patient Health Questionnaire (PHQ9)

The PHQ-9 is the nine-item depression subscale of the Patient Health Questionnaire, which is used to diagnose and determine the severity of depression

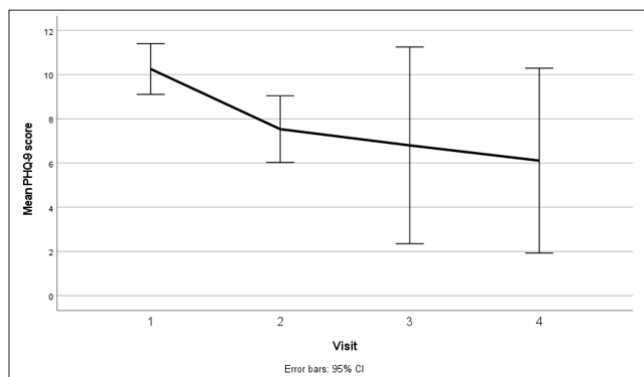


Figure 6: PHQ-9 score changes at each visit

After 2 weeks of herbal medication, the emotion score decreased from 10.3 to 7.5, and after 8 weeks, it further decreased to 6.8. After discontinuing the herbal medication for 4 weeks, it still maintained a downward trend, and the emotion score continued to improve significantly ($p<0.001$, $p=0.016$ and $p=0.035$) Figure 6; Table 9).

The nine depression symptom items share a common stem: “Over the past two weeks, how often have you been bothered by any of the following problems?” The items share a common set of response options: 0, “Not at all”; 1, “Several days”; 2, “More than half the days”; and 3, “Nearly every day”.

The PHQ-9 cut-off point was set at 9.18. A score of 9 or less was considered to be negative for significant depression and a score of >9 was positive for depression. (Table 11)

Table 11: Interpreting PHQ-9 Scores

PHQ-9 Score	Depression Severity
0-4	Minimal depression
5-9	Mild depression
10-14	Moderate depression
15-19	Moderately severe depression
20-27	Severe depression

Table 12: Depression severity as defined by the PHQ-9

	Visit				P value
PHQ-9 score < 9	33 (47.1%)	32 (74.4%)	12 (80.0%)	6(66.7%)	0.010
PHQ-9 score > 9	37 (52.9%)	11 (25.6%)	3 (20.0%)	3(33.3%)	
Total	70	43	15	9	

$\chi^2=11.250$, $p=0.010$

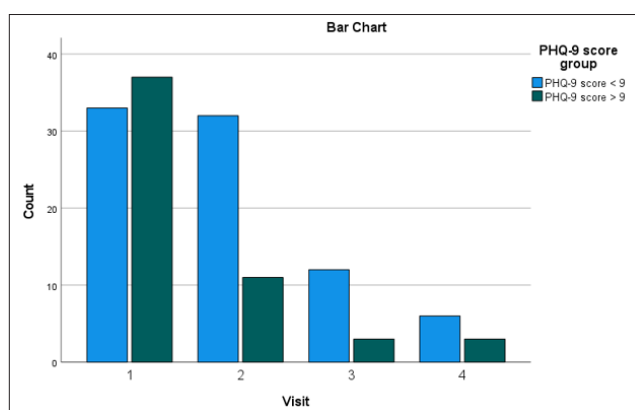


Figure 7: Severity of depression (measured by PHQ-9) at each visit

The number of subjects with a score below 9 after taking medication increased from 47% to 80%; The number of subjects over 9 decreased from 52.9% to 20% ($p=0.010$). The score of PHQ9 showed a significant improvement in the subjects’ emotional assessment after taking the herbal medication (Table 12 and Figure 7)

6) Quality of Life (SF-36)

The SF-36 is a 36-item scale, which measures eight domains of health status: physical functioning (10 items); physical role limitations (four items); bodily pain (two items); general health perceptions (five items); energy/vitality (four items); social functioning (two items); emotional role limitations (three items) and mental health (five items), with each item scoring 100 points. The higher the score, the better the quality of life.

In this study, VT (Vitality) and MH (Mental Health) were selected for evaluation. The higher the score, the better the health condition.

Table 13: Comparison of Vitality and Mental Health

	Baseline (v1) n=70	Visit 2 N=41	P value*
vitality	52.6±13.6	52.8±17.8	0.603
Mental Health	54.7±12.6	61.8±13.7	0.040

* Compared with baseline (visit 1)

Vitality (VT) domain: while evaluating an individual’s subjective perception of his/her own vitality and fatigue level, no significant changes before and after taking the medication were observed in the study ($p=0.603$)

Mental Health (MH): The evaluation of mental health (MH) includes four categories of mental health status, including motivation, suppression, behavioral or emotional loss, and subjective psychological feelings. The results showed that the mental health scores before and after taking the herbal medication were 54.69 and 61.76, with an increase of 12.9% after 2 weeks of medication, including a significant improvement in mental health, which reached a statistically significant level ($p=0.040$). (Table 13)

Discussion

Affected by the legalization of cannabis consumption in some affluent countries and the increasing abuse of synthetic cannabis, teenagers are at greater risks of addicting to the use of cannabis substances. Being one of the widely used psychoactive substances,

cannabis not only has addictive properties that cannot be ignored, but its damage to cognitive functions and higher risks of mental disturbances needs to be better known. [2,5,11]

The harmful effects of cannabis on the human body can be divided into short-term and long-term categories. The most pronounced short-term clinical effects of cannabis manifest as intoxications characterized by disturbances in consciousness, cognition, perception, affect, and behavioral and other psychophysiological functions. [1,3,12].

The long-term consequences include mental disorders such as anxiety, depression, suicidal intentions and attempts, and other marijuana induced mental illnesses [4,13].

The results of this study and our previous case report [14] suggest that treating with Traditional Chinese Medicine could significantly improve the mental and anxiety status of cannabis users. Their craving for marijuana was also reduced.

Concluding observations

Participants under the age of 20 accounted for 45% of all. The most frequent cannabis users were around 20 years of age.

1. There was remarkable differences in the clinical manifestation and therapeutic response between the working group and the fresh youthful group.
2. There was a significant reduction in cannabis consumption as well as the use of other stimulants after 2 weeks herbal medication.
3. Significant improvements in hospital anxiety were observed in the participants (HADS assessment and the Patient Health Questionnaire (PHQ-9) assessment).
4. The quality of life (SF-36) showed significant improvements in the mental health domain, but not in the Vitality domain.

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Conflict of interest

The authors state no conflict of interest.

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