綜合肌肉骨骼健康評估及藥劑師藥物復審方案

張正龍 博士

香港大學 藥理及藥劑學系

Dr CL Cheung, Associate Professor

Department of Pharmacology and Pharmacy, The University of Hong Kong

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PROJECT INCENTIVE 項目動機

- Relationship of illicit drug use with musculoskeletal health is unclear
- 非法藥物使用與肌肉骨骼健康的關係尚不清楚

- Heroin, methadone, diacetylmorphine, and methylamphetamine were reported to be associated with reduced bone mineral density (BMD)
- 據報導，海洛因、美沙酮、二乙酰嗎啡和甲基苯丙胺與骨礦物質密度 (BMD) 降低有關

- No research studies have been conducted to investigate the relationship of illicit drug use with muscle health
- 尚未進行任何研究來調查非法藥物使用與肌肉健康的關係

PROJECT OBJECTIVES 項目目標

- To evaluate the relationship of illicit drug use with **musculoskeletal health**
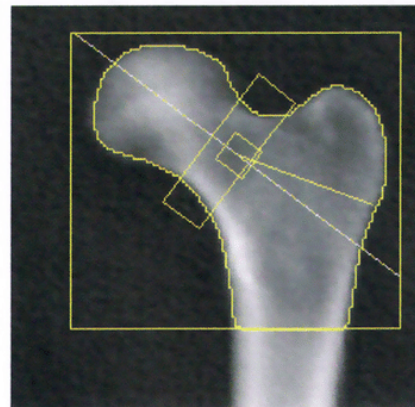 評估非法藥物使用與**肌肉骨骼健康**的關係

PROJECT METHODS & WORKFLOW 項目方法與流程

Substance abusers
and rehabilitees were
recruited from NGO, community partners and
QMH substance abuse clinic during Aug
2018 to April 2021

2018年8月至2021年4月期間，

從相關非政府組織、社區合作伙伴及瑪麗醫院物

質濫用診療所

招募吸毒人士及吸毒康復者

Structured questionnaires

詳細問卷

DXA, BIA, grip strength, gait speed
and peak flow measurement

肌肉及骨密度臨床評估

SUBJECT CHARACTERISTICS 研究對象的背景

	Control (N=1345)			Illicit drug users (N=108)			P
Age (years)	57.99	±	11.85	49.67	±	14.28	<0.001
Female (%)	1063		(79.0)	14		(13.0)	<0.001
BMI	23.28	±	3.64	23.73	±	4.17	0.218
Smoking status (%)							<0.001
non-smoker	1265		(94.1)	17		(15.7)	
ex-smoker	48		(3.6)	16		(14.8)	
current-smoker	32		(2.4)	75		(69.4)	
Drinking status (%)							<0.001
non-drinker	881		(65.5)	21		(19.4)	
ex-drinker	141		(10.5)	35		(32.4)	
current-drinker	323		(24.0)	52		(48.1)	
Physical activity (%)							0.002
Inactive	308		(22.9)	40		(37.0)	
Active	203		(15.1)	8		(7.4)	
Minimally active	834		(62.0)	60		(55.6)	

SUBJECT CHARACTERISTICS 研究對象的背景

Category	Drug	Count	Percentage
Hallucinogens	Cannabis / Marijuana	8	7.4
Depressants	Amyl nitrite	1	0.9
Depressants	Gamma Hydroxybutyric Acid	1	0.9
Narcotics Analgesics	Heroin	53	49.1
Narcotics Analgesics	Methadone	3	2.8
Narcotics Analgesics	Opiates / Opium	1	0.9
Tranquillizers	Midazolam	2	1.9
Stimulants	Cocaine	1	0.9
Stimulants	Methamphetamine	19	17.6
Stimulants	Methylenedioxymethamphetamine	2	1.9
Others	Ketamine	5	4.6
Others	Others	4	3.7
Others	Unknown	8	7.4

RESULTS 結果

108 vs 1345

	Model 1				Model 2			
	Mean difference	95% CI		P	Mean difference	95% CI		P
		lower	upper			lower	upper	
BMD (g/cm^2) at								
Lumbar spine	-0.037	-0.070	-0.005	0.023	-0.046	-0.089	-0.004	0.033
Femoral neck	-0.041	-0.064	-0.018	<0.001	-0.047	-0.078	-0.017	0.002
Total hip	-0.045	-0.069	-0.022	<0.001	-0.05	-0.081	-0.019	0.001

Drug user categories	Lumbar spine	Femoral neck	Total hip
Hallucinogens			
Depressants			
Narcotics Analgesics			
Tranquillizers		x	x
Stimulants	x	x	x
Others or unknown		x	x

RESULTS 結果

**Age and sex-matched cohort
108 vs 108**

BMD (g/cm2) at	Mean difference	95% CI		P
		Lower	Upper	
Lumbar Spine	-0.066	-0.126	-0.007	0.029
Femoral neck	-0.066	-0.113	-0.02	0.006
Total hip	-0.05	-0.099	-0.001	0.046

RESULTS 結果

	Model 1				Model 2			
	Mean difference	95% CI		P	Mean difference	95% CI		P
		lower	upper			lower	upper	
ALM (kg)	-0.424	-0.817	-0.032	0.034	-0.656	-1.172	-0.139	0.013
Gait speed (m/s)	-0.094	-0.139	-0.049	<0.001	-0.107	-0.166	-0.047	<0.001
Handgrip strength (kg)	-0.438	-1.638	0.763	0.475	-1.852	-3.428	-0.276	0.021
PEF (litres per minute)	-82.91	-98.26	-67.56	<0.001	-59.24	-79.38	-39.09	<0.001

Drug user categories	ALM	Gait speed	Grip strength	PEF
Hallucinogens	x		x	x
Depressants			x	
Narcotics Analgesics	x			x
Tranquillizers				
Stimulants		x	x	x
Others or unknown			x	x

結果肌肉質量，
手握力，步速，
峰值呼氣流量

RESULTS 結果

當前用家

過去的用戶

**骨密度，肌肉質量，
手握力，步速，
峰值呼氣流量顯著下降**

骨密度，肌肉質量，
手握力，步速，
峰值呼氣流量
沒有顯著下降

CONCLUSION 總結

- 非法藥物使用者骨密度，肌肉質量，手握力，步速，峰值呼氣流量顯著下降

- 顯著下降主要發生在當前非法藥物使用者，並非在已停止非法藥物使用的人群身上

IMPLICATION & SIGNIFICANCE 研究啟示及意義

- 公眾教育，非法藥物使用對肌肉骨骼健康有顯著負面影響

- 醫療保健專業人員要留意非法藥物使用者的肌肉骨骼健康

- 戒毒可能使肌肉骨骼變回正常

LIMITATION 研究限制

- The number of participants in each illicit drug group was small, thus the null association could be due to insufficient power.

- The small sample size in each illicit drug group also made the analysis of dose and length of drug use on musculoskeletal health infeasible.

- The number of female drug users included was small, thus sex-specific analysis was not conducted due to limited power.

- Blood biomarkers of illicit drug use was not evaluated.

- 樣本數目小
- 未評估非法藥物使用的血液生物標誌物

PROJECT INCENTIVE 項目動機

Psychotropic substance abuser & rehabilitee
吸毒及戒毒復康者
(Insight issue 病識感問題)

Drug-related and compliance problems
藥物相關及依從性問題
(Drugs of abuse also increase risks of psychiatric disorder and other physical morbidities
濫藥亦會增加患上精神病及其他疾病的風險)

Polypharmacy 多重用藥

- Multiple drugs of abuse 多重濫藥
- Prescription drugs 處方藥物
- Over-the-counter drugs 非處方藥物
- Alcohols 酒精
- Cigarettes 煙草

Adverse drug reactions
藥物不良反應
(both predictable or unpredictable
包括可預見及未能預見的)

Drug interactions
藥物相互作用
(drug-drug, drug-food, drug-herb
藥物–藥物/藥物–食物/藥物–草藥)

PROJECT INCENTIVE 項目動機

- Previous studies demonstrated that **pharmacist-led medication review** and counselling for psychiatric inpatient could **enhance medication appropriateness & compliance**, and reduce DRPs
有研究指出，為精神病住院患者進行由**藥劑師主理的藥物復審**及輔導，結果病人**用藥方面更恰當**、病人**更加依從指示服藥**，而藥物相關的問題亦有所減少。

Community
社區

Pharmacists at community level may help **identifying, preventing or tackling potential DRPs**, and as a **point of intervention** to encourage quitting substance abuse
藥劑師可於社區層面**找出**、**預防或解決藥物相關的潛在問題**，及作為其中一個**介入點**，鼓勵戒毒。

PROJECT INCENTIVE 項目動機

- **Medication Reconciliation**, as defined by American Society of Health-System Pharmacists (ASHP), is "the comprehensive evaluation of a patient's medication regimen any time there is a change in therapy in an effort to avoid medication errors or drug interactions, as well as to observe compliance and adherence patterns"
美國衛生系統藥劑師協會就藥物整合定義為「為病人於任何療程改變時的全面用藥評估，以避免醫療失誤及出現藥物相互作用，同時監測病人用藥的依從性」

- Pharmacists are assisting in smoking cessation, alcoholism reduction but very few in drug abuse quitting. This might be attributed to insufficient education, exposure and evidence on effectiveness.
現時藥劑師在協助戒煙、戒酒上有一定角色，但戒毒方面就相對罕見。這可能與培訓不足、經驗不足及文獻例證不足有關
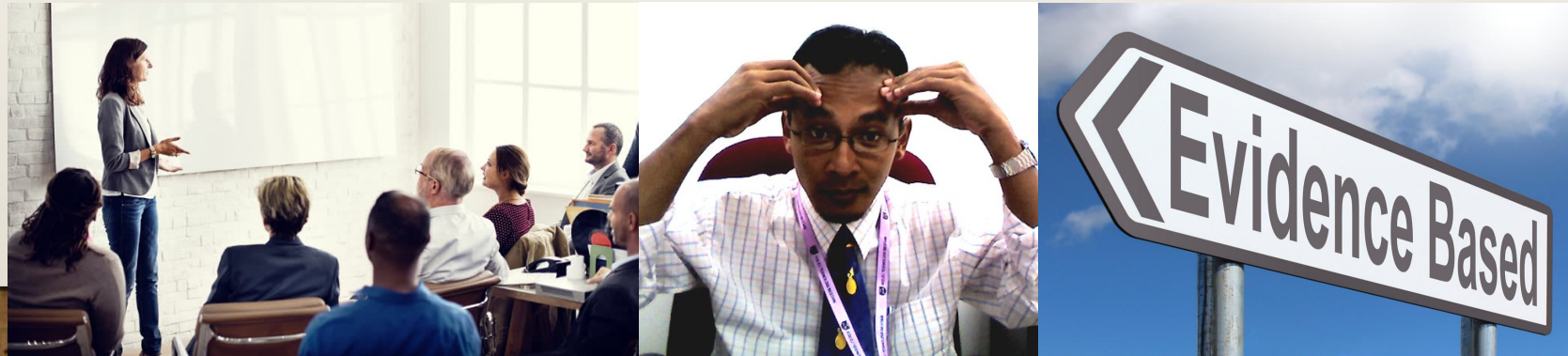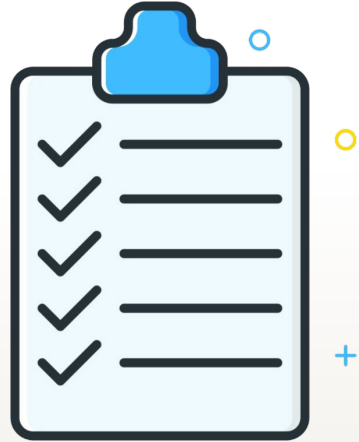
PROJECT OBJECTIVES 項目目標

1. Identify and resolve **drug-related problems** among the substance users in Hong Kong
為香港的吸毒及戒毒復康人士找出並處理**與藥物相關的問題**

2. Contribute evidence to the literature on the **roles of pharmacist** and effectiveness of pharmacist intervention in **reducing substance use** and **enhancing medication safety** for the drug abusers and rehabilitees
為**藥劑師的角色**及其工作成效，包括**減少**吸毒人士**吸毒**及提升他們的**用藥安全**提供例證

PROJECT METHODS & WORKFLOW 項目方法與流程

Substance abusers and rehabilitees were recruited from NGO, community partners and QMH substance abuse clinic during Aug 2018 to April 2021

2018年8月至2021年4月期間，
從相關非政府組織、社區合作伙伴及瑪麗醫院物質濫用診療所招募吸毒人士及吸毒康復者

Medication reconciliation and counselling service was provided by pharmacist

藥劑師提供藥物整合
及藥物輔導服務

BDF Questionnaires
禁毒基金問卷

Follow-up phone calls were made at 3 months post-MR

藥物整合的3個月後
透過電話跟進個案

PROJECT METHODS & WORKFLOW 項目方法與流程

Primary Outcome 主要結果	Secondary Outcome 次要結果
• Medication compliance 藥物依從性 • Frequency of drugs of abuse 濫藥頻率 • Motivation to change 改變動機	• Identified DRPs & completed intervention 發現到的藥物相關問題及完成的介入工作 • Drug-related and therapeutic-related questions raised by subjects 參與者問及的藥物或治療相關的問題

SUBJECT CHARACTERISTICS 研究對象的背景

108 / 115 completed the whole program 完成整個計畫

14%   82%

78% (18-64)

19% (≥65)

43% (BMI > 23)

44%   68%
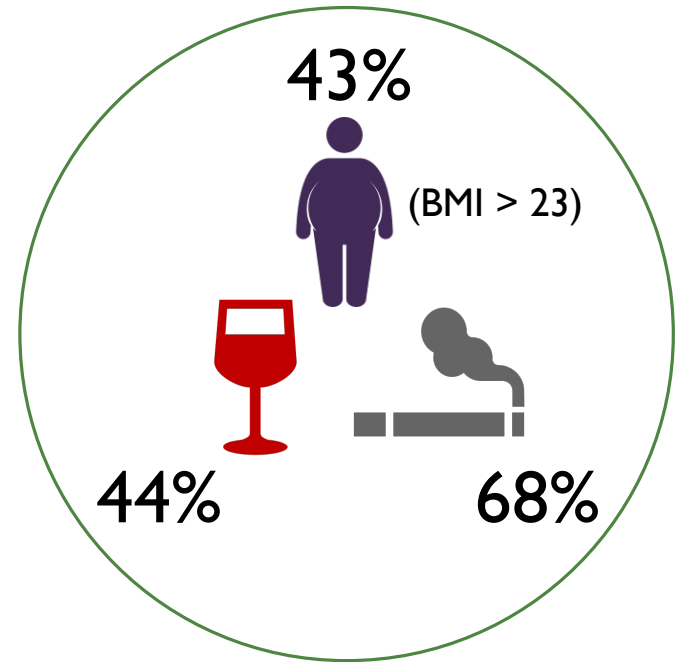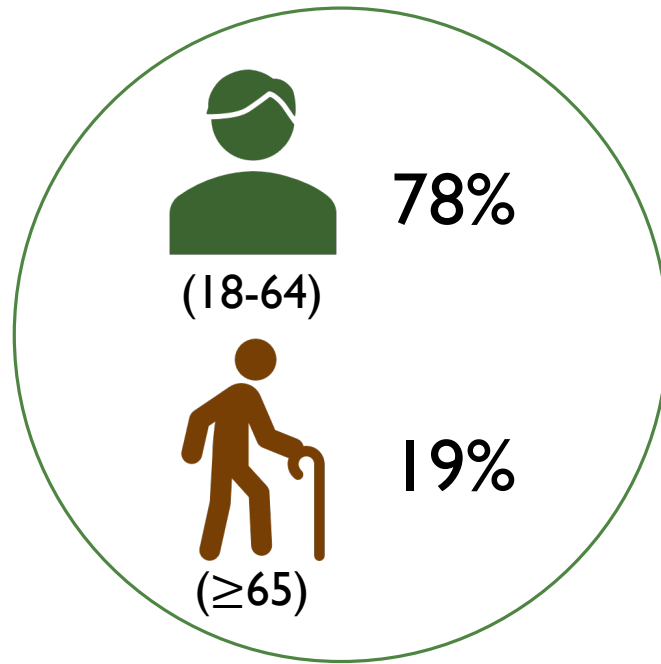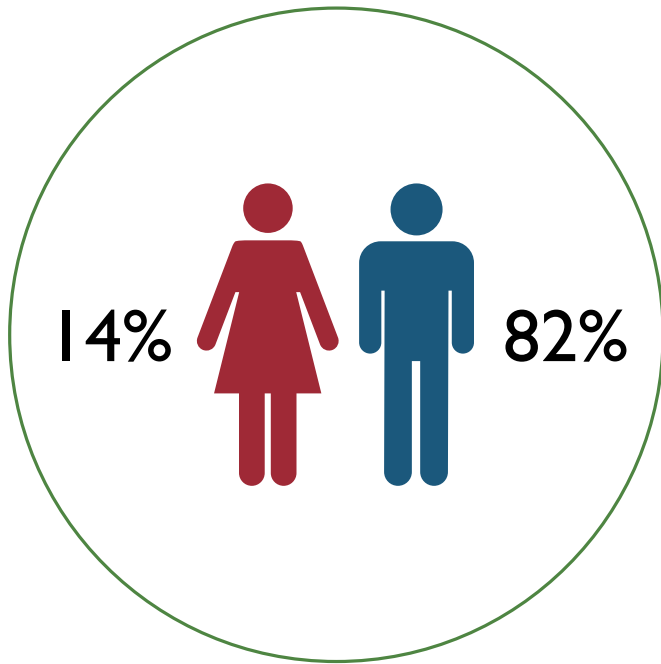
RESULTS 結果

Top FIVE Comorbidities (n = 108)
首5項最常見的共病症

Comorbidities	Number (%)
Psychiatric Disorders 精神病	57 (52.8%)
Cardiovascular Diseases 心血管病	45 (41.7%)
Pain Disorders 痛症	27 (25.0%)
Viral Hepatitis (B/C) 乙/丙型肝炎	26 (24.1%)
GI Disorders 腸胃病	24 (22.2%)
HIV 愛滋病	15 (13.9%)

Polypharmacy 多重用藥 (>5)
46 subjects (42.6%)

Over-the-counter Medications 非處方藥物
82 items

Prescription Medications 處方藥物
332 items

Cardiovascular drugs
心血管科藥物
64 (19.3%)

Psychotropic drugs
精神科藥物
63 (19.0%)

HIV drugs (HAART)
愛滋病藥物
53 (16.0%)

Gastrointestinal drugs
腸胃科藥物
29 (8.7%)

Painkillers 止痛藥
26 (7.8%)

Supplements 補充品
26 (7.8%)
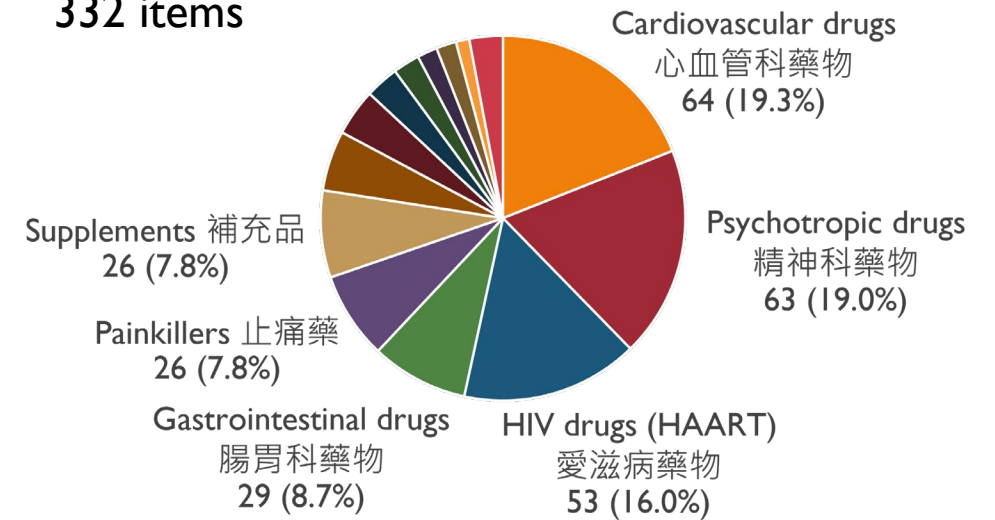
RESULTS 結果

Active substances of abuse over past 3 months (by 31 subjects)
研究進行時過去3個月仍有吸服的毒品 (31名當時仍吸毒者)

Substance of Abuse	Number (%)
Others 其他	28 (31.1%)
Stimulants 興奮劑	26 (28.9%)
Narcotic analgesics 麻醉藥	13 (14.4%)
Depressants 鎮抑劑	12 (13.3%)
Tranquilizers 鎮靜劑	6 (6.7%)
Hallucinogens 迷幻藥	5 (5.6%)
Total 總計	90

Examples of illicit drugs used
吸服毒品的例子

Category	Drug
Hallucinogens	Cannabis / Marijuana
Depressants	Amyl nitrite Gamma Hydroxybutyric Acid
Narcotics Analgesics	**Heroin** **Methadone** **Opioids**
Tranquillizers	Midazolam
Stimulants	Cocaine Methamphetamine Methylenedioxymethamphetamine
Others	Ketamine

PRIMARY OUTCOME 主要結果

A summary change in scores of questionnaires before and after medication reconciliation & review (MR)

Questionnaire	Outcome	Best score	Pre-MR mean (SD)	Post-MR mean (SD)	Change (SD)	One-tail paired t-test p-value	No. of subjects
SEAMS	medication compliance 藥物依從性	39	29.4 (6.5)	32.7 (5.9)	**+ 3.4** (1.5)	**< 0.0001**	108
BDF Questionnaire Set 6	drug use frequency 吸毒頻率	0	65.1 (100.8)	45.8 (94.3)	**− 19.3** (27.8)	**0.0002**	32^
BDF Questionnaire Set 13 (Contemplation Ladder 思動階梯)	motivation to change 改變動機	10	7.6 (3.1)	8.6 (2.4)	**+ 1.0** (1.7)	**< 0.0001**	108

^ only included active drug users before MR activity.

SECONDARY OUTCOME 次要結果

Identified DRPs & completed intervention 發現到的藥物相關問題及完成的介入工作

Problem 問題	Count	(%)
P1. Effectiveness 藥物成效	**121**	**(75.6)**
P1.1 No effect of drug treatment 藥物沒有療效	6	(3.8)
P1.2 Effect of drug treatment not optimal 藥物未達最好療效	71	(44.4)
P1.3 Untreated symptoms or indication 未有作出治療的徵狀或病症	44	(27.5)
P2. Safety 藥物安全	**32**	**(20)**
P2.1 Adverse drug event (possibly) occurring (可能)出現藥物不良反應	32	(20)
P3. Others 其他	**7**	**(4.4)**
P3.2 Unnecessary drug-treatment 不必要的藥物治療	3	(1.9)
	Total	**160**

Suboptimal effects / doses / durations
藥物治療未達最好的效果/劑量/時長

Adverse drug event
藥物不良反應

SECONDARY OUTCOME 次要結果

Identified DRPs & completed intervention 發現到的藥物相關問題及完成的介入工作

Cause 原因	Count	(%)
C1. Drug selection 藥物選擇	**49**	**(30.6)**
C1.6 No drug treatment in spite of existing indication 沒有得到藥物治療現有的病症	34	(21.3)
C7. Patient related 病人方面	**47**	**(29.4)**
C7.1 Patient uses/takes less drug than prescribed or does not take the drug at all 病人使/服用少於或沒有使/服用處方所指示的藥物	27	(16.9)
C7.2 Patient uses/takes more drug than prescribed 病人使/服用多於處方指示的藥物	6	(3.8)
C7.4 Patient uses unnecessary drug 病人使用不必要的藥物	6	(3.8)
C7.5 Patient takes food that interacts 病人所吃的食物與藥物有相互作用	1	(0.6)
C7.6 Patient stores drug inappropriately 病人不當地存放藥物	3	(1.9)
C7.7 Inappropriate timing or dosing intervals 病人於不當的時間使用藥物	3	(1.9)
C8. Others 其他	**48**	**(30.0)**
Total	**160**	

Missing treatment 欠缺適當藥物治療

Noncompliance 不依從指示用藥

SECONDARY OUTCOME 次要結果

Identified DRPs & completed intervention 發現到的藥物相關問題及完成的介入工作

Pharmacist Intervention 藥劑師介入	Count	(%)
I2. At patient level 病人層面	**159**	**(99.4)**
I2.1 **Patient (drug) counselling 向病人作藥物輔導**	155	(96.8)
I2.2 Written information provided (only) (只)提供書面資料	4	(2.5)
I3. At drug level 藥物層面	**1**	**(0.6)**
I3.5 Drug stopped 停藥	1	(0.6)
	160	

Problem Status 問題狀況	Count	(%)
O0.1 Problem status unknown 問題狀況未明	7	(4.4)
O1.1 **Problem totally solved 問題完全解決**	47	(29.4)
O2.1 **Problem partially solved 問題部分解決**	29	(18.1)
O3.1 Problem not solved, lack of cooperation of patient 問題未解決，因病人未有配合	67	(41.9)
O3.4 No need or no possibility to solve 不用或不能解決	10	(6.3)
Total	160	

47.5%

Accepted by 75.6% subjects 75.6% 參與者接受建議

SECONDARY OUTCOME 次要結果

Drug-/therapeutic-related questions raised 參與者問及的藥物或治療相關的問題

Question Categories	Frequency
Diagnosis and Prevention	**8**
Disease Information	**29**
Drug Information	**39**
Use of medications	17
Use of supplements	9
Use of drug of abuse	2
Weight management / dietary advice	11
Adverse Drug Effects	**26**
ADR profile of medications	21
ADR presentation & management	4
Adverse effects of drug of abuse	1
Drug Interaction	**9**
Total:	**111**

- Why did I wait for a long time until ART was prescribed?
- What's CD4+? How to count?
- Is HIV Vaccine available now?
- What is the purpose for collecting urine and saliva samples?

- Wonder if my chronic pain is related to HIV, medications, my history of drug use and smoking?"
- Are there ways to make the doctors prescribe with DAAs?
- Besides, INF/Ribavirin, any other drugs can treat my hep C?
- How long will it take my liver to recover?
- What can increase my bone mineral density?
- What are the signs and symptoms of liver problem?

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- Can steroids be used for pain?
- I have problem with concentration and discussed with psychiatrist. He said treatment does only a little help, since I am grown up.
- Could I change Olanzapine to other drug?
- How can I get off my depression medications?
- How can I half the pill?

- Is antioxidant supplement good for my body condition? I am especially concerned about my appearance (e.g. acne)?
- Can I know more about omega-3 FA, Ca & vitamin D supplements?

SECONDARY OUTCOME 次要結果

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- Can weed alleviate my headache?
- How to facilitate illicit drug excretion?

- What kind of food contains vitamin K?
- What type of diet can help reduce weight?
- What is my ideal body weight?
- What is the safe limit of alcohol consumption?
- Why am I still overweight despite I don't eat much?
- Should I use milk formula to increase Ca intake?

SECONDARY OUTCOME 次要結果

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- Will pain medication damage my liver and kidney?
- Does SSRI damage the brain?
- Can you explain more on the side effects of Hepatitis C treatment?
- Will I be addicted to the psychiatric meds prescribed?
- Do antihypertensive drugs cause sexual dysfunction?
- I am afraid of antibiotic resistance problem, because I take it 3-4 times per year…

- Interested to know more about serotonin syndrome
- Is chocolate helpful in resolving hypoglycaemic attack?

- Is the damage of ketamine to bladder reversible?

SECONDARY OUTCOME 次要結果

Drug-/therapeutic-related questions raised 參與者問及的藥物或治療相關的問題

Question Categories	Frequency
Diagnosis and Prevention	**8**
Disease Information	**29**
Drug Information	**39**
Use of medications	17
Use of supplements	9
Use of drug of abuse	2
Weight management / dietary advice	11
Adverse Drug Effects	**26**
ADR profile of medications	21
ADR presentation & management	4
Adverse effects of drug of abuse	1
Drug Interaction	**9**
Total:	**111**

- What is timeframe and symptoms for interaction between CF & OTC medications?
- Can I take antibiotics with concurrent medications?
- How grapefruit juice and other food substances cause drug interactions?
- How does alcohol affect my medications?
- Will there be problems if I take glucosamine + chondroitin + MSM with concurrent medications?
- If bodybuilding powder drink contain calcium that would interfere with HIV medications?
- Will Ice and Weed antagonize each other effect?
- Can medication take with tea together?
- Can HIV meds take with stomach meds and multivitamin?

CONCLUSION 總結

- Statistically significant improvement in the 統計學上顯著地改善
  (1) confidence to take medication appropriately 正確用藥的信心
  (2) reduction of drug use frequency 減少吸毒的頻率
  (3) motivation to quit drug use and maintain quitting 戒毒的動機及維持不吸毒

72
subjects

160
DRPs

96.9%
counselling

75.6%
accepted

47.5%
resolved

111
questions

IMPLICATION & SIGNIFICANCE 研究啟示及意義

- Establish evidence on the **roles of pharmacist** in providing intervention in
  (1)　**reducing substance use** and
  (2)　**enhancing medication safety**
  for the drug abusers and rehabilitees

- 憑藉介入工作提供實證，確立藥劑師的角色及工作，在吸毒者及戒毒復康者中
  (1) 減少他們吸毒，及
  (2) 提升他們用藥安全

LIMITATION 研究限制

- Small sample size
  (difficult recruitment due to pandemic
  → only 25% subjects reported as still active drug users before MR)

- Self-report bias

- Selection bias (NGO referral)

- Effect of pharmacist intervention on longer duration
  is unknown (e.g. beyond the follow-up at 3rd month)

- 樣本數目小
  (因疫症而增加招募參加者的難度，只有25%的參與者於藥物復審前仍聲稱是活躍吸毒者)

- 自我匯報誤差

- 選擇偏誤 (參加者由NGO轉介)

- 藥劑師介入工作於長期的作用仍未清楚
  (例如於第3個月完成跟進其後的時間)

ACKNOWLEDGEMENT 鳴謝

THANK YOU

QUESTIONS?