METHADONE MAINTENANCE THERAPY IN SELANGOR STATE, MALAYSIA: FACTORS ASSOCIATED WITH PROGRAM EFFECTIVENESS AND CLIENT SATISFACTION.

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METHADONE MAINTENANCE THERAPY IN SELANGOR STATE, MALAYSIA: FACTORS ASSOCIATED WITH PROGRAM EFFECTIVENESS AND CLIENT SATISFACTION

ABSTRACT

Successful patient outcome in methadone maintenance program is a result of long term treatment and rehabilitation. Therefore evaluation of treatment should consider successful outcome as a status of patients after months and years of therapy. Patients' satisfaction with methadone maintenance treatment (MMT) is a key measure of treatment quality. The aim of this study was to explore the quality of life of clients who was addicted to heroin and their responses at baseline and after joining the Methadone Maintenance Therapy and how quality of life can be successfully integrated in the treatment as well as to identify factors that are associated with quality of life of methadone clients. Attention is also given to find out how much of these clients satisfied with the program modality and also to explore the factors that predict the employment outcome after joining the program. This study includes retrospective record review and cross-sectional component among all active clients in methadone treatment between years 2007 and 2012. The study was conducted at government hospitals and primary health care centres in the state of Selangor. Total of 12 Methadone clinics participated in this study. Face-to-face interviews guided by structured questionnaires were conducted by the researcher using a set of questionnaires namely, WHO Quality of Life-BREF (WHOQOL-BREF), Opiate Treatment Index (Health et al.) and Patient's Satisfaction Questionnaire III (PSQ). After applying the inclusion and exclusion criteria total of 661 clients were included in this study. Quality of life of methadone clients showed a significant improvement in all domains with p

values < 0.001 at baseline and after joining the program. In a multivariate analysis, being employed, hepatitis B virus (HBV) negative, hepatitis C virus (HCV) negative, Human immunodeficiency virus (HIV) negative, married, age between 30-50 years old, race, male, dose and years of drug use were the significant predictors of the magnitude of quality of life of methadone clients. . More than 90% of the clients were satisfied with service provided. Years of drug use (11 – 20years), HCV negative status and HBV negative status were the predictors for the level of satisfaction. Being male (AOR 8.60, 95% CI 2.71, 27.30), unemployed before starting treatment (AOR 8.18, 95% CI 4.80, 13.94) and HIV negative (AOR 3.02, 95% CI 1.43, 6.34) were found to be associated with current employment status. The application of methadone maintenance treatment program has been considered as an effective in enhancing the outcomes of employment, reducing the criminal activities, decrease the use of the drug and risky behaviours related to blood-borne diseases while leading to an improved social behaviour and life. Clients on methadone program have a significant quality of life in all domains after joining the program. Treatment satisfactions survey revealed that most clients have overall satisfaction with health care workers and service. Employment status is commonly upheld as a very important outcome. Total of 84% of clients' are employed while in treatment. The methadone maintenance treatment program has great prospects in the treatment of opioid addiction and it is important to ensure the improvement is sustained.

Keywords: Effectiveness, Employment, Methadone maintenance treatment, Quality of life, Satisfaction

TERAPI GANTIAN METHADONE DI SELANGOR, MALAYSIA: FAKTOR YANG BERKAITAN DENGAN KEBERKESANAN PROGRAM DAN KEPUASAN KLIEN

ABSTRAK

Kejayaan pesakit dalam program terapi gantian Methadone adalah hasil dari rawatan dan pemulihan jangka panjang. Olehkerana itu penilaian terhadap rawatan sepatutnya mengambilkira kesan kejayaan pesakit setelah beberapa bulan dan tahun menjalani rawatan. Kepuasan pesakit terhadap rawatan terapi gantian Methadone adalah juga salah satu pengukuran terhadap kualiti rawatan. Tujuan kajian ini adalah untuk mengenalpasti kualiti hidup klien yang merupakan bekas penagih dadah heroin dan tindakbalas mereka setelah menjalani program terapi gantian Methadone serta bagaimana kualiti hidup mereka boleh diintegrasikan dengan berjaya semasa dalam rawatan, disamping mengenalpasti faktor-faktor yang berkaitan dengan kualiti hidup klien Methadone. Turut diperhatikan adalah sejauhmana klien tersebut berpuashati dengan pelaksanaan program dan faktor yang menyumbang terhadap pekerjaan klien selepas mengikuti program tersebut. Kajian ini menggunakan data retrospektif dan kajian rentas di kalangan semua klien aktif dalam rawatan Methadone dari tahun 2007 dan 2012, meliputi hospital kerajaan dan klinik kesihatan yang menjalankan program di Selangor. Sebanyak 12 klinik Metahdone telah menyertai kajian ini. Penyelidik telah mengadakan temubual secara bersemuka menggunakan borang soal selidek seperti; WHO Quality of Life-BREF (WHOQOL-BREF), Opiate Treatment Index (Health et al.) dan Patient's Satisfaction Questionnaire III (PSQ). Setelah melalui kriteria pemilihan, seramai 661 klien telah layak memasuki kajian ini. Penemuan kajian mendapati kualiti hidup klien Methadone menunjukkan peningkatan yang signifikan $p < 0.001$ dalam kesemua

domain. Analisa Multivariat yang dijalankan mendapati faktor-faktor yang signifikan iaitu klien yang bekerja, tidak dijangkiti Hepatitis B, tidak dijangkiti Hepatitis C, tidak dijangkiti HIV, berkahwin, berumur diantara 30-50 tahun, bangsa, lelaki, dos dan tahun jangkamasa penggunaan dadah adalah penyumbang terhadap tahap kualiti hidup klien Methadone. Lebih dari 90% klien berpuas hati terhadap perkhidmatan yang diberikan. Faktor jangkamasa penggunaan dadah (11 – 20 tahun), status jangkitan HCV dan HBV yang negatif turut menyumbang kepada tahap kepuasan klien. Hasil kajian juga menunjukkan faktor lelaki (AOR 8.60, 95% CI 2.71, 27.30), tidak bekerja sebelum memulakan rawatan (AOR 8.18, 95% CI 4.80, 13.94) dan negatif jangkitan HIV (AOR 3.02, 95% CI 1.43, 6.34) mempunyai hubungan dengan status pekerjaan semasa, klien. Pelaksanaan program terapi gantian Methadone dapat dianggap sebagai satu langkah yang berkesan untuk meningkatkan tahap pekerjaan, menurunkan aktiviti tingkahlaku berisiko yang menyebabkan jangkitan bawaan darah, disamping menjurus kepada perubahan tingkahlaku sosial dan hidup yang lebih baik kepada klien. Klien program methadone didapati mempunyai kualiti hidup yang signifikan dalam kesemua domain selepas mengikuti program ini. Kajian kepuasan rawatan menunjukkan kebanyakan klien mempunyai kepuasan yang menyeluruh terhadap anggota dan perkhidmatan yang diberikan. Status pekerjaan biasanya dipertahankan sebagai hasil yang sangat penting. Sebanyak 84% klien mempunyai pekerjaan semasa dalam rawatan. Program terapi gantian Methadone mempunyai prospek yang amat baik dalam rawatan pemulihan penagih dadah opiat dan amat penting memastikan ianya dapat diteruskan.

Kata kunci: keberkesanan, pekerjaan, terapi gantian Methadone, kualiti hidup, kepuasan klien

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF SYMBOLS AND ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
B	Beta Coefficient
CBO	Communities Based Organization
CI	Confident Interval
df	Degree of Freedom
DORIS	Drug Outcome Research in Scotland
SCL-90	Symptom Checklist-90
CSQ-8	Client Satisfaction Questionnaire-8
CVI	Content Validation Index
CVR	Content Validation Ratio
FGD	Focus Group Discussion
GHQ-28	General Health Questionnaire-28
HARB	HIV Associated Risk Behaviour
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HDI	Human Development Index
HIV	Human Immunodeficiency Virus
HRBS	High Risk Behaviour Score
IBBS	Integrated Bio-Behavioral Surveillance
IDU	Intravenous Drug Use
KK	Klinik Kesihatan
MMT	Methadone Maintenance Therapy
MRT	Methadone Reduction Treatment

MSQOL	Multiple Sclerosis Quality of Life
NACDA	National Advisory Committee on Drugs
NADA	National Anti Drug Agency
NMRR	National Medical Research Registry
NRIC	National Registration Identity Card
NSEP	Needle syringe exchange program
AOR	Adjusted Odds Ratio
OECD	Organisation for Economic Co-operation and Development
OTI	Opiate Treatment Index
PHC	Primary Healthcare Clinics
PKD	Pejabat Kesihatan Daerah
PIQ	Perceived Improvement Questionnaire
PWID	People who inject drugs
PSQ	Patient Satisfaction Questionnaire
PQLI	Physical Quality of Life Index
QOL	Quality of Life
SATIS	Satisfaction with Treatment Interview Scale
SD	Standard Deviation
SDS	Severity of dependence scale
SF-12	Short Form Health Survey - 12
SCL-90-R	Symptom Checklist-90-Revised
UMMC	University Malaya Medical Centre
UNODC	United Nations Office on Drugs and Crime
VSSS-MT	Verona Service Satisfaction Scale For Methadone-Treatment

WHO	World Health Organization
WHOQOL-BREF	WHO Quality of Life -BREF
X^2	Chi Square

LIST OF APPENDICES

CHAPTER 1: INTRODUCTION

1.1 Background

Place and role of methadone in pharmacotherapy of opiate dependent has long history in professional medical world. World health organization has placed methadone and buprenorphine on list of essential medicines for the treatment of this severe, chronic and relapsing disease. Although opiate dependency is one of the worst socio-pathological phenomena of modern times, still we cannot say that there are effective ways for its suppression. Even in modern, economically powerful countries, this phenomenon is the leading unsolvable problem, and situation in poor countries that are undergoing a transition phase of development is even worse. Methadone is a synthetic agonist opiate that no doubt has a historical role in the treatment of heroin addicts, according to estimates, in the world today is about one million people involved in this program ("Detox from Heroin Now," 2018)

Drug abuse in Malaysia dates back to 8th century among the Arabs traders. This period was been turned 'pre-independence period'. During the 'post-independence' period in the 60s, the Malay youth slowly took over from the Chinese as the main drug users. (Rusdi et al., 2008). Malaysia is not a major producer of illicit drugs, but geographically close to the Golden Triangle (Myanmar, Laos, and Thailand) (Reid et al., 2007). This together with the rapid progress and urbanization contributed to the rise in domestic drug use. The number of addicts went up drastically from 711 to 1970 to 26,513 in 1982 and 92,310 in1983. On 19th February 1983, the Prime Minister declared 'dadah' as nation's number one enemy. It is a great social threat for government and they has implemented many strategies to tackle the problem (Rusdi et al., 2008). Even with the draconian punishment there has been substantial increase in the number of new and relapsing drug addicts (Reid et al., 2007). Currently it is estimated to be 400,000 to

800,000 drug addicts in Malaysia. However it is the major issue of HIV related to use of intravenous drugs habit that has made the government and community realize the seriousness of the situation (Rusdi et al., 2008).

1.2 Prevalence of opiate dependent

There are no complete statistics about opiate dependent prevalence, this social problem that ruins not only families but entire societies. Some complete studies mention this numbers and facts: It is clear that dependency affects all countries in different scale, and causes different effects due to country economic status and wealth. It is more likely that countries with poor economic status will serve cartels as corridors for drug distribution and also in those countries will be dominant crime connected to drug abasement, men trafficking etc. The highly developed countries are more likely to be a big consummates where drug is distributed and harm is seen only in the end of distribution chain like destroyed individuals and their families (Degenhardt et al., 2014).

1.3 Disease burden

Often opiate dependency is not treated as disease at all among many societies, including the one of high developed countries like Canada or United States. The conscience of people about opiate dependent and therapy against it is often set on crime it connects and the possibility of HIV infection among people who practice it. The burden of disease often include isolation from family members, social stigma in whole and loss of any support that a ill member could receive and which could help persons healing process. The last few years there is a significant change in treatment of opiate dependent but also a big change how other people perceive the disease itself.

Studies performed among opiate dependent both in World (Europe, US) and in Malaysia gave better results than before actions started by World Health organization in prevention and treatment of opiate dependent. That included not only heroine addicted but also other addictions as well, but numbers are notable ("Detox from Heroin Now," 2018; Norsiah et al., 2010).

1.4 Opiate dependent and HIV/AIDS

Connected to drug abasement, general opiate dependency there is also methadone therapy included in the treatment of AIDS ("Detox from Heroin Now," 2018). AIDS is the extraordinary crisis and emergency with long-term consequences. Despite fundings, public and political involvement and international movement for education and prevention, this epidemic is outpacing global response. HIV infection is a major problem in Malaysia in certain subgroups of the population.Also, there was a huge shift toward opiate dependent from 1980s till now. Opiate dependent and HIV infection are interlinked. Injection type of opiate dependent is much more vulnerable to infection transmission because of complex factors and the life style they lead. Injection opiate dependent has a key role in spreading HIV epidemic and viral hepatitis (Bergner et al., 1981). An analysis by the national surveillance system shows new HIV infection has reduced by 50% between 2000 and 2015 (Figure 1.1), while the number of HIV/AIDS related deaths stabilized during the same period.

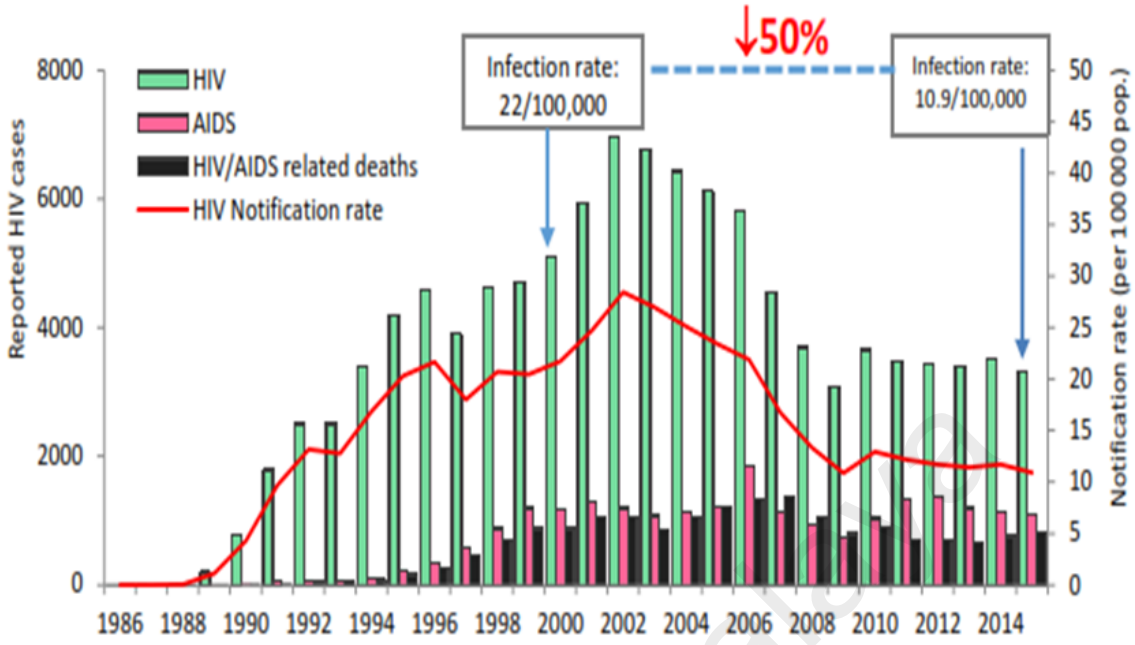

Figure 1.1: Reported HIV, AIDS and HIV/AIDS related deaths, Malaysia 1986-2015 (Suleiman, 2016)

1.5 Harm reduction

Harm reduction involves all factors that lead to improved quality of opiate dependent treatment, prevention education and helping opiate dependent to obtain sterile syringes. It is well known that unsafe sex and needle exchange are the prime transmission methods of HIV infection. (Bergner et al., 1981) Malaysia is one of the world countries which demonstrated political initiative and big commitment by adopting harm reduction on national level in 2005. Additional funding for harm reduction programs and research is started exclusively by the government (UNODC, 2009). Harm reduction program in Malaysia consist of needle syringe exchange program (NSEP) methadone maintenance therapy and provision of condom. Harm reduction working group of Malaysia was established in January 2004 to advocate for implementation of harm reduction initiative.

In Malaysia the HIV epidemic has for the last 15 years primarily affected intravenous drug users (Reid et al., 2007).

The NSEP and provision of condom is carried out by identified NGO's at 5 states. The states are Selangor, Johor, Pahang, Penang and Kelantan. The NSEP program was implemented by a collaborative partnership between communities based organization (CBO) and NGO's working out on drug users' issues and government agencies. The government through the Ministry of Health provides supports while the CBOs, as the implementers of the NSEP, manage the drop in centres and program sites (WHO, 2011).

Government and international organizations support harm reduction program for prevention of HIV infection and other blood born viral infections. It was a strategy to directly affect communities of opiate dependent so they can adopt risk reduction practice and prevent the spread of HIV. Given the epidemiological picture of addiction in the world, Malaysia is listed pretty high, but even in opiate dependent and the growing risk of HIV infection was very much present in Malaysia. Statistic showed that there were 78,784 identified HIV/AIDS cases in Malaysia and 55,340 (72%) of them were IDU's. This is a reason why strategy number 3 under the National Strategic Plan for HIV/AIDS 2011-2015 is reducing HIV vulnerability among Intravenous Drug Use (IDU's) and their partners. The activities for this strategy are scaling up the harm reduction program which consists of needle syringe exchange program and methadone maintenance therapy (MOH, 2011; WHO, 2011). From that point of view, program which includes addiction prevention and treatments of HIV infected people started by the initiative of government are not surprising after all.

Study research through last few decades indicate there is a big possibility that HIV infection can be placed under control, in a way to prevent a number of infected among opiate dependent, slow down or even stopped. These socio-economic problems are

present in other countries too but Malaysia is one of the few countries in the world that has instead of the high mortality rate connected to the crime induced by abuse of drugs, it has a high mortality rate due to HIV infection connected to opiate consumption. After making proper moves and plans through government initiative and the beneficiary help of World Health Organization Malaysia's problems seemed to be put under control, still there are plans and programs for other centres to be open, both on educational level and on the treatment level of taking care of HIV infection or opiate dependent. There are also alarming growth of addicts between the female population of Malaysia (MOH, 2010) and on base of that fact we can conclude that will be present increasing number of HIV infected children which need help even more than already infected adults.

1.6 Methadone maintenance therapy (MMT)

The pioneer phase of the methadone maintenance (MMT) program, launched at the national level in October 2005, involved 1241 patients and 8 government hospitals and 2 primary health centres and 7 private health clinics (WHO, 2011). As of September 2007 there are a total of 58 (hospitals, primary health clinics and private clinics) in Malaysia were running the methadone maintenance treatment program (MOH, 2011; WHO, 2011). By 2009 we had a total of 10,730 clients registered and about 7455 active clients in methadone program.

Methadone is potent synthetic opiate agonist which is well absorbed orally. The effect of methadone is qualitatively similar to morphine and other opiates. Methadone maintenance was first developed as a treatment for heroin addiction in the mid-1960s and has been proven to be an effective and safe mode of treatment. Methadone maintenance treatment is indicated for those who are dependent on opiates and who have had an extended period of regular opiate use. The diagnosis of opiate dependence

made by eliciting the features of opiates dependence in a clinical interview (Rusdi et al., 2008).

The experience in the past 30 years has shown that methadone maintenance therapy (MMT) is currently the most effective intervention method for controlling heroine addicts and its related HIV transmission issues among opiate users. MMT reduces injection related HIV risk behaviour and help drug addicts to recover from their various social functions and health status (Pang et al., 2007).

The Ministry of Health has set the inclusion and exclusion criteria that are to be followed by all the clinics running the MMT program. The inclusion criteria are the patients must volunteer into the treatment program, dependency or addiction must be established chronic cases of opiates addiction, the patient must abide by program regulation and procedures and previous unsuccessful methadone treatment should not exclude a patient from further method treatment. The exclusion criteria are opiate addiction less than 2 years, age less than 18years, poly-substances dependence, and abnormal liver function test, hypersensitivity to methadone and acute medical and/or psychiatric disorder (Rusdi et al., 2008).

1.7 Quality of life

Quality of life (QOL), the term is used to mark general well-being of a person of the group. It includes wealth, employment but also the environment, physical and mental health, education, recreation and leisure time and social (group) belonging. Related to this we can say it also includes freedom, human rights and even personal happiness ("Quality of Life," n.d.). There are few ways to measure or assess the quality of life.

Quantitative measurements of QOL are: Human Development Index (HDI) used by United Nations Development Program, Physical Quality of Life Index (PQLI) (1970)

(Morris, 1980) based on literacy, infant mortality and life expectancy, Happy Planet Index (2006) which uses every country ecological footprint as an indicator of QOL and Gallup researchers trying to find happiest countries (example Denmark). Another type of measurement is Liability in which we include Economist Intelligence Unit's quality-of-life Index and Merced's Quality of Living Report. With special Theory of Broken Window elaborated in work of James Q. Wilson ("general disorder is tolerated and as result it leads in greater crime") other measurements of QOL are connected to Healthcare and special reports about certain illnesses. From instruments in use the most famous are: Sickness Impact Profile (Bergner et al., 1981), SF-36 and The World Health Organization Quality of Life Instrument (WHO, 2002).

If we put all those indexes together in short QOL would be complex factors of: economic situation, financial situation, housing, job, quality of work, structure of household, family relations, balanced family life (harmonic family relations), balance of private a life and professional occupation, health, quality of health care, trust in healthcare system, subjective feeling of welfare and happiness, perception of quality of society, economic activity, education and learned skills, social involvement and perception of roles of the certain social institutions.

1.8 Quality of life of opiate dependent

In the work of De Maeyer et al., (2010) was revealed that among opiate dependant individuals 5 to 10 years after they started MMT most of them are satisfied with self-esteem, safety and meaningful perspective in life, but also the respondent were less satisfied with their finances, family relations, living situation and fulfilment of their life plans.

First, there is a huge difference from life style of the normal person who is not addicted to any drug and person who sole mission in life is the consummation of drug. Anything else falls secondary, including family. Influencing directly on Quality of life of opiate dependent can cause serious health issues, lead to HIV infection and Hepatitis, and also it is a very expensive habit, basically every opiate dependent needs 150 to 250$ per day to satisfy the need. After entering MMT program, things considering life style change in big scale. We have to understand that only MMT is not a complete rehabilitation program, it is only one part of it ("Detox from Heroin Now," 2018).

Health related quality of life among opiate dependent on MMT has become issue of growing interest within medical circles of expertise. Chronic illnesses as consequences of opiate dependency vary from patient to patient in matter of complexity and intensity, but always they are contra productive in meaning of given therapy. Complications like hearth conditions, lungs disease or embolus's caused by opiate dependence through years of usage may be severe factors in treatment of affected patient. Improvements in general health status highly indicate it may lead to faster and easier rehabilitation process.

Opiate dependent have long term relationship with Methadone provider, clinic. That is a big difference from the previous condition of drug addiction where they find drug anywhere to satisfy the need. Also, opiate dependent must follow the treatment plan, completely change lifestyle, provide "clean" urine samples for analyses on a daily time table, visit counsellor and physician and generally follow conditions of the clinic. Clinic also serves as tampon zone that is trying to restore client's productive and functional role in society (Frenopoulo, 2003). In other words their personal freedom and right of choice are limited. Other people make the decision for them because the power of

perception of opiate dependent is blur a with dependency and usually, symptoms of withdrawal

1.9 Outcomes of MMT

1.9.1 Psychological

We all know what the effect of heroin on the human brain is. It changes behavior on neurochemical and molecular level of the brain. Condition of normal healthy individual is degraded by long term heroin abuse in chronic, compulsive drug seeking and use ("Detox from Heroin Now," 2018).

The drug itself produces high degree of tolerance and physical dependence powerfully motivating individual for compulsive actions. The primary purpose in life becomes the urge to satisfy the need. Studies and experience with opiate dependent have shown that addiction is not physical although withdrawal symptoms are; because craving can appear even weeks and months after withdraw symptoms ceased. Also, craving is not connected to withdraw symptoms but to rush drug produces. It is scientifically proven that pain reducing therapy doesn't produce dependency, because users were exposed to it for pain reduction and not for purpose of seeking pleasure (National Institute of Drug Abuse, 2018).

One of the few key actions of UNODC in Malaysia is involvement of man and women who inject drug and other key community members at all stages of the HIV prevention, treatment and care program will result in a stronger national program. This program still doesn't involve screening methods for foreigner who live in Malaysia and refugees (MOH, 2010).

The biggest psychological, impact connected with opiate dependent is concerning overlap between injecting drug use and sex workers. In 2006 (Kamaruzaman, 2007),

15% sexually active males and 100% sexually active females who injected drugs (opiate dependent) reported having either sold or bought sex. Nine from ten new infections are among male opiate dependent, but female infections with HIV virus continues to grow so we can presume it is connected to opiate dependency likewise. Also, the chain of infection and opiate dependency is followed by a transmission from mother to child. Psychological impact of those numbers is enormous and all statistics is almost 2 years old. The magnitude of sexually transmitted infections and opiate dependent sex workers in Malaysia is very much under-estimated so we don't know the real proportion of this problem (MOH, 2010) and Malaysia's Country Progress Report in year 2006-2007 and 2008-2009 says that factor of missing information states that psychological approach to this particular problem should be studied and improved even if there is a steady decline of annual reported new HIV cases. The same thing is with a factor of social relationship of both opiate dependent with MMT and HIV infected on MMT.

1.9.2 Social relationship

Another important action supported by UNODC is overcoming social stigma and discrimination due to HIV and injecting drug use that would help to increase the usage of services by the most marginalized. By today program in Malaysia we have Routine HIV Screening (MOH, 2010) which includes: antenatal care is given to all mothers in government facilities, blood donors, sex workers, drug rehabilitation centres (DRC) inmates, those who are at prison categorised as high risk group (i.e. drug users, drug dealers and), tuberculosis cases, sexually transmitted disease (STD) cases, patients with suspected clinical symptoms, premarital couples, traced contacts of confirmed persons with HIV, migrant workers and participants of harm reduction programmed. Anonymous HIV Voluntary Screening program was first done in 2001 and later

expanded nationwide in 2003, but there is no specified program for the most vulnerable groups of Malaysia subculture or information about distribution of opiate dependent among them or HIV infected users.

By the opinion (MOH, 2010) and estimation of Ministry of Health in 2010 Malaysia was supposed to reach 105,471 people living with AIDS and annual death of almost 6000 people. Prediction for 2015 is 119,471 of HIV infected and 7551 AIDS-related death. With this progressive statistic no wonder opiate dependent are socially isolated even if they are not HIV infected and even if they are opiate dependent participants in MMT.

The most targeted and studied population are the on most at risk: injecting drug users, female sex workers , Trans gendered, homosexual and bisexual persons, but also there are new emerging vulnerable population like children affected by HIV received by birth from HIV infected mothers, migrant workers which are not included in screening methods and refugees.

These new populations in Malaysia still need to be studied and researches on them would be extremely hard because of socio- economic factors which surround them, especially migrant workers and people who are still not registered as HIV infected. The same research awaits opiate dependant person under MMT in Malaysia hospitals. Even they are on constant care and supervision still there is no adequate data to drawn out reasonable conclusions about their social relationships, family circumstances or mental health.

1.9.3 Physical health

Physical dependence starts with higher doses and then withdrawal symptoms occur if usage is reduced or stopped. They begin in few hours after consumption, peek between

1-2 days and lasts for about a week. Symptoms include: restlessness, muscle and bone pain, insomnia, diarrhoea, vomiting, cold flashes and leg movements.

Usually they are harmless for healthy adults but can cause death of fetus (National Institute of Drug Abuse, 2018). MMT eases the effect of withdrawal and there so they can use on rehabilitation better. The withdrawal symptoms are the lesser importance of health issues of opiate dependent. Consequences of chronic heroin use are damage veins, bacterial infections of blood vessels, bacterial infections of heart valves, abscesses, soft tissue infections, liver disease, kidney disease, pneumonia and Tuberculosis caused by poor health condition and drug's depressing effects (National Institute of Drug Abuse, 2018).

Except HIV and blood borne diseases opiate dependent are struggling with medical complications caused by polluted drug which doesn't dilute in blood completely and leads to clogged blood vessels in lungs, liver, kidney and brain causing multiple infections, cardio diseases and stroke, arthritis and rheumatologic problems. So even if the patent or opiate dependent is not HIV positive there are other complications that are slowing down persons healing and also some of those illnesses are chronicle and undergo only trough palliative care and sustaining present state from worsening (illnesses of parenchyma organs and hearth).

1.9.4 Environmental

It is well known that opiate dependent are in much greater danger from all kind of illnesses and drug related crime, as well as particular sex related behaviour, but also they are more in danger of suicide than other sub cultures in particular society. Most of the people still live under society stigmatization and heavily disapproval, and even

under constant anger of their families. These people are the best candidates for relapse because of the lack of necessary feedback from their closest environment.

Malaysia government has started huge project to prevent, slow down and hopefully stop epidemic and also to better conditions, understanding and education for and about people living with AIDS and people going through MMT, but still there is much to learn about socio economic circumstances which could lead to, better or improve healing of entire society.

Studies made in Malaysia in last 20 years didn't take in consideration factor of suicides connected to drug use, HIV infections neither opiate dependent on MMT. Also there is no statistical report about spontaneous abortions connected to pregnant opiate dependent; even if the research about underage persons under 19 has been proven there were 2122 HIV-infected children in Malaysia in year 1998 (MOH, 2010) and year rate of new infected children for 2009 is 90 children per 3000 total new infections. Based on studies and research about opiate dependent person on MMT in Malaysia there is not enough information for the detailed conclusion of environmental factors which influence life quality of those individuals.

1.9.5 Crime status

There is always been a link between crime and addiction and this is very suggestive that addiction to the drug may or will lead to the client to involve in crime. Also can say, crime will lead and will sustain the addicts to stay on with drug forever. Vastly accepted the causal relationship between crime and addiction and it may vary from one individual to another individual. (Gossop et al., 2000) Numerous studies have done in western countries shows injecting drug users mayassociate with high risk crime rates. Counties like New Zealand, one of their major goals in methadone maintenance

program protocol is to reduce illegal drug use association with crime status. The cost of reduction in crime and imprisons may justify for more funding on methadone clinics. (Sheerin et al., 2004). There is no single study which looks into crime status of those clients in methadone maintenance treatment program or among drug users not in the program.

1.9.6 Drug use (Poly drug use)

Numerous drug addicts still use variety of illicit drugs while in Methadone treatment. Poly drugs are one of the exclusion criteria from joining the methadone program (Rusdi et al., 2008). It is strictly prohibited to use any type of drug from the groups of heroine, opiates, Marijuana, tranquillisers, benzodiazepines and amphetamines. Urine test is a mandatory test to be conducted every now and then by the health care workers at the clinic. Urine test is to evaluate and monitor the client continuous illicit drug use. The possibility to terminate the client from the program is very high if he or she has a continuous record more than three time urine test positive for poly drug use. Very little is known about the difference between those who takes illicit drugs while in methadone treatment and those who don't take. How much of the drug they are taking and how often they are taking will be scored in Opiate Treatment Index. The score anyythine more than zero in considered non abstinence (Darke et al., 1991).

1.9.7 Employment status

Employment status is usually upheld as a very important indicator in the context of addiction treatment.(Magura, 2003) and it is important for a person who have been stigmatized because of their history of drug use. Employment status plays a duo role as in economic and non-economic benefits, in recovering clients as in a platform to socialize with nonsubstance users, produce income and respected role in family and

society. By providing work, this will keep them from relapsing because employment can strengthen commitment to better recovery (Blankertz et al., 1998).

Regretably, being unemployed is a major problem among drug addicts. Many research over decades, has explored the relationship between addiction and employment status. Literatures have also revealed on the outcome of treatment on employment status, where it has been shown that there are demographic factors associated with employment status, namely age, gender, ethnicity, marital status and education (Sterling et al., 2001)

1.10 Client satisfaction & perception

In any health care services, feedback from patients are the most important aspect in terms of the services, soft skill, efficiency, competence, dedication and time managment. In dealing with drug addicts in methadone clinics, all health care providers must use extra soft skill while attending them. This group of people are very sensitive to minor issues and at times very aggressive too. Their feedbacks are the ones will idenentify the healthcare prviders weakness and improvement can be achieved. Evaluation of program is very important. Those in this treatment group are the vulnerable group people. Some of them are unemployed, uneducated and poor. Consumers evaluate base on what they receive from the health care providers like perceived competence, skills, attentiveness, courtesy and consideration. (Aniza & Suhaila, 2011).

1.11 Rationale of the study

Combining study research results done in Malaysia, previous papers on MMT topic and acquiring data from practice MMT in prisons, public hospitals and the most important among opiate dependence, HIV positive population will be possible to

determine relevance and functionality of MMT in resolving situation of growing problem connected to infectious disease, crime rate, high risk behaviour and other social issues. Also acquiring exact measurable data is important for prediction of future pace in reducing the above mention problems among the most vulnerable groups and potential vulnerable groups lately emerging. For a MMT programme to succeed, active participation of the opiate dependence needs to assured. This can be achieved by promoting MMT to opiate dependence to change their perception and knowledge towards MMT and the impact of the program.

This study is expected to contribute to scientific literature on methadone maintenance effectiveness and clients' satisfaction in the country. Besides that, it will address issues to improve quality on health care services like compulsory national training for provider at Methadone maintenance treatment clinic should include management and clinical practice of methadone maintenance treatment. Management of substance related disorder, sufficient understanding of treating drug users is essential for the providers is establishing a suitable treatment plan for each client and practical skills in providing methadone treatment.

Employment is a key functioning index in addiction services and consistently emerges as a goal among persons in recovery. Research on employment in the addictions has focused on treatment populations; little is known of employment rates or their predictors among persons in recovery. This study seeks to fill this gap. As for my concern, there is no studies have done and published to evaluate the methadone maintenance treatment program outcome for the state of Selangor. Furthermore the findings could inform policy makers and health services staff about the operation on MMT program. The outcome from this study is also can be an effective public health approach to reduce problem associated with heroin dependence and remaining in

treatment can improve their quality of life and reduce their risky behaviour compare to those who leave the program prematurely or discontinue.

1.12 Statement of problem

Opiate dependence is considered as a chronic relapsing disorder involving various life domains (e.g. social issues, unemployment, housing issues, mental illnesses, health problems, criminal involvement, absence of drug use and their overall well-being) (WHO, 2009). However, very limited numbers of studies have done for the long-term outcomes of methadone maintenance therapy treatment and research on opiate-dependent individuals' on quality of life several years after starting treatment are very few (Fei et al., 2016; Flynn et al., 2003; Hubbard et al., 2003).

The measurement of satisfaction can be difficult because there is no clear definition of satisfaction and a lack of understanding of its underlying factors (Baker, 1997). This has caused difficulty in comparing of research findings. In spite of the increased emphasis on assessing clients' satisfaction because satisfaction can affect treatment outcome, the literature regarding clients' satisfaction remains limited (de los Cobos et al., 2004). Another major limitation is there are very limited instruments to measure clients' satisfaction in MMT. Even though there is no clear definition of satisfaction, clients' satisfaction can be viewed as clients' perceptions of how well the services provided fulfilled their needs. Assessing clients' satisfaction with the MMT services is crucial because at present the trend is for health care services to be more patient oriented. Given that clients' satisfaction evaluation is important and that WHO has recommended it for improving the quality of services at MMT centres.

Lacking of understanding of the local community and the employers on how to accept drug users who have curbed their habits as part of the society should be carried

out to help reduce the stigmatization and discrimination of drug users. This will make the clients gain better employment as well as improving their quality of life. A better quality of life and good employment can help in reducing the risk of relapse among the drug users.

Furthermore, consistent evidence is lacking in improvement of drug-related aspects which contributes to opiate-dependent individuals' quality of life. Therefore, the concept of quality of life is a wide measure that provides information on the impact of opiate addiction on various domains of opiate-dependent individuals' life and their overall feeling of well-being. Therefore, this study will add the evidence to methadone maintenance treatment program positive outcomes.

1.13 Research question

a) Is methadone maintenance treatment program is an effective treatment for drug addicts based on WHOQOL score and OTI score?
b) What are clients' satisfactions towards the methadone maintenance treatment program?
c) What are the factors associated with employment status after joining the treatment program?

The above three research questions may be conceptualized by the 'PICO' concept, in this case:

P: Drug addict in methadone maintenance therapy program in Selangor.

I: Methadone maintenance therapy

C: Baseline and after joining treatment

O: Effectiveness and satisfaction of clients towards treatment.

Where P stands for people or population, I stands for intervention, C stands for comparison and O is for outcomes.

1.14 Hypothesis

The following hypotheses have been put forward.

a) There is an association between improving physical status and MMT.

b) There is an association between improving psychological status and MMT.

c) There is an association between improving environmental status and MMT.

d) There is an association between improving social functioning and MMT.

e) There is an association between reducing drug use and MMT.

f) There is an association between increasing health status and MMT.

g) There is an association between decreasing crime status and MMT.

h) There is an association between reducing HIV (needle risk behaviour) and MMT.

i) There is an association between reducing HIV (sexual risk behaviour) and MMT.

j) There is an association between employment status and MMT.

k) There is an association between client satisfaction and MMT.

1.15 Study objective

1.15.1 General objective

To evaluate the effectiveness and client satisfaction towards the Methadone maintenance treatment program among methadone clients

1.15.2 Specific objective

a) To study the quality of life of respondents at baseline and after joining the treatment and the trend of quality of life by years between 2007 and 2012.

b) To identify factors that associated with quality of life of methadone clients.

c) To study the level of satisfaction and factors that associated with satisfaction of methadone clients.

d) To compare the employment status at intake and after joining the treatment and to determine the factors associated with employment status after joining the methadone program

CHAPTER 2: LITERATURE REVIEW

2.1 Background

Almost 40years ago methadone maintenance treatment was introduce in treating heroine dependent. Today most of the countries in the world use methadone as the comprehensive drug to treat withdrawal syndromes from drug influence. The general objective of MMT of this study is to see the effectiveness of the program implemented since 2005, and also to see how well state of Selangor is doing. The core thing about methadone maintenance program is to improve the drug addicts' quality of life in many aspects. Including to reduce relapse, to improve the physical and mental condition, to reduce spread of infection among IDU's and those sharing needles, to improve psychological functioning, including ability to obtain or remain in employment and to reduce criminal activities among opiate dependents (Rusdi et al., 2008).

Study from University Malaya to determine how good is the program to our local setting and also to look into the possible issue can arise from implementing this MMT program in Malaysia.(Gill et al., 2007) was carried out with several positive outcome.

2.2 Search strategy

Article was searched base on PICO method. P (Population/Patient), I (Intervention), C (Comparison) and O (Outcome) to summarize the major findings of the 24 primary studies to review on the effectiveness of methadone. Subsequent processes developed base on the PICO method .Search term were use based on PICO component combined method using the phrase 'AND' and 'OR' to combine the synonyms and searched in electronically database.

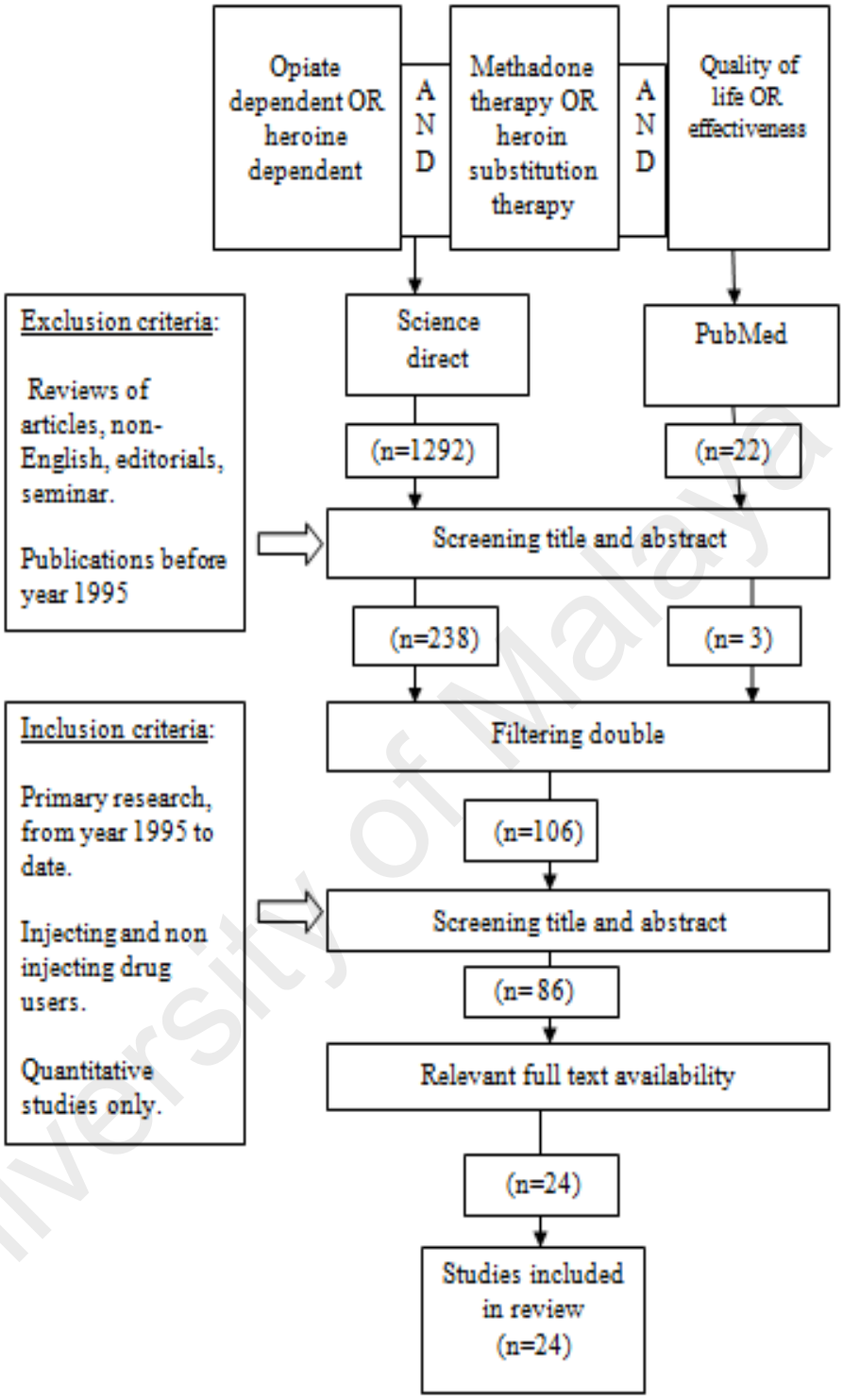

Figure 2.1: Flow chart of search strategy for methadone studies on quality of life

The research strategies were specific to each database, aimed on the subject headings used in order to index the mentioned collections of articles. Subject Heading search terms were used in concordance with appropriate keywords. Total of 1292 articles were reviewed from PubMed and Science Direct. Screening base through inclusion and exclusion criteria number of articles met the criteria is only 86. Second wave screening was repeated for the process and only 24 were available with full text. A search for articles written only in English, starting with the year 1990 to 2017 was searched on the following databases, PubMed and Science Direct.

2.3 Review on quality of life of methadone clients

Over many years many studies has been done on quality of life. Evaluation of quality of life can be represent as an impact of drug substitution treatment among drug addicts well-being and social functioning as well. (Vanagas et al., 2004) When we look into applications to measure the scales there are three main applications:

a) Descriptive studies – comparison among various community and populations.

b) Intervention studies – looking into quality of life as an outcome variable.

c) Association studies – quality of life is associated with client characteristic.

The Table 2.1 summarizes the studies selected for systematic review of methadone maintenance treatment program on quality of life of methadone clients'. Twenty four articles were identified with thirteen studies deploying the longitudinal methodology study (Chou et al., 2013; Gossop et al., 2000a, 2000b; Grella et al.,1995; Ha, 2010; Corsi et al., 2008; Lin et al., 2010; Maremmani et al., 2007; Musa et al., 2012; Norsiah, et al., 2010; Friedmann et al., 2003; Teesson et al., 2006; Padaiga et al., 2007), seven cross sectional studies (Karow et al., 2010; Ali et al., 2017; Gerra et al., 2004; Qian et al., 2008; Stein et al.,2001; Strauss et al., 2004; Walley et al., 2005), two record

reviews & cross sectional studies (Fei et al., 2016; Nordin, 2009) and two record review studies (Baharom et al., 2012; Devi et al., 2012).

The demographic characteristics of the studies reviewed are mainly opiate dependent patients who are currently enrolled in some varieties of clinics for treatment purposes and mainly on methadone maintenance therapy program.. Attributes of respondents in the studies had an extremely noteworthy part to play in communicating and giving the satisfactory results in the research studies, researchers have examined an array of individual attributes, in particular, age, income, sex, race, occupation, education, blood borne diseases, dose and years of drug use and given out reports on their contribution to data received from research work.

Total of thirteen studies have used similar measurement tool (WHOQOL-BREF and OTI) as this study (Karow et al., 2010; Baharom et al., 2012; Chou et al., 2013; Devi et al., 2012; Fei et al., 2016; Gerra et al., 2001; Ha, 2010; Lin et al., 2010; Musa et al., 2012; Nordin, 2009; Norsiah et al., 2010; Teesson et al., 2006; Padaiga et al., 2007).

The selected studies used various substitution therapies (methadone, buprenorphine, heroin, psychosocial treatment, detoxification, rehabilitation and residential treatment). Eighteen out of twenty four studies used methadone only as a substitution therapy (Ali et al., 2017; Baharom et al., 2012; Chou et al., 2013; Devi et al., 2012; Fei et al., 2016; Gossop et al., 2000b; Grella et al., 1995; Ha, 2010; Corsi et al., 2008; Lin et al., 2010; Musa et al., 2012; Nordin, 2009; Norsiah et al., 2010; Qian et al., 2008; Stein et al., 2001; Strauss et al., 2004; Walley et al., 2005; Padaiga et al., 2007).

2.3.1 Reduce drug use

Seven out of twenty studies included in this review shows the effectiveness of MMT in reducing illicit drug use among (Gossop et al., 2000a; Teesson et al., 2006; Gerra et al., 2004; Grella, Anglin, & Wugalter, 1995; Gossop et al., 2000b; Corsi et al., 2008; Qian et al., 2008; Mohamad et al., 2010). The association between crime reduction and drug use shows that those in high rate group strongly involve in crime and for those ceased regular heroin shows 11 times less like reduction in crime (Gossop et al., 2000a). Study from Australia was using three different modalities to see the reduction in illicit drug use. Substantial reduction in heroin drug use among those who were abstinence for more than 1 year in all three modalities, about 62% from MMT program, 52% from detoxification and rehabilitation is about 63% compare to those not in treatment is 25%. There are clients' still uses drugs despite taking the substitution therapy. Methadone patients with continuous positive urine test shows negative interpersonal relationship and employment status. Methadone patients with continuous positive urine test shows negative interpersonal relationship and employment status. Numerous studies conducted worldwide on the effectiveness of MMT clearly mention that MMT results are reduction of illicit drug use. Based on an evidence by Gerra et al. (2004), shows that adequate dose can decline the usage of illicit drugs. A local study mentioned that the likelihood for the addicts to reduce illicit drug use while in treatment is that, as we increase the methadone dose, we can see the decrease in illicit drug use. (Mohamad et al., 2010) MMT program consistently reduces other drug use as well like cocaine, marijuana alcohol, benzodiazepines, barbiturates, and amphetamines (Corsi et al., 2008).

2.3.2 Reduction in criminality

For the two decades studies have been shown multiple evidences on crime reduction. Four studies were included in this review (Gossop et al., 2000a; Teesson et al., 2006; Gossop et al., 2000a; Corsi et al., 2008). Three studies were followed up for 12months and one cross sectional survey which done among clients who were in treatment after 12 months. Study by Teesson et al. (2006) shows the most comment type of crime reported in property crime and dealing and this had reduced 16% and 11% respectively. Significant association was noted between crime activity and young age with OR 0.97 (Teesson et al., 2006). Researchers from Australia from their research proved that, the positive reduction in number crime committed and also patient who involve in crime. Reduction of 67% in number of crime committed and reduction of 22% of who involve in crime compare to baseline 50%. The association between crime reduction and drug use shows that those in high rate group strongly involve in crime and for those ceased regular heroin shows 11 times less like reduction in crime (Gossop et al., 2000). All the four studies mention above shows a drastic reduction in crime rate. This is simply because clients get methadone for free and they need not to involve in any crime to get the money, to buy their illicit drugs. Retention rate is also another factor that predict reduction in crime status as in the longer the clients stay in the program the better the reduction rate. All the studies been explaining about the type of offences, numbers of crime committed ant also the number of clients engage in crime.(Gossop et al., 2000) (Teesson et al., 2006) (Corsi et al., 2008; Gossop et al., 2000b). Figure 2.1 illustrates that number of crime pre and post treatment after 6 months, a study done in USA (Ball JC, 1991).

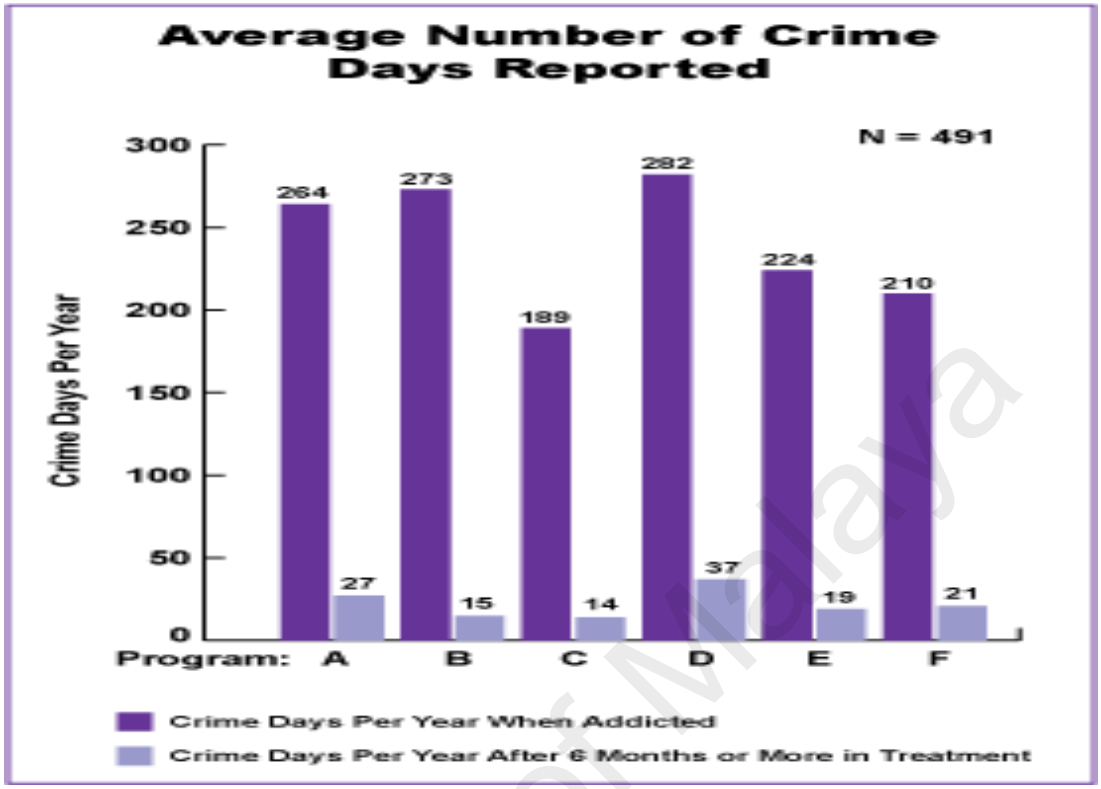

Figure 2.2 Average number of crime reported by as study from USA, 1991

2.3.3 Health status

Generally drug addict shows markedly lower quality of life compare to general population. The poor mental health is also can be explained be with the high comorbid psychiatric illnesses among addicts. Ten - from twenty studies basically touched about physical and/or mental health (Norsiah, 2010; Adeline et al., 2009; Maremmani et al., 2007; Padaiga et al., 2007; Karow et al., 2010; Lin et al., 2010; Friedmann et al., 2003; Teesson et al., 2006; Gerra et al., 2004; Gossop et al., 2000a). The number of longitudinal studies examined in this review was six and cross sectional survey was four. The longitudinal studies were followed up mostly between 3 months to 2years.Total six studies were evaluated physical domain in quality of life studies show

physical health markedly increasing after joining the MMT program. A study by Teesson et al. (2006) revealed, physical health at baseline noted more injecting related health problem, a significant results was shown with good modal fit after 1 year in treatment. Whereby, mental health dropped from baseline to 1year Methadone 26% to 11%, Detoxication 32% to 18% and Rehabilitation 32% to 13%. (Teesson et al., 2006) The only comparison noted is clients on varies modalities of treatment namely, MMT, burprenorphine, rehabilitation treatment, detoxication, outpatient drug free and psychosocial treatment. From varies modalities mentionedbove, outcomes from MMT modality shown to be the greatest.

2.3.4 HIV associated high risk behaviour & Hepatitis C Virus

Seven – from twenty studies have talked about HIV associated risk behaviour and hepatitis C virus. Number of longitudinal follow up studies is three (Teesson et al. 2006; Gossop et al., 2000; Corsi et al., 2008) and another four studies were cross sectional (Qian et al., 2008; Strauss et al., 2004; Walley et al., 2005; Stein et al., 2001)All the seven studies mainly used methadone as the modality of the treatment and threes studies used drug free treatment and detoxication. Most studies found that, there is a positive correlation between methadone and HIV associated risk behaviour and transmission of blood borne viruses like hepatitis C virus. This is evidence by reduction in injecting behaviour and sharing needle among them. Study by Gossop et al. (2000b), use methadone maintenance treatment and methadone reduction treatment as treatment modalities and the results revealed that, great reduction for injecting and also sharing the needles with others addicts in both modalities. Injecting behaviour in MMT dropped from 65% to 34% and MRT 58% to 35% whereby, sharing needle is MMT 13% to 4%

and MRT 14% to 4% (Gossop et al., 2000b). Sexual behaviour activity is only addressed in two of these studies, multiple sexual partners and unprotected sex is less likely with those in MMT, OR 0.3, and about 15% clients had reported had unprotected sex with no primary partner, about ½ of the clients had primary sexual partner and 1/5 of them had more than one partner (Qian et al., 2008). In a study, reported that, The only variable is significant for this outcome is having sex for money and drug, decrease from 19% to 6%. (Corsi et al., 2008).

MMT program in our country situated to screen those joining the MMT program for antibody hepatitis C virus. It's a blood born infectious disease that can find among drug users by sharing the needles. Cross sectional studies using face to face interview have done to look into how much clients know about the disease, client's interest for treatment and the opportunity and accessibility to do the test. A study from USA looked at the opportunity and accessibility to do HCV testing at both treatment groups. Almost all the clients in MMT program were getting to check their status of HCV. Proportion of the clients ever injecting fewer than 10% at drug free treatment is estimated about 55% and clients at MMT program whomever injecting more than 50% was estimated to 73%. This paper also mentioned that some treatment program planning to increase the service and some planning to cut of the service due to lack of funding and resources (Strauss et al., 2004). Funding is most important part here when we talk about treating hepatitis C clients because the treatment cost a lot. In our country treatment for hepatitis C is not subsidise by government and therefore patients is not treated and this indirectly increases the mortality rate. So it is our duty to create the awareness to this vulnerable group, by educating them regarding the risk and mode of transmission and how they can tackle this problem. A study by (Walley et al., 2005) revealed about the knowledge of the clients in MMT program in USA, Almost 92% think people with HCV will

eventually die. Mode of transmission is known by the participants, 97% knew it could transmit via needle sharing and 87% by sharing the paraphernalia. Less than 50% knows there is treatment for this HCV infection. They also evaluated the awareness of the clients; this showed none of them knew about the treatment. Only 5% interested to go for the treatment after knowing the risk and benefit of the treatment.

Table 2.1: Evidence based table showing the effectiveness towards MMT program among methadone clients

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding
1.	Norsiah et al . (2006), Malaysia	Longitudinal. Follow-up study	WHOQOL-BRIEF	143 opiate dependent patients	Methadone maintenance treatment	The retention rate in treatment program in this study was much higher than other studies reported. A study in Lithuania – that will be presented after this study - reported that out of 102 patients that were undergoing MMT, 30.2% dropped out after 6 months Even though the retention rate is 30.2% but there is a significant improvement in all 4 domains: physical. Social. Psychological and environment.
2.	Nordin, et al. (2009), Malaysia	retrospective report review & Cross sectional study	WHOQOL-BREF	78 methadone clients	Methadone Maintenance Treatment	There was significant improvement in all four domains of QOL scores for subjects in MMT ($p<0.05$). The improvements in the physical and psychological domains were the most marked, with increases of 2.26 (18.9%) and 2.28 (20.0%respectively.

Table 2.1 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding
3.	Maremmani et al (2007), Italy	Longitudinal, follow-up study	SCL-90-R	213 opiate dependent patients	Methadone maintenance treatment/ Buprenorphine	After 12 moth, 83 (78.30%) of the 106 patients in treatment with buprenorphine were still in treatment. During the same period, 80 (74.76%) of the 107 patients in treatment with methadone were still in treatment. Five patients were transferred to other programs for reasons independent of their treatment. Both groups showed good quality of life after 3 months of treatment. The Buprenorphine group scored better after 3 months of treatment and their scores were significantly better for 'total quality of life' and 'work' compared with the methadone group. Quality of life both the treatment group had improved significantly after 9 month.

Table 2.1 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding
4.	Padaiga et al. (2007), Lithuania	Longitudinal follow-up study	WHOQOL-BRIEF	102 opiate dependent patient	Methadone maintenance treatment	Of all the four domains only three domains were proved significantly improved namely, physical, environment and psychological component of quality of life; social domain didn't show a good improvement in this study 0 p value 0.362)
5.	Karow et al. (2008), Germany	Cross sectional study	MSQOL OTI	938 opiate dependent patients	Methadone And heroin/ Psychosocial treatment	The study participant was divided into 4 subgroups heroin vs. MMT and case management vs. psycho education. MSQoL domains at baseline and after 12months treatment showed positive improvement in physical domain in heroin group compare to MMT. Also noted treatment with PSE is more significant than CM in both heroin and methadone. Physical status from OTI score shows significant difference from baseline to 12 months (OTI > 13).

Table 2.1 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding
6.	Lin et al. (2010), China	Cohort study	QOL Instrument 6 domains: physical health, mental health, family relationship and social support, living condition, drug dependence and satisfaction with life	122 opiate dependent patients at outpatient clinics at 5 MMT clinics.	Methadone maintenance treatment	**Physical health**: Good improvement in this subscale from day 1 up to day 90. **Mental health:** Significant improvement from day 1 to day 30 and day 30 to day 90 **Family & social support**: Improve over day 1 to day 30. Only subscale shows decrease in day 90, but the results was not significant. **Living condition**: The subscale shows higher in day 30 and not no differences in from day 30 to day 90. **Drug dependence:** The largest improvement among all the subscales in 30days. Score remain the same up to 90 days. **Satisfaction with life:** Only very minor improvement Only very minor improvement from the start point till day 90. Overall MMT help to improve QOL of clients in China.

Table 2.1 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding
7.	Friedmann et al (2003), USA	Longitudinal follow up study	10 item factor score on self reported heath status Scale: excellent, fair, poor	4786 patients from 75 drug treatment centres, who join DATOS study was followed up.	Methadone maintenance treatment, long term residential, short term residential and outpatients' drug free.	From the four modalities they used. Patient with outpatient MMT had the worse outcome on health status compare to the ones long term and short term residential modalities, they had fairly good heath status .Drug free outpatient has better treatment of all.36% reported having functional disability had reduce to 25% after treatment
8.	Gossop et al. (2000a), UK	Longitudinal follow up study 1 year after intake.	Structured interview by researchers using modified and published instrument.	753 patients. 487 community methadone program and 275 from residential treatment program.	Methadone maintenance treatment and residential rehabilitation units.	Positive reduction on number crime committed and also patient who involve in crime. Reduction of 67% in number of crime committed and reduction of 22% of whom involve in crime compare to baseline 50% They father divide the crime rate into three subgroup, high rate crime, low rate crime and no crime. Significant reduction noted in low crime rate group. The association between crime reduction and drug use shows that those in high rate group strongly involve in crime and for those ceased regular heroin shows 11 times less like reduction in crime.

Table 2.1 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding
9.	Teesson et al. (2006), Australia	Longitudinal prospective cohort study	Opiate treatment index, Composite International Diagnostic Instrument and Diagnostic Interview Schedule.SF-12	675 patients	Methadone/ buprenorphine, detoxication and rehabilitation	**Heroin use** Substantial reduction in heroin drug use among those who were abstinence for more than 1 year in all three modalities, about 62% from MMT program, 52% from detoxification and rehabilitations is about 63% compare to those not in treatment is 25%. **Physical health** At baseline noted more injecting related health problem, a significant results was shown with good modal fit after 1 year in treatment **Needle risk taking** OR 4.32 had decline to OR 1.11 after 1 year follow up. Reduction in all modalities is noticed except the no treatment group. **Mental health** MDD has droped from baseline to 1year Methadone 26% to 11% Detoxication 32% to 18% Rehabilitation 32% to 13% **Criminal activity** The most comment type of crime reported in property crime and dealing and this had reduced 16% and 11% respectively. Significant association was noted between crime activity and young age OR 0.97.

Table 2.1 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding
10.	Gerra et al. (2004), Italy	Cross sectional study	SCL-90 VAS MMPI-2 are suppose to complete by the counsellors for each patients	154 patients Methadone and Buprenorphine	Methadone buprenorphine	**Dosage** Average dose in both intervention are METH 81.5 ± 35.4mg, BUP 9.2 ± 3.4mg **Retention rate** The retention rate is METH 61.5% BUP 59.2% this showed that the risk for failure is almost the same. **Psychiatric co-morbidity** Measured using SCL 90 and MMPI 2 score reveal there is no difference in both treatment groups. Significant decrease in SCL 90 scores for both METH and BUP. **Urinalysis** Methadone patients with continuous positive urine test shows negative interpersonal relationship and employment status. In BUP group not much of changes in interpersonal relationship and employment status. After 12 weeks of treatment with BUP 25% reduction was noted and with meth 32.1%
11.	Grella et al. (1995), USA	Longitudinal follow up	CES-D SPS Instrument	409 High-risk Heroin Addicts	Methadone Maintenance Treatment	This study concludes that cocaine users have high risk to engage with criminal activities, sexual and needle sharing activities. Consumption of alcohol and psychological problem. Heroine addict who id also takes crack cocaine has higher risk in involving the above mention activities.

Table 2.1 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding
12.	Gossop et al (2000b), UK	Longitudinal prospective cohort study	Face to face interview. (instrument use is not mentioned in this paper)	667 patients (MMT 458 and MRT 209)	Methadone Maintenance Treatment and methadone reduction treatment	This is the follow up results from the National Treatment Outcome Research Study,. **Illicit drug use** Significant results in terms of reduction in illicit drug use in both modalities from baseline to 1 year after treatment. **Injecting behaviour** Great reduction for injecting and also sharing the needles with others addicts in both modalities. Injecting behaviour in MMT dropped from 65% to 34% and MRT 58% to 35% whereby, sharing needle is MMT 13% to 4% and MRT 14% to 4%. **Health status** Better overall improvement in both physical and Psychological heaths in both groups at 1 year**.** **Crime status** Reduction in acquisitive crime was great after 12 months in treatment. Mean score at intake was 44 and post treatment mean score was only 5.

Table 2.1 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding
13.	Qian et al. (2008), China	Cross sectional study	Structured questionnaire based on China National study forms.	397 IDUs	Methadone Maintenance Treatment	**Blood borne infection** Those have not enrolled in this program have odd of 1.9 time higher to get blood borne infection compare to those enrolled in MMT. **Drug use & risky sexual behaviour** Those are receiving MMT less likely to use drug or inject drug OR 0.2 and no significant changes in sharing needles. Multiple sexual partner and unprotected sex is less likely with those in MMT OR 0.3. About 15% clients had reported had unprotected sex with no primary partner, about ½ of the clients had primary sexual partner and 1/5 of them had more then one partner
14.	Corsi et al. (2008), USA	Longitudinal follow up	RBA DIS	160 injecting drug users	Methadone Maintenance Treatment	**Drug use** Among all the predictors used to predict the significant in drug use, more day in treatment showed a positive association with the decline rate of 100% to 76% in urine analysis. **Productivity** Those with legal income had increased their productivity up to 15%. **Criminal behaviour** For those whom having illegal income at baseline had improved the status with decline rate of 42% to 23%.

Table 2.1 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding
						HIV Needle risk behaviour Minority of the clients had shared paraphernalia and needle respectively 61% and 36% at baseline and during the follow up reduce to 46% 35%. **HIV sexual risk behaviour** The only variable is significant for this outcome is having sex for money and drug, decrease from 19% to 6%
15.	Strauss et al. (2004), USA	Cross sectional study	Computer assisted telephone interview using QDS software.	256 patients(188 MMT and 416 drug free treatment)	Methadone Maintenance Treatment and drug free treatment	The aim of the study was to check to opportunity and accessibility to do HCV testing at both treatment groups. Almost all the clients in MMT program were getting to check their status of HCV. Proportion of the clients ever injecting fewer than 10% at drug free treatment is estimated about 55% and clients at MMT program whom ever injecting more than 50% was estimated to 73%. This paper also mentioned that some treatment program planning to increase the service and some planning to cut of the service due to lack of funding and resources

Table 2.1 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding
16.	Walley et al. (2005), USA	Cross sectional study	Face to face interview. (instrument use is not mentioned in this paper)	110 opiate dependent	Methadone Maintenance Treatment	**Knowledge about HCV** Almost 92% think people with HCV will eventually die. Mode of transmission is known by the participants, 97% knew it could transmit via needle sharing and 87% by sharing the paraphernalia. Less than 50% knows there is treatment for this HCV infection. **Evaluation for HCV Treatment** Evaluation was done for those in MMT program OR 6.6.None of them knew about interferon alpha and Ribavirin. **Interest in HCV Treatment** About 5% interested after knowing the risk and benefit of the treatment.
17.	Stein et al (2001), USA	Cross sectional study	Face to face interview. (instrument use is not mentioned in this paper)	306 drug addicts	Methadone Maintenance Treatment	Participants were self reported on their HCV status. Of the total participant recruited 69% were with available results and 87% of them are seropositive. Those who reported no test was done or don't know the results showed 82% were seropositive and for those claim they are seronegative actually 67% fo them are seropositive HCV. More than half would want to use interferon if the risk and benefit is explained to them. Study is also revealed that there is gap in knowledge about HCV.

Table 2.1 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding
18.	Baharom et al. (2012), Malaysia	retrospective report review	WHOQOL-BREF & OTI	122 methadone clients records	Methadone Maintenance Treatment	Showed an improvement in all four domains. In MLR, tertiary education was a significant predictor in social and psychological domains. As for environment domain HIV negative status was significant.
19.	Devi et al. (2012), Malaysia	retrospective report review	OTI	117 methadone clients records	Methadone Maintenance Treatment	significant reduction in the mean scores after 12 months: • Heroin Q score, mean difference 2.01 (95% CI: 1.45, 2.56) • HIV Risk-taking Behaviour score, mean difference 7.64 (95% CI: 6.03, 9.26) • Health score, mean difference 5.35(95% CI: 3.90, 6.79).
20.	Fei et al. (2016), Malaysia	retrospective report review & Cross sectional study	WHOQOL-BREF & OTI	92 methadone clients	Methadone Maintenance Treatment	MMT has been an effective treatment. However evidence of its positive outcome over a longer duration of treatment is limited as most studies focus on short term outcome. • Effective in reducing heroin use, injecting practices, crime and in improving social functioning and physical symptoms. • Reducing sex-related HIV risk taking behaviour.

Table 2.1 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding
						• The outcome of quality of life was not significantly greater as the duration of treatment increased. • **Age** – clients more than 50 years old showed better quality of life. • **HIV positive** – showed poor quality of life between baseline and follow up. • **Hepatitis B positive –** better quality of life in social domain.
21.	Ha, (2010), vietnam	Cohort study	WHOQOL-BREF	440 heroine users	Methadone Maintenance Treatment	• All four domains in WHOQOL-BREF showed a significant improvement ($p<0.001$) • Researcher compared mean of quality of life by age, years of using heroine and HIV status of heroine users. • All three variables showed an improvement in quality of life.

Table 2.1 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding
22.	Chou et al. (2013), Taiwan	Follow up study	WHOQOL-BREF	553 heroin-dependents	Methadone Maintenance Treatment	This study showed there were statistically significant improvements in the psychological and environmental domains between baseline and 6 months. Significant improvements were found in psychological and social domains between baseline and 12 months.
23.	Musa et al. (2012), Malaysia	Follow up study	WHOQOL-BREF	107 methadone clients	Methadone Maintenance Treatment	**Quality of life** • Significant improvement in all four domains($p<0.001$) **Employment** • At baseline 70.1% employed and after 2 years in treatment, percentage increased to77.6%. **Urine analysis** • Total Number of Positive Urine Tests for Illicit Substances, from 12.7% drop to 8.3%. **Retention rate** • The retention rates obtained in this study was quite promising, with a retention rate of 68.6%.

Table 2.1 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding
24.	Ali et a.l (2017), Malaysia	Cross sectional study	WHOQOL-BREF & OTI	1233 methadone clients	Methadone Maintenance Treatment	**WHOQOL-BREF scores** • significant improvements in quality of life in the physical, psychological, social, and environmental domains **OTI scores** • There were significant reductions in opioid use, HIV risk-taking score, social functioning, crime and health ($p < 0.01$). **Dose** • Lower methadone dosage was significantly associated with improvements in the physical, psychological, and environmental domains. Factors associated with quality of life were, high criminality at baseline, alcohol consuming, employed and being married.

2.4 Review on methadone maintenance treatment program impact on clients' satisfaction.

2.4.1 Search strategy

Article was searched base on PICO method. P (Population/Patient), I (Intervention), C (Comparison) and O (Outcome) to summarize the major findings of the ten primary studies to review on the satisfaction towards MMT program. Subsequent processes developed base on the PICO method .Search term were use based on PICO component combined method using the phrase 'AND' and 'OR' to combine the synonyms and searched in electronically database.

The research strategies were specific to each database, aimed on the subject headings used in order to index the mentioned collections of articles. Also included all type of study design, as there were limited studies on satisfaction outcome among methadone clients'. Subject Heading search terms were used in concordance with appropriate keywords. Total of 155 articles were reviewed from PubMed and Science Direct. Screening base through inclusion and exclusion criteria number of articles met the criteria is only 35. Second wave screening was repeated for the process and only 22 are available with full text. Studies included in this review were only 10. A search for articles written only in English, starting with the year 1990 to 2018 was searched on the following databases, PubMed and Science Direct. Flow chart of search strategy for methadone studies on satisfaction in Figure 2.2.

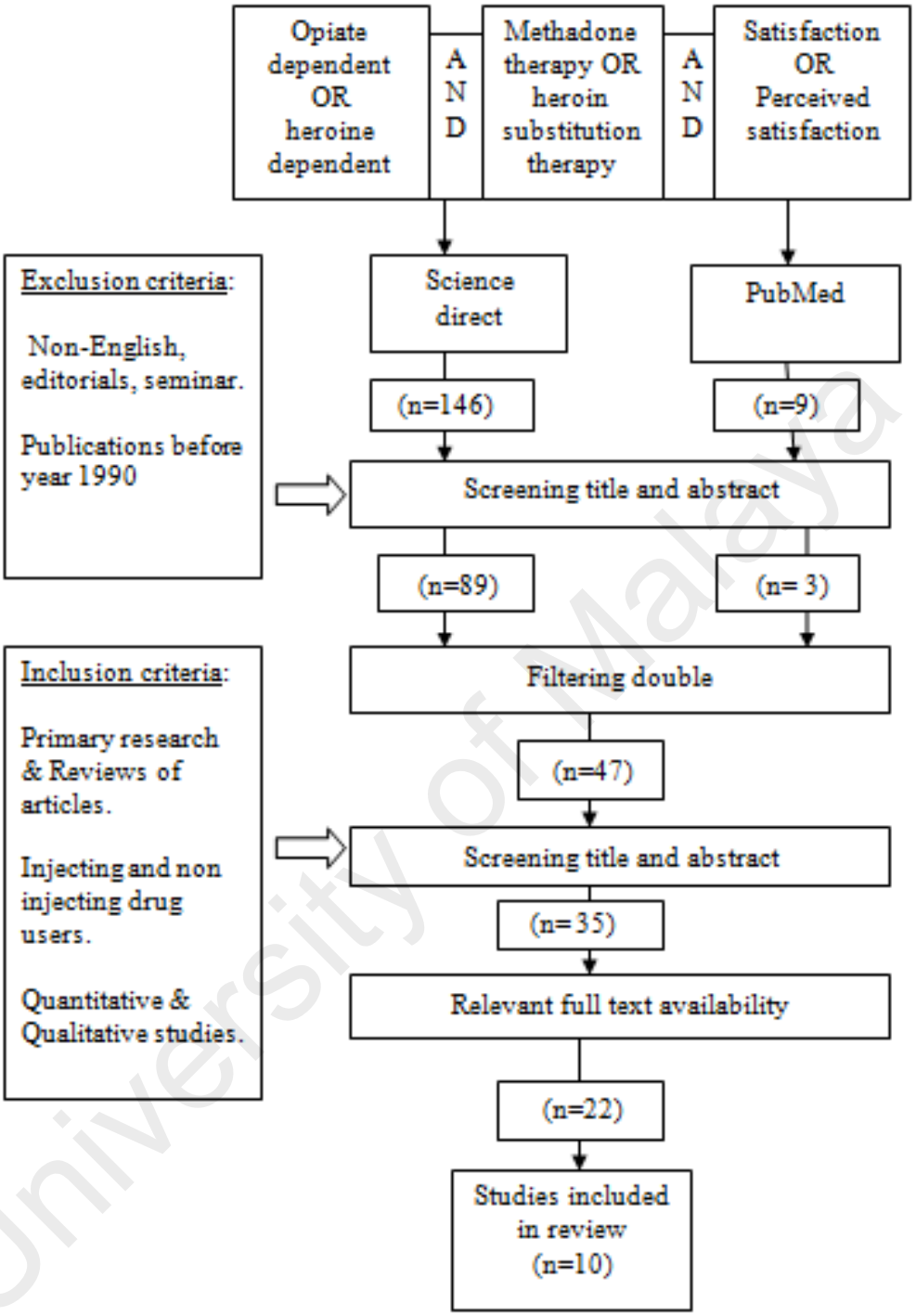

Figure 2.3: Flow chart of search strategy for methadone studies on satisfaction

2.4.2 Demographic

The Table 2.2 summarizes the studies selected for systematic review of methadone maintenance treatment program impact on clients' satisfaction. Ten articles were identified with two studies deploying the longitudinal methodology study (Andersson et al, 2017; Kelly et al., 2010) and eight cross sectional studies (Aziz & Chong, 2015; Kehoe & Wodak, 2004; Li et al, 2017; Madden et al., 2009; Marchand et al, 2015 ; Perreault et al., 2010; Trujols et al., 2014; Tran et al., 2015).

The demographic characteristics of the studies reviewed are mainly opiate dependent patients who are currently enrolled in some varieties of clinics for treatment purposes. Attributes of respondents in the studies had an extremely noteworthy part to play in communicating and giving the satisfactory results in the research studies, researchers have examined an array of individual attributes, in particular, age, income, sex, race, occupation, education just to mention a few and given out reports on their contribution to data received from research work.

Clients' treatment satisfaction is a multidimensional idea and a wide measure that can be affected by different elements, from the tabled studies customer social characteristics, condition, treatment length, and drug abuse history.

Table 2.2: Evidence based table showing the satisfaction towards MMT program among methadone clients

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding	General Comments
1.	Li et al. (2017), China	Cross sectional study	Structural equation modelling (SEM)	68 MMT clinics in five provinces of China, including 2,448 MMT clients	Methadone maintenance treatment	From the study, MMT age, possessed direct effect on satisfaction towards treat and an indirect effect that has been boosted by the rapport created by counselling. Depressive indications and an absence of social help had an immediate negative effect on treatment satisfaction.	Among long term opioid dependency patients under methadone treatment, males' detailed lower satisfaction with their opioid dependency treatment than females. More seasoned and older patients were also found to be happier with the services received from the practitioners when contrasted with more youthful customers.
2.	Trujols et al (2014), Spain	Cross sectional study	Verona Service Satisfaction Scale for Methadone Treatment (VSSS-MT) General Health Questionnaire-28 (GHQ-28)	123 methadone-maintained patients	Methadone Maintenance treatment	From this study the variables that were independently related with the probability of being satisfied with methadone maintenance treatment were number of years of training finished, number of patients per focus, recurrence of accepting information about methadone dosage changes, and Social Dysfunction. Patients from bigger centres, who see themselves as taking an interest to some	This study gave an account of the attainability of utilizing two unique questionnaires to quantify the nature of methadone maintenance patients mind and to decide markers for understanding

Table 2.2 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding	General Comments
						degree in treatment choices, and indicating lower decay in social working will probably be much more satisfied with MMT according to this study.	satisfaction.
3.	Aziz & Chong (2015), Malaysia	Interviewer administered questionnaire	Rankin Court questionnaire	425 opioid-dependent patients	Methadone maintenance treatment	As far as general satisfaction is concerned, this study finds out that a high level of respondents (85%) were happy with the MMT administrations. A logistic regression analysis demonstrated that centres and conjugal status were related with general satisfaction and that being single or wedded was related with higher chances of general satisfaction contrasted with being separated or divorced. An investigation of the responses relating to the most wanted changes required discovered dosing hours, holding up area and staff deficiencies to be normal	This investigation done in Malaysia detailed that being single or wedded was related with higher chances of general treatment satisfaction contrasted with separated or divorced clients

Table 2.2 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding	General Comments
4.	Tran et al. (2015), Vietnam	Cross-sectional survey using interviews	SATIS questionnaire	1,016 MMT patients at 5 clinic	Methadone maintenance treatment	Patients were totally contented and satisfied with general wellbeing administrations and treatment results. More established older age, advanced education, having any issue in self-care and nervousness/discouragement were adversely connected with patient's satisfaction. In the interim, patients getting MMT at facilities, where more exhaustive HIV and general human services administrations were accessible, will probably report a total satisfaction	Methadone, its steady beginning and long half-life add to its adequacy. As an incomplete μ-opioid agonist, it has a roof impact on its action, with the end goal that after a humble dose is gotten, further measurements don't prompt expanding impacts and, accordingly, the danger of respiratory gloom and overdose is low.
5.	Marchand et al, (2015), British Columbia	Cross-sectional study	Client Satisfaction Questionnaire (CSQ-8)	160 long-term opioid-dependent individuals	Opioid agonist therapy Both Buprenorphine and Methadone	In the multivariable linear regression framework, the clients who were more seasoned and older, those of Aboriginal lineage, and at present getting OAT had higher OAT fulfilment scores, while members who had methadone dosage inclinations of 30mg or less had bring down OAT fulfilment. In stratified investigations among ladies, the connection between favoured methadone measurement and current OAT remained fundamentally connected with fulfilment.	Instructive fulfillment was likewise distinguished as a huge determinant of treatment satisfaction, with less learned customers announcing more prominent satisfaction.

Table 2.2 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding	General Comments
6.	Kehoe & Wodak (2004), Australia.	Cross-sectional study	Verona Service Satisfaction Scale for methadone-treated opioid-dependent patients (VSSS-MT)	213 opioid dependent patients	Buprenorphine Methadone	Results generally indicated a high level of patient satisfaction with services. 76% of respondents would either definitely, or with reservations, recommend Rankin Court to a friend who needed treatment. Rankin Court also rated well with respondents in the domains of efficacy, information, and professionals' skills and behaviours (where 68%, 58%, and 83% of respondents respectively considered the clinic's service as mostly satisfactory or excellent). Respondents were less positive when questioned in regard to the clinic's access: only 44% of respondents considered the clinic's physical environment for patients to be mostly satisfactory or excellent and only 40% of respondents reported the same level of feeling.. Thematic analysis of free text responses determined that the most commonly desired changes at the clinic pertained to dosing hours, patients' access to takeaway pharmacotherapy, and clinic staff's attitudes and practices.	Overall direction and quality of service, areas of service that highlighted. Greater communication was recommended by the researcher between the clinic and its patients on the application process and eligibility criteria for take away pharmacotherapy

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Table 2.2 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding	General Comments
7.	Madden et al. (2009) , Australia	Cross-sectional study	Random interviewer-administered questionnaire	432 opiod dependent patients	methadone buprenorphine	Overall satisfaction with treatment was high (mean: 3.8; very satisfied = 5). Participants were mainly satisfied with service provided by the clinic, although had concerns over the inflexibility associated with the clinic atmosphere, frequency of clinic attendance, dosing hours and lack of takeaway doses. While relationships with prescribers and case managers were rated positively, 16% and 21% of participants wanted to see their prescriber and case manager more often, respectively; 53% reported that they did not have input into their care plan.	While participants reported being mainly satisfied with their treatment, results must be viewed within the context of what a consumer reasonably expects to receive from a service.
8.	Kelly et al. (2010), USA.	Longitudinal follow up study	Addiction Severity Index (ASI) Client Evaluation of Self and Treatment (CEST)	283 opioid-addicted individuals	Methadone Maintenance Treatment	Findings from this study suggest a positive association between patient satisfaction and measures of treatment outcome and retention. Thus, satisfaction with the program and the counsellor at 3 months was negatively related to the concurrent self-reported use of cocaine and heroin, to illegal activity, and to drug tests positive for the combination of heroin and cocaine, and positively related to retention at 12 months.	Those patients who have more needs and patients who are dissatisfied with treatment have an increased risk of drop out. Consequently, it is possible that patients' perceptions of their progress in treatment can lead to their greater satisfaction with treatment.

Table 2.2 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding	General Comments
9.	Perreault et al, (2010), Canada	Cross sectional study	Perceived Improvement Questionnaire (PIQ).	Two hundred and thirty-two clients of a methadone maintenance treatment program	Methadone maintenance program	Correlation analyses revealed a significant relationship between participants' perceived improvement and their level of satisfaction with services received throughout their treatment. A factor analysis identified 3 sub-scales of the PIQ: emotional health, social relations and physical health.	The scale's potential to provide valuable information such as clinical assessment and program evaluation should be explored.
10.	Andersson et al. (2017), Norway	Longitudinal follow up study	Questionnaire with five-point Likert scale	188 patients with alcohol and/or illicit substance use disorder	General drug addiction treatment	A significant proportion of patients were dissatisfied with the support provided for housing, financial issues and employment. Confidence in staff competence was the domain of treatment satisfaction most strongly associated with the outcome score.	The results suggest that patient-experienced improvements are connected to confidence in staff competence and user involvement. The findings may be interpreted as supporting a collaborative relationship between patients and counsellors.

2.4.3 Type of intervention

Methadone maintenance treatment is the most prominent method of opioid addiction treatment in the studies reviewed. Five studies (Li et al, 2017, Trujols et al, 2014, Aziz & Chong, 2015, Tran et al, 2015 and Kelly et al., 2010) were mainly focused on the clients that have already been registered for methadone maintenance treatment at clinics. Three studies (Marchand et al., 2015, Kehoe & Hodak, 2004, Madden et al., 2009) gave options of using buprenorphine as a substitute agent for treatment of opioid addiction. This studies covered clients in both treatment methods and Tran et al. (2015) highlighted the contrasts and benefits of using buprenorphine as a substitute for opiate dependency treatment. Andersson et al. (2017) respondents were not fished from methadone maintenance clinics; they were just drug addicts who were undergoing any form of rehabilitation

2.4.4 Study design

In the literature review table above there were 2 longitudinal follow up studies and 8 cross sectional studies. The two longitudinal studies happened over numerous points in time across a longer time-frame. They are typically observational in nature. By observational, it implies that the researchers never meddled with the respondents that were giving data and results for the research study. The most vital difference between longitudinal and cross-sectional research studies, for the purpose of the studies reviewed in the table, is the period of events. Rather than a researcher gathering information from changing respondents so as to study similar outcomes, similar respondents were used to study different circumstances, at times, and the two studies were completed after a long period of that, that is sufficed with follow up studies.

A cross-sectional study, the most popular study having 8 of the reviewed studies, analyzes different respondents at a single time frame. Rather than gathering information after some time on a single outcome, these 8 studies stuck to several respondents giving feedback about the same outcomes with no follow up study.

2.4.5 Measurement tool

Collection and measurement of patients' satisfaction with health services provided to them in the studies arraigned in the review table were conducted in a variety of ways, including surveys, focus groups, questionnaires and interviews. From the studies, a variety of tools all different in each and every study emerged to monitor the care processes of the patients receiving opioid dependency treatment and to improve different areas of care.

Nine of the studies (Andersson et al., 2017, Kelly et al., 2010, Trujols et al., 2014, Aziz & Chong, 2015, Tran et al., 2015, Marchand et al., 2015, Perreault, et al., 2010, Kehoe & Hodak, 2004, and Madden et al., 2009) used questionnaires to get feedback and responses from the clients of MMT services. Those studies that did a parallel control survey on the caregivers gave them a chance to fill in the questionnaires themselves but the client focused questionnaires were filled either anonymously or confidentially by use of face to face interviews with the patients undergoing treatment at the clinics or pharmacies administering the treatments. A study by Li et al, 2017 in contrast to the remaining nine studies deployed a more complex Structural Equation Modeling (SEM) which is a bit complex and statistical.

2.4.6 Outcomes

From the literature reviewed there are several factors that came out as being related with satisfaction. The factors varied from study to study but the most predominant ones

were age, educational level, race and dosage. The age factor being the most predominantly was evident four studies (Kelly et al., 2010, Li et al., 2017, Marchand et al., 2015, Tran et al., 2015) that asserted that older and more seasoned patients were likely to be more satisfied with the treatment.

Marchand et al. (2015) figured out that aboriginal lineage and dosage contributed to satisfaction. Tran et al. (2015) and Aziz & Chong (2015) added sex and marital status to the factors determining satisfaction and Tran et al. (2015) touched on literacy levels and confidence. There was a quite unique factor among the studies (Trujols et al, 2014) that was not related to the social demographic factors of the respondents, Trujols et al. (2014) contended that the center sizes and number of patients per processes were related to satisfaction level of the patients.

The domains that the satisfaction levels were graded on also differed from study to study but the most evident domains were competency of the services offered by the caregivers / administrators and treatment outcome. Kehoe & Hodak (2004) was very detailed in his study naming efficiency, information, professional skills, access to the clinic, and response to complaints, attitude and practices as the gradable domains. This summarized exhaustively on the nine remaining studies (Aziz & Chong, 2015; Kelly et al., 2010; Li et al, 2017; Madden et al., 2009; Marchand et al., 2015; Tran et al., 2015; Trujols et al., 2014). Lastly Kelly et al. (2010) drew out the relationship between patient satisfaction and retention of patients within the methadone treatment program in a way that more satisfied clients were more likely to stay longer in the program without quitting.

2.4.7 Conclusion

This systematic literature review of research papers on methadone maintenance treatment program impact on clients' satisfaction showed that a considerable number of published studies found an association between age, sex, marital status, race, dosage,

years of use, Status in blood borne diseases factors within the technical quality, interpersonal manner, communication, financial aspects of care, time spent with doctor, and accessibility of care domains. The domains from study to study may vary to more specific aspects like waiting time, effectiveness of staff but they all are collectively in one way or another related to PSQ major domains.

2.5 Review on methadone maintenance treatment program impact on employment outcome

2.5.1 Search strategy

Article was searched base on PICO method. P (Population/Patient), I (Intervention), C (Comparison) and O (Outcome) to summarize the major findings of the ten primary studies to review on the employment outcome of the MMT clients. Subsequent processes developed base on the PICO method .Search term were use based on PICO component combined method using the phrase 'AND' and 'OR' to combine the synonyms and searched in electronically database.

The research strategies were specific to each database, aimed on the subject headings used in order to index the mentioned collections of articles. Subject Heading search terms were used in concordance with appropriate keywords. Total of 237 articles were reviewed from PubMed and Science Direct. Screening base through inclusion and exclusion criteria number of articles met the criteria is only 44. Second wave screening was repeated for the process and only 24 are available with full text. Studies included in this review were only 10. A search for articles written only in English, starting with the year 1989 to 2018 was searched on the following databases, PubMed and Science Direct. Flow chart of search strategy for methadone studies on satisfaction in Figure 2.3.

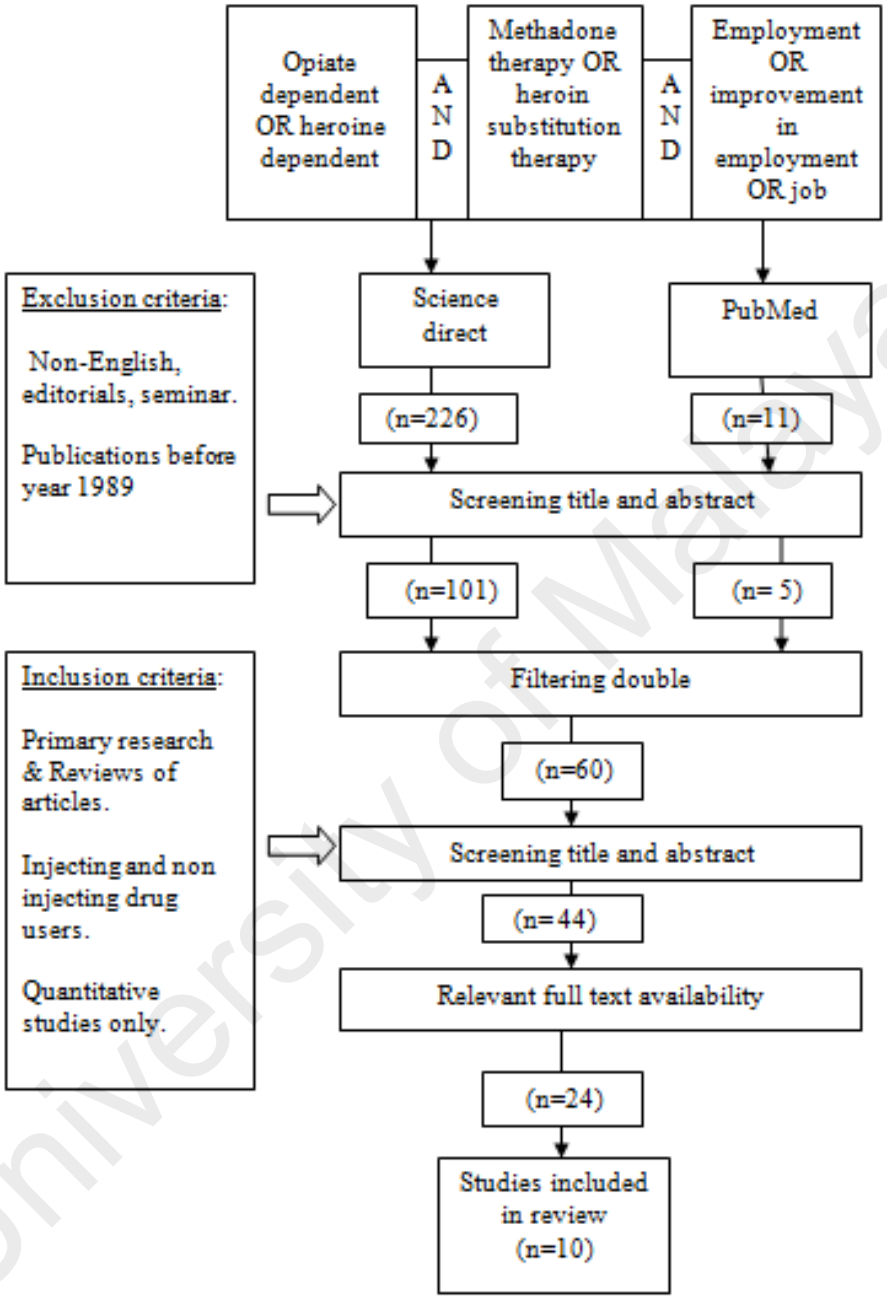

Figure 2.4: Flow chart of search strategy for methadone studies on employment

2.5.2 Demographic

Table 2.3 summarizes the studies selected for systematic review of methadone maintenance treatment program impact on clients' employment status. Ten articles were identified with five studies deploying the longitudinal methodology study (Blix, 1989; Li et al, 2012; McLellan, 1993; Richardson et al., 2013; Segest et al., 1990), three cross sectional studies (Laudet, 2012; Coffman et al., 2017; Nong et al, 2017);) and two Randomize control study (Svikis,et al., 2012; Zanis et al., 1994)

The demographic characteristics of the studies reviewed are mainly opiate drug addicts either in the common populace of enrolled in some form of treatment at several clinics that were studied. Some of the social demographic attributes of respondents in the studies reviewed were age, income, sex, race, occupation, education just to mention a few.

Table 2.3: Evidence based table showing the employment outcome among methadone clients

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding	General Comments
1.	Blix (1989), Sweden	Longitudinal follow up study	Comprehensive review of national data report	345 heroin clients	Methadone Maintenance Treatment	More than 80% of individuals with serious heroin dependence acquired new jobs and were reintegrated into society subsequent to accepting MMT. 70– 80% employment rate among MMT customers was reported.	This was more of a report rather than a research study with minimal measuring instruments/tools.
2.	Coffman et al (2017), United Kingdom	Cross sectional study	Online Experiments	100 participants representing workers seeking jobs, and another 800 representing employers looking to hire workers	N/A	Using test results as their guide, employees still steered clear of the odd-month, or female workers, choosing them only 37 percent of the time. When identified as women, they were chosen 43 percent of the time	The take home point from this study is, most employers tend to favour men during the recruitment process not on the grounds that they are preferential against ladies, but rather in light of the fact that they have a perception

Table 2.3 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding	General Comments
							that men perform better averagely at certain tasks.
3.	Richardson et al (2012), Canada	Longitudinal follow up study	Custom Made Questionnaire	1,579 individuals enrolled in the Vancouver Injection Drug Users Study (VIDUS)	Methadone, LAAM, Buprenorphine, Naloxone	Survival analysis initially found no association between addiction treatment enrolment and employment initiation. However, when methadone maintenance therapy (MMT) was separated from other treatment modalities, non-MMT treatment positively predicted employment transitions, while MMT was negatively associated with employment initiation.	Findings suggest that individual factors impacting employment transitions may systematically apply to MMT clients, and that, in this setting, the impact of treatment on employment outcomes is contingent on treatment type and design.

Table 2.3 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding	General Comments
4.	Li et al (2013), China	Longitudinal follow up study	Providers: self-administrated paper/pencil questionnaires Clients: face-to-face survey Mixed-effects regression models	41 providers and 179 clients from the six MMT CARE clinics in China	Methadone Maintenance Treatment	Significant intervention effects for providers were found in improved methadone maintenance therapy knowledge, provider-client interaction, and perceived clinic support. For clients, better improvements in employment status, drug avoidance, self-efficacy and reduced concurrent drug use were observed for the intervention compared to the standard care group.	Discussion chapter of this paper stated a report by OECD that shows that the probability of millennial to get a job at any given moment is higher than any other age group. The age group 20 to 30 years old in the study finding have a higher percentage of employment.

Table 2.3 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding	General Comments
5.	Laudet, (2012), USA	Cross sectional study	Questionnaire Development System, QDS: Nova Research	311 urban Polysubstance Dependent individuals at various stages of recovery	Not Indicated	Overall, 44.4% were currently employed full or part-time for duration of one year at their current job. Beingmale and being Caucasian roughly doubled the odds of being employed whereas indices of ongoing mental and physical health problems decreased the odds of being employed by about half. Younger age, higher educational attainment and not having a history of homelessness yielded significant results when examined individually.	For the larger part the results of this study capitalised on Substance Abuse Disorder (SUD) instead of Employment Outcome

Table 2.3 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding	General Comments
6.	Svikis et al (2012), USA	randomization study	Common Assessment Battery (CAB), Addiction Severity Index-Lite (ASI-Lite), Timeline Follow Back Interview for Employment (TLFB-E)	628 patients from drug abuse treatment program.	Methadone maintenance treatment	Job Seekers' Workshop (JSW) and standard care (SC) participants had similar 12- and 24-week results for the primary outcome measure (, One-fifth of participants at 12 weeks (20.1 – 24.3%) and nearly one-third at 24 weeks (31.4–31.9%) had positive outcomes, with "obtaining a new taxed job" .	Majority of jobs obtained appeared to fall into the categories of unskilled and semi-skilled. It is important to understandthe differences between significant positive employment/training outcomes.
7.	Zanis et al, (2001), USA	Randomized control trial	Addiction Severity Index	340 opiate addicted individual	Methadone maintenance treatment	Results of these analyses found lower depression scores, cocaine abstinence, education, and marital status correlated with stable employment conditions.	In this study respondents who were male were more likely to find a job compare to female respondents after joining the treatment.

Table 2.3 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding	General Comments
						Interventions designed to change these characteristics may improve employment conditions among methadone patients.	
8.	McLellan, (1993), USA	Longitudinal follow up study	Customised Questionnaires	Ninety-two male intravenous opiate users	Methadone maintenance Therapy	Positive change in quality of life was relate with less utilization of illicit drugs, having the capacity to get employed and better money related status and in addition better living conditions. Notwithstanding, quality of life was enhanced, with level of education, clients in this study had secondary or lower training. r	The addition of basic counselling was associated with major increases in efficacy; and the addition of on-site professional services was even more effective.

Table 2.3 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding	General Comments
9.	Segest et al. (1990), Denmark	Longitudinal follow up study	Customised questionnaire	169 opiate drug addicts	Methadone maintenance treatment	. The treatment with methadone was unstable and only 11% had received stable prolonged maintenance treatment. The study recommended lack of a possibility to reject a model that described increasing mortality rates neither as a function of falling methadone maintenance treatment nor as a function of socially unstable addicts' contra stable addicts. Unemployment was high in the cohort.	In this study no clear relationship could be demonstrated between methadone maintenance treatment and employment.

Table 2.3 continued

No	Author, year & study location	Study type & methodology	Measurement tool	Study sample & characteristics	Exposure/ Intervention	Outcome measures/ main finding	General Comments
10.	Nong et al. (2017), Vietnam	Cross sectional study	Work Productivity and Activity Impairment Questionnaire: General Health V2.0 (WPAI-GH)	241 methadone clients	Methadone maintenance treatment.	Most of the participants (>90%) were employed at the time of the study. About half of them had been refused by employers because of their drug use history and/or HIV status. No statistically significant difference between patients enrolled in MMT for <1 year and those who had been enrolled >1 year. Factors associated with work productivity included not endorsing problems in mobility, self-care or pain; being HIV-negative and having greater MMT treatment adherence.	Rates of absenteeism (missed work), presenteeism (impairment while working) and overall loss of productivity were 15.8%, 5.6% and 11.2%, respectively. The most proficient job was 'freelancer' (17.5%), followed by 'blue-collar worker' (10.6%) and 'farmer' (10.2%). Only 26.8% of patients reported that they actively sought jobs in the past.

2.5.3 Type of intervention

Methadone maintenance treatment is the most prominent method of opioid addiction treatment in the studies reviewed. Seven studies (Blix, 1989; Li et al, 2012; McLellan, 1993; Nong et al., 2017; Segest et al., 2009; Svikis et al,. 2012; Zanis et al., 1994) were mainly focused on the clients that have already been registered for methadone maintenance treatment at clinics. Laudet et al. (2012) and Coffman et al. (2017), study did not indicate the treatment of the respondents that were used because the respondents were recruited randomly. Richardson et al., 2013, used patients using all methadone, LAAM, buprenorfine, Naloxone as agents of opiate dependency treatment.

2.5.4 Study design

In the literature review table above there were five longitudinal follow up studies, four cross sectional studies and one randomization study. The five longitudinal studies happened over numerous points in time across a longer time-frame. The researchers changed the respondents that were giving data and results for the research study. The four cross-sectional studies were all about analyzing different respondents at a single time frame. Rather than gathering information after some time on a single outcome, these 4 studies stuck to several respondents giving feedback about the same outcomes with no follow up study.

2.5.5 Measurement tool

Collection and measurement of the employment outcome of methadone maintenance treatment in the studies arraigned in the review table were conducted in a variety of ways, including surveys, focus groups, questionnaires and interviews. From the studies,

a variety of tools all different in each and every study emerged to monitor the employment status before, during and after the methadone maintenance program treatment.

2.5.6 Outcomes

From the studies several factors were presented to be associated with employment status. For all the ten studies (Blix, 1989; Coffman et al., 2017; Laudet, 2012; Li et al, 2012; McLellan, 1993; Nong et al, 2017; Richardson et al., 2013; Segest et al., 2009, Svikis et al, 2012; Zanis et al., 1994) this factors included sociodemographic, dose, years of drug addiction and blood borne diseases.

As per six studies (Blix, 1989; Li et al, 2012; McLellan, 1993; Nong et al, 2017; Segest et al., 2009; Zanis et al., 1994) being male, unemployed before starting treatment and HIV negative made a unique statistically significant contribution to the results. The strongest predictor of reporting employment status after starting treatment was being male. Most of the research studies stipulate that respondents who were male are more likely to find a job compare to female respondents after joining the treatment.

2.5.7 Conclusion

This systematic literature review of research papers on methadone maintenance treatment program impact on clients' employment status showed that a considerable number of published studies found an association between socio-demographic, dose, years of drug addiction and blood borne diseases factors and the employment status of the respondents before, during and after the methadone maintenance treatment program.

2.5.8 Summary

In summary, methadone maintenance therapy program is a vast topic, which has been examined in details by investigating its program outcome, measurement, associated factors, and the intervention used in this MMT program. Studying these factors together in a holistic manner would aid in understanding this topic among methadone clients in Selangor. The above systematic review has revealed a number of key points that must be considered in the design of this study. Most commonly used tools were WHOQOL-BREF and OTI as it measures physical, psychological, social, environmental, drug use, HIV risk taking behaviour, crime and health status. Therefore, to interpret the study findings in the context of previous research, it is important to use a similar tool.

CHAPTER 3: METHODOLOGY

3.1 Study design

This study includes both a retrospective cohort and cross-sectional component among all active clients in methadone treatment between years 2007 and 2012. This time frame was chosen because the methadone maintenance treatment program was started nationwide in year 2007 after the pilot project in year 2005. The pre-treatment data was extracted from the client's individual files. Clients joining Methadone treatment were asked to fill up the baseline WHOQOL-BREF score questionnaire and Opiate Treatment Index (WHO, 2009) score questionnaire prior to starting the treatment in all methadone clinics at government settings during the induction period. Flow chart of the study was explained in Figure 3.1.

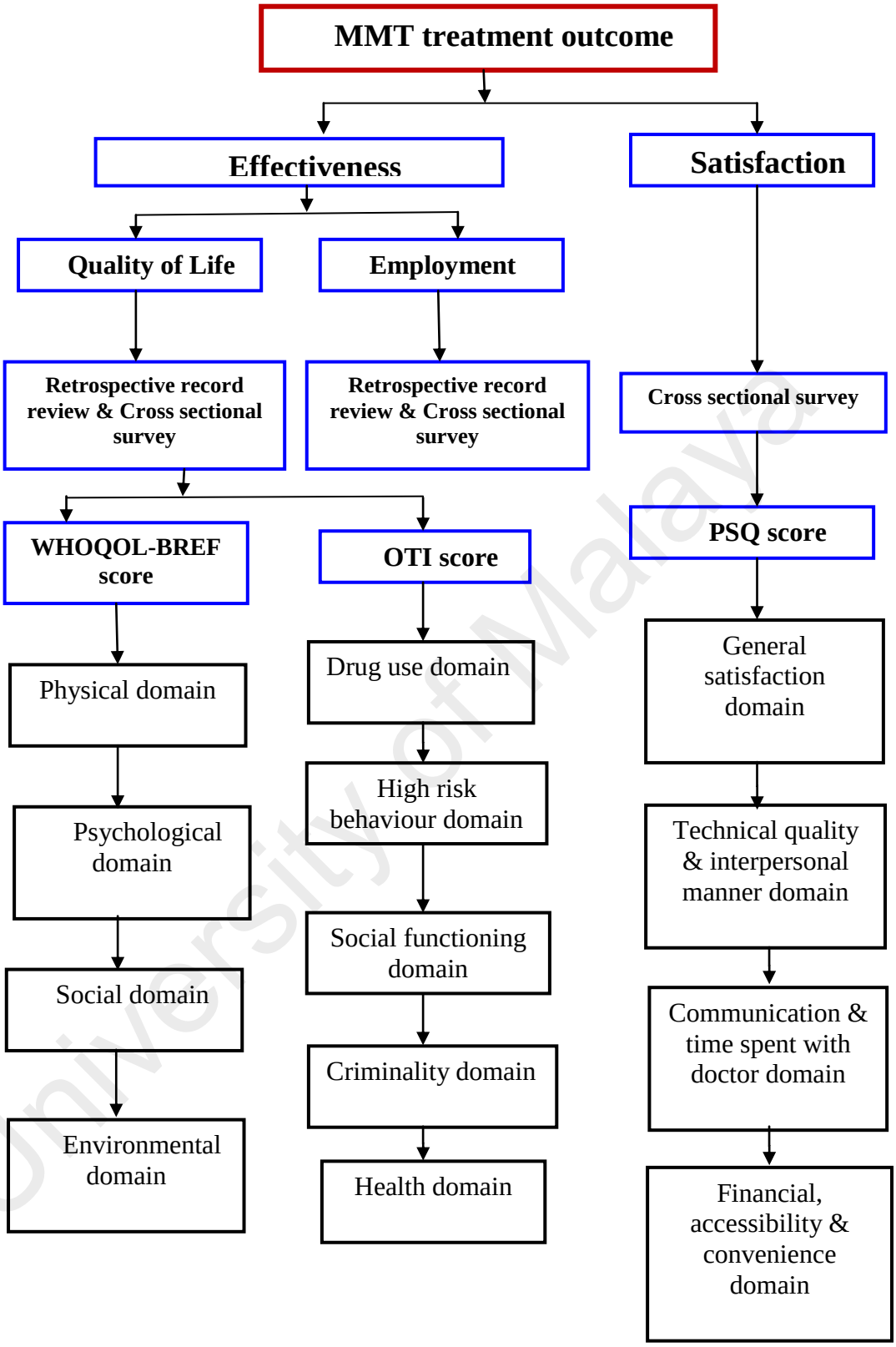

Figure 3.1: Flow chart of study

3.2 Study area and duration of study

Selangor is one of the more developed states among the 14 states in Malaysia. Selangor is situated in Peninsular Malaysia. The Federal Territories of Kuala Lumpur and Putrajaya are situated in the middle of the Selangor as an economic hub and the country's administrative centre. The study was conducted at government hospitals and primary health care centres in Selangor. There are 10 hospitals and 75 primary health care clinics from the nine districts in Selangor (Petaling, Gombak, Klang, Sabak Bernam, Sepang, Hulu Langat, Kuala Langat, Hulu Selangor, and Kuala Selangor). Out of the 10 hospitals, only five hospitals are providing methadone maintenance treatment services:

1) Hospital Banting **(methadone)**
2) Hospital Sungai Buloh **(methadone)**
3) Hospital Tanjung Karang **(methadone)**
4) Hospital Tengku Ampuan Jemaah **(methadone)**
5) Hospital Tengku Ampuan Rahimah **(methadone)**

Public health services in Malaysia are administered by the Ministry of Health through state and district offices. The District Health Offices [Pejabat Kesihatan Daerah (PKD)] mainly manage and coordinate the delivery of an affordable, efficient and effective health services in the districts throughout Malaysia. (Liyanatul Najwa et al., 2016). Methadone services are delivered at primary healthcare clinics [Klinik Kesihatan (KK)] in districts. From the 75 primary health care clinics, only 7 clinics are providing methadone services to these vulnerable groups starting 2007. KK AU2 is one of the pilot clinics that started the methadone treatment service in year 2005 in Selangor. Totally, there are 17 centres providing this service to opiate dependants. The duration of the study was from June 2013 till May 2014.

PKD Gombak

KK AU2

KK Taman Ehsan

PKD Klang

KK Pandamaran

PKD Hulu Langat

KK Batu 9

PKD Petaling

KK Seri Kembangan

PKD Sepang

KK Salak

PKD Hulu Selangor

KK Serendah

Figure 3.2 shows the map of Selangor with all the nine district health offices [Pejabat Kesihatan Daerah (PKD)] and hospitals in this state. Those PKDs and hospitals involved in this study were circled in red in the picture below.

Figure 3.2: Map of PKD and hospitals in Selangor

3.3 Study population

The population of Selangor state exceeded 5million (5,411,324) as of year 2010 (Department Of Statistic, 2010). The developed states such as Selangor, Federal Territory of Kuala Lumpur, Putrajaya, Johor, and Pulau Pinang showed a higher number of drug addicts as compared with other states. Besides the ease of procuring drugs easily, the challenges of living in urban areas including social and economic issues were the key factors contributing to drug misuse. Among them, drug addicts' aged 18 to 65 who had registered in methadone maintenance treatment program in Selangor numbered 1574 clients of whom 1022 were actively taking methadone (MOH, 2013). Opiate dependents who visited the public hospitals and primary health care clinics for methadone treatment who met the inclusion and exclusion criteria were enrolled in this study.

3.3.1 Inclusion criteria

- The patient must volunteer to take part in this research.
- Age between 18 to 65 years old.
- Drug users – injecting and non-injecting.
- Clients who have registered for this program between years 2007 and 2012.
- Previous unsuccessful methadone treatment should not exclude a patient from this study.

3.3.2 Exclusion criteria

- Acute medical and psychiatric disorder.
- Transferred in from other centres.
- Those who don't understand Malay or English.

3.4 Sample size estimation

Sample size was calculated base on Epi Info sample size calculation sofware. Sample was calculated using odds ratio of 0.03 for 'no sex for drug or money' from a study conducted in USA, the effect of methadone maintenance on positive outcome for opiate injection drug users' in year 2008 (Corsi et al., 2008). Based on the estimated porportion with alpha of 0.05,95% confidence interval and power of 80%, the sample size required was 412 respondents. Drug addicts are categorised in a vulnerable group, therefore 50% of non-response rate was applied. The estimated sample required was 618 respondents.

3.5 Sampling procedure

All clients who met the inclusion and exclusion criteria were included in this study. Universal sampling method was used to recruit the respondents. This sampling method was used because total number of active clients in all 12 centers who met the inclusion and exclusion criterias were 661 clients. Therefore we planned to include all the 661 clients in this study. First and foremost the researcher had finalized the list of clients names with the help of the pharmacist from each clinic. To acomplish this, the researcher also had went through the clients' registry book to look for those enrolled in the program from year 2007 to 2012 and reported as actively taking methadone dose daily. The flow chart of sampling procedure shown in Figure 3.3.

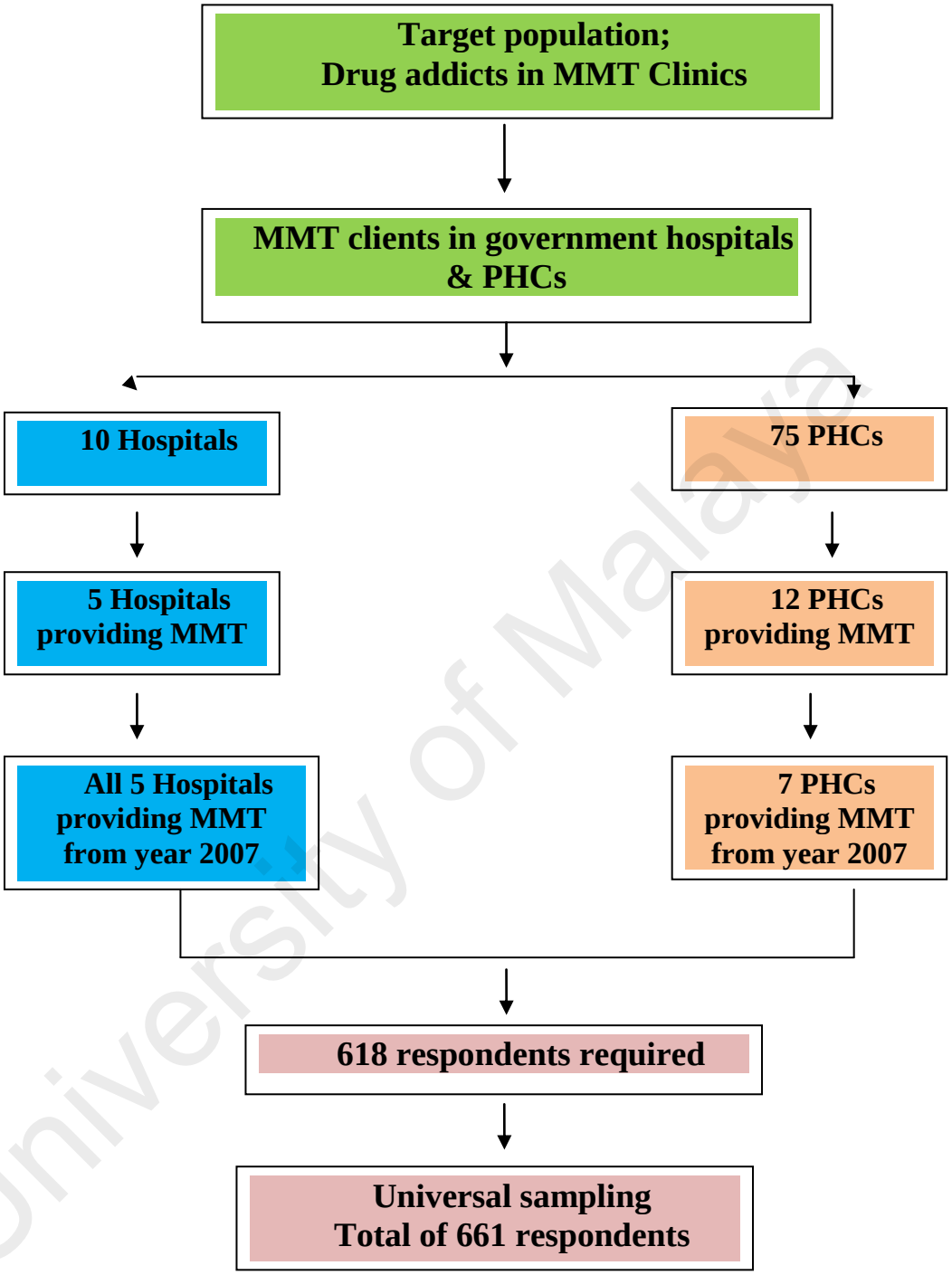

Figure 3.3: Flow chart of sampling procedure

3.6 Study variables

3.6.1 Dependent variable

A dependent variable is one which describes the outcome of the study. The dependent variable correlates to the independent variable.

3.6.1.1 Quality of life

- Physical outcome
- Social relationship outcome
- Psychological outcome
- Environmental outcome
- Health status outcome
    - General
    - Injection related problem
    - Cardiorespiratory
    - Genitourinary
    - Gynaecology
    - Musculoskeletal
    - Neurology
    - Gastrointestinal
- Crime status outcome
    - Property crime
    - Dealing
    - Fraud
    - Crime involving violence

- Drug use outcome
    - Heroine use
- HRBS (High Risk Behaviour Score)

  Injecting
    - Needle sharing

  Sexual behaviour
    - Ever had sexual intercourse
    - Number of sexual partners
    - Use of condom

3.6.2 Secondary outcome variables

3.6.2.1 Satisfaction

One of the specific objectives is to determine the satisfaction towards the program among opiate dependents. The secondary outcome variables which are included in this study are namely:

- General satisfaction
- Technical quality & Interpersonal manner
- Communication & Time spent with doctors
- Financial status, accessibility & convenience

3.6.2.2 Employment Status

Another specific outcome is to determine the factors associated with employment status after joining the methadone program.

3.6.3 Independent variable

An independent variable is one that has been fixed and has an effect on the dependent variable. Background variables consist of socio-demographic variables and clinical variables namely:

- Age (18 to 65 years)
- Ethnicity (Malay, Chinese, Indian)
- Sex (Male, female)
- Education level (No formal education, Primary, secondary, tertiary)
- Occupation (employed or unemployed)
- Marital status (Single, married, widowed, divorced)
- Blood borne infectious diseases (HIV, Hepatitis C, Hepatitis B)
- Years of drug use
- Dosage

3.6.4 Confounding variables

Confounding variables are those that might influence the outcome of the study.

- Age
- Marital status
- Years of drug use
- Dosage
- Sex
- Ethnicity
- Education level
- Employment

3.7 Validity and reliability

3.7.1 Content and face validity

The main objectives of the study are to determine the effectiveness and satisfaction of the MMT program among opiate dependents and its association with various factors, using the WHOQOL-BREF, OTI and PSQ. Therefore, only content validation and face validation were sought to ensure the questions used had sufficient local validity. Quantitative content validity of the patient satisfaction questionnaire (PSQ) was sought via expert opinion, consulting three experts in the field of public health, psychiatric and family medicine, to obtain their perspective on the questions. The PSQ's 18 items were modified to 13 items by the experts (Table 3.1).

Table 3.1: Quantitative content validity of patient satisfaction questionnaire (PSQ)

EFFECTIVENESS AND SATISFACTION OUTCOME TOWARDS METHADONE MAINTENANCE THERAPY PROGRAM AMONG METHADONE CLIENTS IN SELANGOR STATE, MALAYSIA

Essential	**Clarity**
1. Essential	1.Clear
2. Useful but not essential	2. Item need revision
3. Not necessary	3. Not clear

Question No.	Essential				Clarity			
	Expert 1	Expert 2	Expert 3	CVR	Expert 1	Expert 2	Expert 3	CVR
1	1	1	1	0.99	1	1	2	0.33
2	1	1	1	0.99	1	1	1	0.99
3	1	1	1	0.99	1	1	1	0.99
4	1	1	1	0.99	1	1	1	0.99
5	1	1	1	0.99	1	1	1	0.99
6	1	1	1	0.99	1	1	1	0.99
7	1	1	1	0.99	1	1	1	0.99
8	1	1	1	0.99	1	1	1	0.99
9	1	1	1	0.99	1	1	2	0.33
10	1	1	1	0.99	1	1	1	0.99
11	1	1	1	0.99	1	1	1	0.99
12	1	1	1	0.99	1	1	1	0.99
13	1	1	1	0.99	1	1	1	0.99

CVI: 12.87/13 = 0.99

CVI: 11.55/13 = 0.88

Based on Lawshe (1975), Content Validation Ratio **(CVR)** & Content Validation Index **(CVI)** was calculated using the formula below:

$$\mathbf{CVR} = (ne - n/2) / (n-2)$$

Where ***ne*** *= number of experts who gave the item a rating of essential*

n*= total number of experts*

Acceptable condition of CVR/CVI is larger than 0.75

CVI = average of CVRs

Further to this, face validation of the WHOQOL-BREF, OTI and PSQ was sought by reading through the questionnaire with 30 selected methadone clients from Klinik Kesihatan Kepong, Kuala Lumpur, to ensure the meaning of the words was understood, by asking the clients to interpret what they thought each question was referring to. Acceptability of wording, clarity of meaning, comprehension and possible discomfort was also looked into. An actual pilot study was done further to this with n=130 methadone clients from Klinik Kesihatan Kepong and Klinik Kesihatan Jinjang, Kuala Lumpur. Permission was obtained from the Health Director, Federal Territory of Kuala Lumpur. The characteristic of respondent in the pilot study were comparable with characteristic of respondent in the actual data collection. and informed written consent was taken prior to the start of the interview. An honorarium of RM5 was given to each participant upon completion of the interview.

3.7.2 Reliability assessment

3.7.2.1 Internal consistency of WHOQOL-BREF

The first tool assessed for reliability was the WHOQOL-BREF, which had been previously validated locally. Table 3.2 shows a good internal consistency of the physical domain assessment via the WHOQOL-BREF as shown by the Cronbach alpha reliability coefficient of 0.750 which is higher than 0.6.

Table 3.2: Reliability statistics for physical domain via WHOQOL-BREF

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.608	.750	7

In addition, the corrected item total correlation figures in Table 3.3 are mostly higher than 0.3, indicating each item correlates well with the total score.

Table 3.3: Item-total statistics for physical domain via WHOQOL-BREF

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Physical1 To what extent are you having physical pain that could refrain you from doing your activities?	20.561	3.442	0.460	0.148	0.339
Physical2 How frequent would you need treatment to do your daily chores?	20.677	3.910	0.573	0.18	0.438
Physical3 To what extent do you have enough energy to do your daily chores?	18.792	3.422	0.318	0.24	0.173
Physical4 Are you getting proper sleep at night?	18.654	3.794	0.710	0.082	0.287
Physical5 Do you feel satisfied with your own ability to do your daily chores?	18.692	3.610	0.728	0.416	0.191
Physical6 Do you feel satisfied with your own ability to do activities at work?	18.762	3.206	0.652	0.323	0.187
Physical7 To what extent do you have the ability to commute from one place to another?	18.585	4.059	0.705	0.112	0.292

Table 3.4 shows a good internal consistency of the psychological domain assessment via the WHOQOL-BREF as shown by the Cronbach alpha reliability coefficient of 0.672 which is higher than 0.6.

Table 3.4: Reliability statistics for psychological domain via WHOQOL-BREF

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.674	.672	6

In addition, the corrected item total correlation figures in Table 3.5 are mostly higher than 0.3, indicating each item correlates well with the total score.

Table 3.5: Item-total statistics for psychological domain via WHOQOL-BREF

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Psychological1 Are you happy with your current life?	16.881	4.010	0.469	0.434	0.612
Psychological2 Are you having a meaningful life currently?	16.730	3.463	0.622	0.563	0.548
Psychological3 How well can you pay attention?	16.786	3.690	0.582	0.393	0.570
Psychological4 How would you describe your body posture and physical appearance? How well do you accept it?	16.770	3.699	0.459	0.338	0.612
Psychological5 Are you satisfied with yourself?	16.857	3.995	0.45	0.326	0.617
Psychological6 How often do you get negative feelings like disappointment, sadness. nervousness/dull	18.714	5.262	0.374	0.025	0.774

Table 3.6 shows a good internal consistency of the social domain assessment via the WHOQOL-BREF as shown by the Cronbach alpha reliability coefficient of 0.614 which is higher than 0.6.

Table 3.6: Reliability statistics for social domain via WHOQOL-BREF

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.578	.614	3

In addition, the corrected item total correlation figures in Table 3.7 are mostly higher than 0.3, indicating each item correlates well with the total score.

Table 3.7: Item-total statistics for social domain via WHOQOL-BREF

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Social1 Are you satisfied with your personal relationships?	6.3101	2.200	0.540	0.294	0.337
Social2 Are you satisfied with your sexual relationships?	6.9381	1.684	0.372	0.213	0.524
Social3 Are you satisfied with support from your friends and family?	6.6434	2.028	0.314	0.142	0.591

Table 3.8 shows a good internal consistency of the environmental domain assessment via the WHOQOL-BREF as shown by the Cronbach alpha reliability coefficient of 0.774 which is higher than 0.6.

Table 3.8: Reliability statistics for environmental domain via WHOQOL-BREF

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.761	.774	8

In addition, the corrected item total correlation figures in Table 3.9 are mostly higher than 0.3, except for question 4 and 8, indicating most items correlates well with the total score.

Table 3.9: Item-total statistics for environmental domain via WHOQOL-BREF

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Environmental1 Do you feel secure in your daily life?	25.661	6.923	0.551	0.471	0.717
Environmental2 How healthy is your physical environment?	25.715	7.073	0.610	0.539	0.709
Environmental3 Do you have enough money to support yourself?	26.153	7.728	0.282	0.168	0.770
Environmental4 How accessible are your amenities to get information in your daily life?	25.923	6.738	0.623	0.460	0.703
Environmental5 Do you have opportunities to do outdoor activities?	26.138	6.167	0.502	0.357	0.737
Environmental6 Do you feel satisfied with your current living environment?	25.738	7.699	0.475	0.351	0.734
Environmental7 Do you feel satisfied with amenities which are providing health services?	25.584	7.888	0.578	0.399	0.729
Environmental8 Do you feel satisfied with your transportation? Public transportation?	25.638	8.636	0.194	0.143	0.771

Table 3.10 shows the comparison of internal consistency of WHOQOL-BREF with current studies and studies done at Netherlands and Malawi (Fons et al., 2005; Tim et al., 2012) Findings from these two countries were similar to the current study.

Table 3.10: Comparison of internal consistency of WHOQOL-BREF with other studies

	Countries		
Domains	**Netherlands**	**Malawi**	**Current study**
Physical	0.80	0.82	0.75
Psychological	0.74	0.78	0.67
Social	0.66	0.69	0.61
Environmental	0.73	0.82	0.77

3.7.2.2 Internal consistency of OTI

Table 3.11 shows a good internal consistency of the HRBS domain assessment via the OTI as shown by the Cronbach alpha reliability coefficient of 0.832 which is higher than 0.6.

Table 3.11: Reliability statistics for HRBS domain via OTI

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.632	.832	11

In addition, the corrected item total correlation figures in Table 3.12 are mostly higher than 0.3, except for question 2 on injecting, indicating most items correlates well with the total score.

Table 3.12: Item-total statistics for HRBS domain via OTI

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Injecting1 How many times have you hit up (injected any drugs) in the last month?	4.000	24.062	0.321		0.624
Injecting2 How many times in the last month have you used a needle after someone else had use it?	4.007	24.442	0.280		0.629
Injecting3 How many different people have used a needle before you in last month?	4.015	24.186	0.379		0.625
Injecting4 How many times in the last month has someone used a needle after you have used it?	4.023	24.457	0.393		0.629
Injecting5 How often in the last month have you cleaned needles before re-using them?	3.953	22.711	0.312		0.610
Injecting6 Before using needles again how often in the past month did you use bleach to clean them?	3.961	22.781	0.303		0.611
Sexual1 How many people including clients have you had sex with in the last month?	3.530	20.561	0.689		0.559
Sexual2 How often have you used condoms when having sex with your regular partner in the last month?	2.230	13.977	0.352		0.668
Sexual3 How often did you use condoms when you had sex with casual partners in the last month?	3.192	15.567	0.499		0.552
Sexual4 How often have you used condoms when you have been paid for sex in the last month?	3.684	19.923	0.444		0.575
Sexual5 How many times did you have anal sex in the last month?	3.784	22.527	0.324		0.608

Table 3.13 shows a good internal consistency of the social domain assessment via the OTI as shown by the Cronbach alpha reliability coefficient of 0.422 which is lesser than 0.6.

Table 3.13: Reliability statistics for social domain via OTI

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.240	.422	12

In addition, the corrected item total correlation figures in Table 3.14 are mostly higher than 0.3, except for question 2 and 4, indicating most items correlates well with the total score.

Table 3.14: Item-total statistics for social domain via OTI

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SocialFunc1 How many different places have you lived in over the last six months?	11.709	20.623	0.133	0.156	0.219
SocialFunc2 How much of the last six months have you been employed?	9.305	25.721	0.408	0.489	0.521
SocialFunc3 How many different full time jobs have you had in the last six months?	10.987	18.692	0.428	0.453	0.255
SocialFunc4 How often in the last six months have you had conflicts with your relatives?	11.267	19.059	0.197	0.354	0.181
SocialFunc5 How often in the last six months have you had conflicts with your partner(s)?	11.358	20.001	0.518	0.262	0.213
SocialFunc6 How often in the last six months have you had conflicts with your friends?	11.404	19.874	0.371	0.261	0.200
SocialFunc7 About how many close friends would you estimate that you have?(include partner)	10.206	14.873	0.363	0.459	0.032
SocialFunc8 When you are having problems. are you satisfied with the support you get from your friends?	10.526	21.42	0.294	0.126	0.285
SocialFunc9 About how often do you see your friends?	9.984	15.031	0.492	0.576	-.0100
SocialFunc10 How many of the people you hang around with now have you known for more than six months?	10.870	14.591	0.332	0.689	0.040
SocialFunc11 How much of the last six month have you been living with anyone who uses heroin?	11.748	20.621	0.602	0.240	0.223
SocialFunc12 How many of the people you hang around with now are users (include partner)?	11.290	21.361	0.482	0.355	0.279

Table 3.15 shows a good internal consistency of the criminal domain assessment via the OTI as shown by the Cronbach alpha reliability coefficient of 0.449 which is lesser than 0.6.

Table 3.15: Reliability statistics for criminal domain via OTI

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.393	.449	4

In addition, the corrected item total correlation figures in Table 3.16 are mostly higher than 0.3, indicating each item correlates well with the total score.

Table 3.16: Item-total statistics for criminal domain via OTI

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Crime1 Property Crime: How often on average during the last month have you committed property crime?	0.061	0.089	0.313	0.338	0.221
Crime2 Dealing: How often on average during the last month have you sold drugs to someone?	0.053	0.082	0.399	0.100	0.530
Crime3 Fraud: How often on average during the last month have you committed a fraud?	0.068	0.095	0.377	0.273	0.194
Crime4 Crimes involving violence: How often on average during the last month?	0.068	0.111	0.462	0.196	0.376

Table 3.17 shows a good internal consistency of the social domain assessment via the OTI as shown by the Cronbach alpha reliability coefficient of 0.713 which is lesser than 0.6.

Table 3.17: Reliability statistics for health domain via OTI

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.264	.713	8

In addition, the corrected item total correlation figures in Table 3.18 are mostly higher than 0.3, except for question 2 on injection related problem and question 5 on gynaecological problem, indicating most items correlates well with the total score.

Table 3.18: Item-total statistics for health domain via OTI

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Health1 General	1.45	5.553	0.438	0.088	0.216
Health2 Injection related problem	1.8	8.364	0.024	0.023	0.271
Health3 Cardio/respiratory	1.55	6.442	0.303	0.026	0.241
Health4 Genito-urinary	1.61	7.011	0.319	0.183	0.155
Health5 Gynaecological-Women Only	1.8	8.354	0.004	0.049	0.269
Health6 Musculo-skeletal	1.7	7.715	0.332	0.153	0.208
Health7 Neurological	1.74	8.153	0.525	0.002	0.268
Health8 Gastro intestinal	0.98	4.992	0.406	0.064	0.272

Table 3.19 shows the comparison of internal consistency of OTI with current studies and studies done at Australia and Spain. (Darke et al., 1991; González-Saiz & García-Valderrama, 2012). Findings from these two countries were similar to the current study.

Table 3.19: Comparison of internal consistency of OTI with other studies

	Countries		
Domains	**Australia**	**Spain**	**Current study**
HRBS	0.70	0.61	0.83
Social function	0.58	0.49	0.42
Criminal	0.38	0.34	0.44
Health	0.76	0.78	0.71

3.7.2.3 Internal consistency of PSQ

Table 3.20 shows a good internal consistency of the social domain assessment via the OTI as shown by the Cronbach alpha reliability coefficient of 0.509 which is lesser than 0.6 but within the acceptable range.

Table 3.20: Reliability statistics for PSQ

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.570	.509	13

In addition, the corrected item total correlation figures in Table 3.21 are mostly higher than 0.3, except for question 1 on general satisfaction, questions 7, 8, 9 on communication and question 11 on financial support, indicating most items correlates well with the total score

Table 3.21: Item-total statistics for PSQ

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
General Satisfaction1 The medical treatment that I have received was good	26.530	4.763	0.260	0.200	0.419
General Satisfaction2 I'm not quite happy with the treatments that I have received	25.484	4.515	0.399	0.111	0.406
Technical Quality3 I feel this clinic has all the amenities that are needed	26.576	4.339	0.318	0.286	0.371
Technical Quality4 The doctor in this clinic checks me thoroughly	26.630	4.855	0.473	0.119	0.442
Technical Quality5 The doctor treats me with proper manner	26.607	4.767	0.444	0.181	0.423
Communication6 The doctor has explained well about the medical examination	26.669	4.75	0.346	0.101	0.423
Communication7 At times, there are those who are in a hurry giving me treatments	25.607	5.248	0.223	0.173	0.497
Communication8 At times, doctors do not even listen to what I say to them	25.484	5.228	0.083	0.25	0.467
Communication9 I'm not satisfied with certain matters about the treatment that I had received.	26.330	4.425	0.273	0.269	0.385
Financial10 I feel I can get treatment from this clinic without thinking about the cost.	26.953	4.370	0.302	0.192	0.404
Financial11: In this clinic, I can get medical consultant's review whenever I need.	26.476	3.786	0.107	0.293	0.317
Financial12 In this clinic, patients are waiting for so long to be seen by doctors	25.738	4.799	0.533	0.150	0.462
Financial13 I can get the treatment easily from this clinic	26.353	4.571	0.431	0.330	0.400

3.8 Study instrument

There were three sets of questionnaires were used to collect the data, namely:

a) WHO-Quality of Life-BREF

b) Opiate Treatment Index (WHO, 2009)

c) Patient Satisfaction Questionnaire (PSQ)

3.8.1 Socio-demographic data

Baseline demographic factors in the form of age, sex, marital status, Ethnicity, Education level, Occupation, HIV status, Hepatitis B status, Hepatitis this was the correct person being interviewed from the sampling frame given. This was verified by client ID number.

3.8.2 WHOQOL-BREF questionnaire

WHOQOL-BREF questionnaire was developed in year 1991 by WHO to compare and to assess globally the quality of life of an individual, according to the patient's own perception of quality of life and standard of living. This instrument has been used worldwide and been widely tested for reliability (WHO, 1996). The questionnaire consists of 26 items, two individually scored items about an individual's overall perception of health and quality of life. The remaining 24 items are dividing into four domains namely;

1) Physical domain, it has seven items which explains on- activities of daily living, dependence on medicinal substances and medical aids, energy and fatigue, mobility, pain and discomfort, sleep and rest, work capacity

2) Psychological domain has 6 items which comprise of – bodily image and appearance, negative and/or positive feelings, self-esteem, spirituality/religion/personal beliefs, thinking/learning/memory and concentration.
3) Social domain has three items, which express on- personal relationships, social support and sexual activity
4) Environment domain has 8 items, which explains on – financial resources, freedom/physical safety/security, health and social care: accessibility and quality, home environment, opportunities for acquiring new information and skills, participation in and opportunities for recreation/leisure activities, physical environment: pollutions/noise/traffic/climate and transport facilities. In Malaysia the WHOQOL-BREF questionnaire was adapted and translated into the national language (Bahasa Malaysia) and validated and pre-tested since 1999 from University Sains Malaysia, Kelantan in year 2002 (Hasanah et al., 2003). This translated questionnaire is being used in our Methadone Maintenance Therapy clinics nationwide.

Every domain is given a score. All four domain scores will show an individual perception on quality of life. The domains scores are in five points Likert scale and each item is scored from 1 to 5 in a positive direction. Highest score denotes highest or best quality of life. Three items – item 3, item 4 and item 26 were negatively phrased. All these three items were transformed from negatively phrased items to positively phrased ones. The domains score was calculated by the mean score of items within each domain. The Mean scores are then multiplied by 4 in order to make domain scores comparable with the scores used in the WHOQOL-100 (WHO, 1996). Shown below are the items in every domain:

General domain

1. How would you rate your quality of life?
2. How satisfied are you with your health?

Physical domain

3. To what extent do you feel that physical pain prevents you from doing what you need to do?
4. How much do you need any medical treatment to function in your daily life?
5. Do you have enough energy for everyday life?
6. How well are you able to get around?
7. How satisfied are you with your sleep?
8. How satisfied are you with your ability to perform your daily living activities?
9. How satisfied are you with your capacity for work?

Psychological domain

10. How often do you have négative feelings such as blue mood, despair, anxiety and depression?
11. To what extent do you feel your life to be meaningful ?
12. How well are you able to concentrate ?
13. Are you able to accept your bodily appearance ?
14. How satisfied are you with yourself ?
15. How often do you have négative feelings such as blue mood, despair, anxiety and depression?

Social domain

16. How satisfied are you with your personal relationships?

17. How satisfied are you with your sex life?

18. How satisfied are you with the support you get from your friends?

Environment domain

14. How safe do you feel in your daily life?

15. How healthy is your daily life?

3.8.3 OTI (Opiate Treatment Index) questionnaire

The Opiate Treatment Index (Health et al.) is a standardized and validated set of instruments for evaluation of opiate treatment, which has been successfully tested for reliability in UK and New Zealand (Darke et al., 1991). The Opiate Treatment Index questionnaire is also one of the standard tools in our methadone maintenance therapy program in all government settings.

Drug use domain

This domain is like other treatment outcome domains, which examines the client's recent drug use behaviour. The information is collected on the recent drug use on the past three days of the heroin and other drug use. Q score for heroine and other drugs was calculated as mentioned in the formula below. The clients are asked a series of questions

$$Q = \frac{q1 + q2}{t1 + t2}$$

where Q = average amount per day

q1 = amount consumed on the last use occasion

q2 = amount consumed on the second last use occasion

t1 = interval between the last day of drug use and the next to last use day.

t2 = interval between the second and third last day of drug use.

The higher the value of Q score, the heavier the use of the drug. A Q score of zero is taken as abstinence. A Q score of 0.01to 0.13 is taken as using drugs once a week. A soce of 0.14 to 0.99 shows the client is using drugs more than once a week. A score of 1.00 to 1.99 means daily use of drugs and a score of 2.00 or more means using drug use more than once a day (Darke et al., 1991) For the purpose of this study a Q score of anything more than zero is taken as non-abstinence.

1. How many times have you hit up (injected any drug) in the last month?

   If the subject has not injected in the month prior to the interview, record zero for the drug use subtotal and go on to the sexual behaviour section.

2. How many times in the last month have you used a needle after someone else had already used it?

   i. Record the number of times the clients has injected with a needle that another person has already injected with, whether the needle shared had been cleaned before re-use or not.

3. How many people have used a needle before you in the last month?

    ii. This means the total number of different individuals in the month prior to the interview who used a needle before the client and the sexual partners.

4. How many times in the last month has someone used a needle after you have used it?

    iii. As with question 2 and 3, it may be necessary to question the client further concerning their sexual partner. This question is concerned with the risk the client might pose to other IVDU through sharing needles.

5. How often in the past month, have you cleaned needles before re-using them?

    iv. This question is concerned with any needles the clients has re-used in the last month, whether borrowed from another person or re-using their own.

6. Before using needles again, how often in the last month did you use bleach to clean them?

    v. Given that bleach is known to be virucidal, question 6 asked whether the client has used bleach to clean their needles before re-using them.

HIV associated risk behaviour domain

The HIV associated risk behaviour (HARB) scale is made to measure the behaviour of injecting drug users who are at risk of getting or transmitting on the Human Immunodeficiency Virus (HIV) and also other blood borne viruses through injection (e.g. hepatitis B and hepatitis C). The HIV associated risk behaviour scale measures the HIV associated risk behaviour in two parts, namely for sexual activity and needle sharing.

(a) ***Drug use section***

1. How many times have you hit up (injected any drug) in the last month?

   If the subject has not injected in the month prior to the interview, record zero for the drug use subtotal and go on to the sexual behaviour section.

2. How many times in the last month have you used a needle after someone else had already used it?

   Record the number of time the clients has injected with a needle that another person has already injected with, whether the needle shared had been cleaned before re-use or not.

3. How many people have used a needle before you in the last month?

   This means the total number of different individuals in the month prior to the interview who used a needle before the client and the sexual partners.

4. How many times in the last month has someone used a needle after you have used it?

   As with question 2 and 3, it may be necessary to question the client further concerning their sexual partner. This question is concerned with the risk the client might pose to other IDU through sharing needles.

5. How often in the past month, have you cleaned needles before re-using them?

   This question is concerned with any needles the clients has re-used in the last month, whether borrowed from another person or re-using their own.

6. Before using needles again, how often in the last month did you use bleach to clean them?

   Given that bleach is known to be virucidal, question 6 asked whether the client has used bleach to clean their needles before re-using them. Drug use section

(b) ***Sexual behaviour section***

7. How many people, including clients have you had sex with in the last month?

   All questions in the sexual behaviour section refer to penetrative sex, i.e. sex where there is some penetration of the vagina or anus with the penis. If the clients had no penetrative sex in the month prior to the interview, record zero for sexual behaviour.

8. How often have you used condoms when having sex with your regular partners(s) in the last month?

   'Regular partner(s) in this questions refers to any person the client regularly has sex with, i.e. the client may have more than one regular sexual partner.

9. How often do you use condoms when you had sex with casual partners in the last month?

   'Casual partner' means any partners that the subject had penetrative sex with in the month prior to the interview that is not a regular sexual partner and is not a paying client. Prostitutes whom the clients have paid for sex are regarded as casual partners.

10. How often have you used a condom when you have been paid for sex in the last month?

    This question asks the client about any instance where they have exchanged sex for money or drugs in the last month prior to the day of interview.

11. How many times did you have anal sex in the last month?

    Anal sex refers to the insertion of the penis into the anus. It counts instances of both active and passive anal sex, both with and without a condom.

The HIV associated risk behaviour provides three scores, a total score indicating level of HIV risk taking behaviour, a drug use subtotal indicating level of risk due to

drug or drug taking practice; and a sexual behaviour subtotal indicating level of risk associated with unsafe sex. In all cases, the higher the score the greater the risk the clients have for contracting and passing on HIV.

Social function domain

Major aspects of these scales address the social function. The scale especially addresses how much a drug user is involved in the drug culture, for instance how many of their friends are drug users and whether they living in the same house. It also asks about their employment status (full time job, part time job or odd jobs).This domain is also to know about their relationship with their family members and also among their friends and the support they receive from them. Below are the questions described in this section.

1. How many different places have you lived in over the last six months?

   To address the social adjustment of the clients.

2. How much of the last six months have you been employed?

   Employment included full time work and permanent part time work.

3. How many different full-time jobs have you had in the last six months?

   Include under the full-time work anyone whose usual employment is permanent and part time.

4. How often in the last six months have you had conflict with your relatives?

   Conflict here refers to arguments disputes. It is usually helpful to show the interviewee the scale and let them choose the term that they feel best described the frequency of conflict the have had over the six months prior the interview. If the person has no family or has not been in contact with them in the last six months, circle N/A and score the item as 0.

5. How often in the last six month have you had conflict with your partner(s)

   If the person has no partner or has not been in contact with them in the last six months, circle N/A and score item as 0.

6. How often in the last six months have you had conflict your friends?

   Friends in this case refer to acquaintances, as well as close friends. Basically, this question refers to the people the person 'hangs around with'. If the person has no friends, circle N/A and score the items as 4. The reason for this is that it indicates the absence of any social support.

7. About how many close friends would you estimate that you have?

   Close friends may be defined as people that the person feels that they can rely on; if the person has a sexual partner, make sure they are included in the estimate.

8. When you are having problem, are you satisfied with the support you get from your friends?

   Anything which causes the clients distress can be viewed as a problem e.g. financial, emotional, etc. If the person is insistent that they do not ask their friends for help, circle N/A and score 0 for the item.

9. About how often do you see your friends?

   If the person has no friends, circle N/A and score the items as 4As with question 6, the reason for this is that it indicates the absence of any social support.

10. How many of the people you hang around with now have you known for more than six months?

If the person has no friends, circle N/A and score the item as 4.As with question 6 and 9, the reason for this is that it indicates the absence of any social support.

11. How much of the last six months have you been living with anyone who uses drugs?

    Anyone who has taken drugs in the six months prior to the interview should be considered, for the purposes of the OTI, a drug user. Include both sexual partners and housemate

12. How many of the people you hang around with now are users?

    This question refers to acquaintances as well as close friends. If the client has a sexual partner who is a current user, they were also included in the estimate.

The scores for the social functioning scale are calculated by simply adding up the individual scores for each of the twelve questions.

Crime domain

This is to assess the frequency and severity of criminal activity the drug users have been involved with. The scale is divided into 4 major crime areas a) dealing – type of drug deal (heroin, cocaine, marijuana, speed, hallucinogens, barbiturates and tranquillisers) b) fraud (forging cheque, forging prescription, using someone else's card, social security scams) c) property crime breaking & entering, receiving stolen goods, stealing prescription pad, stealing a car, shoplifting, robbery without violence) d) crime involving violence (assault, armed robbery, murder, using violence in robbery, rape, manslaughter). Current conviction was also asked in this domain. It is usually necessary to explain the kind of activity that makes up each crime area. For each of the four crime areas, ask the clients to estimate how often they have committed the type of

crime during the last month. The total score for the criminality scale was calculated by adding up the score for each of the four crime areas.

Health domain

The health scale is a symptom check list that has been designed to give an indication of the client's current state of health, especially is relation to those areas within which IDUs usually develop problems. The scale is divided into items addressing symptoms and signs in each of the major organ systems namely:

1. General condition

Fatigue & energy loss, poor appetite, weight loss/underweight, trouble in sleeping, fever, night sweats, swollen glands, jaundice, bleeding easily, bruising easily, teeth problems, eyes and/or vision problems, ears and/or hearing problems and cuts needing stitches.

2. Injection Related

Overdose, abscesses and/or infections from injecting, prominent scarring & bruising and difficulty injecting.

3. Cardio-Respiratory

Persistent cough, coughing, coughing up blood, wheezing, sore throat, shortness of breath, chest pains, heart flutters and swollen ankles.

4. Genitor-Urinary

Painful urination, loss of sex urge, discharge from penis & vagina and rash on and/or around penis/vagina.

5. Gynaecological

Irregular period and miscarriage

6. Muscular-Skeletal

Joints pains and/or stiffness, broken bones and muscle pain

7. Neurological

Headache, blackouts, tremors, numbness/tingling, dizziness, fits/seizure, difficulty walking, head injury and forgetting things.

8. Gastro intestinal

Nausea, vomiting, stomach pains, constipation and diarrhoea

The interviewer reads outs the list to the clients and ticks any of the symptoms that the client has experienced in the previous month. The score for the health scale is derived by adding up the totals for each sub-section. Higher scores indicated poorer overall health of the clients.

3.8.4 PSQ (Patient Satisfaction Questionnaire)

Patient satisfaction questionnaire III (PSQ-III) is a 50 item questionnaire. In 1994, a valid and reliable short form version of the PSQ with 18 items was developed. The items comprised all seven dimension from the PSQ III . The seven dimensions are a) general satisfaction b) technical quality c) interpersonal manner d) communication e) financial support f) time spent with doctors g) accessibility and convinience (Marshall & Hays, 1994) For the purpose of this study, this tool was adapted and modified before using it for this research. 18 items was moddfied to 13 items. Every item were given four point likert scale ranging from 1=strongly agree, 2=agree, 3=disagree and 4=strongly disagree. This questionnare contains both positively and negatively worded items. Positively worded items like items 1, 2, 3, 4, 5, 6, 8. 11 and 13 score were reversed because higher the scores are better the satisfaction (Marshall & Hays, 1994). This PSQ-18 items were translated into Bahasa Melayu by researchers from UKMMC

from University Kebangsaan Malaysia Medical Centre. Shown below are the items in each domain:

General satisfaction domain

1. The medical care I have been receiving is just about perfect.
2. I'm dissatisfied with some things about the medical care I receive.

Technical quality & Interpersonal manner domain

3. I think my doctor's office had everything needed to provide complete care.
4. When I go for medical care, they are careful to check everything when treating and examining me.
5. My doctors treat me in a very friendly and courteous manner

Communication & Time spent with doctors domain

6. Doctors are good about explaining the reason for medical tests.
7. Doctors sometimes ignore what I tell them.
8. Those who provide my medical care sometimes hurry too much when they treat me.
9. Doctors usually spend plenty of time with me.

Financial support, Accessibility & Convenience domain

10. I feel confident that I can get the medical care I need without being set back financially.
11. I have easy access to the medical specialist I need.
12. Where I get my medical care, people have to wait too long for the treatment.
13. I am able to get medical care whenever I need it.

3.9 Informed consent & Ethical consideration

All participants were given an explanation about the purpose of the study. Those were agreed to participate were given a consent form to sign (Appendix A). Approval of study protocol and consent forms by the Medical Ethics Committee of the University of Malaya Medical Centre (Appendix B), which governs all research projects involving humans conducted in the Medical Faculty of University of Malaya or sponsored by it, with MEC Reference Number 914.84 dated 9th March 2012, was obtained prior to start of recruitment. This study was also registered with the National Medical Research Registry (NMRR), Ministry of Health Malaysia with identification number NMRR 12-923-11511. This study received a grant from the Post Graduate Research Grant 2012 (PPP) on 13th December 2012 bearing registration number PV147-2012A.

3.10 Data collection

Data collection was made easier and faster once there was collaboration between Ministry of Health and state health departments. Ministry of Health was able to supply relevant data on statistics of MMT program and also in issuing a supporting letter to the participating hospitals and primary health care clinics in Selangor. All the directors of the five hospitals and seven primary health care clinics at respective districts were visited to obtain their approval to conduct the research at their premises.

The baseline data of WHOQOL-BREF questionnaire and OTI questionnaire was obtained from the client's case notes. All respondents' case notes must have these two questionnaires filled up at induction week (entry week) before commencing to methadone treatment program according to standard operating procedure. Primary data for this study was obtained from the same WHOQOL-BREF questionnaire and OTI questionnaire to compare the differences at intake and after joining in treatment. PSQ is

to assess the respondent's satisfaction level after being in treatment. All respondents were given respondent information sheets on the objectives of the study, benefits of the study to the respondent and also to the researcher. The information sheets also contained information about the risks and harms (if any) to the respondent. The researcher explained to the respondent the importance of responding as sincerely and honestly as possible. As a drug addicts are from the vulnerable group, therefore the researcher employed soft skills to maximise results obtained from them. Respondents who agreed to participate were given the consent form to sign. The respondents were allowed to withdraw their consent at any time from participating in the study.

Respondents were interviewed with the structured questionnaire via face-to-face interview by the researcher in a private room, set up at the respective methadone clinics to protect the confidentiality of the respondent. To ensure the respondents were comfortable, the researcher explained that all data will be kept confidentially and anonymous. The collected data was grouped according to the hospital and primary health care centres and kept in strict confidence. Once data was collected, all data was double checked for missing data before the respondent left the room. Data was entered into a computer and checked for double entries and also for missing data. Corrections were made to data which contained errors as needed. A copy of the database was made and kept in a safe and secure place as a backup plan. Since respondents are from vulnerable and sensitive communities, therefore all data were limited to authorized personnel only. Those who participated in this survey were given RM10 as a token of appreciation.

3.11 Data analysis

3.11.1 Descriptive analysis

Socio demographics, blood borne disease, current dosage and years of drug use were tabulated for descriptive statistics. Categorical variables were described using frequency and percentage. The continuous variables were described using both mean and standard deviation for all normally distributed data

3.11.2 To compare the mean score of each domain at baseline and after joining the treatment

Variables involved in this objective were continuous data. The variables used were:

i. Drug use score for heroine at baseline and after joining the treatment.
ii. Injecting and sexual behaviour score at baseline and after joining the treatment.
iii. Social functioning score at baseline and after joining the treatment.
iv. Criminality score at baseline and after joining the treatment.
v. Health status score at baseline and after joining the treatment.
vi. Physical domain score at baseline and after joining the treatment.
vii. Psychological domain score at baseline and after joining the treatment.
viii. Social domain score at baseline and after joining the treatment.
ix. Environment domain score at baseline and after joining the treatment.

The statistical analysis used for this objective was paired t-test. Test variables were numerical paired data. The samples were scored for each group at baseline and after joining the methadone treatment. The normal distribution for this score was checked using histogram and central limit theorem. All data were normally distributed and thus parametric analysis was carried out.

3.11.3 To compare the mean score of each domain from WHOQOL-BREF and OTI scores at baseline and after joining the programme by year, between 2007 and 2012

. Variables involved in this objective were continuous data. The variables used were:

i. Drug use score for heroine at baseline and after joining the treatment between 2007 and 2012.
ii. Injecting and sexual behaviour score at baseline and after joining the treatment between 2007 and 2012.
iii. Social functioning score at baseline and after joining the treatment between 2007 and 2012.
iv. Criminality score at baseline and after joining the treatment between 2007 and 2012.
v. Health status score at baseline and after joining the treatment between 2007 and 2012.
vi. Physical domain score at baseline and after joining the treatment between 2007 and 2012.
vii. Psychological domain score at baseline and after joining the treatment between 2007 and 2012.
viii. Social domain score at baseline and after joining the treatment between 2007 and 2012.

ix. Environment domain score at baseline and after joining the treatment between 2007 and 2012.

The statistical analysis used for this objective was paired t-test. Test variables were numerical paired data. The samples were scored for each group for each year at baseline and after joining the methadone treatment. The normal distribution for this score was checked using histogram and central limit theorem. All data were normally distributed and thus parametric analysis was carried out.

3.11.4 To identify factors those were associated with quality of life of methadone clients

The dependent variables for this objective were domains from WHOQOL-BREF and OTI scores. The independent variables used were age, gender, ethnicity, marital status, education level, employment status, pre-employment status, HIV, Hepatitis B, Hepatitis C, years of drug use and dosage. Independent t-test and Analysis of Variance (ANOVA) was used for this objective. Means and standard deviations were calculated separately for each WHOQOL-BREF and OTI scores domains. Post-hoc comparisons were performed using Tukey adjustment for multiple comparisons. This objective was explored further with simple and multiple linear regression models using enter method selection to explore the data to find variables with possible association. For all the categorical variables, dummy variables were created. The variables explored were age, gender, race, marital status, education level, and employment status, pre-employment status, HIV, Hepatitis B, Hepatitis C, dose, years of drug use. The model was assessed by determining the linearity assumptions, multicollinearity and outliers using a standardised residual plot. The level of significance was set at p-value less than 0.05 for the final model.

3.11.5 To compare the employment status at intake and after joining the treatment

Variables involved in this objective were the employment status at baseline and employment status after joining the treatment. Employment status was categorized into employed and unemployed. Employment was defined as being employed when the respondent had any type of employment either full time or part time. Categorical data analysis using Chi-square was used to tabulate the changes in employment status. Employment status after joining the treatment was taken as the outcome variable and employment status at baseline was keyed in as the independent variable. A p-value of less than 0.05 was taken as significant changes.

3.11.6 To determine the factors associated with employment status after joining the methadone treatment

The dependent variable for this objective is employment after joining the treatment programme which was categorized as employed coded as 1 and unemployed coded as 0. The independent variables used were age, gender, ethnicity, marital status, education level, HIV, Hepatitis B, Hepatitis C, yeas of drug use, dosage and all four domains from WHOQOL-BREF domain scores (physical, psychological, social and environmental) and all five domains from OTI domain score (drug use, Injecting/Sex behaviour, social functioning, crime status & health). All four domains from PSQ (general, technical & interpersonal, communication & time spent with doctor and financial support & accessibility). Statistical analysis was comprised of simple and multiple logistic regressions. Simple logistic regression analysis was used to explore the data to find variables with possible association with employment status after joining the treatment. The variables explored were age, gender, race, marital status, education level, pre-employment status, HIV, Hepatitis B, Hepatitis C, dose, years of drug use, all four

domains from WHOQOL-BREF domain scores (physical, psychological, social and environmental) and all five domains from OTI domain score (drug use, Injecting/Sex behaviour, social functioning, crime status & health). All four domains from PSQ (general, technical & interpersonal, communication & time spent with doctor and financial support & accessibility). The variables with p value of < 0.25 and confounding variables were selected for multiple logistic analyses. All the potential variables which were analyzed were supported by previous literature (Ali et al., 2013; Devi et al., 2012). The selected variables from simple logistic analyses were age, gender, race, marital status, education level, pre-employment status, HIV, HBV, HCV, dosage, years of drug use, all four domains (physical, psychological, social and environmental) from WHOQOL-BREF scores and two domains (Injecting/Sex behaviour & health) from OTI score. The modal was created after comparing models from using both Backward LR and Enter methods. The main effect model contained only three variables, which were gender, pre-employment status and HIV. The model was checked for multicollinearity. The final model was then checked for a perfect model fit. The Hosmer-Lemeshow goodness-of-fit test with a p-value of 1 indicating a perfect fit was used. Odds ratio (crude and adjusted) and 95% confidence intervals were presented for the final model. The level of significance was set at p-value less than 0.05 and two-sided hypothesis was applied.

3.11.7 To determine the level of satisfaction of clients in methadone treatment

For this objective each items were describe in terms of frequency and percentage. The level of satisfaction was shown by items and domains using mean score and standard deviation.

3.11.8 To identify factors those were associated with satisfaction of methadone clients

The dependant variables for this objective were domains from PSQ scores. The independent variables used were age, gender, ethnicity, marital status, education level, employment status, pre-employment status, HIV, Hepatitis B, Hepatitis C, yeas of drug use and dosage. Independent t-test and Analysis of Variance (ANOVA) was used for this objective. Post-hoc comparisons were performed using Tukey adjustment for multiple comparisons. The guideline by Cohen's for interpreting the results are 0.01 = small effect, 0.06 = moderate effect and 0.14 = large effect (Cohen, 1998) Mean and standard deviations were calculated separately for each PSQ score domains. This objective was explored further with simple and multiple linear regression models using enter method to explore the data to find variables with possible association. For all the categorical variables, dummy variables were created. The variables explored were age, gender, race, marital status, education level, employment status, pre-employment status, HIV, Hepatitis B, Hepatitis C, dose, and years of drug use. The model was assessed by determining the linearity assumptions, multicollinearity and outliers using standardised residual plot. The level of significance was set at p-value less than 0.05 for the final model.

CHAPTER 4: RESULTS

4.1 Baseline information

4.1.1 Socio-demographic characteristics of subjects

Table 4.1 presents the characteristics of the study sample. A total of 649 respondents completed the survey, giving a response rate of 97.5% (n=633). The majority of respondents were in the age group of 31 - 50 years old which accounted for 68.2%, followed by the respondents in the age group of 51 - 70 years and 20 - 30 years, at 22.9 and 8.8% respectively. The mean age of respondents was 47.73 (SD±9.29). Respondents were predominantly male; 97.3%. A high proportion of the respondents (81.2%) were Malay. Approximately 35% of respondents had never been married while the percentage of respondents who were married was 52.4%. Nearly half of the respondents (42.7%) reported no formal education and primary schooling, followed by secondary school (51.7%), while about 5.7% had completed tertiary education. The rate of employment among respondents undergoing treatment was 84.2%.

Table 4.1: Socio-demographic characteristics of respondents (n=633)

Variables	N=633	(%)
Age		
Mean Age	42.73±(9.29)	
20 -30 yrs	56	8.8
31-50 yrs	432	68.2
51-70 yrs	145	22.9
Gender		
Male	616	97.3
Female	17	2.7
Race		
Malay	514	81.2
Non Malay	119	18.8
Marital status		
Single	221	34.9
Married	332	52.4
Widowed/divorced	80	12.6
Education level		
No formal education/Primary	270	42.7
Secondary	327	51.7
Tertiary	36	5.7
Employment status		
Employed	533	84.2
Unemployed	100	15.8
Pre-treatment employment		
Employed	462	73
Unemployed	171	27

4.1.2 Blood borne (HIV, Hepatitis C and Hepatitis B) disease status

Table 4.2 shows the distribution of HIV**,** Hepatitis C and Hepatitis B status among respondents. The majority of respondents (88.3%) were negative for HIV infection while almost 12% were infected with HIV. Almost half of the respondents (47.4%) reported having tested positive for Hepatitis C and 4.4% reported having tested positive for Hepatitis B.

Table 4.2: Blood borne (HIV, Hepatitis C and Hepatitis B) diseases status

Variables	N=633	(%)
HIV		
Positive	74	11.7
Negative	559	88.3
HCV		
Positive	300	47.4
Negative	333	52.6
HBV		
Positive	28	4.4
Negative	605	95.6

4.1.3 Current methadone dose status and years of drug use prior to joining the MMT programme

The average methadone dose was 61.67mg (SD 30.55). Most of the respondents (42%) were on 31 – 90mg of methadone daily. For duration of heroin use , about 29% of respondents had used for less than 10 years, 45.5% used between 11-20 years, and 26% had used for more than 21 years. The respondents' duration of heroin use was on average 17 years (Table 4.3)

Table 4.3: Current methadone dose status and years of drug use

Variables	N=633	(%)
Dose		
Mean dose	61.67±(30.55)	
<30mg	95	15
31-60mg	266	42
61-90mg	201	31.8
>91mg	71	11.2
Years of drug use		
Mean years	16.88±(8.41)	
< 10 yrs	182	28.8
11-20 yrs	288	45.5
> 21 yrs	163	25.8

4.2 Quality of life outcome evaluation

4.2.1 Comparison of overall means score of WHOQOL-BREF at baseline and after joining the treatment

Paired t-test was applied for WHOQOL-BREF scores at baseline and current treatment, for all four domains (Table 4.4). The results of the WHOQOL-BREF showed significant mean differences in all four domains with p values <0.001. The largest mean difference was for the psychological domain, with a mean of -5.67 (95% CI: -6.05, -5.29). Social domain showed the least improvement in WHOQOL scores [-1.88 (95% CI: -2.06, -1.69)]. Overall mean difference for all four domains was -17.44 (95% CI: -18.51, -16.29). The assumption that the mean difference scores were normally distributed was tested using the explore procedure. The Shapiro-Wilk test of normality gave a p-value of 0.087. Since the p-value was more than 0.05, the mean difference score was assumed to be normally distributed. As the 95% confidence interval of mean difference did not contain the tested value of 0 and the p-value of the test was less than 0.05, thus, there was a significant change in quality of life of respondents. Since the mean quality of life during current treatment was higher than mean quality of life at baseline, therefore the methadone treatment program is effective.

Table 4.4: Comparison of overall quality of life among methadone clients at baseline and after joining treatment using WHOQOL-BREF scores (n=633)

Variables	Mean ±(SD)		Mean difference	t	95%CI	*p*-value
	Baseline	Current treatment				
WHOQOL						
Physical	21.52±(3.64)	26.01±(3.54)	-4.49±(4.85)	-23.30	-4.87, -4.12	<0.001*
Psychological	17.94±(3.32)	23.61±(3.34)	-5.67±(4.83)	-29.55	-6.05, -5.29	<0.001*
Social	8.85±(1.90)	10.73±(1.70)	-1.88±(2.40)	-19.71	-2.06, -1.69	<0.001*
Environment	24.35±(4.03)	29.71±(3.65)	-5.36±(5.15)	-26.16	-5.76, -4.95	<0.001*
Overall	72.66±(10.42)	90.05±(10.17)	-17.40±(14.21)	-30.81	-18.51, -16.29	<0.001*

*Significant at $p < 0.05$

4.2.2 Comparison of mean score of WHOQOL=BREF at baseline and after joining the treatment by year between 2007 and 2012

Below are the tables (4.2.2.1 till 4.2.2.6) for quality of life by year between 2007 and 2012 for WHOQOL-BREF scores using paired t-test.

Comparison of mean score of WHOQOL-BREF domains at baseline and after 1 year (2012) of joining the treatment.

A paired sample t-test was conducted (Table 4.5) to evaluate the impact of methadone maintenance therapy program on quality of life for clients who had joined the program in year 2012. There was a statistically significant improvement in quality of life (WHOQOL-BREF score) for the physical domain from baseline (mean =21.45, SD = 3.99) to after joining the program (mean= 23.40, SD= 3.07), $p<0.001$ (two tailed). The mean score difference increased by -1.94 (95% CI-2.80 to -1.08). As for psychological domain, the mean difference score was -14.58 (95% CI -15.29 to -13.87). Other outcome measures for the social and environment domains were also statistically significant ($p<0.001$) (Mean=8.82, SD=1.18 to Mean= 10.64, SD=1.62, mean difference -1.83 (95% CI -2.27 to -1.38) and (Mean=24.05, SD=4.25 to Mean= 29.71, SD=3.55, mean difference -5.66 (95% CI 6.64 to 4.68) respectively. Clients in this group have shown the most reduction in psychological problems, followed by having better living environments. The mean differences in physical and social domains were almost similar (Figure 4.1)

Table 4.5: WHOQOL-BREF - Paired t-test analysis for 1 year (2012) in MMT (n=121)

Years	Domains	Baseline	Current treatment	Mean Difference	95%CI	*p*-value
1Year 2012 (n=121)	Physical	21.45±(3.39)	26.15±(3.60)	-4.69±(4.92)	(-5.58, -3.80)	<0.001*
	Psychological	17.88±(3.23)	23.40±(3.07)	-5.51±(4.97)	(-6.40, -4.61)	<0.001*
	Social	8.82±(1.81)	10.64±(1.62)	-1.83±(2.49)	(-2.27, -1.38)	<0.001*
	Environment	24.05±(4.25)	29.71±(3.55)	-5.66±(5.45)	(-6.64, -4.68)	<0.001*

*Significant at $p < 0.05$

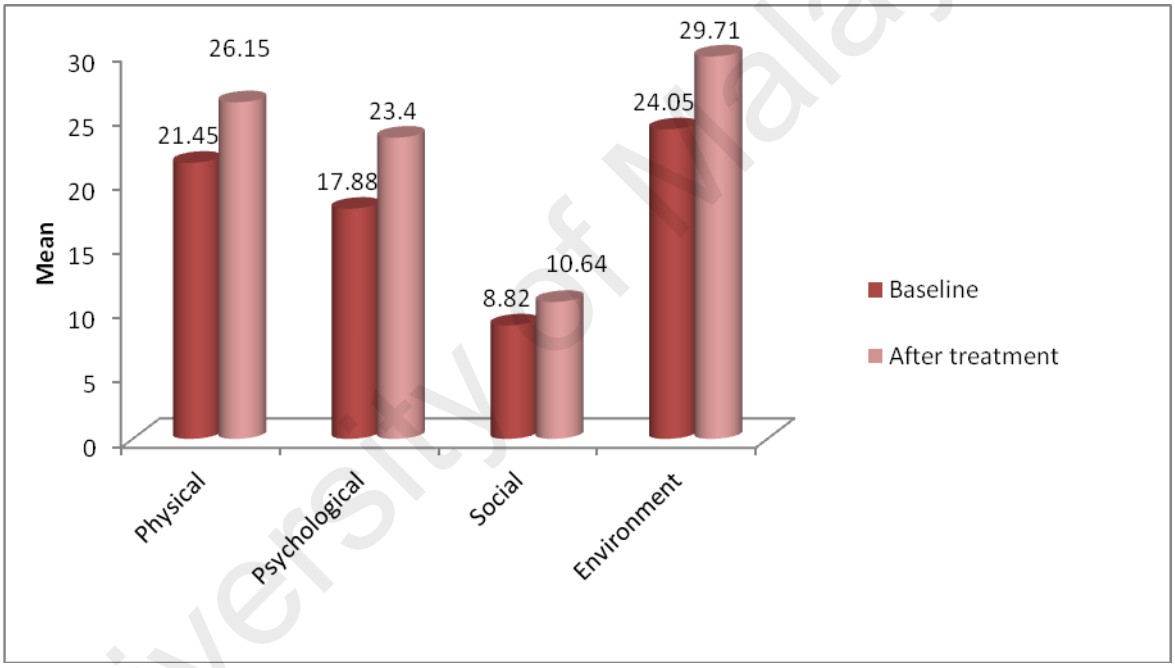

Figure 4.1: Comparison of WHOQOL BREF scores at baseline and after 1 year of treatment in MMT

Comparison of mean score of WHOQOL-BREF domains at baseline and after 2 years (2011) joining the treatment

A paired sample t-test was conducted (Table 4.6) to evaluate the impact of Methadone maintenance therapy program on the clients who had joined the program in year 2011 on the quality of life. There was a statistically significant increase in quality of life (WHOQOL-BREF score) for physical domain from baseline (Mean =22.74, SD = 3.68) to after joining the program (Mean= 26.08, SD= 3.86), P<0.001 (two-tailed). The mean score increased by 3.34 (95% CI -4.47 to -2.22). As for psychological domain, results at baseline (Mean=18.75, SD=3.21) to after joining the programme (Mean= 23.24, SD=3.33), P<0.001 showed that the mean score increased by 4.48 (95% CI -5.55 to -3.42). Other outcome measures were statistically significant (p<0.001) for social and environment domains (Mean=10.85, SD=1.90 to Mean= 15.18, SD=5.04, mean difference -4.33 (95% CI 3.17 to 1.69) and (Mean=25.68, SD=4.42 to Mean= 29.93, SD=3.85, mean difference -4.25 (95% CI 2.76 to 1.48) respectively. Clients in this group also have shown most improvements in the psychological domain compared to the other three domains. The mean differences in physical, social and environment domains were almost similar (Figure 4.2)

Table 4.6: WHOQOL-BREF - Paired t-test analysis for 2 year (2011) in MMT (n=85)

Years	Domains	Baseline	current treatment	Mean Difference	95%CI	*p*-value
2 Year 2011 (n=85)	Physical	22.74±(3.68)	26.08±(3.86)	-3.34±(5.22)	(-4.47, -2.22)	<0.001*
	Psychological	18.75±(3.21)	23.24±(3.33)	-4.48±(4.94)	(-5.55, -3.42)	<0.001*
	Social	10.85±(1.90)	15.18±(5.04)	-4.33±(5.45)	(-5.51, -3.15)	<0.001*
	Environment	25.68±(4.42)	29.93±(3.85)	-4.25±(5.94)	(-5.53, -2.97)	<0.001*

*Significant at $p < 0.05$

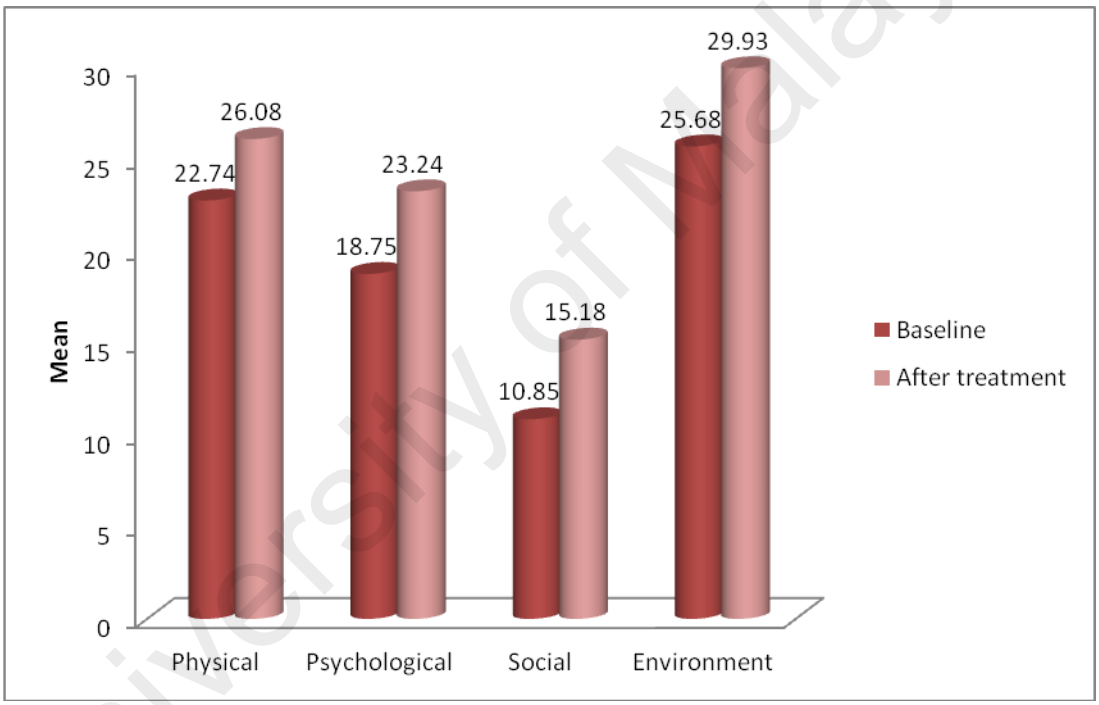

Figure 4.2: Comparison of WHOQOL BREF scores at baseline and after 2 years of treatment in MMT

Comparison of mean score of WHOQOL-BREF domains at baseline and after 3 years (2010) joining the treatment

A paired sample t-test was conducted (Table 4.7) to evaluate the impact of Methadone maintenance therapy program on the clients who had joined the program in year 2010 on the quality of life. There was a statistically significant increase in quality of life (WHOQOL-BREF score) for physical domain from baseline (Mean =21.09, SD = 3.62) to after joining the program was (Mean= 25.69, SD= 3.40), P<0.001 (two-tailed). The mean score increased by 4.60 (95% CI (-5.64 to -3.57). As for psychological domain, baseline (Mean=18.29, SD 2.81) to (Mean= 23.36, SD=3.49), P<0.001. The mean score increased by 5.06 (95% CI -6.02 to -4.11). Whereas other outcome measures were statistically significant (p<0.001) for social and environment domains (Mean=8.96, SD=1.67 to Mean= 10.71, SD=1.67), mean difference -1.74 (95% CI -2.24 to -1.24) and (Mean=24.53, SD=3.96 to Mean= 28.76, SD=4.04, mean difference -4.23 (95% CI -5.40 to -3.07) respectively. Clients in this group also have shown the most improvement in the psychological domain followed by physical, social and environment domains. (Figure 4.3)

Table 4.7: WHOQOL-BREF - Paired t-test analysis for 3 years (2010) in MMT (n=78)

Years	Domains	Baseline	current treatment	Mean Difference	95%CI	*p*-value
3 Year 2010 (n=78)	Physical	21.09±(3.62)	25.69±(3.40)	-4.60±(4.59)	(-5.64, -3.57)	<0.001*
	Psychological	18.29±(2.81)	23.36±(3.49)	-5.06±(4.25)	(-6.02, -4.11)	<0.001*
	Social	8.96±(1.67)	10.71±(1.67)	-1.74±(2.21)	(-2.24, -1.24)	<0.001*
	Environment	24.53±(3.96)	28.78±(4.04)	-4.25±(5.17)	(-5.40, -3.07)	<0.001*

*Significant at $p < 0.05$

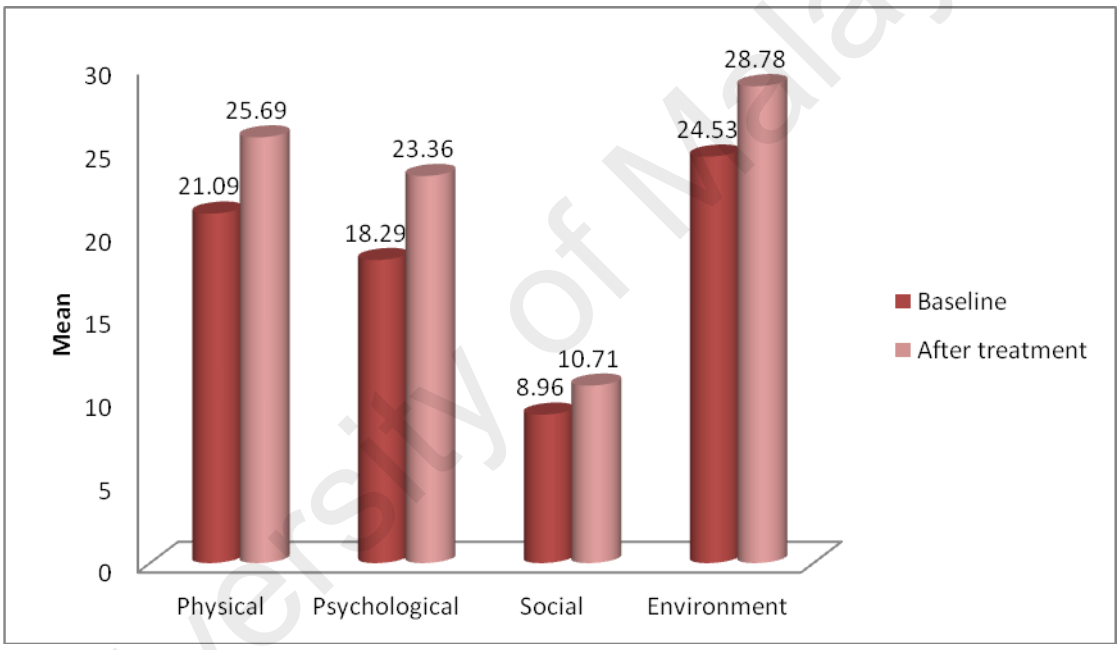

Figure 4.3: Comparison of WHOQOL BREF scores at baseline and after 3 years of treatment in MMT

Comparison of mean score of WHOQOL-BREF domains at baseline and after 4 years (2009) of joining the treatment

A paired sample t-test was conducted (Table 4.8) to evaluate the impact of Methadone maintenance therapy program on the clients whom have joined the program in year 2009 on the quality of life. There was a statistically significant increase in quality of life (WHOQOL-BREF score) for physical domain from baseline (Mean =20.94, SD = 3.15) to after joining the program was (M= 25.71, SD= 3.54), P<0.001 (two tailed). The mean score increased by 4.78 (95% CI -5.60 to -3.94). As for psychological domain, baseline (M=17.78, SD=3.05) to (M= 23.81, SD=3.04), P<0.001. The mean score increased by 6.04 (95% CI -6.87 to -5.21. Whereas other outcome measures were statistically significant (p<0.001) for social and environment domains (Mean=8.69, SD=2.04 to Mean= 10.56, SD=1.74, mean difference -1.87 (95% CI -2.33 to -1.41) and (Mean=23.82, SD=3.21 to Mean= 29.96, SD=3.51, mean difference -6.14 (95% CI -6.96 to -5.31) respectively. Clients in this group also have shown best improved in environment domain followed by Psychological, physical and social domains. (Figure 4.4)

Table 4.8: WHOQOL-BREF - Paired t-test analysis for 4 year (2009) in MMT (n=108)

Years	Domains	Baseline	current treatment	Mean Difference	95%CI	*p*-value
4 Year 2009 (n=108)	Physical	20.94±(3.15)	25.71±(3.54)	-4.78±(4.34)	(-5.60, -3.94)	<0.001*
	Psychological	17.78±(3.05)	23.81±(3.40)	-6.04±(4.36)	(-6.87, -5.21)	<0.001*
	Social	8.69±(2.04)	10.56±(1.74)	-1.87±(2.43)	(-2.33, -1.41)	<0.001*
	Environment	23.82±(3.21)	29.96±(3.51)	-6.14±(4.32)	(-6.96, -5.31)	<0.001*

*Significant at $p < 0.05$

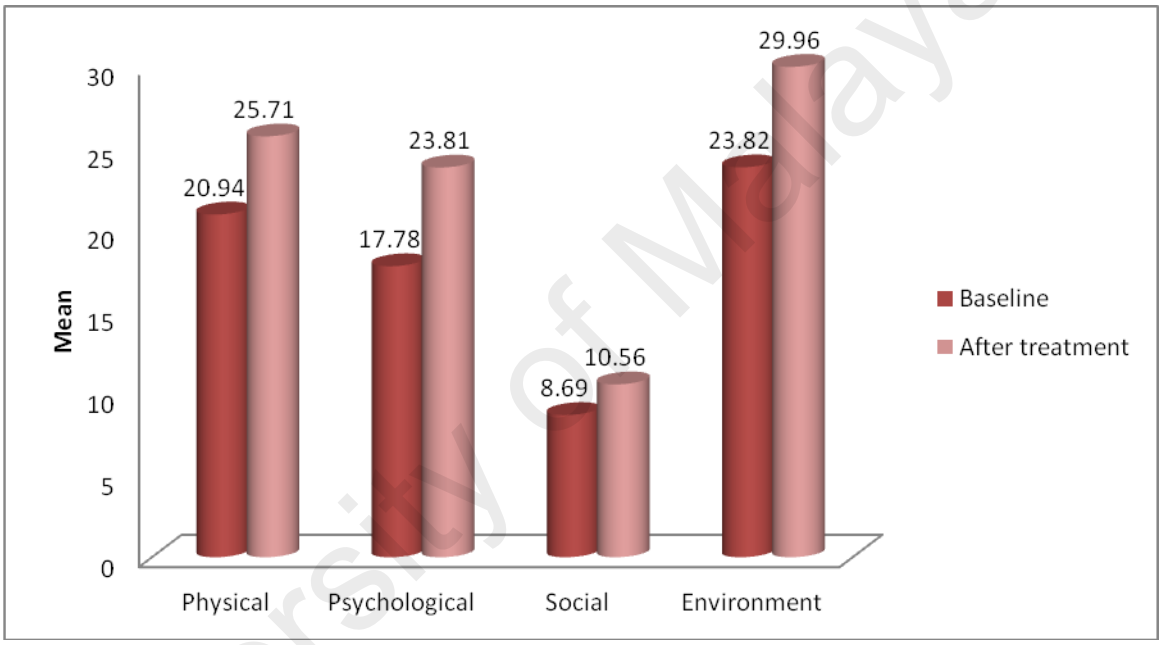

Figure 4.4: Comparison of WHOQOL BREF scores at baseline and after 4 years of treatment in MMT

Comparison of mean score of WHOQOL-BREF domains at baseline and after 5 years (2008) of joining the treatment

A paired sample t test was conducted (Table 4.9) to evaluate the impact of Methadone maintenance therapy program on the clients whom have joined the program in year 2008 on the quality of life. There was a statistically significant increase in quality of life (WHOQOL-BREF score) for physical domain from baseline (Mean =21.51, SD = 3.99) to after joining the program was (Mean= 26.04, SD= 3.13), P<0.001 (two tailed). The mean score increased by 4.54 (95% CI -5.54 to -3.53). As for psychological domain, baseline (Mean=17.84, SD=3.66) to (Mean= 23.52, SD=3.43), P<0.001. The mean score increased by 5.68 (95% CI -6.71 to -4.64. Whereas other outcome measures were statistically significant (p<0.001) for social and environment domains (Mean=8.80, SD=1.77 to Mean= 12.91, SD=4.80, mean difference -4.11 (95%CI -5.13 to -3.09) and (Mean=24.53, SD=3.98 to Mean= 29.63, SD=3.69, mean difference -5.10 (95% CI -6.13 to -4.08) respectively. Clients in this group also have shown best improved in psychological domain followed by environment, physical and social domains. (Figure 4.5)

Table 4.9: WHOQOL-BREF - Paired t-test analysis for 5 years (2008) in MMT (n=99)

Years	Domains	Baseline	current treatment	Mean Difference	95%CI	*p*-value
5 Year	Physical	21.51±(3.99)	26.04±(3.13)	-4.54±(5.04)	(-5.54, -3.53)	<0.001*
2008	Psychological	17.84±(3.66)	23.52±(3.43)	-5.68±(5.19)	(-6.71, -4.64)	<0.001*
(n=99)	Social	8.80±(1.77)	12.91±(4.80)	-4.11±(5.13)	(-5.13, -3.09)	<0.001*
	Environment	24.53±(3.98)	29.63±(3.69)	-5.10±(5.14)	(-6.13, -4.08)	<0.001*

*Significant at $p < 0.05$

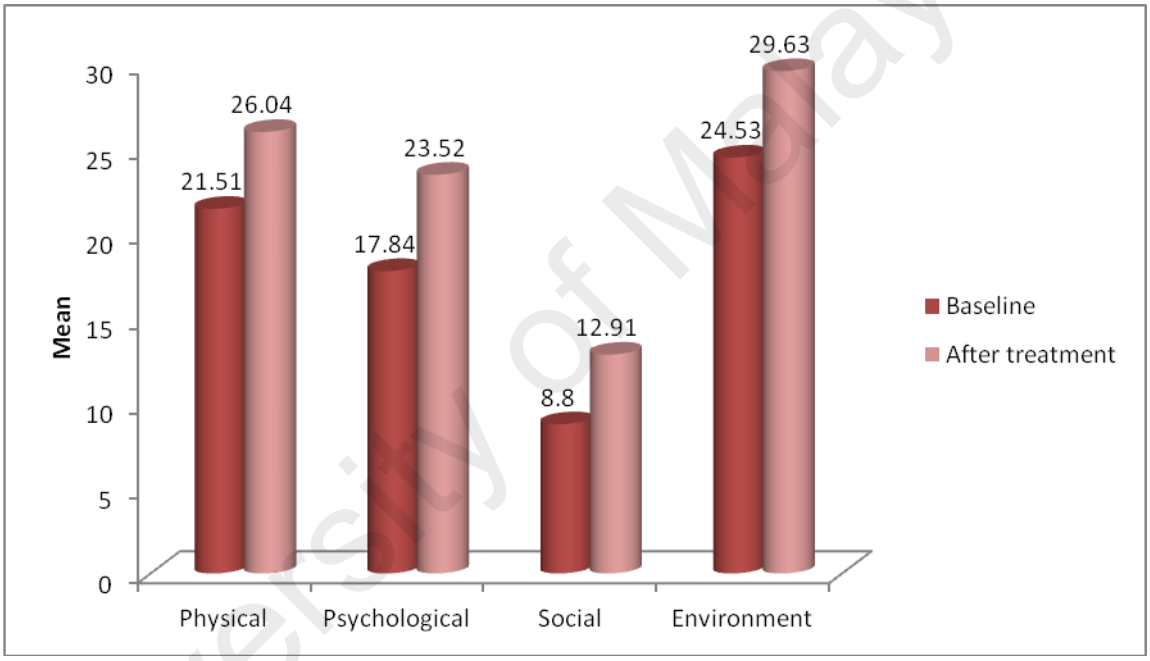

Figure 4.5: Comparison of WHOQOL BREF scores at baseline and after 5 years of treatment in MMT

Comparison of mean score of WHOQOL-BREF domains at baseline and after 6 years (2008) joining the treatment

A paired sample t test was conducted (Table 4.10) to evaluate the impact of Methadone maintenance therapy program on the clients whom have joined the program in year 2007 on the quality of life. There was a statistically significant increase in quality of life (WHOQOL-BREF score) for physical domain from baseline (Mean =21.51, SD = 3.80) to after joining the program was (M= 24.05, SD= 3.39), P<0.001 (two tailed). The mean score increased by 2.54 (95% CI -3.34 to -1.74). As for psychological domain, baseline (Mean=17.48, SD=3.80) to (Mean= 24.05, SD=3.39), P<0.001. The mean score increased by 6.57(95% CI -3.34 to -1.74). Whereas other outcome measures were statistically significant (p<0.001) for social and environment domains (Mean=8.88, SD=1.99 to Mean= 10.83, SD=1.54, mean difference -1.95 (95% CI -2.32 to -1.59) and (Mean=23.99, SD=4.13 to Mean= 29.95 SD=3.43, mean difference -5.96 (95% CI -6.76 to -5.16) respectively. Clients in this group also have shown best improved in psychological domain followed by environment, physical and social domains. (Figure 4.6)

Table 4.10: WHOQOL-BREF - Paired t-test analysis for 6 years (2007) in MMT (n=142)

Years	Domains	Baseline	current treatment	Mean Difference	95%CI	*p*-value
6 Year 2007 (n=142)	Physical	21.51±(3.80)	26.23±(3.65)	-4.71±(4.93)	(-5.53, -3.89)	<0.001*
	Psychological	17.48±(3.62)	24.05±(3.39)	-6.57±(4.89)	(-7.38, -5.76)	<0.001*
	Social	8.88±(1.99)	10.83±(1.54)	-1.95±(2.20)	(-2.32, -1.59)	<0.001*
	Environment	23.99±(4.13)	29.95±(3.43)	-5.96±(4.81)	(-6.76, -5.16)	<0.001*

*Significant at $p < 0.05$

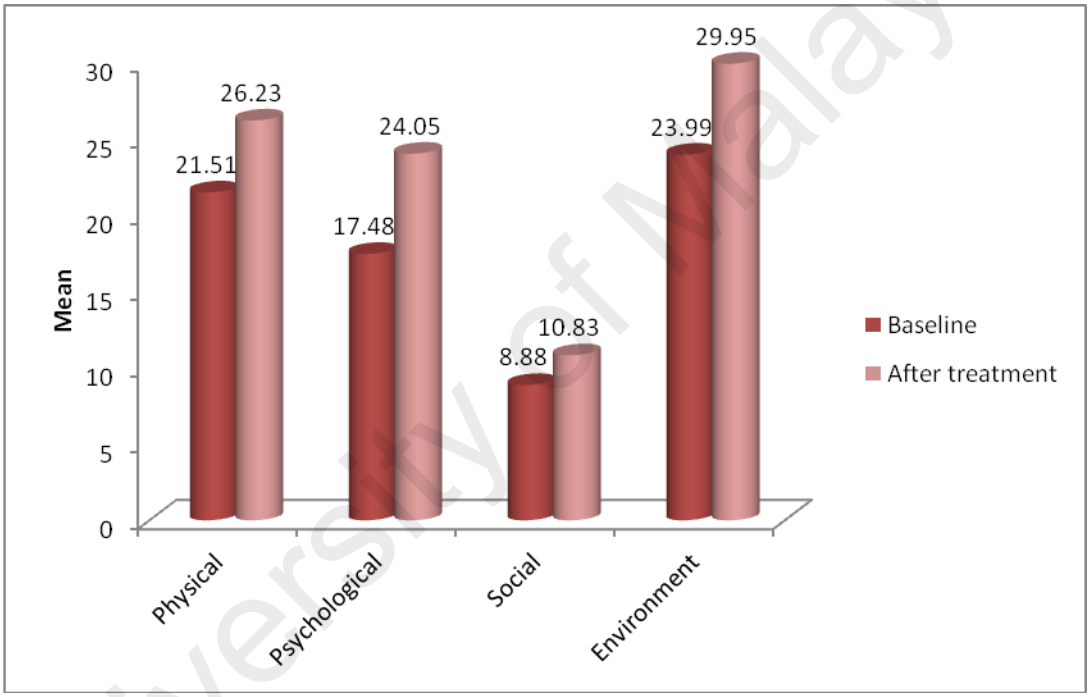

Figure 4.6: Comparison of WHOQOL BREF scores at baseline and after 6 years of treatment in MMT

4.2.2.1 Overall mean difference for WHOQOL-BREF score domains by years (2007 – 2012)

Table 4.11 presents overall mean differences for WHOQOL scores by domains between year 2007 and 2012. Physical domain - the average mean scores were almost similar (ranging from -4.54 to -4.78) for all years except for year 2011, the mean difference was -3.34. Similarly for psychological domain, clients in 2nd years in the treatment program showed to have least improvement compare to others. However, clients in 2nd and 6th year showed a drastic improvement in social aspect. The highest mean difference for environment domain was among clients in the program for 4 years (-6.14). Year 2 and year 3 showed a similar outcome with the mean differences of 4.25 for both. Overall, clients from year 1 till year 6 had shown a significant improvement in all for domains.

Table 4.11: Overall mean differences for WHOQOL-BREF scores domains by years (2007 – 2012)

Years (n=633)	WHOQOL-BREF Domains			
	Physical Mean difference (95% CI)	**Psychological Mean difference (95% CI)**	**Social Mean difference (95% CI)**	**Environment Mean difference (95% CI)**
1year (2012) n= 121	-4.69 (-5.58, -3.80)*	-5.51 (-6.40, -4.61)*	-1.83 (-2.27, -1.38)*	-5.66 (-6.64,-4.68)*
2years (2011) n= 85	-3.34 (-4.47, -2.22)*	-4.48 (-5.55, -3.42)*	-4.33 (-5.51,-3.15)*	-4.25 (-5.53, -2.97)*
3years (2010) n= 78	-4.60 (-5.64, -3.57)*	-5.06 (-6.02,-4.11)*	-1.74 (-2.24, -1.24)*	-4.25 (-5.40, -3.07)*
4years (2009) n=108	-4.78 (-5.60, -3.94)*	-6.04 (-6.87, -5.21)*	-1.87 (-2.33, -1.41)*	-6.14 (-6.96,-5.31)*
5years (2008) n= 99	-4.54 (-5.54, -3.53)*	-5.68 (-6.71, -4.64)*	-4.11 (-5.13, -3.09)*	-5.10 (-6.13, -4.08)*
6years (2007) n=142	-4.71 (-5.53, -3.89)*	-6.57 (-7.38, -5.76)*	-1.95 (-2.32, -1.59)*	-5.96 (-6.76, -5.16)*

*Significant at $p < 0.05$

4.2.3 Comparisons of overall mean score of OTI at baseline and after joining the treatment

Paired t-test was applied for OTI scores at baseline and current treatment, for all five domains (Table 4.12). The results showed significant reduction in the mean differences in all five domains with p values < 0.001. The improvements in the injecting and sexual behaviour score and crime domains were the most marked, with reduction of 3.84 (95% CI: 2.93, 4.75) and 3.43 (95% CI: 3.20, 3.66) respectively, followed by the health domain with a mean difference of 2.00 (95% CI: 1.75, 2.25). Crime and social functioning domains showed similar mean difference which is 1.90. Overall mean difference for all five domains was 10.93 (95% CI: 9.71, 12.15) with a significant p-value ($p<0.001$). Before drawing a conclusion, the assumption that the mean difference scores were normally distributed was tested using the explore procedure. The Shapiro-Wilk test of normality gave a p-value of 0.728. Since the p-value is more than 0.05, the assumption that the mean difference scores were normally distributed is met. In conclusion, the 95% confidence interval of mean difference does not contain the tested value of 0 and the p-value of the test was less than 0.05. Thus, there is a significant reduction in all five domains among respondents. Since the mean for the current treatment was lower than mean at baseline, therefore the methadone treatment program is effective.

Table 4.12: Comparison of overall quality of life among Methadone clients at baseline and after joining treatment using OTI scores (n=633)

Variables	Mean ±(SD)		Mean difference	t	95%CI	*p*-value
	Baseline	Current treatment				
Drug use (Heroin Q)	2.11±(1.46)	0.21±(0.51)	1.90±(1.54)	31.00	1.78, 2.02	<0.001*
Injecting/Sex behaviour	10.41±(9.76)	6.57±(7.68)	3.84±(11.66)	8.29	2.93, 4.75	<0.001*
Social functioning	14.11±(5.40)	12.21±(5.04)	1.90±(6.81)	7.00	1.37, 2.44	<0.001*
Crime	3.52±(2.92)	0.09±(0.56)	3.43±(2.97)	29.08	3.20, 3.66	<0.001*
Health	3.52±(2.92)	1.52±(1.84)	2.00±(3.18)	15.83	1.75, 2.25	<0.001*
Overall	31.51±(12.91)	20.58±(10.54)	10.93±(15.61)	17.58	9.71, 12.15	<0.001*

*Significant at $p<0.05$

4.2.4 Comparison of mean score of OTI domains at baseline and after joining the treatment by years between 2007 and 2012

Below are the tables (4.2.4.1 till 4.2.4.6) for quality of life by year between 2007 and 2012 for OTI scores using paired t-test.

Comparison of mean score of OTI domains at baseline and after 1 year (2012) of joining the treatment

Table 4.13 indicates the OTI scores for the five domains namely, drug use (Heroine Q), injecting and sexual behaviour, social functioning, crime status and health status between baseline and after 1 year of joining the Methadone Maintenance Therapy Program. The table below shows significant reduction in all five domains, with the p-value <0.05. Reduction in injecting drugs and sexual activity was almost 50% after 1 year of joining the program (Mean=10.98, SD=2.75 to Mean=5.87, SD=7.39). This was followed by the drug use domain with the mean difference of 4.50, (95% CI 3.91, 5.09). Conversely, the smallest mean difference score was for the crime domain (Mean difference = 1.21, (95% CI 0.84 to 1.57). Figure 4.7 shows comparison of means of all five domains. Based on the results, we can conclude that patients under methadone maintenance treatment after 1 year had statistically significant improvement in quality of life in all domains.

Table 4.13: OTI - Paired t-test analysis for 1 year (2012) in MMT (n=121)

Years	Domains	Baseline	Current treatment	Mean Difference	95%CI	*p*-value
1 Year 2012 (n=201)	Drug use (Heroin Q)	5.04±(2.75)	0.54±(1.57)	4.50±(3.25)	(3.91, 5.09)	<0.001*
	Injecting/Sex behaviour	10.98±(9.11)	5.87±(7.39)	5.12±(9.32)	(3.44, 6.79)	<0.001*
	Social Functioning	14.72±(5.91)	13.00±(5.24)	1.72±(6.45)	(0.56, 2.88)	0.004*
	Crime	1.28±(2.01)	0.07±('0.41)	1.21±(2.02)	(0.84, 1.57)	<0.001*
	Health	3.08±(3.02)	1.66±(1.89)	1.42±(3.39)	(0.81, 2.03)	<0.001*

*Significant at $p < 0.05$

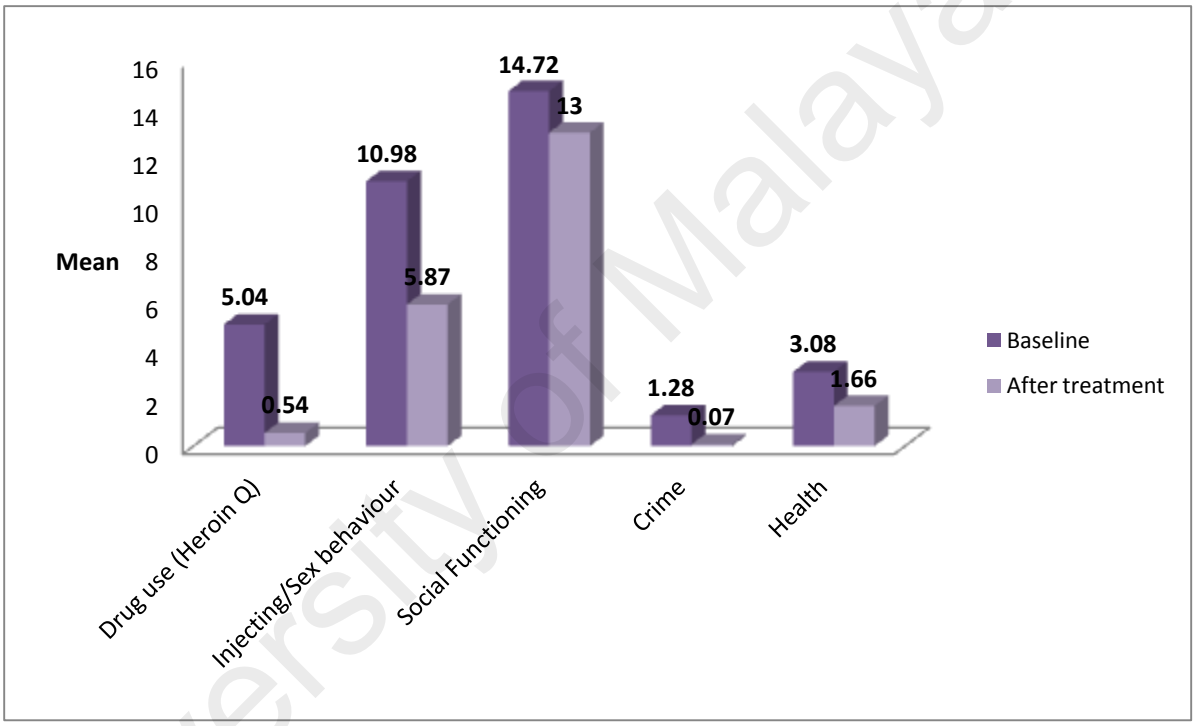

Figure 4.7: Comparison of OTI scores at baseline and after 1 year of treatment in MMT

Comparison of mean score of OTI domains at baseline and after 2 years (2011) of joining the treatment

Table 4.14 shows the OTI scores at baseline and 2 years after joining Methadone maintenance therapy program. The average of heroine use score reduced (Mean difference =4.49) after 2 years of joining the program (Mean=4.87, SD=3.01 to Mean=0.38 SD=1.19). Likewise, after 2 years being in treatment, there is a good improvement in social functioning with a mean difference of 3.46 (95% CI 1.92, 5.00). Four out of five domains, namely, drug use, social functioning, crime and health domains showed statistically significant reduction in OTI scores ($p<0.001$). Injecting and sexual behaviour domain, shows (Mean=9.14, SD=9.80 to Mean= 6.78, SD=8.05), P=0.04. Figure 4.8 shows comparison of means of all five domains. Based on the results, we can conclude that patients under methadone maintenance treatment after 2 years had statistically significant improvement in quality of life in four domains except for injecting and sexual behaviour.

Table 4.14: OTI - Paired t-test analysis for 2 years (2011) in MMT (n=85)

Years	Domains	Baseline	Current treatment	Mean Difference	95% CI	*p*-value
2 Year	Drug use (Heroin Q)	4.87±(3.01)	0.38±(1.19)	4.49±(3.11)	(3.82, 5.16)	<0.001*
2011	Injecting/Sex behaviour	9.14±(9.80)	6.78±(8.05)	2.37±(10.24)	(0.16,4.57))	0.040*
(n=85)	Social Functioning	15.18±(5.04)	11.72±(5.27)	3.46±(7.13)	(1.92, 5.00)	<0.001*
	Crime	0.73±(1.25)	0.09±(0.57)	0.64±(1.40)	(0.33, 0.94)	<0.001*
	Health	2.88±(2.73)	0.95±(1.34)	1.93±(2.72)	(1.34, 2.52)	<0.001*

*Significant at $p < 0.05$

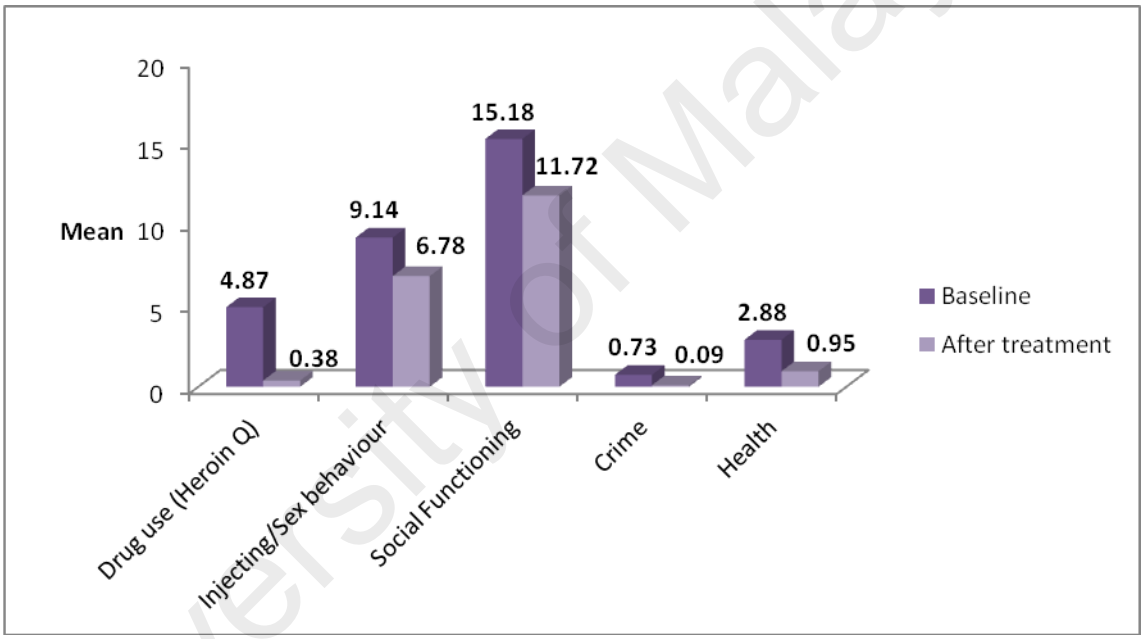

Figure 4.8: Comparison of OTI scores at baseline and after 2 years of treatment in MMT

Comparison of mean score of OTI domains at baseline and after 3 years (2010) of joining the treatment

A two-tailed paired sample t-test revealed the impact of Methadone maintenance therapy program among clients who had joined the program in year 2010. (Table 4.15) Three domains namely, drug use, crime and health domains showed significant improvement ($p<0.001$). The greatest mean gain after joining the program was seen in the drug use domain (Mean=5.22, SD=3.13to Mean=0.43, SD=1.09)) and the least mean gain was seen in the Injecting and sexual behaviour domain (Mean=10.03, SD=11.03 to Mean=10.01, SD=10.49). Crime status showed a significant improvement in reducing crime activity with a mean difference of 1.21 (95% CI 0.84 to 1.57). Clients were also healthier after joining the program; mean difference =2.29 (95% CI 1.72 to 2.85). Even though the social functioning domain was not statistically significant, nevertheless it showed improvement with a mean difference of 1.21 (95% CI 0.06 to 3.11). Figure 4.9 shows comparison of means of all five domains. Based on the results, we can say that after 3 years, patients under methadone maintenance treatment had statistically significant improvement in quality of life in three domains except for injecting/sexual behaviour.

Table 4.15: OTI - Paired t-test analysis for 3 years (2010) in MMT (n=78)

Years	Domains	Baseline	Current treatment	Mean Difference	95% CI	*p*-value
3 Year	Drug use (Heroin Q)	5.22±(3.13)	0.43±(1.09)	4.79±(3.43)	(4.02, 5.57)	<0.001*
2010	Injecting/Sex behaviour	10.03±(11.06)	10.01±(10.49)	0.02±(14.89)	(-3.35,3.37)	0.990
(n=78)	Social Functioning	14.21±(5.35)	12.68±(5.04)	1.53±(7.04)	(-0.06, 3.11)	0.060
	Crime	1.31±(1.59)	0.10±(0.41)	1.21±(1.62)	(0.84, 1.57)	<0.001*
	Health	3.50±(2.72)	1.22±(1.52)	2.29±(2.51)	(1.72, 2.85)	<0.001*

*Significant at $p < 0.05$

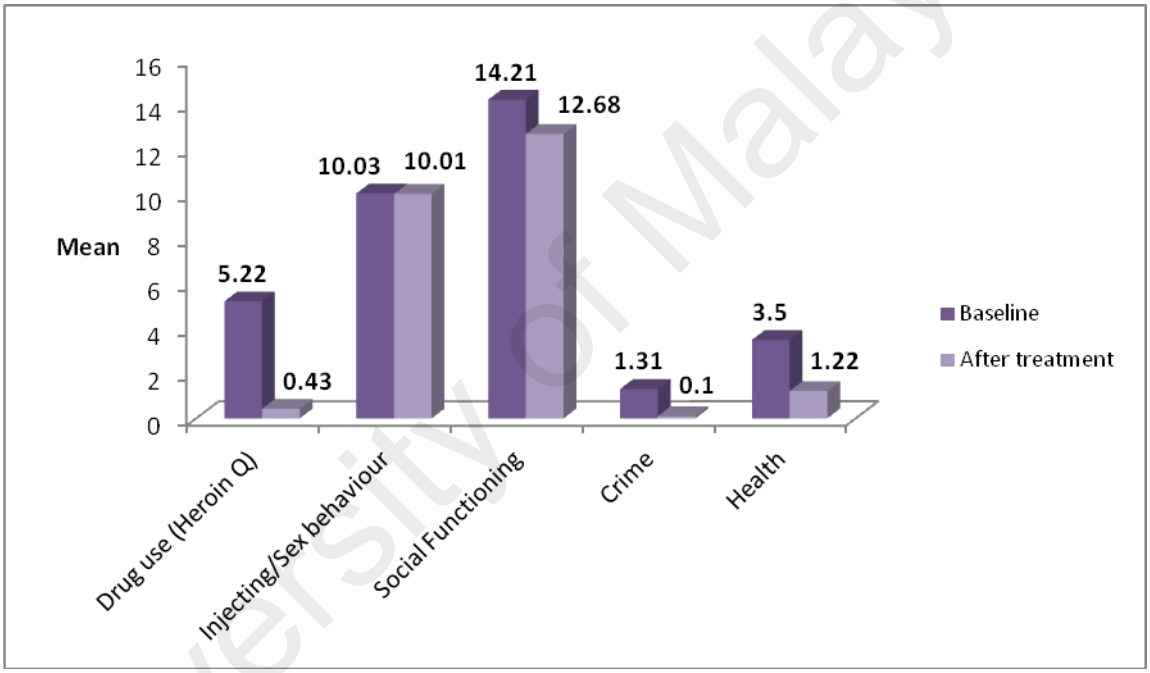

Figure 4.9: Comparison of OTI scores at baseline and after 3 years of treatment in MMT

Comparison of mean score of OTI domains at baseline and after 4 years (2009) of joining the treatment

Similarly, Table 4.16 describes the different OTI scores of respondents which include the five domains of drug use (Heroine Q), injecting and sexual behaviour, social functioning, crime status and health status between baseline and after 4 years of joining the Methadone Maintenance Therapy Program. The table below shows significant reduction in all five domains ($p<0.05$). Injecting and sexual behaviour showed the greatest mean reduction at 5.33 (95% CI 4.11 to 5.35). Equally, a good reduction in mean can be seen in drug use domain (Mean=5.31, SD=3.90 to Mean=0.58, SD=1.26)). Conversely, the smallest mean difference score was for crime domain, with mean difference= 1.07 (95% CI 0.68 to 1.47). Figure 4.10 shows comparison of means of all five domains. Based on the results, we can say that after 4 years under methadone maintenance treatment patients had statistically significant improvement in quality of life in all domains.

Table 4.16: OTI - Paired t-test analysis for 4 years (2009) in MMT (n=108)

Years	Domains	Baseline	Current treatment	Mean Difference	95% CI	*p*-value
4 Year	Drug use (Heroin Q)	5.31±(3.09)	0.58±(1.26)	4.72±(3.25)	(4.11, 5.35)	<0.001*
2009	Injecting/Sex behaviour	10.60±(10.49)	5.27±(6.71)	5.33±(12.27)	(2.99, 7.67)	<0.001*
(n=108)	Social Functioning	14.34±(5.03)	11.14±35.03)	3.21±(1.88)	(0.18, 2.17)	<0.002*
	Crime	1.25±(2.02)	0.18±(1.03)	1.07±(2.09)	(0.68, 1.47)	<0.001*
	Health	3.56±(2.69)	1.60±(1.92)	1.96±(3.16)	(1.36, 2.57)	<0.001*

*Significant at $p < 0.05$

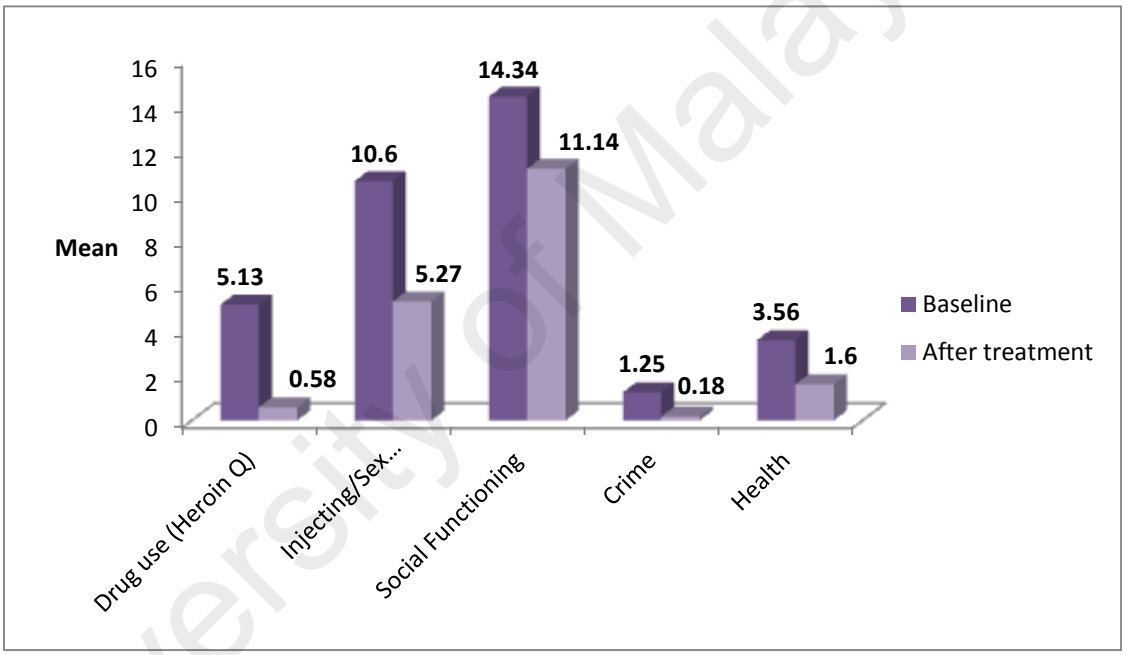

Figure 4.10: Comparison of OTI scores at baseline and after 4 years of treatment in MMT

Comparison of mean score of OTI domains at baseline and after 5 years (2008) of joining the treatment

Table 4.17 shows the OTI scores at baseline and 5 years after joining Methadone maintenance therapy program. Three domains namely, drug use, crime and health domains showed significant improvement with p-value of $p<0.001$. The greatest mean gain after joining the program was seen in the drug use domain (Mean=4.96, SD=2.92 to Mean=0.41, SD=1.23) and the least mean gain seen in the crime domain (Mean=1.55 SD=2.09 to Mean=0.08, SD=0.44). Clients were also healthier after joining the program; mean difference =1.54 (95% CI 0.81 to 2.26). Injecting and sexual behaviour and social functioning domains showed significant improvements ($p<0.05$). Figure 4.11 shows comparison of means of all five domains. Based on the results, we can conclude that patients under methadone maintenance treatment for 5 years had statistically significant improvement in quality of life in all five domains.

Table 4.17: OTI - Paired t-test analysis for 5 years (2008) in MMT (n=99)

Years	Domains	Baseline	current treatment	Mean Difference	95% CI	*p*-value
5 Years	Drug use (Heroin Q)	4.94±(2.92)	0.41±(1.23)	4.53±(3.09)	(3.92, 5.15)	<0.001*
2008	Injecting/Sex behaviour	9.23±(9.47)	6.65±(7.36)	2.59±(11.14)	(0.36, 4.81)	0.020*
(n=99)	Social Functioning	14.40±(5.31)	12.91±(4.80)	1.50±(6.87)	(0.12, 2.87)	0.030*
	Crime	1.55±(2.09)	0.08±(0.44)	1.47±(2.07)	(1.05, 1.88)	<0.001*
	Health	3.35±(3.10)	1.82±(2.24)	1.54±(3.65)	(0.81, 2.26)	<0.001*

*Significant at $p < 0.05$

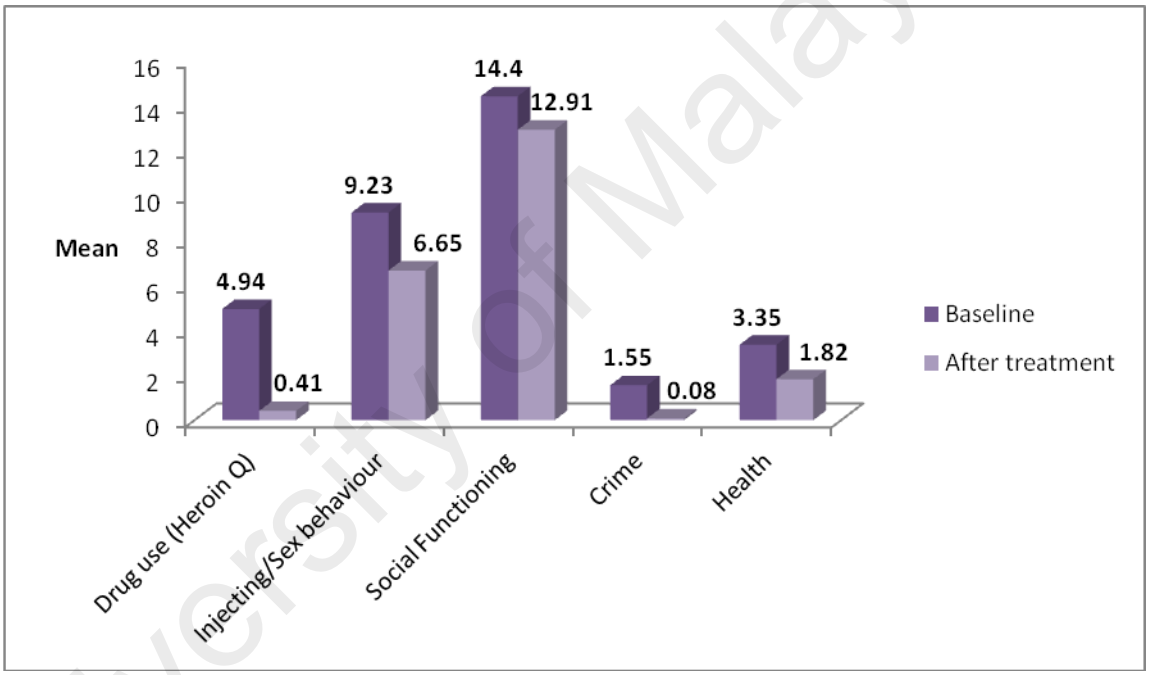

Figure 4.11: Comparison of OTI scores at baseline and after 5 years of treatment in MMT

Comparison of mean score of OTI domains at baseline and after 6 years (2007) of joining the treatment

A two-tailed paired sample t-test revealed the impact of Methadone maintenance therapy program among clients who had joined the program in year 2007. (Table 4.18) Four domains namely, drug use, injecting and sexual behaviour, crime and health domains showed significant improvement with p-value $p<0.001$. The greatest mean gain after joining the program was seen in the injecting and sexual behaviour domain (Mean=11.58, SD=9.47 to Mean=6.68, SD=7.41) while there was not much of improvement in the social functioning domain (Mean=11.76, SD=4.86 to Mean=11.75, SD=4.87, p=0.32). A few of the clients were still taking heroin despite being in treatment. Crime status showed a significant reduction in crime activity with a mean difference of 1.48 (95% CI 1.13 to 1.85). Clients were also healthier after joining the program, mean difference =2.85 (95% CI 2.34 to 3.36). Figure 4.12 shows comparison of means of all five domains. Based on the results, we can say that patients under methadone maintenance treatment for six years had statistically significant improvement in quality of life in four domains except for social functioning.

Table 4.18: OTI - Paired t-test analysis for 6 years (2007) in MMT (n=142)

Years	Domains	Baseline	Current treatment	Mean Difference	95% CI	*p*-value
6 Year	Drug use (Heroin Q)	4.83±(2.71)	0.25±(0.74)	4.58±(2.79)	(4.12, 5.05)	<0.001*
2007	Injecting/Sex behaviour	11.58±(9.47)	6.68±(7.41)	4.90±(12.58)	(2.81, 6.99)	<0.001*
(n=142)	Social Functioning	11.76±(4.86)	11.75±(4.87)	0.01±(0.17)	(-0.01, 0.4)	0.320
	Crime	1.49±(2.13)	0.01±(0.12)	1.48±(2.12)	(1.13, 1.83)	<0.001*
	Health	4.35±(2.95)	1.50±(1.60)	2.85±(3.06)	(2.34, 3.36)	<0.001*

*Significant at $p < 0.05$

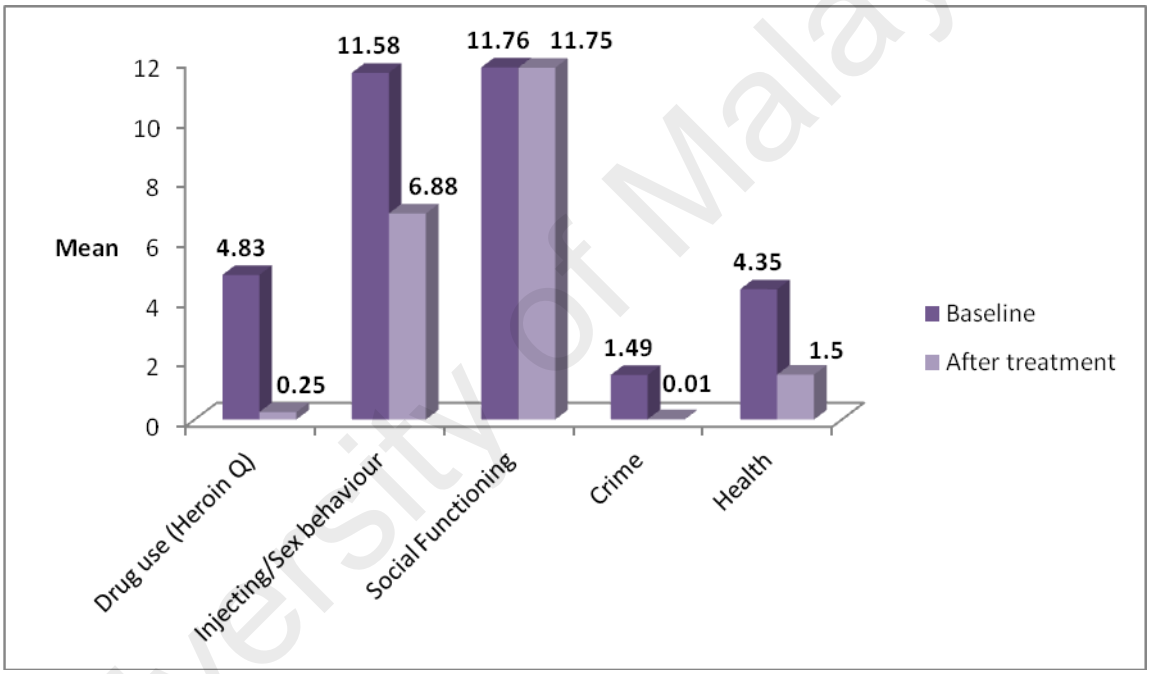

Figure 4.12: Comparison of OTI scores at baseline and after 6 years of treatment in MMT

4.2.4.1 Overall mean difference for OTI score domains by years (2007 – 2012)

As shown below, Table 4.19 presents mean differences for OTI scores by domain between year 2007 and 2012. The drug use domain (Heroine Q) shows clients in 3 years of treatment to have higher mean difference (4.79) followed by clients in 4 years of treatment with the mean difference of 4.58. However, in the injecting and sexual behaviour domain, clients in their third year showed the least improvement (mean difference 0.02). Clients in years one, four and six of treatment showed the highest score (range 4.90 to 5.33). Those in year two and year four of treatment showed a good improvement in the social functioning domain. The least mean difference was seen among those in year six of treatment with a mean of 0.01. The highest mean difference for crime domain was among those in the program for six years with the mean difference of 1.48. The lowest mean score was in year five of treatment; 0.64. Clients in all six years had shown a significant improvement in the health domain. Clients in year three and year six had shown a better improvement compared to the other four years.

Table 4.19: Overall mean differences for OTI score domains by years (2007 – 2012)

Years (n=633)	OTI Domains				
	Drug use (Heroin Q) Mean difference (95% CI)	**Injecting/Sex behaviour Mean difference (95% CI)**	**Social Functioning Mean difference (95% CI)**	**Crime Mean difference (95% CI)**	**Health Mean difference (95% CI)**
1year (2012) n=121	4.50 (3.91, 5.09)*	5.12 (3.44, 6.79)*	1.72 (0.56, 2.88)*	1.21 (0.84, 1.57)*	1.42 (0.81, 2.03)*
2years (2011) n= 85	4.49 (3.82, 5.16)*	2.37 (0.16, 4.57)*	3.46 (1.92, 5.00)*	0.64 (0.33, 0.94)*	1.93 (1.34,2.52)*
3years (2010) n= 78	4.79 (4.02,5.57)*	0.02 (-3.35,3.37)	1.53 (-0.06, 3.11)	1.21 (0.84,1.57)*	2.29 (1.72, 2.85)*
4years (2009) n= 108	4.72 (4.11, 5.35)*	5.33 (2.99,7.67)*	3.21 (0.18, 2.17)*	1.07 (0.68, 1.47)*	1.96 (1.36, 2.57)*
5years (2008) n= 99	4.53 (3.92, 5.15)*	2.95 (0.36, 4.81)*	1.50 (0.12, 2.87)*	1.47 (1.05, 1.88)*	1.54 (0.81,2.26)*
6years (2007) n= 142	4.58 (4.12, 5.05)*	4.90 (2.81, 6.99)*	0.01 (-0.01 0.40)	1.48 (1.13, 1.83)*	2.85 (2.34,3.36)*

* Significant at $p < 0.05$

4.2.5 Comparison of mean scores of QOL of methadone clients as shown by WHOQOL-BREF domains by socio-demographic, clinical status, current dose, and years of drug use after joining the treatment.

Table 4.20 illustrates the comparison of mean scores of quality of life of methadone clients using WHOQOL-BREF domains. The mean score, standard deviation, t-value and p-value of each domain across socioeconomic characteristics, blood borne diseases status on HIV, Hepatitis B and Hepatitis C, current dose intake and years of drug use is presented. The mean scores for physical domain ranged from 7 to 35, for psychological domain ranged from 6 to 30, social domain ranged form 3 to 15 and environment domain ranged from 8 to 40. All four domains in employment status showed statistically significant level of $p<0.001$. Quality of life was higher in employed respondents than the unemployed respondents. Respondents with HIV negative status had significant quality of life (Mean=24.09, SD=3.21) than respondents with HIV positive status (Mean=23.54, SD=3.36). This difference was significant in the psychological domain, $t(631) = -1.34$, $p=0.02$. All four domains showed that HIV negative respondents have higher quality of life compared to HIV positive respondents. All HCV negative respondents had higher quality of life compared to HCV positive respondents in all four domains. This difference was significant in the physical domain, $t(631) = 1.20$, $p=0.03$, (Mean=26.04, SD=3.70 to Mean=25.98, SD=3.38). Comparison of HCV positive and HCV negative respondents between psychological, social and environment domains revealed there was no significant difference. Respondents on 61mg – 90mg of methadone dose had a better quality of life. This difference was significant in the physical domain, $p=0.04$.

Table 4.20: Comparison of mean scores of WHOQOL-BREF domains after joining the treatment by socio-demographic, clinical status, current dose, and years of drug use

Factors	Domain 1 Physical		Domain 2 Psychological		Domain 3 Social Relationship		Domain 4 Environment	
	Mean ±(SD)	t/F, *p*-value	Mean ±(SD)	t/F, *p*-value	Mean ± (SD)	t/F, *p*-value	Mean ±(SD)	t/F, *p*-value
Age								
20 - 30years	25.50±3.20		23.54±3.69		10.84±1.52		29.59±3.89	
31 - 50years	25.99±3.72	F=0.96	23.58±3.35	F=0.12	10.78±1.70	F=1.15	29.65±3.70	F=0.31
51 - 70years	26.26±3.08	p=0.39	23.72±3.21	p=0.89	10.54±1.75	p=0.32	29.91±3.42	p=0.74
Gender								
Male	26.07±3.51	t=2.46	23.65±3.32	t=1.94	10.75±1.70	t=1.51	29.74±3.64	t=1.55
Female	23.94±3.85	p=0.10	22.06±3.75	p=0.06	10.12±1.41	p=0.13	28.35±3.90	p=0.12
Race								
Malay	25.92±3.54	t=-1.32	23.48±3.33	t=-1.95	10.71±1.68	t=-0.67	29.66±3.69	t=-0.70
Non Malay	26.39±3.53	p=0.19	24.14±3.37	p=0.05	10.82±1.78	p=0.50	29.92±3.45	p=0.49
Marital status								
Single	25.95±3.49		23.70-±3.47		10.69±1.77		29.61±3.87	
Married	25.95±3.50	F=0.70	23.52±3.21	F=0.25	10.69±1.63	F=1.06	29.77±3.53	F=0.14
Widowed/divorced	26.45±3.83	p=0.50	23.73±3.55	p=0.78	10.99±1.79	p=0.35	29.71±3.54	p=0.87
Education								
No formal education/Primary	25.77±3.61		23.53±3.39		10.60±1.83		29.56±3.54	
Secondary	26.17±3.46	F=1.08	23.66±3.32	F=0.13	10.84±1.59	F=1.56	29.83±3.73	F=0.39
Tertiary	26.31±3.63	p=0.34	23.72±3.34	p=0.88	10.67±1.53	p=0.21	29.67±3.79	p=0.68
Employment status								
Employed	26.06±3.55	t=-0.84	23.58±3.38	t=1.44	10.74±1.72	t=-1.32	29.74±3.70	t=-0.50
Unemployed	25.74±3.49	**p=0.04***	23.74±3.15	**p=0.01***	10.68±1.58	**p=0.01***	29.54±3.40	**p=0.03***
Pre-employment status								
Employed	26.15±3.52	t=-1.67	23.70±3.25	t=-1.17	10.76±1.71	t=-0.68	29.78±3.69	t=-0.80
Unemployed	25.63±3.55	p=0.10	23.35±3.57	p=0.24	10.65±1.67	p=0.50	29.51±3.55	p=0.42
HIV								
Positive	25.94±3.53	t=-1.30	23.54±3.36	t=-1.34	10.75±1.77	t=-0.10	29.91±3.40	t=0.50
Negative	26.51±3.59	p=0.19	24.09±3.21	**p=0.02***	10.73±1.69	p=0.99	29.68±3.68	p=0.62

Significant at $p<0.05$

Table 4.20 continued

Factors	Domain 1 Physical		Domain 2 Psychological		Domain 3 Social Relationship		Domain 4 Environment	
	Mean ±(SD)	**t/F, *p*-value**	**Mean ±(SD)**	**t/F, *p*-value**	**Mean ±(SD)**	**t/F, *p*-value**	**Mean ± (SD)**	**t/F, *p*-value**
HCV								
Positive	25.98±3.38	t=1.20	23.45±3.48	t=-1.24	10.70±1.69	t=-0.42	29.66±3.66	t=-0.30
Negative	26.04±3.70	**p=0.03***	23.78±3.18	p=0.22	10.76±1.70	p=0.67	29.75±3.64	p=0.76
HBV								
Positive	26.03±3.51	t=-0.51	23.62±3.34	t=-0.40	10.61±1.50	t=-0.39	29.72±3.63	t=-0.31
Negative	25.68±4.06	p=0.61	23.36±3.37	p=0.69	10.74±1.71	p=0.70	29.50±4.04	p=0.76
Current dose								
<30mg	25.48±3.19		23.64±3.23		10.75±1.57		29.51±3.49	
31-60mg	25.91±3.62		23.74±3.35		10.74±1.76		29.71±3.66	
61-90mg	26.55±3.44	F=2.73	23.76±3.21	F=2.30	10.75±1.70	F=0.18	30.07±3.59	F=1.86
>91mg	25.58±3.82	**p=0.04***	22.63±3.70	p=0.08	10.59±1.66	p=0.91	28.93±3.91	p=0.14
Duration of drug use								
<10years	25.67±3.48		23.44±3.32		10.64±1.63		29.67±3.63	
11 -20years	26.05±3.78	F=1.51	23.62±3.40	F=0.42	10.83±1.68	F=0.92	29.60±3.78	F=0.44
>21years	26.33±3.12	p=0.22	23.77±3.29	p=0.66	10.66±1.80	p=0.40	29.93±3.44	p=0.64

Significant at *$p<0.05$

4.2.6 Factors associated with QOL of methadone clients as shown by WHOQOL-BREF domains by socio-demographic, clinical status, current dose, and years of drug use after joining the treatment

Physical domain

The results of simple and multivariate linear regression for the physical domain are presented in Table 4.21. In a simple linear analysis, testing the factors associated with the physical domain one by one, the factors which were significantly associated at a significance level of 0.25 were many; these were current employment status, pre-treatment employment status, HIV, HBV and current dose. There was a significant linear relationship between those who were employed after treatment and physical domain (P<0.001). For every one unit increase in employment status, the physical well-being will increase by 1.6 units (95% CI: 0.81 to 2.48) holding the current dose and Hepatitis B negative status constant. Respondents with Hepatitis B negative status have higher quality of life in the physical domain compared to Hepatitis B positive respondents (95% CI: 0.06 to 2.77, p=0.041) holding dose and current employment status constant. There was a significant linear relationship between dose and physical domain. This model predicts that for every unit increase in dose [31 - 60mg (P=0.042, 95% CI: 0.03 to 1.91) and 61 – 90mg. (P=0.015, (95% CI: 0.23 to 1.16)] the physical well-being will increase by 1.0 and 1.2 units respectively holding current employment status and Hepatitis B negative status constant. Overall, the multivariate analysis showed that being employed, Hepatitis B negative and taking methadone dose of 31 – 90mg were positively associated with higher quality of life in the physical aspect. R^2 value is 0.653. Thus, 65.3% of the variation in improving quality of life in physical domain can be explained by current employment status, dose and Hepatitis B status.

Table 4.21: Association between physical domain of WHOQOL-BREF score and socio-demographic factors, clinical status, current dose and years of drug use

Factors	(n=633)	Physical Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Age							
20 -30 yrs	56(8.8)	0.47	(-0.62, 1.57)	0.397	0.66	(-0.58, 1.90)	0.299
31-50 yrs	432(68.2)	0.36	(-0.31, 1.03)	0.291	0.35	(-0.40, 1.10)	0.354
51-70 yrs	145(22.9)	1			1		
Gender							
Male	616(97.3)	0.43	(-1.27, 2.14)	0.618	-0.13	(-1.89, 1.63)	0.883
Female	17(2.7)	1			1		
Race							
Malay	514(81.2)	-0.33	(-1.04, 0.38)	0.363	-0.44	(-1.17, 0.30)	0.244
Non Malay	119(18.8)	1			1		
Marital status							
Single	221(34.9)	0.10	(-0.81, 1.01)	0.826	0.22	(-0.68, 1.13)	0.628
Married	332(52.4)	0.41	(-0.46, 1.27)	0.357	0.52	(-0.34, .38)	0.234
Widowed/divorced	80(12.6)	1			1		
Education level							
No formal education/Primary	270(42.7)	0.15	(-1.09, 1.38)	0.816	0.42	(-0.82, 1.66)	0.504
Secondary	327(51.7)	0.39	(-0.84, 1.61)	0.536	0.67	(-0.54, 1.89)	0.276
Tertiary	36(5.7)	1			1		
Employment status							
Employed	533(84.2)	1.61	(0.86, 2.35)	**<0.001****	1.65	(0.81, 2.49)	**<0.001***
Unemployed	100(15.8)	1			1		

Significant at *$p < 0.05$ ** $p < 0.25$

[a] = Crude beta coefficient

[b] = Adjusted beta coefficient

Table 4.21 continued

Factors	(n=633)	Physical Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Pre-employment status							
Employed	462(73)	0.5	(-0.12, 1.13)	**0.112****	-0.13	(-0.82, 0.56)	0.713
Unemployed	171(27)	1			1		
HIV							
Positive	74(11.7)	1			1		
Negative	559(88.3)	0.70	(-0.16, 1.56)	**0.109****	0.19	(-0.73, 1.10)	0.687
HCV							
Positive	300(47.4)	1			1		
Negative	333(52.6)	-0.18	(-0.74, 0.37)	0.519	-0.30	(-0.87, 0.28)	0.314
HBV							
Positive	28(4.4)	1			1		
Negative	605(95.6)	1.43	(0.09, 2.77)	**0.036****	1.42	(0.06, 2.78)	**0.041***
Dose							
<30mg	95(15)	-0.31	(-1.21, 0.95)	0.812	-0.09	(-1.177, 0.99)	0.874
31-60mg	266(42)	0.91	(-0.01, 1.83)	**0.052****	0.97	(0.03, 1.91)	**0.042***
61-90mg	201(31.8)	1.20	(0.24, 2.15)	**0.014****	1.20	(0.24, 2.17)	**0.015***
>91mg	71(11.2)	1			1		
Year of drug use							
< 10 yrs	182(28.8)	-0.04	(-0.79, 0.71)	0.925	-0.26	(-1.13, 0.61)	0.56
11-20 yrs	288(45.5)	0.10	(-0.58, 0.78)	0.771	-0.05	(-0.78, 0.69)	0.904
>21yrs	163(25.8)	1			1		

Significant at *$p < 0.05$ ** $p < 0.25$
[a] = Crude beta coefficient
[b] = Adjusted beta coefficient
$R^2 = 0.653$

Psychological domain

The results of simple and multivariate linear regression for the psychological domain are presented in Table 4.22. In a simple linear analysis, testing the factors associated with psychological domain one by one, the factors which were significantly associated at a significance level of 0.25 were age, marital status, current employment status, HBV, current dose and years of drug use. Respondents from mid range age group of 31 -50 years showed greater improvement in psychological well being compared to those older than 51 years (p=0.018, 95% CI: 0.14 to 1.55). For marital status, every unit increase in married status, predicts the psychological domain by 0.8 units holding age, current employment status, Hepatitis B negative status, current dose and years of drug use constant. There was a significant linear relationship between employment and psychological well-being (P=0.004). This model predicts that for every unit increase in employment, the psychological well-being will increase by 1.2 units holding age, marital status, Hepatitis B negative status, current dose and years of drug use constant. There was a significant linear relationship between dose and psychological domain in all categories compared to the reference category. Those having Methadone dose 30mg – 90mg had higher quality of life in the psychological domain holding age, current employment status, years of drug use and HBV status constant. The Hepatitis B negative respondents had higher quality of life in the psychological domain than Hepatitis B positive respondents (p=0.01). Every one unit increase in Hepatitis B negative status, predicts the psychological well-being increase by 1.7 units holding age, current dose, years of drug use and current employment status constant. Overall, the multivariate analysis showed being in mid range age group, being employed and having dose <30mg - 90mg, as well as Hepatitis B negative status were positively associated with quality of life of psychological domain. However, taking drugs for less than 21

years was negatively associated with psychological domain, with an R^2 value is 0.760. Thus, 76.0% of the variation in improvement of quality of life in the psychological domain can be explained by age, marital status, Hepatitis B negative status, current employment status, current dose and years of drug use as there was no multicollinearity issue (VIF range 1.2 to 2.9) and all model assumptions were met.

Table 4.22: Association between psychological domain of WHOQOL-BREF scores and socio-demographic factors, clinical status, current dose and years of drug use

Factors	(n=633)	Psychological Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Age							
20 -30 yrs	56(8.8)	0.57	(-0.46, 1.60)	0.280	1.11	(-0.05, 2.28)	0.062
31-50 yrs	432(68.2)	0.51	(-0.12, 1.13)	**0.110****	0.85	(0.14, 1.55)	**0.018***
51-70 yrs	145(22.9)	1			1		
Gender							
Male	616(97.3)	0.24	(-1.37, 1.84)	0.773	0.02	(-1.65, 1.66)	0.999
Female	17(2.7)	1			1		
Race							
Malay	514(81.2)	0.07	(-0.60, 0.73)	0.847	-0.03	(-0.72, 0.67)	0.943
Non Malay	119(18.8)	1			1		
Marital status							
Single	221(34.9)	0.24	(-0.61, 1.10)	0.577	0.73	(-0.12, 1.58)	0.091
Married	332(52.4)	0.36	(0.46, 1.17)	0.387	0.81	(0.00, 1.62)	0.049
Widowed/divorced	80(12.6)	1			1		
Education level							
No formal education/Primary	270(42.7)	-0.13	(-1.29, 1.03)	0.831	0.36	(-0.80, 1.52)	0.539
Secondary	327(51.7)	-0.02	(-1.17, 1.13)	0.971	0.20	(-0.95, 1.34)	0.737
Tertiary	36(5.7)	1			1		
Employment status							
Employed	533(84.2)	-0.27	(-0.98, 0.45)	**0.162****	1.16	(0.37, 1.95)	**0.004***
Unemployed	100(15.8)	1			1		

Significant at *$p < 0.05$ ** $p < 0.25$

[a] = Crude beta coefficient

[b] = Adjusted beta coefficient

Table 4.22 continued

Factors	(n=633)	Psychological Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Pre-employment status							
Employed	462(73)	0.31	(-0.27, 0.90)	0.295	-0.13	(-0.77, 0.52)	0.700
Unemployed	171(27)	1			1		
HIV							
Positive	74(11.7)	1			1		
Negative	559(88.3)	-0.32	(-1.13, 0.49)	0.439	0.31	(-0.55, 1.17)	0.475
HCV							
Positive	300(47.4)	1			1		
Negative	333(52.6)	0.18	(-0.34, 0.70)	0.701	0.30	(-0.24, 0.84)	0.272
HBV							
Positive	28(4.4)	1			1		
Negative	605(95.6)	-0.37	(-1.63, 0.90)	**0.179****	1.67	(0.40, 2.95)	**0.010***
Dose							
<30mg	95(15)	0.26	(-0.76, 1.29)	**0.218****	1.14	(0.13, 2.15)	**0.028***
31-60mg	266(42)	0.38	(-0.49, 1.26)	**0.190****	1.02	(0.14, 1.90)	**0.023***
61-90mg	201(31.8)	-0.08	(-0.98, 0.82)	**0.163****	1.64	(0.73, 2.54)	**<0.001***
>91mg	71(11.2)	1			1		
Year of drug use							
< 10 yrs	182(28.8)	0.37	(-0.33, 1.07)	0.302	-1.05	(-1.87, -0.23)	**0.012***
11-20 yrs	288(45.5)	0.47	(-0.17, 1.11)	**0.147****	-0.77	(-1.46, -0.07)	**0.032***
>21yrs	163(25.8)	1			1		

Significant at *$p < 0.05$ ** $p < 0.25$
[a] = Crude beta coefficient
[b] = Adjusted beta coefficient
$R^2 = 0.760$

Social domain

The results of simple and multivariate linear regression for the social domain are presented in Table 4.23. In a simple linear analysis, testing the factors associated with the social domain one by one, the factors which were significantly associated at a significance level of 0.25 were age, race, marital status, education level, current employment status, pre-treatment employment status, HIV status, current dose and years of drug use. Respondents from mid-range age group of 31 -50 years showed higher improvement in social well-being compared to those older than 51 years (p=0.034, 95% CI: 0.03 to 0.73) holding marital status, education level, current employment status and current dose constant. There was a significant linear relationship between employment and social domain level (P=0.004). This model predicts that for every unit increase in employment, the social well-being will increase by 0.6 units holding age, marital status, education and dose constant. There is a significant linear relationship between marital status and social domain (P<0.001). Those who were married have shown significantly higher quality of life in the social domain compare to those widowed/ divorced (95% CI: 0.39 to 1.20) holding age, education, current employment status and current dose constant. Those with secondary education levels were shown to have a higher quality of life (p=0.044). Every one unit increase in education level showed a 0.6 unit increase in the social domain holding age, marital status, current dose and current employment status constant. There was a significant linear relationship between current dose and social domain (p=0.049, 95% CI: 0.00 to 0.91) Those who were taking 61mg – 90mg of methadone dose have higher quality of life in the social domain holding age, marital status education and current employment status constant. Overall, the multivariate analysis showed being in mid age group, married, having secondary education level, being currently employed and taking

61mg – 90mg of methadone dose to be positively associated with quality of life of social domain. The R^2 value is 0.671. Thus, 67.1% of the variation in improvement of quality of life in the social domain can be explained by age, marital status, education level, current employment status and current dose. There was no multicollinearity issue (VIF range 1.2 to 5.0) and all model assumptions were met.

Table 4.23: Association between social domain of WHOQOL-BREF scores and socio-demographic factors, clinical status, current dose and years of drug use

Factors	(n=633)	Social Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Age							
20 -30 yrs	56(8.8)	0.35	(-0.17, 0.88)	0.184	0.34	(-0.24, 0.93)	0.249
31-50 yrs	432(68.2)	0.41	(0.99, 0.74)	**0.010****	0.38	(0.03, 0.74)	**0.034***
51-70 yrs	145(22.9)	1			1		
Gender							
Male	616(97.3)	0.45	(-0.37, 1.27)	0.283	0.37	(-0.46, 1.20)	0.382
Female	17(2.7)	1			1		
Race							
Malay	514(81.2)	0.29	(-0.05, 0.63)	**0.095****	0.07	(-0.28, 0.41)	0.708
Non Malay	119(18.8)	1			1		
Marital status							
Single	221(34.9)	0.12	(-0.31, 0.54)	0.587	0.16	(-0.27, 0.59)	0.460
Married	332(52.4)	0.81	(0.41, 1.22)	**<0.001****	0.80	(0.39, 1.20)	**<0.001***
Widowed/divorced	80(12.6)	1			1		
Education level							
No formal education/Primary	270(42.7)	0.38	(-0.21, 0.97)	**0.203****	0.51	(0.004, 1.17)	0.084
Secondary	327(51.7)	0.40	(-0.19, -0.98)	**0.183****	0.59	(-0.07, 1.08)	**0.044***
Tertiary	36(5.7)	1			1		
Employment status							
Employed	533(84.2)	0.80	(0.44, 1.15)	**<0.001****	0.58	(0.19, 0.98)	**0.004***
Unemployed	100(15.8)	1			1		

Significant at *$p < 0.05$ ** $p < 0.25$

[a] = Crude beta coefficient

[b] = Adjusted beta coefficient

Table 4.23 continued

Factors	(n=633)	Social Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Pre-employment status							
Employed	462(73)	0.52	(0.22, 0.82)	**0.001****	0.17	(-0.16, 0.49)	0.315
Unemployed	171(27)	1			1		
HIV							
Positive	74(11.7)	1			1		
Negative	559(88.3)	0.34	(-0.08, 0.75)	**0.109****	0.13	(-0.31, 0.56)	0.561
HCV							
Positive	300(47.4)	1			1		
Negative	333(52.6)	0.10	(-0.16, 0.37)	0.454	0.004	(-0.27, 0.28)	0.977
HBV							
Positive	28(4.4)	1			1		
Negative	605(95.6)	-0.13	(-0.78, 0.51)	0.685	-0.21	(-0.85, 0.44)	0.529
Dose							
<30mg	95(15)	0.27	(-0.25, 0.80)	0.306	0.29	(-0.22, 0.80)	0.260
31-60mg	266(42)	0.44	(-0.002, 0.89)	**0.051****	0.43	(-0.02, 0.87)	0.058
61-90mg	201(31.8)	0.39	(-0.07, -0.85)	**0.100****	0.46	(0.002, 0.91)	**0.049***
>91mg	71(11.2)	1			1		
Year of drug use							
< 10 yrs	182(28.8)	0.33	(-0.31, 0.69)	**0.073****	0.11	(-0.30, 0.52)	0.609
11-20 yrs	288(45.5)	0.21	(-0.12, 0.54)	**0.206****	0.03	(-0.32, 0.37)	0.883
>21yrs	163(25.8)	1			1		

Significant at *$p < 0.05$ ** $p < 0.25$

[a] = Crude beta coefficient

[b] = Adjusted beta coefficient

$R^2 = 0.671$

Environment domain

The results of simple and multivariate linear regression for the environment domain are presented in Table 4.24. In a simple linear analysis, testing the factors associated with the environment domain one by one, the factors which were significantly associated at a significance level of 0.25 were age, race, marital status, education level, current employment status, pre-treatment employment status, HCV status, HBV status and current dose. Significant linear relationship was shown between race and environmental domain (P=0.03). This model predicts that for every unit increase in race, the environment domain will increase by 0.8 units holding marital status, current employment status, HBV, dose and years of drug use constant. There was a significant linear relationship between marital status and environmental domain (p=0.026) where for every unit of married respondents in the program, we estimate quality of life in environmental domain to be higher by 1.0 unit holding race, current employment status, HBV status, current dose and years of drug use constant. Those who were employed showed a significant linear relationship with the environment domain (p=0.003, 95% CI: 0.46 to 2.18) where for every unit increase in employment status, we predict 1.3 unit higher quality of life in environmental aspect holding race, marital status, HBV status, current dose and years of drug use constant. The Hepatitis B negative respondents have higher quality of life in this domain holding race, marital status, current employment status, dose and years of drug use constant (p=0.017, 95% CI: 0.31 to 3.09). Those who were taking 30mg to 90mg of methadone dose have significant higher quality of life in the environment domain holding age, marital status, current employment status, years of drug use and HBV status constant. Respondents who were using drugs <10 years showed have higher environmental well being compared to those who took drugs >10 years (p=0.025, 95% CI: -1.91 to -0.13). For every one year decrease in drug use, we

estimate quality of life in environmental domain to be higher by 1.0 unit holding age, marital status, current employment status, current dose and HBV status constant Overall, the multivariate analysis showed being Malay, married, currently employed, Hepatitis B negative and dose >90mg and being a drug user <10 years were positively associated with quality of life in the environmental domain with an R^2 value of 0.761. Thus, 76.1% of the variation in improved quality of life in the environment domain can be explained by race, marital status, current employment status, Hepatitis B status, current dose and years of drug use. There was no multicollinearity issue (VIF range 1.0 to 2.9) and all model assumptions were met.

Table 4.24: Association between environment domain of WHOQOL-BREF scores and socio-demographic factors, clinical status, current dose and years of drug use

Factors	(n=633)	Environment Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Age							
20 -30 yrs	56(8.8)	0.61	(-0.52, 1.74)	0.288	0.73	(-0.54, 2.00)	0.260
31-50 yrs	432(68.2)	0.541	(-0.15, 1.23)	**0.122****	0.528	(-0.24, 1.30)	0.177
51-70 yrs	145(22.9)	1			1		
Gender							
Male	616(97.3)	0.967	(-0.79, 2.73)	0.281	0.507	(-1.30, 2.31)	0.581
Female	17(2.7)	1			1		
Race							
Malay	514(81.2)	1.139	(0.42, 1.86)	**0.002****	0.834	(0.08, 1.59)	**0.030***
Non Malay	119(18.8)	1			1		
Marital status							
Single	221(34.9)	0.592	(-0.34, 1.52)	**0.212****	0.548	(-0.38, 1.48)	0.246
Married	332(52.4)	1.167	(0.28, 2.06)	**0.010****	1.004	(0.12, 1.89)	**0.026***
Widowed/divorced	80(12.6)	1			1		
Education level							
No formal education/Primary	270(42.7)	-0.917	(-2.19, 0.35)	**0.157****	-0.430	(-1.70, 0.84)	0.505
Secondary	327(51.7)	-0.403	(-1.66, 0.85)	0.528	-0.066	(-1.31, 1.18)	0.917
Tertiary	36(5.7)	1			1		
Employment status							
Employed	533(84.2)	1.444	(0.67, 2.22)	**<0.001****	1.316	(0.46, 2.18)	**0.003***
Unemployed	100(15.8)	1			1		

Significant at *p < 0.05 ** p <0.25
[a] = Crude beta coefficient
[b] = Adjusted beta coefficient

Table 4.24 continued

Factors	(n=633)	Environment Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Pre-employment status							
Employed	462(73)	0.783	(0.14, 1.42)	**0.016****	0.072	(0-0.63, 0.78)	0.842
Unemployed	171(27)	1			1		
HIV							
Positive	74(11.7)	1			1		
Negative	559(88.3)	0.188	(-0.70, 1.07)	0.678	-0.531	(-1.47, 0.40)	0.265
HCV							
Positive	300(47.4)	1			1		
Negative	333(52.6)	0.639	(0.07, 1.21)	**0.028****	0.474	(-0.12, 1.06)	0.114
HBV							
Positive	28(4.4)	1			1		
Negative	605(95.6)	1.935	(0.56, 3.31)	**0.006****	1.699	(0.31, 3.09)	**0.017***
Dose							
<30mg	95(15)	1.078	(-0.05, 2.20)	**0.060****	1.137	(0.03, 2.25)	**0.044***
31-60mg	266(42)	0.903	(-0.05, 1.86)	**0.064****	0.980	(0.02, 1.94)	**0.046***
61-90mg	201(31.8)	0.83	(-0.16, 1.82)	**0.100****	1.032	(0.04, 2.02)	**0.041***
>91mg	71(11.2)	1			1		
Year of drug use							
< 10 yrs	182(28.8)	-0.333	(-1.11, 0.44)	**0.219****	-1.020	(-1.91, -0.13)	**0.025***
11-20 yrs	288(45.5)	-0.152	(-0.86, 0.55)	0.670	-0.569	(-1.32, 0.19)	0.139
>21yrs	163(25.8)	1			1		

Significant at *$p < 0.05$ ** $p < 0.25$
[a] = Crude beta coefficient
[b] = Adjusted beta coefficient
$R^2 = 0.767$

4.2.7 Comparison of mean scores of QOL of methadone clients as shown by OTI domains by socio-demographic, clinical status, current dose, and years of drug use after joining the treatment

Table 4.25 illustrates the overall results of factors associated with quality of life of methadone clients using OTI scores. The mean score, standard deviation, t value and p value of each domain across socioeconomic characteristics, blood borne diseases status on HIV, Hepatitis B and Hepatitis C, current dose intake and years of drug use is presented. The score for drug use domain is Q score where a Q score of zero is taken as abstinence and a score of 2.00 or more means using drugs more than once a day. For theinjecting & sexual behaviour domain it ranged from 0 to 55, for social domain it ranged from 0 to 48, the criminal domain ranged from 0 to 16 and health domain ranged from 0 to 20. Males have shown significant reduction in crime domain (Mean=0.19, SD=0.57) compared to females (Mean=0.09, SD=0.57), $p<0.001$ where 97% of the respondents were males. Therefore, mean score of drug use, injecting & sexual behaviour and social functioning were higher among male respondents' except for health domain. Females were healthier than males. Employed respondents were healthier than the unemployed respondents. Health domain showed statistically significant level of $t(631) = 3.75$, $p<0.001$. HIV negative respondents had higher quality of life (Mean=0.09, SD=0.59) than HIV positive respondents (Mean=0.01, SD=0.12). This difference was significant in the crime domain, $t(631) = 2.85$, $p=0.004$. All HBV negative respondents had higher quality of life compared to HBV positive respondents. This difference was significant in the crime domain, $t(631) = 3.84$, $p<0.001$. Comparison of HBV positive and HBV negative status with drug use, injecting & sexual behaviour domain, social functioning and health domains revealed there no significant difference.

Table 4.25: Comparison of mean scores of OTI domains after joining the treatment by socio-demographic, clinical status, current dose, and years of drug use

Factors	Domain 1 Drug Use(Heroin Q) (score range 0 - >2)		Domain 2 Injecting/Sex behaviour (score range 0-55)		Domain 3 Social Functioning (score range 0-48)		Domain 4 Crime (score range 0-16)		Domain 5 Health (score range 0-20)	
	Mean ±(SD)	t/F, *p* value	Mean ±(SD)	t/F, *p* value	Mean ±(SD)	t/F, *p* value	Mean ±(SD)	t/F, *p* value	Mean ±(SD)	t/F, *p* value
Age										
20 - 30years	0.10±0.35		6.70±7.02		12.63±4.93		0.16±0.60		1.39±1.57	
31 - 50years	0.21±0.53	F=1.41	6.79±7.76	F=0.79	12.03±5.12	F=0.97	0.10±0.64	F=1.58	1.57±1.95	F=0.55
51 - 70years	0.23±0.48	P=0.25	5.87±7.67	p=0.46	12.63±4.91	p=0.38	0.02±0.14	p=0.21	1.41±1.56	p=0.58
Gender										
Male	0.21±0.51	t=-0.72	7.53±8.05	t=-0.52	12.23±5.06	t=0.33	0.19±0.57	t=3.84	1.51±1.84	t=-0.43
Female	0.12±0.33	p=0.47	6.54±7.67	p=0.60	11.82±5.08	p=0.74	0.02±0.12	**P<0.001**	1.71±1.57	p=0.66
Race										
Malay	0.21±0.53	t=0.17	6.50±7.78	t=-0.47	12.18±5.21	t=-0.42	0.09±0.59	t=0.21	1.48±1.82	t=-0.87
Non Malay	0.20±0.42	p=0.87	6.87±7.25	p=0.64	12.39±4.36	p=0.67	0.08±0.41	p=0.83	1.65±1.90	p=0.38

Significant at *$p < 0.05$

Table 4.25 continued

Factors	Domain 1 Drug Use(Heroin Q) (score range 0 - >2)		Domain 2 Injecting/Sex behaviour (score range 0-55)		Domain 3 Social Functioning (score range 0-48)		Domain 4 Crime (score range 0-16)		Domain 5 Health (score range 0-20)	
	Mean ±(SD)	**t/F, *p* value**	**Mean ±(SD)**	**t/F, *p* value**	**Mean ±(SD)**	**t/F, *p* value**	**Mean ±(SD)**	**t/F, *p* value**	**Mean ±(SD)**	**t/F, *p* value**
Marital status										
Single	0.18±0.48		6.15±7.22		12.32±5.27		0.07±0.45		1.62±2.08	
Married	0.20±0.49	F=2.46	6.61±7.77	F=0.98	12.08±4.92	F=0.31	0.10±0.67	F=0.37	1.47±1.72	F=0.63
Widower/divorce	0.32±0.63	p=0.09	7.55±8.49	p=0.38	12.51±5.04	p=0.73	0.05±0.22	p=0.69	1.41±1.58	p=0.53
Education										
No formal education/Primary	0.20±0.46		6.28±7.82		12.01±4.99		0.06±0.31		1.55±1.80	
Secondary	0.20±0.52	F=0.75	6.73±7.56	F=0.42	12.35±5.07	F=0.44	0.11±0.72	F=0.70	1.54±1.88	F=1.06
Tertiary	0.31±0.67	p=0.47	7.28±7.77	p=0.66	12.58±5.52	p=0.64	0.08±0.28	p=0.50	1.08±1.68	p=0.35
Employment status										
Employed	0.18±0.38	t=-0.58	6.51±7.68	t=0.43	12.21±5.12	t=0.07	0.07±0.58	t=-0.30	1.61±1.90	t=-3.75
Unemployed	0.21±0.53	p=0.56	6.87±7.68	p=0.67	12.25±4.73	p=0.95	0.09±0.43	p=0.77	1.02±1.33	**p<0.001**

Significant at *$p < 0.05$

Table 4.25 continued

Factor variables	Domain 1 Drug Use(Heroin Q) (score range 0 - >2)		Domain 2 Injecting/Sex behaviour (score range 0-55)		Domain 3 Social Functioning (score range 0-48)		Domain 4 Crime (score range 0-16)		Domain 5 Health (score range 0-20)	
	Mean ±(SD)	t/F, *p* value	Mean ±(SD)	t/F, *p* value	Mean ±(SD)	t/F, *p* value	Mean ±(SD)	t/F, *p* value	Mean ±(SD)	t/F, *p* value
Pre-treatment employment										
Employed	0.22±0.55	t=-1.06	6.58±7.79	t=-0.08	12.30±5.16	t=-0.68	0.10±0.62	t=-0.90	1.52±1.81	t=-0.15
Unemployed	0.17±0.39	p=0.29	6.53±7.39	p=0.94	11.99±4.77	p=0.50	0.05±0.35	p=0.37	1.50±1.90	p=0.88
HIV										
Positive	0.19±0.53	t=-0.26	6.44±7.61	t=1.21	11.74±5.41	t=-0.86	0.09±0.59	t=-2.85	1.31±1.24	t=-1.02
Negative	0.21±0.51	p=0.80	7.58±8.14	p=0.23	12.28±5.01	p=0.39	0.01±0.12	**p=0.004**	1.54±1.90	p=0.31
HCV										
Positive	0.22±0.52	t=0.55	6.54±7.74	t=-0.11	12.35±5.31	t=0.64	0.09±0.67	t=0.06	1.42±1.73	t=-1.19
Negative	0.19±0.49	p=0.59	6.60±7.63	p=0.92	12.10±4.82	p=0.52	0.08±0.44	p=0.95	1.60±1.93	p=0.23

Significant at *$p < 0.05$

Table 4.25 continued

Factor variables	Domain 1 Drug Use(Heroin Q) (score range 0 - >2)		Domain 2 Injecting/Sex behaviour (score range 0-55)		Domain 3 Social Functioning (score range 0-48)		Domain 4 Crime (score range 0-16)		Domain 5 Health (score range 0-20)	
	Mean ±(SD)	**t/F, *p* value**	**Mean ±(SD)**	**t/F, *p* value**	**Mean ±(SD)**	**t/F, *p* value**	**Mean ±(SD)**	**t/F, *p* value**	**Mean ±(SD)**	**t/F, *p* value**
HBV										
Positive	0.19±0.39	t=-0.15	5.32±6.53	t=-0.88	10.68±5.42	t=-1.65	0.20±0.79	t=-3.84	1.46±1.69	t=-0.15
Negative	0.21±0.51	p=0.88	6.63±7.73	p=0.38	12.29±5.03	p=0.10	0.09±0.57	**p<0.001**	1.52±1.84	p=0.88
Current dose										
<30mg	0.21±0.56		7.38±8.82		12.34±5.17		0.07±0.53		1.41±1.84	
31-60mg	0.23±0.52		6.24±7.27		12.35±5.17		0.11±0.61		1.52±1.81	
61-90mg	0.18±0.46	F=0.29	6.63±7.78	F=0.52	12.21±4.69	F=0.44	0.06±0.52	F=0.22	1.69±2.01	F=1.64
>91mg	0.20±0.52	p=0.83	6.54±7.35	p=0.67	11.59±5.51	p=0.73	0.08±0.50	p=0.88	1.15±1.28	p=0.18
Duration of drug use										
<10years	0.22±0.57		6.55±7.83		11.93±5.01		0.15±0.78		1.45±1.73	
11 -20years	0.22±0.53	F=0.91	6.98±7.72	F=1.09	12.53±5.30	F=1.02	0.07±0.53	F=2.11	1.58±1.98	F=0.32
>21years	0.16±0.40	p=0.40	5.87±7.42	p=0.34	11.99±4.66	p=0.36	0.04±0.19	p=0.12	1.48±1.70	p=0.73

Significant at *$p < 0.05$

4.2.8 Factors associated with QOL of methadone clients as shown by OTI domains by socio-demographic, clinical status, current dose, and years of drug use after joining the treatment

Drug use domain

The results of simple and multivariate linear regression for drug use domain are presented in Table 4.26. In a simple linear analysis, testing the factors associated with drug use domain one by one, the factors which were significantly associated at a significance level of 0.25 were gender, marital status and education level. There is a significant linear relationship between marital status and drug use domain (P=0.008). Those who were married showed significant reduction in taking drugs after joining methadone treatment compared to those widowed/divorced (95% CI: -0.30 to -0.05) holding other variables constant. Overall, the multivariate analysis showed being married was negatively associated with the habit of using drugs with an R^2 value of 0.290. Thus, 29.0% of the variation in drug intake reduction can be explained by marital status. There were no multicollinearity issues (VIF range 1.1 to 2.5) and all model assumptions were met.

Table 4.26: Association between drug use domain of OTI scores and socio-demographic factors, clinical status, current dose and years of drug use

Factors	(n=633)	Drug use Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Age							
20 -30 yrs	56(8.8)	-0.048	(-0.21, 0.11)	0.548	0.009	(-0.17, 0.19)	0.923
31-50 yrs	432(68.2)	0.029	(-0.07, 0.13)	0.549	0.047	(-0.06, 0.16)	0.399
51-70 yrs	145(22.9)	1			1		
Gender							
Male	616(97.3)	-0.152	(-0.40, 0.09)	**0.225****	-0.147	(-0.40, 0.11)	0.265
Female	17(2.7)	1			1		
Race							
Malay	514(81.2)	-0.035	(-0.14, 0.07)	0.497	-0.024	(-0.13, 0.08)	0.664
Non Malay	119(18.8)	1			1		
Marital status							
Single	221(34.9)	-0.133	(-0.26, -0.00)	**0.044****	-0.131	(-0.26, 0.00)	0.052
Married	332(52.4)	-0.163	(-0.29, -0.04)	**0.010****	-0.171	(-0.30, -0.05)	**0.008***
Widowed/divorced	80(12.6)	1			1		
Education level							
No formal education/Primary	270(42.7)	0.128	(-0.05, 0.31)	**0.156****	0.113	(-0.07, 0.29)	0.220
Secondary	327(51.7)	0.13	(-0.05, 0.31)	**0.144****	0.115	(-0.06, 0.29)	0.204
Tertiary	36(5.7)	1			1		
Employment status							
Employed	533(84.2)	-0.061	(-0.17, 0.05)	0.273	-0.051	(-0.17, 0.07)	0.414
Unemployed	100(15.8)	1			1		

Significant at *$p < 0.05$ ** $p < 0.25$

[a] = Crude beta coefficient

[b] = Adjusted beta coefficient

Table 4.26 continued

Factors	(n=633)	Drug use Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Pre-employment status							
Employed	462(73)	-0.012	(-0.10, 0.08)	0.795	0.014	(-0.09, 0.11)	0.786
Unemployed	171(27)	1			1		
HIV							
Positive	74(11.7)	1			1		
Negative	559(88.3)	0.018	(-0.11, 0.14)	0.772	0.051	(-0.08, 0.18)	0.454
HCV							
Positive	300(47.4)	1			1		
Negative	333(52.6)	-0.002	(-0.08, 0.08)	0.956	0.008	(-0.08, 0.09)	0.844
HBV							
Positive	28(4.4)	1			1		
Negative	605(95.6)	-0.084	(-0.28, 0.11)	0.392	-0.095	(-0.29, 0.10)	0.349
Dose							
<30mg	95(15)	0.072	(-0.08, 0.23)	0.366	0.078	(-0.08, 0.24)	0.332
31-60mg	266(42)	0.065	(-0.07, 0.20)	0.340	0.070	(-0.07, 0.21)	0.320
61-90mg	201(31.8)	0.018	(-0.12, 0.16)	0.798	0.001	(-0.14, 0.14)	0.992
>91mg	71(11.2)	1			1		
Years of drug use							
< 10 yrs	182(28.8)	-0.031	(-0.14, 0.08)	0.574	-0.048	(-0.18, 0.08)	0.454
11-20 yrs	288(45.5)	0.040	(-0.06, 0.14)	0.423	0.026	(-0.08, 0.13)	0.642
>21yrs	163(25.8)	1			1		

Significant at *$p < 0.05$ ** $p < 0.25$
[a] = Crude beta coefficient
[b] = Adjusted beta coefficient
$R^2 = 0.290$

Injecting/sex behaviour domain

The results of simple and multivariate linear regression for injecting/sex behaviour domain are presented in Table 4.27. In a simple linear analysis, testing the factors associated with injecting/sex behaviour domain one by one, the factors which were significantly associated at a significance level of 0.25 were age, race, gender, current employment status, HCV status, HBV status, current dose and years of drug use. Significant linear relationship was shown between race and injecting/sex behaviour domain (P=0.028). Malays indulged less in high risk behaviour like injecting and sexual practice (B -1.795, 95% CI: -3.40 to -0.19) as compared to non-Malays, holding HCV and dose constant. The HCV negative respondents were less likely to be involved in high risk behaviours than HCV positive respondents (p=0.027). For every unit decrease in HCV negative status, we predict a 1.4 unit lesser involvement in injecting and sexual behaviour holding race and dose constant. There was a significant linear relationship between dose and injecting/sex behaviour domain. Those having <30mg of methadone dose were involved more in high risk behaviour like injecting and sexual behaviour, where for every unit increase in current dose, we estimate quality of life increased by 2.5 units holding race and HCV status constant. Overall, the multivariate analysis showed current dose of <30mg of methadone to be positively associated and being Malay and HCV negative were negatively associated with injecting/sex behaviour domain, with an R^2 value of 0.554. Thus, 55.4% of the variation in reduction of high risk behaviour can be explained by race, HCV status and current dose. There was no multicollinearity issue (VIF range 1.1 to 2.0) and all model assumptions were met.

Table 4.27: Association between injecting/sex behaviour domain of OTI scores and socio-demographic factors, clinical status, current dose and years of drug use

Factors	(n=633)	Injecting/sex behaviour domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Age							
20 -30 yrs	56(8.8)	1.94	(-1.08, 4.96)	**0.207****	-0.137	(-2.85, 2.58)	0.921
31-50 yrs	432(68.2)	0.34	(-1.50, 2.18)	0.717	0.438	(-1.20, 2.07)	0.599
51-70 yrs	145(22.9)	1			1		
Gender							
Male	616(97.3)	-3.084	(-7.79, 1.63)	**0.199****	-1.196	(-5.04, 2.65)	0.542
Female	17(2.7)	1			1		
Race							
Malay	514(81.2)	-0.664	(-2.62, 1.29)	**0.204****	-1.795	(-3.40, -0.19)	**0.028***
Non Malay	119(18.8)	1			1		
Marital status							
Single	221(34.9)	-0.959	(-3.45, 1.53)	0.450	-0.638	(-1.33, 0.39)	0.527
Married	332(52.4)	1.112	(-1.27, 3.49)	0.359	1.113	(-2.99, 0.40)	0.245
Widowed/divorced	80(12.6)	1			1		
Education level							
No formal education/Primary	270(42.7)	0.815	(-2.59, 4.22)	0.639	0.65	(-2.05, 3.35)	0.636
Secondary	327(51.7)	1.305	(-2.06, 4.68)	0.447	-0.004	(-2.66, 2.65)	0.998
Tertiary	36(5.7)	1			1		
Employment status							
Employed	533(84.2)	2.471	(0.39, 4.55)	**0.020****	0.671	(-1.16, 2.50)	0.472
Unemployed	100(15.8)	1			1		

Significant at *$p < 0.05$ ** $p < 0.25$

[a] = Crude beta coefficient

[b] = Adjusted beta coefficient

Table 4.27 continued

Factors	(n=633)	Injecting/sex behaviour domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Pre employment status							
Employed	462(73)	0.162	(-1.56, 1.88)	0.853	1.081	(-0.42, 2.58)	0.158
Unemployed	171(27)	1			1		
HIV							
Positive	74(11.7)	1			1		
Negative	559(88.3)	-0.927	(-3.30, 1.45)	0.443	1.178	(-0.81, 3.17)	0.246
HCV							
Positive	300(47.4)	1			1		
Negative	333(52.6)	-1.253	(-2.78, 0.27)	**0.107****	-1.419	(-2.67, -0.17)	**0.027***
HBV							
Positive	28(4.4)	1			1		
Negative	605(95.6)	1.884	(-0.54, 6.86)	**0.094****	-0.017	(-2.98, 2.95)	0.991
Dose							
<30mg	95(15)	0.474	(-2.53, 3.48)	0.757	2.468	(0.11, 4.83)	**0.040***
31-60mg	266(42)	-0.024	(-2.58, 2.53)	0.986	0.654	(-1.40, 2.71)	0.532
61-90mg	201(31.8)	-1.649	(-4.29, 0.99)	**0.221****	-0.399	(-2.51, 1.71)	0.710
>91mg	71(11.2)	1			1		
Year of drug use							
< 10 yrs	182(28.8)	-1.162	(-3.23, 0.91)	**0.270****	1.39	(-0.51, 3.29)	0.150
11-20 yrs	288(45.5)	0.073	(-1.81, 1.95)	0.939	0.19	(-1.42, 1.80)	0.816
>21yrs	163(25.8)	1			1		

Significant at *$p < 0.05$ ** $p < 0.25$
[a] = Crude beta coefficient
[b] = Adjusted beta coefficient
$R^2 = 0.554$

Social functioning domain

The results of simple and multivariate linear regression for the social functioning domain are presented in Table 4.28. In a simple linear analysis, testing the factors associated with social functioning domain one by one, the factors which were significantly associated at a significance level of 0.25 were race, marital status and HBV status. Significant linear relationship was shown between marital status and social functioning domain (p=0.036). Those who were single were less likely to have better quality of life in social well-being as compared to those who were married and those who were widowed/divorced (B -1.415, 95% CI: -2.74 to -0.09, p=0.036) holding all variables constant. Overall, the multivariate analysis showed being single was negatively associated with quality of life of social functioning domain with an R^2 value of 0.217. Thus, 21.7% of the variation in improved quality of life in the social functioning domain can be explained by marital status. There was no multicollinearity issue (VIF range 1.1 to 2.5) and all model assumptions were met.

Table 4.28: Association between social functioning domain of OTI scores and socio-demographic factors, clinical status, current dose and years of drug use

Factors	(n=633)	Social functioning Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Age							
20 -30 yrs	56(8.8)	0.623	(-0.94, 2.19)	0.625	1.023	(-0.79, 2.84)	0.269
31-50 yrs	432(68.2)	0.603	(-0.03, 0.13)	0.410	0.745	(-0.35, 1.84)	0.182
51-70 yrs	145(22.9)	1			1		
Gender							
Male	616(97.3)	0.345	(-2.10, 2.79)	0.781	0.857	(-1.72, 3.43)	0.514
Female	17(2.7)	1			1		
Race							
Malay	514(81.2)	-0.673	(-1.68, 0.34)	**0.191****	-0.978	(-2.05, 0.10)	0.074
Non Malay	119(18.8)	1			1		
Marital status							
Single	221(34.9)	-1.331	(-2.63, -0.04)	**0.044****	-1.415	(-2.74, -0.09))	**0.036***
Married	332(52.4)	-0.890	(-2.13, 0.35)	**0.157****	-0.822	(-2.08, 0.44)	0.200
Widowed/divorced	80(12.6)	1			1		
Education level							
No formal education/Primary	270(42.7)	-0.070	(-1.84, 1.69)	0.938	-0.188	(-1.99, 1.62)	0.838
Secondary	327(51.7)	0.051	(-1.70, 1.80)	0.954	-0.046	(-1.82, 1.73)	0.959
Tertiary	36(5.7)	1			1		
Employment status							
Employed	533(84.2)	-0.251	(-1.33, 0.83)	0.649	-0.649	(-1.88, 0.58)	0.299
Unemployed	100(15.8)	1			1		

Significant at *$p < 0.05$ ** $p < 0.25$

[a] = Crude beta coefficient

[b] = Adjusted beta coefficient

Table 4.28 continued

Factors	(n=633)	Social functioning Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Pre employment status							
Employed	462(73)	0.428	(-0.46, 1.32)	0.345	0.581	(-0.42, 1.59)	0.257
Unemployed	171(27)	1			1		
HIV							
Positive	74(11.7)	-0.625	(-1.85, 0.60)	0.318	-0.461	(-1.80, 0.87)	0.498
Negative	559(88.3)	1			1		
HCV							
Positive	300(47.4)	-0.174	(-0.97, 0.62)	0.665	-0.038	(-0.88, 0.80)	0.929
Negative	333(52.6)	1			1		
HBV							
Positive	28(4.4)	-1.154	(-3.07, 0.77)	**0.238****	-1.097	(-3.09, 0.89)	0.279
Negative	605(95.6)	1			1		
Dose							
<30mg	95(15)	-0.020	(-1.59, 1.54)	0.980	0.1	(-1.48, 1.68)	0.901
31-60mg	266(42)	0.208	(-1.12, 1.54)	0.759	0.226	(-1.15, 1.60)	0.747
61-90mg	201(31.8)	0.022	(-1.35, 1.40)	0.974	0.023	(-1.39, 1.43)	0.975
>91mg	71(11.2)	1			1		
Year of drug use							
< 10 yrs	182(28.8)	0.382	(-0.69, 1.46)	0.484	0.114	(-1.16, 1.39)	0.860
11-20 yrs	288(45.5)	0.266	(-0.71, 1.24)	0.592	0.03	(-1.05, 1.11)	0.956
>21yrs	163(25.8)	1			1		

Significant at *$p < 0.05$ ** $p < 0.25$
[a] = Crude beta coefficient
[b] = Adjusted beta coefficient
$R^2 = 0.217$

Crime domain

The results of simple and multivariate linear regression for crime domain are presented in Table 4.29. In a simple linear analysis, testing the factors associated with crime domain one by one, the factors which were significantly associated at a significance level of 0.25 were age, gender, marital status, HIV status and current dose. Significant linear relationship was shown between gender and involvement in crime (P=0.005). For every male drug addict who joined the program, we estimate there will be reduction in crime activity by 0.4 units holding HIV and current dose constant. The HIV negative respondents less likely to be involve in crime as compared to HIV positive respondents, holding gender and dose constant (p=0.039, 95% CI: -0.30 to -0.01). Those who were taking 61mg – 90mg of methadone dose (p=0.046, 95% CI: -0.31 to -0.00) had good quality of life and were not involvedcrime, holding gender and HIV status constant. Overall, the multivariate analysis showed being male was positively associated in reducing crime activity and being HIV negative and taking methadone dose of 61mg – 90mg were negatively associated with crime domain with an R^2 value of 0.425. Thus, 42.5% of the variation in reducing crime rate can be explained by gender, HIV status and current dose. There was no multicollinearity issue (VIF range 1.1 to 2.7) and all model assumptions were met.

Table 4.29: Association between crime domain of OTI scores and socio-demographic factors, clinical status, current dose and years of drug use

Factors	(n=633)	Crime Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Age							
20 -30 yrs	56(8.8)	0.097	(-0.08, 0.27)	0.268	0.099	(-0.10, 0.30)	0.326
31-50 yrs	432(68.2)	0.072	(-0.03, 0.18)	**0.180****	0.054	(-0.07, 0.17)	0.38
51-70 yrs	145(22.9)	1			1		
Gender							
Male	616(97.3)	-0.396	(-0.66, 0.13)	**0.004****	-0.401	(-0.68, -0.12)	**0.005***
Female	17(2.7)	1			1		
Race							
Malay	514(81.2)	0.033	(-0.08, 0.14)	0.567	0.025	(-0.09, 0.14)	0.676
Non Malay	119(18.8)	1			1		
Marital status							
Single	221(34.9)	0.083	(-0.06, 0.23)	0.258	0.095	(-0.05, 0.24)	0.198
Married	332(52.4)	0.084	(-0.05, 0.22)	**0.229****	0.083	(-0.06, 0.22)	0.237
Widowed/divorced	80(12.6)	1			1		
Education level							
No formal education/Primary	270(42.7)	0.015	(-0.18, 0.24)	0.881	0.035	(-0.16, 0.23)	0.730
Secondary	327(51.7)	0.045	(-0.15, 0.24)	0.644	0.063	(-0.13, 0.26)	0.527
Tertiary	36(5.7)	1			1		
Employment status							
Employed	533(84.2)	-0.029	(-0.15, 0.09)	0.631	0.044	(-0.09, 0.18)	0.522
Unemployed	100(15.8)	1			1		

Significant at *$p < 0.05$ ** $p < 0.25$

[a] = Crude beta coefficient

[b] = Adjusted beta coefficient

Table 4.29 continued

Factors	(n=633)	Crime Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Pre employment status							
Employed	462(73)	-0.051	(-0.15, -0.05)	0.305	-0.058	(-0.17, 0.05)	0.300
Unemployed	171(27)	1			1		
HIV							
Positive	74(11.7)	1			1		
Negative	559(88.3)	-0.148	(-0.28, -0.01)	**0.032****	-0.154	(-0.30, -0.01)	**0.039***
HCV							
Positive	300(47.4)	1			1		
Negative	333(52.6)	-0.009	(-0.10, 0.08)	0.841	-0.003	(-0.10, 0.09)	0.948
HBV							
Positive	28(4.4)	1			1		
Negative	605(95.6)	0.089	(-0.12, 0.30)	0.409	0.117	(-0.10, 0.33)	0.291
Dose							
<30mg	95(15)	-0.194	(-0.37, -0.02)	**0.027****	-0.170	(-0.34, 0.003)	0.054
31-60mg	266(42)	-0.113	(-0.26, 0.03)	**0.130****	-0.058	(-0.21, 0.09)	0.450
61-90mg	201(31.8)	-0.2	(-0.35, -0.05)	**0.009****	-0.157	(-0.31, 0.003)	**0.046***
>91mg	71(11.2)	1			1		
Year of drug use							
< 10 yrs	182(28.8)	0.003	(-0.12, 0.21)	0.965	-0.035	(-0.17, 0.10)	0.621
11-20 yrs	288(45.5)	0.011	(-0.10, 0.12)	0.848	-0.006	(-0.12, 0.11)	0.920
>21yrs	163(25.8)	1			1		

Significant at *$p < 0.05$ ** $p < 0.25$
[a] = Crude beta coefficient
[b] = Adjusted beta coefficient
$R^2 = 0.425$

Health domain

The results of simple and multivariate linear regression for health domain are presented in Table 4.30. In a simple linear analysis, testing the factors associated with health domain one by one, the factors which were significantly associated at a significance level of 0 were age, race, marital status, education level, current employment status, pre-treatment employment status, and HIV status. Significant linear relationship was shown between HIV status and health status (P<0.001, 95% CI: 0.59, 1.54). The model predicts that for every one unit increase decrease in HIV negative status, the health status would increase by1.0 units holding all other variables constant. Overall, the multivariate analysis showed being HIV negative was positively associated with quality of life of health domain with an R^2 value of 0.610. Thus, 61.0% of the variation in improved quality of life in the health domain can be explained by HIV status. There was no multicollinearity issue (VIF range 1.1 to 5.0) and all model assumptions were met.

Table 4.30: Association between health domain of OTI scores and socio-demographic factors, clinical status, current dose and years of drug use

Factors	(n=633)	Health Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Age							
20 -30 yrs	56(8.8)	0.301	(-0.27, 0.87)	0.297	0.336	(-0.31, 0.98)	0.307
31-50 yrs	432(68.2)	-0.204	(-0.55, 0.14)	**0.247****	-0.229	(-0.62, 0.16)	0.248
51-70 yrs	145(22.9)	1			1		
Gender							
Male	616(97.3)	0.106	(-0.78, 0.99)	0.814	0.305	(-0.61, 1.22)	0.514
Female	17(2.7)	1			1		
Race							
Malay	514(81.2)	0.22	(-0.15, 0.59)	**0.238****	0.257	(-0.13, 0.64)	0.187
Non Malay	119(18.8)	1			1		
Marital status							
Single	221(34.9)	-0.311	(-0.78, 0.16)	**0.195****	-0.381	(-0.85, 0.09)	0.112
Married	332(52.4)	-0.241	(-0.69, 0.21)	0.292	-0.234	(-0.68, 0.21)	0.304
Widowed/divorced	80(12.6)	1			1		
Education level							
No formal education/Primary	270(42.7)	-0.341	(-0.98, 0.30)	0.296	-0.277	(-0.92, 0.37)	0.398
Secondary	327(51.7)	-0.442	(-1.08, 0.19)	**0.170****	-0.315	(-0.95, 0.32)	0.327
Tertiary	36(5.7)	1			1		
Employment status							
Employed	533(84.2)	-0.457	(-0.85, -0.07)	**0.022****	-0.281	(-0.72, 0.16)	0.206
Unemployed	100(15.8)	1			1		

Significant at *$p < 0.05$ ** $p < 0.25$

[a] = Crude beta coefficient

[b] = Adjusted beta coefficient

Table 4.30 continued

Factors	(n=633)	Health Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Pre-employment status							
Employed	462(73)	-0.32	(-0.64, 0.002)	**0.051****	-0.286	(-0.64, 0.07)	0.117
Unemployed	171(27)	1			1		
HIV							
Positive	74(11.7)	1			1		
Negative	559(88.3)	0.901	(0.46, 1.34)	**<0.000****	1.064	(0.59, 1.54)	**<0.000***
HCV							
Positive	300(47.4)	1			1		
Negative	333(52.6)	0.073	(-0.21, 0.36)	0.618	0.219	(-0.08, 0.52)	0.150
HBV							
Positive	28(4.4)	1			1		
Negative	605(95.6)	-0.321	(-1.02, 0.38)	0.367	-0.088	(-0.79, 0.62)	0.807
Dose							
<30mg	95(15)	0.178	(-0.39, 0.74)	0.538	0.282	(-0.28, 0.84)	0.325
31-60mg	266(42)	0.275	(-0.21, 0.76)	0.263	0.462	(-0.03, 0.95)	0.064
61-90mg	201(31.8)	0.11	(-0.39, 0.61)	0.666	0.327	(-0.17, 0.83)	0.201
>91mg	71(11.2)	1			1		
Year of drug use							
< 10 yrs	182(28.8)	0.002	(-0.39, 0.39)	0.994	0.07	(-0.38, 0.52)	0.761
11-20 yrs	288(45.5)	-0.11	(-0.46, 0.24)	0.543	-0.005	(-0.39, 0.38)	0.978
>21yrs	163(25.8)	1			1		

Significant at *$p < 0.05$ ** $p < 0.25$
[a] = Crude beta coefficient
[b] = Adjusted beta coefficient
$R^2 = 0.610$

4.3 Satisfaction level of methadone respondents

4.3.1 Level of satisfaction using PSQ scores by items and domains

Table 4.31 shows PSQ scoring by mean score, frequency and percentage for each item for all four domains. All items have similar satisfactory mean score (range 2.8 to 3.2). Between communication & time spent with doctor (Mean=12.00, SD 1.21) and financial support & accessibility (Mean=12.21, SD 1.33) respondents have greatest satisfaction from lesser financial burden and also faster and easier accessibility to clinic or hospital. More than 95% of the respondents were satisfied with the technical & interpersonal skills of the doctors and staff (Mean=9.33, SD=1.30). **G**enerally, more than 95% of respondents were satisfied with the medical care and treatment they received (Mean=6.08, SD=0.67).

Table 4.31: Level of satisfaction by items and domains using PSQ mean score (n=633)

Items	Satisfied (%)		Dissatisfied (%)		
	Strongly Agree (Score 1)	Agree (Score 2)	Disagree (Score 3)	Strongly Disagree (Score 4)	Mean±(SD)
General (total score range 2 - 8)					
The medical care I have been receiving is just about perfect	111 (17.5)	509 (80.4)	12 (1.9)	1 (0.2)	3.15±(0.42)
I am dissatisfied with some things about the medical care I receive	5 (0.8)	77 (12.2)	509 (80.4)	42 (6.6)	2.93±(0.46)
Total Mean					**6.08±(0.67)**
Technical & interpersonal (total score range 3 - 12)					
I think my doctor's office has everything needed to provide complete medical care	90 (14.2)	513 (81.0)	29 (4.6)	1 (0.2)	3.09±(0.43)
When I go for medical care, they are careful to check everything when treating and examining me	98 (15.5)	516 (81.5)	16 (2.5)	3 (0.5)	3.12±(0.40)
My doctors treat me in a very friendly and courteous manner	105 (16.6)	496 (78.4)	30 (4.7)	2 (0.3)	3.11±(0.46)
Total Mean					**9.33±(1.03)**
Communication & time spent with doctor (total score range 4 - 16)					
Doctors are good about explaining the reason for medical test	126 (19.9)	500 (79.0)	6 (0.9)	1 (0.2)	3.19±(0.42)
Those who provide my medical care sometimes hurry too much when they treat me	6 (0.9)	66 (10.4)	491(77.6)	70 (11.1)	2.99±(0.47)
Doctors sometimes ignore what I tell them	3 (0.5)	62 (9.8)	505 (79.8)	63 (10.0)	2.99±(0.50)
Doctors usually spend plenty of time with me	46 (7.3)	442 (69.8)	139 (22.0)	6 (0.9)	2.83±(0.55)
Total Mean					**12.00±(1.21)**

Table 4.31 continued

Items	Satisfied (%)		Dissatisfied (%)		
	Strongly Agree (Score 1)	**Agree (Score 2)**	**Disagree (Score 3)**	**Strongly Disagree (Score 4)**	**Mean±(SD)**
Financial & accessibility (total score range 4 - 16)					
I feel confident that I can get the medical care I need without being set back financially	208 (32.9)	400 (63.2)	22 (3.5)	3 (0.5)	3.28±(0.55)
I have easy access to the medical specialist I need	81 (12.8)	492 (77.7)	59 (9.3)	1 (0.2)	3.03±(0.48)
Where I get medical care, people have to wait too long for treatment	16 (2.5)	99 (15.6)	472 (74.6)	46 (7.3)	2.87±(0.56)
I am able to get medical care whenever I need it	66 (10.4)	520 (82.1)	43 (6.8)	4 (0.6)	3.02±(0.44)
Total Mean					**12.21±(1.33)**

4.3.2 Comparison of mean scores of satisfaction of methadone clients as shown by PSQ domains by socio-demographic, clinical status, current dose, and years of drug use after joining the treatment

Table 4.32 illustrates the overall results of factors associated with satisfaction level of methadone clients using PSQ scores. The mean score, standard deviation, t value and p value of each domain across socioeconomic characteristics, blood borne diseases status on HIV, Hepatitis B and Hepatitis C, current dose intake and years of drug use is presented. The score for general domain ranged from 2 to 8, for technical & interpersonal domain ranged from 3 to 12, communication & time spent with doctor domain ranged from 4 to 16 and financial & accessibility domain ranged from 4 to 16 too. Those respondents employed prior to starting the treatment were satisfied with the treatment modality in all domains and this was proven significant as shown in communication & time spent time with doctors (p=0.02). HCV negative respondents had higher satisfaction levels in all four domains with p-value of <0.05 than HCV positive respondents. HBV negative respondents too had higher satisfaction level in all domains; general domain (p=0.02), communication & time spent with doctor domain (p=0.03) and financial & accessibility domain (p=0.03) except for technical & interpersonal domain. The number of years respondents were involved in drug use showed statistically significant satisfaction towards the program in the general domain F (631) =4.63, p=0.01. Post-hoc comparisons were performed using Tukey adjustment for multiple comparisons. The test revealed that respondents exposed to drugs for less than 10 years had greater satisfaction towards the program in all four domains compared to those exposed more than 10 years.

Table 4.32: Comparison of mean scores of PSQ domains by socio-demographic, clinical status, current dose, and years of drug use

Factors	Domain 1 General (Score range 2-8)		Domain 2 Technical & interpersonal (Score range 3-12)		Domain 3 Communication & time spent with doctor (Score range 4-16)		Domain 4 Financial & accessibility (Score range 4-16)	
	Mean ±(SD)	**t/F, *p* value**	**Mean ±(SD)**	**t/F, *p* value**	**Mean ±(SD)**	**t/F, *p* value**	**Mean ±(SD)**	**t/F, *p* value**
Age								
20 - 30years	6.20±0.75		9.46±1.06		12.05±1.23		12.48±1.38	
31 - 50years	6.10±0.67	F=2.46	9.34±1.02	F=1.09	12.03±1.22	F=0.79	12.21±1.33	F=1.69
51 - 70years	5.99±0.65	p=0.09	9.23±1.09	p=0.34	11.89±1.18	p=0.46	12.10±1.31	p=0.19
Gender								
Male	6.09±0.66	t=1.25	9.31±1.03	t=-1.54	12.00±1.21	t=0.00	12.21±1.33	t=0.28
Female	5.88±0.86	p=0.21	9.71±1.16	p=0.13	12.00±1.27	p=1.00	12.12±1.41	p=0.78
Race								
Malay	6.10±0.64	t=1.03	9.31±1.04	t=-0.91	12.01±1.20	t=0.59	12.23±1.32	t=0.95
Non Malay	6.03±0.80	p=0.30	9.40±1.04	p=0.36	11.94±1.28	p=0.56	12.10±1.39	p=0.34
Marital status								
Single	6.10±0.69		9.32±0.99		11.91±1.20		12.18±1.34	
Married	6.08±0.67	F=0.08	9.33±1.04	F=0.03	12.09±1.25	F=1.83	12.23±1.37	F=0.17
Widowed/divorced	6.06±0.62	p=0.92	9.31±1.13	p=0.97	11.89±1.08	p=0.16	12.16±1.17	p=0.84
Education								
No formal education/Primary	6.07±0.69		9.29±1.15		11.97±1.19		12.11±1.38	
Secondary	6.09±0.65	F=0.06	9.33±0.93	F=1.06	12.00±1.21	F=0.71	12.24±1.27	F=2.52
Tertiary	6.11±0.79	p=0.94	9.56±1.03	p=0.35	12.22±1.44	p=0.49	12.61±1.46	p=0.08
Employment status								
Employed	6.08±0.67	t=0.13	9.32±1.05	t=0.05	12.02±1.24	t=0.72	12.22±1.37	t=-0.78
Unemployed	6.09±0.65	p=0.90	9.33±0.95	p=0.96	11.92±1.05	p=0.47	12.11±1.14	p=0.44
Pre-employment status								
Employed	6.10±0.69	t=-0.81	9.35±1.09	t=-0.83	12.07±1.25	t=2.30	12.24±1.40	t=-0.95
Unemployed	6.05±0.62	p=0.42	9.27±0.87	p=0.41	11.82±1.08	**p=0.02***	12.12±1.13	p=0.34

Significant at **p* value <0.05

Table 4.32 continued

Factors	Domain 1 General (Score range 2-8)		Domain 2 Technical & interpersonal (Score range 3-12)		Domain 3 Communication & time spent with doctor (Score range 4-16)		Domain 4 Financial & accessibility (Score range 4-16)	
	Mean ±(SD)	**t/F, *p* value**	**Mean ±(SD)**	**t/F, *p* value**	**Mean ±(SD)**	**t/F, *p* value**	**Mean ±(SD)**	**t/F, *p* value**
HIV								
Positive	6.09±0.53	t=0.17	9.27±0.82	t=-0.49	12.07±0.96	t=0.51	12.15±0.90	t=-0.39
Negative	6.08±0.69	p=0.87	9.33±1.07	p=0.63	11.99±1.24	p=0.61	12.21±1.38	p=0.70
HCV								
Positive	5.95±0.60	t=-4.67	9.21±1.00	t=-2.75	11.87±1.10	t=-2.51	12.06±1.25	t=-2.69
Negative	6.20±0.71	**p=0.00***	9.43±1.06	**p=0.01***	12.11±1.30	**p=0.01***	12.34±1.39	**p=0.01***
HBV								
Positive	5.79±0.63	t=-2.40	9.07±0.98	t=-1.33	11.50±1.07	t=-2.24	11.68±0.95	t=-2.14
Negative	6.10±0.67	**p=0.02***	9.34±1.04	p=0.19	12.02±1.21	**p=0.03***	12.23±1.35	**p=0.03***
Current dose								
<30mg	6.13±0.61		9.24±0.90		11.74±1.12		11.96±1.27	
31-60mg	6.13±0.73		9.31±1.10		12.09±1.25		12.26±1.40	
61-90mg	6.01±0.68	F=1.45	9.38±1.08	F=0.43	12.05±1.27	F=2.57	12.21±1.30	F=1.43
>91mg	6.03±0.45	p=0.23	9.32±0.81	p=0.74	11.85±0.97	p=0.06	12.32±1.25	p=0.23
Duration of drug use								
<10years	6.21±0.80		9.48±1.08		12.03±1.38		12.30±1.40	
11 -20years	6.03±0.58	F=4.63	9.27±0.98	F=2.79	11.99±1.13	F=0.07	12.10±1.31	F=1.64
>21years	6.04±0.64	**p=0.01***	9.26±1.08	p=0.06	11.98±1.17	p=0.93	12.28±1.30	p=0.20

Significant at **p* value <0.05

4.3.3 Factors associated with satisfaction of methadone clients as shown by PSQ domains by socio-demographic, clinical status, current dose, and years of drug use after joining the treatment

General domain

The results of simple and multivariate linear regression for general domain are presented in Table 4.33. In a simple linear analysis, testing the factors associated with general domain one by one, the factors which were significantly associated at a significance level of 0.25 were age, HCV status and years of drug use. The HCV negative respondents were more likely to be satisfied generally on the treatment modality than HCV positive respondents holding years of drug use constant (p=0.005, 95% CI: 0.05 to 0.27). There was a significant linear relationship between years of drug use and the general domain. The model predicts that for every one unit decrease in years of drug use (11 - 20years), the satisfaction level increased by 0.16 units holding HCV status constant. Overall, the multivariate analysis showed HCV status to be positively associated with general domain and years of drug use negatively with associated with general domain with a R^2 value of 0.639. Thus, 63.9% of the variation in increased satisfaction in the general domain can be explained by HCV and HBV status. There was no multicollinearity issue (VIF range 1.1 to 1.8) and all model assumptions were met.

Table 4.33: Association between general domain of PSQ scores and socio demographic factors, clinical status, current dose and years of drug use

Factors	(n=633)	General Domain					
		Simple Linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Age							
20 -30 yrs	56(8.8)	0.221	(-0.02, 0.43)	**0.036****	0.225	(-0.01, 0.46)	0.064
31-50 yrs	432(68.2)	0.102	(-0.02, 0.23)	**0.113****	0.14	(-0.04, 0.28)	0.057
51-70 yrs	145(22.9)	1			1		
Gender							
Male	616(97.3)	-0.036	(-0.36, 0.29)	0.825	0.019	(-0.32. 0.36)	0.910
Female	17(2.7)	1			1		
Race							
Malay	514(81.2)	-0.033	(-0.17, 0.10)	0.625	-0.067	(-0.21, 0.07)	0.209
Non Malay	119(18.8)	1			1		
Marital status							
Single	221(34.9)	0.054	(-0.12, 0.23)	0.537	0.011	(-0.16, 0.19)	0.903
Married	332(52.4)	0.025	(-0.14, 0.19)	0.762		(-0.17, 0.17)	0.990
Widowed/divorced	80(12.6)	1			1		
Education level							
No formal education/Primary	270(42.7)	-0.111	(-0.35, 0.12)	0.351	-0.054	(-0.29, 0.18)	0.657
Secondary	327(51.7)	-0.072	(-0.30, 0.16)	0.542	-0.014	(-0.25, 0.22)	0.903
Tertiary	36(5.7)	1			1		
Employment status							
Employed	533(84.2)	0.003	(-0.14, 0.15)	0.972	0.008	(-0.15, 0.17)	0.924
Unemployed	100(15.8)	1			1		
Pre employment status							
Employed	462(73)	0.008	(-0.11, 0.13)	0.889	-0.012	(-0.14, 0.12)	0.864
Unemployed	171(27)	1			1		

Significant at *$p < 0.05$ **$p < 0.25$

[a] = Crude beta coefficient

[b] = Adjusted beta coefficient

Table 4.33 continued

Factors	(n=633)	General Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
HIV							
Positive	74(11.7)	1			1		
Negative	559(88.3)	0.032	(-0.13, 0.20)	0.701	-0.060	(-0.24, 0.12)	0.499
HCV							
Positive	300(47.4)	1			1		
Negative	333(52.6)	0.169	(0.65, 0.27)	**0.002****	0.157	(0.05, 0.27)	**0.005***
HBV							
Positive	28(4.4)	1			1		
Negative	605(95.6)	0.235	(-0.02, 0.49)	0.069	0.16	(-0.10, 0.42)	0.230
Dose							
<30mg	95(15)	0.025	(-0.23, 0,18)	0.814	-0.039	(0.25, 0.17)	0.710
31-60mg	266(42)	0.068	(-0.11, 0.24)	0.450	0.057	(-0.12, 0.24)	0.532
61-90mg	201(31.8)	0.003	(-0.18, 0.19)	0.971	0.006	(-0.18, 0.19)	0.949
>91mg	71(11.2)	1			1		
Year of drug use							
< 10 yrs	182(28.8)	0.013	(-0.13, 0.16)	0.853	-0.093	(-0.26, 0.07)	0.274
11-20 yrs	288(45.5)	0.125	(-0.25, 0.004)	**0.050****	-0.168	(-0.31, -0.03)	**0.020***
>21yrs	163(25.8)	1			1		

Significant at *$p < 0.05$ **$p < 0.25$
[a] = Crude beta coefficient
[b] = Adjusted beta coefficient
$R^2 = 0.639$

Technical & interpersonal domain

The results of simple and multivariate linear regression for general domain with respect to the technical and interpersonal domain are presented in Table 4.34. In a simple linear analysis, testing the factors associated with technical & interpersonal domain one by one, the factors which were significantly associated at a significance level of 0.25 were age, HIV, HCV and HBV. The HCV negative respondents) were more likely to have greater satisfaction in the technical & interpersonal domain than HCV positive respondents, holding HBV constant (p=0.036, 95% CI: 0.01 to 0.35. There was a significant linear relationship between HBV status and the technical & interpersonal domain. The model predicts that for every one unit increase in HBV negative status, the satisfaction level will increase by 0.41 units holding HCV constant. Overall, the multivariate analysis showed that HCV and HBV status were positively associated with technical & interpersonal domain, with an R^2 value of 0.329. Thus, 32.9% of the variation in increased satisfaction in technical & interpersonal domain can be explained by HCV and HBV status. There was no multicollinearity issue (VIF range 1.0 to 5.0) and all model assumptions were met.

Table 4.34: Association between technical & interpersonal domain of PSQ scores and socio demographic factors, clinical status, current dose and years of drug use.

Factors	(n=633)	Technical & interpersonal Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Age							
20 -30 yrs	56(8.8)	0.465	(0.15, 0.78)	**0.004****	0.347	(-0.02, 0.72)	0.347
31-50 yrs	432(68.2)	0.235	(0.04, 0.43)	**0.018****	0.188	(-0.04, 0.41)	0.188
51-70 yrs	145(22.9)	1			1		
Gender							
Male	616(97.3)	-0.27	(-0.77, 0.23)	0.290	-0.103	(-0.63, 0.42)	0.699
Female	17(2.7)	1			1		
Race							
Malay	514(81.2)	-0.044	(-0.25, 0.16)	0.675	-0.117	(-0.34, 0.10)	0.294
Non Malay	119(18.8)	1			1		
Marital status							
Single	221(34.9)	0.018	(-0.25, 0.28)	0.895	-0.039	(-0.31, 0.23)	0.778
Married	332(52.4)	0.013	(-0.24, 0.27)	0.921	-0.005	(-0.26, 0.25)	0.968
Widowed/divorced	80(12.6)	1			1		
Education level							
No formal education/Primary	270(42.7)	-0.128	(-0.49, 0.23)	0.488	-0.019	(-0.39, 0.35)	0.918
Secondary	327(51.7)	-0.071	(-0.43, 0.29)	0.696	0.016	(-0.34, 0.38)	0.929
Tertiary	36(5.7)	1			1		
Employment status							
Employed	533(84.2)	-0.041	(-0.26, 0.18)	0.717	-0.098	(-0.35, 0.15)	0.438
Unemployed	100(15.8)	1			1		
Pre employment status							
Employed	462(73)	0.045	(-0.14, 0.23)	0.626	0.035	(-0.17, 0.24)	0.740
Unemployed	171(27)	1			1		

Significant at *$p < 0.05$ **$p < 0.25$

[a] = Crude beta coefficient

[b] = Adjusted beta coefficient

Table 4.34 continued

Factors	(n=633)	Technical & interpersonal Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
HIV							
Positive	74(11.7)	1			1		
Negative	559(88.3)	0.170	(-0.08, 0.42)	**0.186****	0.040	(-0.23, 0.31)	0.774
HCV							
Positive	300(47.4)	1			1		
Negative	333(52.6)	0.232	(0.07, 0.39)	**0.005****	0.182	(0.01, 0.35)	**0.036***
HBV							
Positive	28(4.4)	1			1		
Negative	605(95.6)	0.527	(0.14, 0.92)	**0.008****	0.413	(0.01, 0.82)	**0.045***
Dose							
<30mg	95(15)	-0.043	(-0.36, 0.28)	0.791	-0.096	(-0.42, 0.23	0.556
31-60mg	266(42)	0.028	(-0.25, 0.30)	0.843	-0.011	(-0.29, 0.27)	0.937
61-90mg	201(31.8)	0.077	(-0.20, 0.36)	0.590	0.063	(-0.22. 0.35)	0.667
>91mg	71(11.2)	1			1		
Year of drug use							
< 10 yrs	182(28.8)	0.244	(0.03, 0.46)	0.029	0.103	(-0.16, 0.36)	0.433
11-20 yrs	288(45.5)	0.035	(-0.16, 0.23)	0.729	-0.019	(-0.24, 0.20)	0.865
>21yrs	163(25.8)	1			1		

Significant at *$p < 0.05$ **$p < 0.25$
[a] = Crude beta coefficient
[b] = Adjusted beta coefficient
$R^2 = 0.329$

Communication and time spent with doctors' domain

The results of simple and multivariate linear regression for general domain with respect to the communication with and time spent with doctors' are presented in Table 4.35. In a simple linear analysis, testing the factors associated with communication and time spent with doctors' domain one by one, the factors which were significantly associated at a significance level of 0.25 were age, gender, pre-treatment employment status, HCV negative status, HBV negative status and current dose. There was a significant linear relationship between HBV status and communication and time spent with doctors' domain. The model predicts that for every one unit increase in HBV negative status, the satisfaction level increased by 0.25 units holding all other variables constant. Overall, the multivariate analysis showed that HBV status was positively associated with communication and time spent with doctors' domain with an R^2 value of 0.463. Thus, 46.3% of the variation in increased satisfaction in communication and time spent with doctors domain can be explained by HBV status. There was no multicollinearity issue (VIF range 1.1 to 5.0) and all model assumptions were met.

Table 4.35: Association between communication and time spent with doctor's domain of PSQ scores and socio-demographic factors, clinical status, current dose and years of drug use

Factors	(n=633)	Communication & time spent with doctor Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Age							
20 -30 yrs	56(8.8)	0.314	(-0.06, 0.69)	**0.100****	0.278	(-0.16, 0.71)	0.278
31-50 yrs	432(68.2)	0.131	(-0.10, 0.36)	0.260	0.125	(-0.14, 0.39)	0.125
51-70 yrs	145(22.9)	1			1		
Gender							
Male	616(97.3)	-0.423	(-1.01, 0.16)	**0.156****	-0.397	(-1.01, 0.22)	0.205
Female	17(2.7)	1			1		
Race							
Malay	514(81.2)	-0.103	(-0.35, -0.14)	0.402	-0.138	(-0.39, 0.12)	0.292
Non Malay	119(18.8)	1			1		
Marital status							
Single	221(34.9)	0.078	(-0.23, 0.39)	0.620	0.063	(-0.25, 0.38)	0.696
Married	332(52.4)	0.115	(-0.18, 0.41)	0.448	0.103	(-0.20, 0.40)	0.502
Widowed/divorced	80(12.6)	1			1		
Education level							
No formal education/Primary	270(42.7)	-0.056	(-0.48, 0.37)	0.796	0.021	(-0.41, 0.45)	0.210
Secondary	327(51.7)	-0.062	(-0.48, 0.36)	0.772	0.013	(-0.41, 0.44)	0.138
Tertiary	36(5.7)	1			1		
Employment status							
Employed	533(84.2)	-0.024	(-0.28, 0.24)	0.857	-0.083	(-0.38, 0.21)	0.576
Unemployed	100(15.8)	1			1		
Pre employment status							
Employed	462(73)	0.168	(-0.05, 0.38)	**0.121****	0.199	(-0.04, 0.44)	0.104
Unemployed	171(27)	1			1		

Significant at *$p < 0.05$ **$p < 0.25$

[a] = Crude beta coefficient

[b] = Adjusted beta coefficient

Table 4.35 continued

Factors	(n=633)	Communication & time spent with doctor Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
HIV							
Positive	74(11.7)	1			1		
Negative	559(88.3)	0.046	(-0.25, 0.34)	0.760	-0.084	(-0.40, 0.23)	0.603
HCV							
Positive	300(47.4)	1			1		
Negative	333(52.6)	0.120	(-0.07, 0.31)	**0.212****	0.076	(0.13, 0.28)	0.400
HBV							
Positive	28(4.4)	1			1		
Negative	605(95.6)	0.336	(0.12, 0.80)	**0.151****	0.257	(0.22, 0.73)	**0.028***
Dose							
<30mg	95(15)	0.011	(-0.36, 0.38)	0.953	-0.008	(-0.39, 0.37)	0.967
31-60mg	266(42)	0.225	(-0.09, 0.54)	**0.164****	0.205	(-0.12, 0.53)	0.221
61-90mg	201(31.8)	0.229	(-0.10, 0.56)	**0.172****	0.234	(-0.10, 0.57)	0.173
>91mg	71(11.2)	1			1		
Year of drug use							
< 10 yrs	182(28.8)	0.109	(-0.15, 0.37)	0.403	0.02	(-0.28, 0.32)	0.899
11-20 yrs	288(45.5)	-0.083	(-0.32, 0.15)	0.487	-0.124	(-0.38, 0.13)	0.346
>21yrs	163(25.8)	1			1		

Significant at *$p < 0.05$ **$p < 0.25$
[a] = Crude beta coefficient
[b] = Adjusted beta coefficient
$R^2 = 0.463$

Financial support and accessibility domain

The results of simple and multivariate linear regression for general domain with respect to finances and accessibility are presented in Table 4.36. In a simple linear analysis, testing the factors associated with financial and accessibility domain one by one, the factors which were significantly associated at a significance level of 0.25 were age, education level, pre-treatment employment status, HCV status, HBV status and years of drug use.. The HCV negative respondents were more likely to be satisfied in the financial and accessibility domain than HCV positive respondents, holding HBV constant (p=0.01, 95% CI: 0.16 to 0.60). There was a significant linear relationship between HBV status and the financial and accessibility domain. The model predicts that for every one unit increase in HBV negative status, the satisfaction level will increase by 0.54 units holding HCV constant. Overall, the multivariate analysis showed HCV and HBV status to be positively associated with technical & interpersonal domain with an R^2 value of 0.329. Thus, 32.9% of the variation in increased satisfaction in financial and accessibility domain can be explained by HCV and HBV status. There was no multicollinearity issue (VIF range 1.1 to 5.0) and all model assumptions were met.

Table 4.36: Association between financial and accessibility domain of PSQ scores and socio-demographic factors, clinical status, current dose and years of drug use

Factors	(n=633)	Financial & accessibility Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*-value
Age							
20 -30 yrs	56(8.8)	0.302	(-0.11, 0.71)	**0.151****	0.122	(-0.35, 0.60)	0.615
31-50 yrs	432(68.2)	0.181	(-0.07, 0.43)	**0.158****	0.095	(-0.19, 0.38)	0.513
51-70 yrs	145(22.9)	1			1		
Gender							
Male	616(97.3)	0.09	(-0.56, 0.74)	0.784	0.227	(-0.45, 0.90)	0.508
Female	17(2.7)	1			1		
Race							
Malay	514(81.2)	0.118	(-0.15, 0.39)	0.384	-0.002	(-0.28, 0.28)	0.988
Non Malay	119(18.8)	1			1		
Marital status							
Single	221(34.9)	-0.029	(-0.37, 0.31)	0.867	-0.094	(-0.44, 0.25)	0.592
Married	332(52.4)	0.053	(-0.27, 0.38)	0.748	0.011	(-0.32, 0.34)	0.946
Widowed/divorced	80(12.6)	1			1		
Education level							
No formal education/Primary	270(42.7)	-0.37	(-0.84, 0.09)	**0.118****	-0.229	(-0.70, 0.24)	0.341
Secondary	327(51.7)	-0.265	(-0.72, 0.20)	**0.259****	-0.15	(-0.61, 0.31)	0.526
Tertiary	36(5.7)	1			1		
Employment status							
Employed	533(84.2)	0.078	(-0.21, 0.36)	0.594	-0.005	(-0.33, 0.32)	0.977
Unemployed	100(15.8)	1			1		
Pre-employment status							
Employed	462(73)	0.153	(-0.08, 0.39)	**0.200****	0.063	(-0.20, 0.33)	0.638
Unemployed	171(27)	1			1		

Significant at *$p < 0.05$ **$p < 0.25$

[a] = Crude beta coefficient

[b] = Adjusted beta coefficient

Table 4.36 continued

Factors	(n=633)	Financial & accessibility Domain					
		Simple linear regression			Multiple linear regression		
		B[a]	95%CI	*p*-value	B[b]	95%CI	*p*- value
HIV							
Positive	74(11.7)	1			1		
Negative	559(88.3)	-0.058	(-0.38, 0.27)	0.725	-0.30	(-0.65, 0.05)	0.091
HCV							
Positive	300(47.4)	1			1		
Negative	333(52.6)	0.39	(0.18, 0.60)	**<0.001****	0.384	(0.16, 0.60)	**0.010***
HBV							
Positive	28(4.4)	1			1		
Negative	605(95.6)	0.589	(0.08, 1.09)	**0.022****	0.542	(0.02, 1.06)	**0.041***
Dose							
<30mg	95(15)	-0.162	(-0.57, 0.25)	0.439	-0.197	(-0.61, 0.22)	0.349
31-60mg	266(42)	0.034	(-0.32, 0.38)	0.849	0.023	(-0.34, 0.38)	0.900
61-90mg	201(31.8)	-0.031	(-0.39, 0.33)	0.865	0.005	(-0.36, 0.37)	0.981
>91mg	71(11.2)	1			1		
Year of drug use							
< 10 yrs	182(28.8)	0.174	(-0.11, 0.46)	**0.226****	0.065	(-0.27, 0.40)	0.700
11-20 yrs	288(45.5)	-0.036	(-0.29, 0.22)	0.781	-0.076	(-0.36, 0.21)	0.597
>21yrs	163(25.8)	1			1		

Significant at *$p < 0.05$ **$p < 0.25$
[a] = Crude beta coefficient
[b] = Adjusted beta coefficient
$R^2 = 0.392$

4.4 Employment outcome

4.4.1 Comparison of overall employment status between pre-treatment and after joining treatment

Employment status is commonly upheld as a very important outcome in the context of drug addiction treatment and also the recovery period. Table 4.37 showed that there was a significant change in employment status of the unemployed respondents at pre-treatment. A total of 103 (16.3%) gained employment and 10.7% remained unemployed after starting the methadone maintenance treatment. After starting treatment, a total of 533 (84.2%) were employed. There was a small percentage (5.1%) of respondents who were employed initially who became unemployed after joining the treatment modality.

Table 4.37: Comparison of overall employment status between pre-treatment and after joining treatment (n=633)

Employment status at pre-treatment	Employment status after joining treatment [n(%)]			
	Unemployed	**Employed**	**Total**	***p*-value**
Unemployed	68 (39.8)	103 (60.2)	171 (27.1)	<0.001*
Employed	32 (6.9)	430 (93.1)	462 (72.9)	
Total	100(15.8)	533 (84.2)	633 (100)	

Significant at *$p < 0.05$

4.4.2 Comparison of employment status between pre-treatment and after joining treatment between year 2007 and 2012

Table 4.38 presents comparison of employment status between pre-treatment and after joining methadone treatment between year 2007 and 2012**.** There were significant changes ($p<0.001$) in employment status of the unemployed respondents at pre-treatment in almost all years, except for year 2010 ($p=0.054$). The numbers of highest employment rate (from unemployed to employed status) after starting treatment was in year 2007 (29) followed by year 2012 (18), 2008 (16), 2010 (16), 2009 (14) and 2011(10) respectively. Almost 44% of respondent from year 2010 showed the highest percentage who were employed before starting treatment but become unemployed after treatment, followed by year 2009 (43%) and year 2010 (31.6%). Those who were employed pre-treatment and after joining treatment were more than 75% in all six years. Unemployment rate after starting treatment by number of years of treatment were 15.7%, 12.9%, 11.5%, 19.4%, 18.2% and 15.5% for those in one, two, three, four, five, and six years of treatment, respectively. Therefore, this study shows that almost 20% of the respondents still unemployed.

Table 4.38: Comparison of employment status between pre-treatment and after joining treatment between year 2007 and 2012 (n=633)

Years of treatment	Employment status at pre treatment	Employment status after treatment [n (%)]			
		Unemployed	Employed	*p*-value	χ^2 (df)
1 year	**Unemployed**	13 (68.4)	18 (17.6)		
2012	**Employed**	6 (31.6)	84 (82.4)		21.668
n=121	**Total**	19(100)	102 (100)	<0.001*	(1)
2 years	**Unemployed**	9 (81.8)	10 (13.5)		
2011	**Employed**	2 (18.2)	64 (86.5)		25.742
n=85	**Total**	11 (100)	74 (100)	<0.001*	(1)
3 years	**Unemployed**	5 (55.6)	16 (23.2)		
2010	**Employed**	4 (44.4)	53 (76.8)		4.239
n=78	**Total**	9 (100)	69 (100)	0.054	(1)
4 years	**Unemployed**	12 (57.1)	14 (16.1)		
2009	**Employed**	9 (42.9)	73 (83.9)		15.596
n=108	**Total**	21 (100)	87 (100)	<0.001*	(1)
5 years	**Unemployed**	14 (77.8)	16 (19.8)		
2008	**Employed**	4 (22.2)	65 (80.2)		23.477
n=99	**Total**	18 (100)	81 (100)	<0.001*	(1)
6 years	**Unemployed**	15 (68.2)	29 (24.2)		
2007	**Employed**	7 (31.8)	91 (75.8)		16.843
n=142	**Total**	22 (100)	120 (100)	<0.001*	(1)

Significant at *$p < 0.05$

4.4.3 Association between employment status at pre-treatment and after joining the treatment

Table 4.39 showed the comparison and association of employment status between pre-treatment and after joining methadone treatment. Gender showed a significant association among those unemployed during pre-treatment and were still unemployed after starting the treatment and among those unemployed during pre-treatment who became employed after treatment (p=0.024). Chi square analysis showed that age, race, HIV status and years of drug use were significantly associated with those employed during pre- treatment who became unemployed and for those still employed after treatment.

Table 4.39: Association between employment status at intake and after joining the treatment

Factors	Employment status from pre treatment to current treatment					
	unemployed to unemployed (n=171)	unemployed to employed	*p*-value	employed to unemployed (n=462)	employed to employed	*p*-value
	(n=68)	(n=103)		(n= 32)	(n=430)	
Age						
20 -30 yrs	4 (30.8)	9 (69.2)		2 (4.7)	41 (95.3)	
31-50 yrs	44 (41.5)	62 958.5)		18 (5.5)	308 (94.5)	
51-70 yrs	20 (38.5)	32 (61.5)	0.737	12 (12.9)	81 (87.1)	**0.039***
Gender						
Male	60 (37.5)	100(62.5)		30 (6.6)	426 (93.4)	
Female	8 (72.7)	3 (27.3)	**0.024 ***	2 (33.3.)	4 (66.7)	0.590
Race						
Malay	51 (41.1)	73 958.9)		22 (5.6)	368 (94.4)	
Non Malay	17 (36.2)	30 (63.8)	0.340	10 (13.9)	62 (86.1)	**0.016 ***
Marital status						
Single	32 (43.8)	41 (56.2)		13 (8.8)	135 (91.2)	
Married	31 (41.9)	43 (58.1)		13 (5.0)	245 (95.0)	
Widowed/divorced	5 (20.8)	19 (79.2)	0.120	6 (10.7)	50 (89.3)	0.177
Education level						
No formal education/Primary	37 (42.5)	50 (57.5)		14 (7.7)	169 (92.3)	
Secondary	29 (38.7)	46 (61.3)		17 (6.7)	235 (93.3)	
Tertiary	2 (22.2)	7 (77.8)	0.479	1 (3.7)	26 (06.3)	0.742
HIV						
Positive	13 (54.2)	11 (45.8)		8 (16.0)	42 984.0)	
Negative	55 (37.4)	92 (62.6)	0.093	24 (5.8)	388 (94.2)	**0.015 ***

Significant at *$p < 0.05$

Table 4.39 Continued

Factors	Employment status from pre treatment to current treatment					
	unemployed to unemployed (n=171)	unemployed to employed	*p*-value	employed to unemployed (n=462)	employed to employed	*p*-value
	(n=68)	(n=103)		(n= 32)	(n=430)	
HCV						
Positive	36 (37.9)	59 (62.1)		16 (7.8)	189 (92.2)	
Negative	32 (42.1)	44 (57.9)	0.344	16 (6.2)	241 (93.8)	0.314
HBV						
Positive	4 (40.0)	6 (60.0)		1 (5.6)	17 (94.4)	
Negative	64 (39.8)	97 (60.2)	0.616	31 (7.0)	413 (93.0)	0.641
Dose						
<30mg	12 (40.0)	18 (60.0)		5 (7.7)	60 (92.3)	
31-60mg	27 (45.8)	32 (54.2)		17 (8.2)	190 (91.8)	
61-90mg	22(37.3)	37 (62.7)		8 (5.6)	134 (94.4)	
>91mg	7 (30.4)	16 (69.6)	0.599	2 (4.2)	46 (95.8)	0.676
Year of drug use						
< 10 yrs	17 (39.5)	26 (60.5)		5 (3.6)	134 (96.4)	
11-20 yrs	26 (39.4)	40 (60.6)		14 (6.3)	208 (93.7)	
> 21 yrs	25 (40.3)	37 (59.7)	0.994	13 (12.9)	88 (87.1)	**0.018***
Duration of MMT						
1 year	13 (41.9)	18 (58.1)		6 (6.7)	84 (93.3)	
2 years	9 (47.4)	10 (52.6)		2 (3.0)	64 (97.0)	
3 years	5 (23.8)	16 (76.2)		4 (7.0)	53 (93.0)	
4 years	12 (46.2)	14 (53.8)		9(11.0)	73 (89.0)	
5 years	14 (46.7)	16 (53.4)		4 (5.8)	65 (94.2)	
6 years	15 (34.1)	29 (65.9)	0.496	7(7.1)	91 (92.9)	0.580

Significant at *$p < 0.05$

4.4.4 Factors associated with current employment status after joining the treatment

Table 4.40 tests the factors associated with employment status one by one, the factors which were significantly associated with employment status at a significance level of 0.25 were age, gender, race, marital status, pre-employment, HIV negative status, years of drug use, WHOQOL-BREF - physical, psychological, social and environment domains and OTI domains - injecting/sex behaviour and health domain. However, it is seen that when these variables were entered together in the model, as how it often occurs in real life with interplay of factors, the results differ.

Table 4.40: Factors associated with being employed and unemployed after joining the treatment using simple logistic regression

	Employment status after joining treatment (n=633)		Simple Logistic regression of current employment status (Employed Vs Unemployed)		
Factors	**Employed (n=533)**	**Unemployed (n=100)**	**Crude OR**	**95%CI**	***p*-value**
Age					
20 -30 yrs	50 (89.3)	6 (10.7)	2.360	(0.92, 6.00)	**0.071***
31-50 yrs	370 (85.6)	62 (14.4)	1.690	(1.05, 2.72)	
51-70 yrs	113 (77.9)	32 (22.1)	1	1	
Gender					
Male	526 (85.4)	90 (14.6)	8.349	(3.09, 22.50)	**<0.001***
Female	7 (41.2)	10 (58.8)	1		
Race					
Malay	441 (85.8)	73 (14.2)	1.773	(1.08, 2.91)	**0.023***
Non Malay	92 (77.3)	27 (22.7)	1		
Marital status					
Single	176 (79.6)	45 (20.4)	1		
Married	288 (86.7)	44 (13.3)	1.674	(1.06, 2.64)	**0.027***
Widowed/divorced	68 (86.2)	11 (13.8)	1.604	(0.78, 3.28)	**0.196***
Education level					
No formal education/Primary	219 (81.1)	51 (18.9)	1		
Secondary	281 (85.9)	46 (14.1)	1.174	(0.63, 2.20)	0.618
Tertiary	33 (91.7)	3 (8.3)	2.590	(0.51, 13.19)	0.252
Pre-employment status					
Employed	103 (60.2)	68 (39.8)	8.871	(5.53, 14.22)	**<0.001***
Unemployed	430 (93.1)	32 (6.9)	1		
HIV					
Positive	53 (71.6)	21 (28.4)	1		
Negative	480 (8.9)	79 (14.1)	2.407	(1.38, 4.21)	**0.002***

Significant at *$p < 0.25$

Table 4.40 continued

Factors	Employment status after joining treatment (n=633)		Simple Logistic regression of current employment status (Employed Vs Unemployed)		
	Employed (n=533)	**Unemployed (n=100)**	**Crude OR**	**95%CI**	***p*- value**
HCV					
Positive	248 (82.7)	52 (17.3)	1		
Negative	285 (85.6)	48 (14.4)	1.245	(0.81, 1.91)	0.315
HBV					
Positive	23 (82.1)	5 (17.9)	1		
Negative	510 (84.3)	95 (15.7)	1.167	(0.43, 3.15)	0.760
Dose					
<30mg	78 (82.1)	17 (17.9)	1		
31-60mg	222 (83.5)	44 (16.5)	1.100	(0.59, 2.04)	0.763
61-90mg	171 (85.1)	30 (14.9)	1.242	(0.647, 2.39)	0.515
>91mg	62 (87.3)	9 (12.7)	1.501	(0.62, 3.59)	0.362
Year of drug use					
< 10 yrs	160 (87.9)	22 (12.1)	2.211	(1.24, 3.93)	**0.007***
11-20 yrs	248 (86.1)	40 (13.9)	1.885	(1.15, 3.09)	**0.012***
> 21 yrs	125 (76.7)	38 (23.3)	1		
Duration of MMT					
1 year	102 (15.7)	19 (84.3)	0.984	(0.50, 1.92)	0.963
2 years	74 (12.9)	11 (87.1)	1.233	(0.56, 2.69)	0.598
3 years	69 (11.5)	9 (88.5)	1.406	(0.61,3.22)	0.422
4 years	87 (19.4)	21 (80.6)	0.760	(0.39, 1.47)	0.413
5 years	81 (18.2)	18 (81.8)	0.825	(0.41, 1.64)	0.581
6 years	120 (15.4)	22 (84.5)	1		

Significant at *$p < 0.25$

Table 4.40 continued

Factors	Employment status after joining treatment (n=633)		Simple Logistic regression of current employment status (Employed Vs Unemployed)		
	Employed (n=533)	Unemployed (n=100)	Crude OR	95%CI	*p*-value
WHOQOL Domains					
Physical	14.86 (2.02)[a]		1.25	(1.12, 1.39)	**<0.001***
Psychological	15.73 (2.22)[a]		1.15	(1.05, 1.26)	**0.003***
Social	14.30 (2.26)[a]		1.22	(1.11, 1.34)	**<0.001***
Environment	14.85 (1.82)[a]		1.22	(1.10, 1.38)	**<0.001***
OTI Domains					
Drug use (Heroin Q)	0.21 (0.51)[a]		0.81	(0.55, 1.18)	0.275
Injecting/Sex behaviour	0.64 (0.73)[a]		1.26	(0.92, 1.72)	**0.156***
Social Functioning	1.02 (0.42)[a]		0.89	(0.53, 1.48)	0.661
Crime	0.02 (0.14)[a]		0.72	(0.19, 2.730	0.633
Health	1.52 (1.84)[a]		0.88	(0.79, 0.980	**0.024***
PSQ Domains					
General	3.04 (0.34)[a]		0.96	(0.51, 1.81)	0.898
Technical & interpersonal	3.11 (0.35)[a]		0.99	(0.53, 1.83)	0.962
Communication & time spent with doctor	3.00 (0.30)[a]		1.3	(0.63, 2.69)	0.472
Financial & accessibility	3.05 (0.33)[a]		1.29	(0.68, 2.48)	0.436

Significant at *$p < 0.25$
a= Mean (SD)

Multiple logistic regression was performed to assess the impact of methadone maintenance treatment on the likelihood that a respondent would report that they had a better employment status. The model contained three independent variables (gender, pre-employment status and HIV status). The full model containing all predictors was statistically significant, Chi square (23, N=633) = 147.67, P<0.001, indicating that the model was able to distinguish between respondents who reported better employment status and poor employment status. The model as a whole explained between 20.2% (Cox and Snell R square) and 34.7% (Nagelkerke R squared) of the variance in employment status and correctly classified 87% of cases. As shown in Table 4.41, only three of the independent variables made a unique statistically significant contribution to the model (male, unemployed before starting treatment and HIV negative). The strongest predictor of reporting employment status after starting treatment was being male, recording an odds ratio of 8.60. This indicated that respondents who were male were almost nine times more likely to find a job compared to female respondents after controlling for other factors. The second highest predictor was being unemployed before starting treatment, recording an odds ratio of 8.18. This indicated that respondents who were not employed before starting methadone treatment were over eight times more likely to report that they could find a job after starting the treatment, controlling for all other factors in the model. HIV negative respondents, showed an odds ratio of 3.02. This indicated that respondents with HIV negative status were three times more likely to find a job compared with those HIV positive, after controlling for other factors.

Table 4.41: Factors associated with being employed and unemployed after joining the treatment using multiple logistic regressions

Factors	Employment status after joining treatment (n=633)		Multiple Logistic regression of current employment status (Employed Vs Unemployed)		
	Employed (n=533)	**Unemployed (n=100)**	**Adjusted OR**	**95%CI**	***p*-value**
Age					
20 -30 yrs	50 (89.3)	6 (10.7)	1.61	(0.47, 5.50)	0.450
31-50 yrs	370 (85.6)	62 (14.4)	1.35	(0.70, 2.59)	0.369
51-70 yrs	113 (77.9)	32 (22.1)	1		
Gender					
Male	526 (85.4)	90 (14.6)	8.60	(2.71, 27.30)	**<0.001***
Female	7 (41.2)	10 (58.8)	1		
Race					
Malay	441 (85.8)	73 (14.2)	1.09	(0.58, 2.04)	0.795
Non Malay	92 (77.3)	27 (22.7)	1		
Marital status					
Single	176 (79.6)	45 (20.4)	1		
Married	288 (86.7)	44 (13.3)	1.42	(0.80, 2.51)	0.233
Widowed/divorced	68 (86.2)	11 (13.8)	1.86	(0.81, 4.30)	0.145
Education level					
No formal education/Primary	219 (81.1)	51 (18.9)	1		
Secondary	281 (85.9)	46 (14.1)	1.03	(0.61, 1.76)	0.912
Tertiary	33 (91.7)	3 (8.3)	2.69	(0.69, 10.54)	0.157
Pre-employment status					
Employed	103 (60.2)	68 (39.8)	1		
Unemployed	430 (93.1)	32 (6.9)	8.18	(4.80, 13.94)	**<0.001***
HIV					
Positive	53 (71.6)	21 (28.4)	1		
Negative	480 (8.9)	79 (14.1)	3.02	(1.43, 6.34)	**0.004***

Significant at *$p < 0.05$

Table 4.41 continued

Factors	Employment status after joining treatment (n=633)		Multiple Logistic regression of current employment status (Employed Vs Unemployed)		
	Employed (n=533)	Unemployed (n=100)	Adjusted OR	95%CI	*p*-value
HCV					
Positive	248 (82.7)	52 (17.3)	1		
Negative	285 (85.6)	48 (14.4)	0.92	(0.53, 1.57)	0.750
HBV					
Positive	23 (82.1)	5 (17.9)	1		
Negative	510 (84.3)	95 (15.7)	0.59	(0.17, 2.05)	0.408
Dose					
<30mg	78 (82.1)	17 (17.9)	1		
31-60mg	222 (83.5)	44 (16.5)	0.63	(0.30, 1.36)	0.239
61-90mg	171 (85.1)	30 (14.9)	1.14	(0.51, 2.55)	0.759
>91mg	62 (87.3)	9 (12.7)	2.20	(0.78, 6.24)	0.137
Year of drug use					
< 10 yrs	160 (87.9)	22 (12.1)	1.29	(0.57, 2.90)	0.539
11-20 yrs	248 (86.1)	40 (13.9)	1.11	(0.58, 2.14)	0.752
> 21 yrs	125 (76.7)	38 (23.3)	1		
Duration of MMT					
1 year	102 (15.7)	19 (84.3)	0.849	(0.38, 1.89)	0.688
2 years	74 (12.9)	11 (87.1)	0.950	(0.37, 2.40)	0.914
3 years	69 (11.5)	9 (88.5)	1.393	(0.53, 3.66)	0.501
4 years	87 (19.4)	21 (80.6)	0.696	(0.32, 1.52)	0.363
5 years	81 (18.2)	18 (81.8)	0.747	(0.34, 1.63)	0.464
6 years	120 (15.4)	22 (84.5)	1		

Significant at *$p < 0.05$

Table 4.41 continued

Factors	Employment status after joining treatment (n=633)		Multiple Logistic regression of current employment status (Employed Vs Unemployed)		
	Employed (n=533)	Unemployed (n=100)	Adjusted OR	95%CI	*p*-value
WHOQOL Domains					
Physical	14.86 (2.02)[a]		1.18	(0.10, 1.40)	0.052
Psychological	15.73 (2.22)[a]		0.98	(0.83, 1.17)	0.849
Social	14.30 (2.26)[a]		1.08	(0.95, 1.23)	0.247
Environment	14.85 (1.82)[a]		1.09	(0.89, 1.34)	0.421
OTI Domains					
Drug use (Heroin Q)	0.21 (0.51)[a]		0.81	(0.5, 1.32)	0.404
Injecting/Sex behaviour	0.64 (0.73)[a]		1.20	(0.83, 1.74)	0.341
Social Functioning	1.02 (0.42)[a]		0.77	(0.38, 1.51)	0.442
Crime	0.02 (0.14)[a]		1.69	(0.37.7.89)	0.501
Health	1.52 (1.84)[a]		0.98	(0.85, 1.12)	0.746
PSQ Domains					
General	3.04 (0.34)[a]		0.83	(0.29, 2.34)	0.720
Technical & interpersonal	3.11 (0.35)[a]		0.71	(0.23, 2.17)	0.551
Communication & time spent with doctor	3.00 (0.30)[a]		0.72	(0.23, 2.26)	0.568
Financial & accessibility	3.05 (0.33)[a]		1.29	(0.42, 3.88)	0.656

Significant at $*p < 0.05$
a= Mean (SD)

CHAPTER 5: DISCUSSION

This study had statistically proves that application of methadone maintenance treatment program is an effective method of enhancing the outcomes of employment, reducing the criminal activities, decrease the use of drug and risky behaviours related to blood-borne diseases while leading to an improved social behaviour and life. Clients on methadone program have a significant quality of life in all domains after joining the program. Treatment satisfaction survey revealed that most clients have overall satisfaction with health care workers and service. The methadone maintenance treatment program has great prospects in the treatment of opioid addiction and it is important to ensure the improvement is sustained.

5.1 Baseline characteristics

5.1.1 Socio-demographic characteristics of respondents

Attributes of respondents have an extremely noteworthy part to play in communicating and giving the results in a research study, thus manysocial sciences researchers have examined an array of individual attributes, in particular, age, income, sex, occupation, education etc and given out reports on their contribution to data received from research work. This research exercise was no different from the prior lake of knowledge since the demographic diversity of the respondents were factored in the methodology hence the results sync well with the research questions.

The results of this research pointed out that the respondents of the exercise were predominantly male with a 97.3% lead. A high prevalence of respondents who are male in this MMT program is quite comparable to findings for other researcher's reports and studies in Malaysia, This is a reflection of Malaysian country data, whereby the

prevalence of male Malay residents who are opiate dependent for the time ending December 2009 was 87.09% (Talebi et al., 2017). A report by National Institute on Drug abuse states that men are more probable to utilize a wide range of illegal drug as compared to ladies. The utilization of unlawful drugs like heroine will probably bring about addiction that will end up in rehabilitation centers and MMT programs at a higher rate in men as compared to ladies. The study also emphasizes that for most of the age groups, masculine have higher rates of use or addiction to illicit brews and drug than feminine. ("Sex and Gender Differences in Substance Use," 2017).

The majority of respondents were found to be in the age group of 31 - 50 years old. There are a few conceivable reasons regarding why there are significantly older opioid dependents who reach out to the substitution of the drug type of treatment. Baharom et al. (2012) makes an assumption that older drug abusers have more consciousness of the addiction they face and are quicker to free themselves from the doomed way of life. He goes ahead to suggest that they are more prone to be in dedicated stable relationships, for example, marriage and family. Being role models for others would urge them to look for solidness in life through drug substitution treatment. The more youthful age aggregate in MMT program is more prone to have poor consistency towards treatment, in contrast with more established age people. This exhibits a higher level of commitment displayed by the mature opioid abusers to discover ways to fix their addiction.

Clients in our investigation had minimal education, up to secondary level. This is clarified by a research by Pani's study findings that ascertain high drug use among the less educated population. Our finding also pointed to the fact that most of the respondents were employed and married in-sync with a current report in Italy (Pani et al., 2014). The investigation announced that heroin clients who are on permanent

employment or married are more likely to pick up on a less strenuous rehabilitation program for example, outpatient methadone treatment, which has less effect on their activity or regular daily existence. Members of other therapeutic rehabilitation methods need to leave their families, surrender previous occupation, and remain in the rehab for a while (Pani et al., 2014).

Our study on employment of respondents is not in sync with other statistics that assert that idle unemployed people are more likely to be caught up with drug addiction and abuse compared to full time workers. There is also a probability that the addicted people could have lost their jobs and will be unemployed by the time they are joining MMT (American Addiction Centres, 2018).

The study shows that 88.3% of respondents were negative for HIV infection and almost 12% were infected with HIV positive, which is relative prevalence compared to an Integrated Bio-Behavioral Surveillance (IBBS) study done in 2009 that discovered HIV predominance among a gathering in Malaysia at 9.3%, this was diminished to 4.8% in the 2012 (Suleiman, 2015). Another study report by IBBS also found out that, in 2014, there was a spike of prevalence to 5.6%. Toward the start of the pestilence, drug users that inject themselves (PWID) represented 70-80% of new cases. People in Southeast Asia have been observed to exhibit high vulnerability for HIV, with empirical proof featuring sexual hazard practices as the mainstream (Suleiman, 2015).

Almost half of the respondents 47.4% were reported being tested positive for Hepatitis C and 4.4% reported being tested positive for HBV. In a prevalence rate and hazard factors for Hepatitis C among people who abuse drugs report by Vicnasingham et al HCV predominance was found to be 65.4% for the general specimen, yet higher among drug abusers that inject themselves (67.1%) compared to non-injecting drug clients (30.8%). Bivariate examination in Vicnashngham research study proposed seven

hazard factors however just sharing injectable and lifetime gay/cross-sexual conduct stayed notable in multivariate investigation (Pang et al., 2007).

Our study revealed that the average daily methadone dose is 61.67mg. Similarly other research study done on patients of the Hong Kong methadone program has demonstrated that patients who go to the health facilities receive roughly the same dosage every day to be able to sustain their addiction. It has likewise been demonstrated that patients getting methadone measurements of more than 60mg every day were less inclined to inject or utilize than patients getting dosages of fewer than 60mg every day (Pang et al., 2007).

Opiate dependent clients of 11-20 years drug ("Detox from Heroin Now," 2018) use formed the largest percentage of our respondents. This could be partly due to the higher level of willingness to seek for a solution to their addiction problem as compared to their less than 10years and more than 21 years counterparts. Clients who have used drugs for over twenty years are most likely more than 40 years if they started using the drugs at the earliest age, and they do not have much to salvage by changing their lifestyle. They are older and most probably they are quite used and comfortable to the low quality of life they subjected themselves to due to drug abuse. This gives them less self-drive to change while those who are less of 10 years into heroin abuse are still excited about the effects of the drug and less likely to see how much the drugs have costed their quality of life.

5.2 Quality of life outcome evaluation

5.2.1 Overall quality of life at baseline and after joining the treatment

Most recent research studies about quality of life in opiate-dependent people indicate that they generally have less stable qualities of life as compared to other general

substance abuse clients in other MMT centres around the world. Drug substitution therapy like MMT has a great role to play in reduction of the harmful effects of addiction plus a greatly beneficial impact of making better the quality of life of the methadone treatment clients.

In our examination, a noteworthy change in quality of life in all the investigated domains was obvious after methadone treatment, with substantial impact sizes. Similar positive impact findings were also found in other studies (Ali et al. 2017; Bharom et al. 2012; Devi at el. 2012; Fei et al. 2016; Ha. 2010; Musa et al. 2012; Nordin et al. 2009; Norsiah et al. 2006; Padaiga et al 2007). The biggest change was found in the mental space which is reliable with different investigations (Adeline et al. 2009; Baharom et al., 2012; Musa et al. 2012). Then again, the social connections space had the minimum change, like different examinations which likewise found the slightest or no change in this area especially in the prior phases of methadone treatment, for example, Baharom et al. (2012) did lesser interval analysis at 6 or a year as compared to our 6 year analysis (Lua & Talib, 2012; Padaiga et al., 2007). This demonstrated while methadone treatment enhanced patients' mental prosperity essentially, their social connections are slower to enhance which mirror the more drawn out timeframe that might be required for patients to reintegrate into the general public as they abandon sedate utilize (Baharom et al., 2012).

Our study findings reveal that a lot of improvement is centred on psychological domain; physical domain follows on closely, then environment domain and finally social relationships. Similar study finding was found by Padaiga (2007). In his study he exposed that the social relationship domain usually has least progression in clients within the methadone treatment programme (Padaiga et al. 2007)**.** Taking account of most parts of this world opioid drug abusers are marginalised socially. This tends to

explain why it becomes difficult for them to improve the social domain of their quality of life as a short term goal in their medical therapy. Padaiga (2007) also recommends the use of alternative ways of ensuring the clients social and relationship skills are strengthened while in the programme by use of different interventions. According to his report on outpatient MMT he insists that in the long run the society should be sensitized to help them take back and integrate the opioid drug abusers into the community without stigmatization (Padaiga et al., 2007).

For the most part, this research study's results bolsters the proof from different investigations that MMT program is a successful treatment for reduction of crime, improvement of general health of clients by saving IDU (injecting drug users) and in particular lessening high risk behaviours that lead to the spread of HIV(Corsi et al. 2008; Devi et al.2010; Fei et al. 2016; Gossop et al. 2000(b); Teesson et al. 2006). The existing literature investigate demonstrates that despite of MMT programs working in varied ways in various countries, for the most part they have four comparable objectives that include decrease in drug utilization and some kind of addiction that is related to high risk HIV behaviour, subsequently lessening HIV transmission.

It is additionally focused on the reduction of crime that is related to drug addiction and helping patients to continue their societal and familial capacities. In the present study, there was a change in the MMT clients' quality of life as displayed by the great positive improvement in all the tested domains.

The upcoming risk of HIV among drug abusing clients who inject themselves has been the principle purpose behind the coming up with Methadone Maintenance Treatment programs in Malaysia. The decrease in heroin and sedative utilization uncovered by this investigation might be taken as a sign that the MMT program lessens

drug abuse hence diminishing the opiate injection conduct. These outcomes are with regards to a study on ‘Effectiveness of methadone treatment in reducing HIV risk behaviour and HIV seroconversion among injecting drug users’ by Gibson (Gibson et al., 1999). The critical diminishment in HIV high risk behaviours underpins other examination too (Cox et al., 2009). Further, long haul follow up examine should be directed to assess the viability of the program in decreasing the frequency of HIV.

Althoughstatistically measurable, our investigation additionally uncovered that MMT lessens wrong doing as demonstrated by studies that have been done by National Advisory Committee on Drugs (NACDA) previously like ‘Evaluating drug treatment effectiveness: summary of 1-year outcomes’ by Cox (Cox et al., 2009). At the point when given in sufficient restorative doses, methadone hinders the euphoric impacts of heroin injections, in this way giving a chance to the person to enhance his or her social working

5.2.2 Effectiveness of Methadone treatment by years between 2007 and 2012

From our study the drug abuse domain indicates that use of illicit drugs like Heroine domain in 3 years of treatment seems to have higher mean difference followed by clients in 4 years of treatment. A research study by Fei et al. (2016) seconded that the adequacy of MMT in decreasing heroin utilization, drug injecting practices and crime related wrongdoing and in addition in enhancing social working and physical side effects. His study confirmed that patients on methadone maintenance treatment programme demonstrated change in personal satisfaction in all spaces at follow-up when contrasted with pattern, in spite of the fact that there were no critical contrasts in the change of personal satisfaction when looking at patients who have been on

methadone treatment for a length of 2 to 6 years, 7 to 8 years or 9 to 10 years (Fei et al., 2016).

Similar to the study by Fei et al. (2016), this research study's result in injecting and sexual behaviour domain clients in 3rd year showed least improvement. Clients in year 1, 4 and 6 showed the highest score. This is very irregular since in normal cases the results are supposed to be rising steadily and then plateau after a number of years. Those in year 2 and year 4 of treatment had shown a good improvement in social functioning domain. This is attributed to the adaptation and coexistence with societal stigma. The least mean difference was seen among those in year 6 of treatment this is quite similar to the study by Fei et al (2016).. The highest mean difference for crime domain was among those in the program for 6 years. A low mean score in year 5 of treatment is similarly attributed to the onset of the 6th year. Clients in all 6 years had shown a significant improvement in health domain. This may be ascertained to be due to good health practices due to improved quality of life, reduction of high risk characters and reformed nature that reduces the affinity for diseases.

5.2.3 Factors associated with quality of life

This study shows that MMT fundamentally diminished the self-revealed rate of drug-related crime, drug abuse, sexual and drug injection characters. Interestingly, MMT has in a fast rate enhanced employment rate and social wellbeing of the clients. These discoveries are reliable with other universal investigations in other areas like England, Lithuania, and Israel. A meta-analysis led by Marsch (1998) demonstrated that 85% of drug abuse clients who got MMT led to a reduction of drug-related crime. A methodical audit directed by Sun Holloway et al likewise demonstrated that criminal conduct was diminished in MMT customers contrasted to non-MMT drug clients (Sun et al., 2015). Further important investigations to assess different parts of MMT, including basic

hindrances and cost-adequacy of the program, to help advice applicable strategies later on should be commenced.

In our study it is notable that were factors that related with the improvement on quality of life for the clients hence their variation indicated a change in the measured domains; they were employment level, marital status, and high rate of criminal behaviour at the baseline and they gradually reduced while on the methadone treatment making the domains statistical scores to go up. A reduced methadone dose was altogether connected with great positive changes in the environmental, physical and psychological domains. In a study by Ali et al. (2017) there were also noteworthy changes in quality of life in the mental, physical, environmental and social relationship domains of the clients hosted in the methadone program that she investigated (Ali et al., 2017).

The adequacy of methadone as treatment for opioid dependency syndrome has been built up in a many investigations. In a Cochrane Collaboration audit contrasting methadone treatment and different types of treatment not including opioid substitution treatment, methadone treatment was more powerful in treatment maintenance and diminishment of heroin use than the last mentioned (Mattick et al., 2008). Notwithstanding enhancing treatment maintenance and diminishing illegal heroin utilize, methadone positively affects addiction related HIV risky conduct, criminal action and mortality, like our discoveries (Fullerton et al., 2014).

5.2.3.1 Physical well being

For The multivariate analysis done in this study revealed that being employed, Hepatitis B negative and taking a proper methadone dose of 31 – 90mg were positively associated with higher quality of life in physical aspect. This is simply because the

physical wellbeing of an individual is largely dependent on their quality of life. Employment puts disposable income at the table making it easier for someone to survive the day to day struggles. It can reasonably be deduced that the variation in improving quality of life in physical domain can be explained by current employment status, dose and Hepatitis B status.

5.2.3.2 Social functioning

This study finding shows that the variation in improving quality of life in social functioning domain can be explained by marital status. Those who were married showed significantly higher quality of life in social domain compare to widower/divorces. This is as a result of continued support from their spouses who are committed to assisting them out of their addiction behaviour. A study by Lin et al. (2015) on the factors that are associated with methadone treatment also demonstrated that being married is a contributing factor to a high quality of life at baseline, greater improvement to the quality of life during a fixed period of time under methadone treatment and a shorter period on MMT as compared to not married clients.

Additionally, respondents from mid-range age group 31 -50 years showed higher improvement in social well-being compare to those older than 51years old holding marital status, education level, current employment status and dose constant. This could be attributed to by the freedom and vitality that is present in the 31-50 years old generation as compared to the older ones. Responsibility and role modelling within the older group will lead to social stigmatisation hence reducing the score of the domain.

In our investigation, one of the components observed to be related with a poorer change in life quality was age much more than 50 years of age, when contrasted with more youthful clients who exhibited a bigger change in quality of life especially in the

mental, social connections and condition spaces. Patients on methadone treatment who were 50 years and more seasoned in different examinations announced a high rate of physical and psychological wellness issues, including hypertension, joint inflammation, interminable obstructive aspiratory sickness and real sorrow (Maruyama et al., 2013; Rosen et al., 2008). This may prompt lower life quality, predictable with different investigations which demonstrated a converse connection amongst age and life quality of opiate dependents (Sheerin et al., 2004; Millson et al., 2006).

Usually, there is relationship between employment status of an individual and social relationship life that he is living. This could be attributed to by dispensable income and status quo. A model deployed by our study predicts that for every unit increase in employment the social well-being will increase by 0.6 units holding age, marital status, education and dose constant.

5.2.3.3 Psychological well being

The results of our multivariate analysis showed that being in mid-range age group, employed and having dose <30mg - 90mg, Hepatitis B negative status were positively associated with quality of life of psychological domain. However, taking drugs for less 21years was negatively associated with psychological domain. Opiate dependents of less than 21years of drug use tend to be less aware of the harmful long time effects of heroine since it has not delved much into their psychological system. For the clients above 21years of use, prolonged, habitual, and heavy use of opiates makes the brain to begin developing additional opiate receptors that can bind with more and more of the drug making them; gradually this makes their receptors more responsive to the treatment (Torres, 2014).

Methadone blocks the euphoric effects of injected heroin when given in sufficient therapeutic doses, thus offering significant opportunities for the people to improve their psychological functioning (Hall, 1996). Like other researches for example Padaiga et al. (2007) and Adeline et al. (2009), the outcome would be as a result of the stigma faced by the clients which affects them psychologically plus the effects of the drugs abused.

5.2.3.4 Environmental

The findings of our research study asserted that quality of life of environmental domain improved with respect to being Malay, married, employed, Hepatitis B negative and dose of more than 90mg and being an illicit drug user for less than 10 years. People's tendency to feel more secured in daily life gets better as they undergo methadone treatment. As time under the treatment progresses the clients have more disposable income and easier access to amenities. The clients developed several opportunities to do outdoor activities that made them feel satisfied with the current living environment as the treatment progressed.

A study by Lin et al. (2015) ascertains that MMT not only helps in alleviating the physical harm associated with heroin addiction, but also improves psychological and environmental domains of their lives, as they found out in their study results done in a period of 6 months. They then concluded that with improvements in psychological and environmental well-being, patients would be more willing and able to re-establish social relationships (Lin et al. 2015).

5.2.3.5 Drug use

Overall, our multivariate analysis showed that being married was negatively associated with habit of using drugs. There is a tendency of married people to have high reduction rates of drug use as compared to those who do not have families, either single

or divorced. This is as a result of continued support from their spouses who are committed to assisting them out of their addiction behaviour. Variation in reducing drug intake can be explained by marital status since most married respondents have marital satisfaction and hence less inclined to drug abuse. A research asserts to this by investigating on the factors that are associated with methadone treatment and their results demonstrated that being married is a contributing factor to faster results on the reduction and eradication of continued drug abuse while on methadone maintenance treatment by the clients (Lin et al., 2015)

5.2.3.6 Sexual & injection behaviour

Our research study revealed that taking dose of less than 30mg of methadone positively associated and being Malay and HCV negative were negatively associated with injecting/sex behaviour domain. HCV is transmitted via needles by the drug injecting crowd hence those that did restrained from the injecting behaviour were more likely to be HCV negative and HCV negative ones were likely to be non-injectors. Variation in reducing high risk behaviour can be explained by race, HCV and dose. A stable dose will help the client's urge to inject reduce. Furthermore, the act of sharing needles additionally dropped among clients.

The level of needle sharing found in recent MMT studies is altogether lower than that detailed by the 2009 Integrated Bio-Behavioral Surveillance (IBBS) (3.3% in Hai Phong and 20% in Ho Chi Minh City area). Our results did not delve so much into this topic. Different studies like one by Moss likewise discovered lower frequencies of drug abuse and needle sharing among Drug abusers on MMT contrasted with those not on treatments. In a particular illustration, an investigation by Moss et al. (1994) detailed that the rate of simultaneous drug abuse diminished from 33% to 15% and drug Injection from 19% to 6% during 5 years of study.

5.2.3.7 Criminal activity

In a statistical way this study found out that methadone maintenance therapy program decreases crime. Most researchers have seconded to the significant statistical deviation of crime rate after MMT evidenced multiple projects online about the crime rate reduction in MMT. MMT programs have been indisputably shown to be successful in diminishing criminal rates and enhancing work result and social prosperity of its clients. In a nutshell, the multivariate analysis showed that being male was positively associated in reducing crime activity and being HIV negative and taking methadone dose of between 61mg and 90mg were negatively associated with crime domain. This means more men at lesser doses were susceptible to criminal activities.

5.2.3.8 Health status

Our research study revealed that taking dose of less than 30mg of methadone positively associated and being Malay and HCV negative were negatively associated with injecting/sex behaviour domain. All four WHOQOL-BREF domains showed that HIV negative respondents have higher quality of life compare to HIV positive respondents. HIV negative clients have an overall better health status even before they start on the methadone treatment as a result of good immunity. This will give them an upper hand as they receive the treatment since they will only be on methadone and not an addition of Anti-Retroviral (ARV). All HCV negative respondents have better quality of life compare to HCV positive respondents. Even though Methadone Maintenance Therapy program operate differently in diverse nations, methadone maintenance therapy programs normally have four identical objectives that includes

decreased drug utilization as well as addictions associated with HIV risk behaviours, thus decreasing transmission of blood borne diseases.

5.3 Satisfaction level of methadone respondents

Our study used PSQ-III which is 18-item survey, than modified to 13 items that taps satisfaction with medical care as well as satisfaction with six aspects of care: technical quality, interpersonal manner, communication, financial aspects of care, time spent with doctor, and accessibility of care. The aspects were subdivided into four domains for simplicity i.e. General domain, Technical & interpersonal domain, Communication & time spent with doctor domain and finally Financial & accessibility domain. In each domain there are statements that compose the main items to generate the domain's score. Cross sectional design was used to collect the data. Researcher by her self conducted face to face interview with the clients and this interview done anonymously so that can obtain genuine answers from the clients on the satisfaction level. From our overall study finding, between communication & time spent with doctor and financial & accessibility the clients seemed to have greatest satisfaction, lesser financial burden and also faster and easier accessibility to clinic or hospital. A good number of the clients were satisfied with the technical & interpersonal skills of the doctors and staffs, medical care and treatment they receive in general.

In the existing pool of literature there were no found studies that used similar questionnaire (PSQ) to measure the satisfaction level of methadone clients towards the program. Questionnaires like Severity of dependence scale (SDS), Drug Outcome Research in Scotland (DORIS), Verona Service Satisfaction Scale for Methadone Treatment (VSSS-MT) and Client Satisfaction Questionnaire-8 (CSQ-8) were used in evaluating MMT were notable but particular PSQ in MMT has been covered for the first

time in our study. Trujols et al. (2012) in his study 'Patient satisfaction with methadone maintenance treatment: the relevance of participation in treatment and social functioning' used Verona Service Satisfaction Scale for Methadone Treatment (VSSS-MT), and mental health status with the General Health Questionnaire-28 (GHQ-28) to identify independent factors that contribute significantly to satisfaction with MMT.

5.3.1 Factors associated with satisfaction

There is normally a positive relationship between client satisfaction to methadone treatment and the outcome of treatment in addition to retention of the clients in the programme. From our study the variables that significantly predicted the satisfaction domains were HCV negative, HBV negative and years of drug use. There are no much studies that have been done to second this finding but it's evident that this hepatitis negative people have no health issues to deal with hence less victimization and better treatment at the centres.

This study finding revealed that HBV negative respondents have higher satisfaction level in all four domains in univariate analysis. However in multiple regression it was particularly evident that HBV negative clients were significantly satisfied in technical & interpersonal, communication & time spent with doctor and financial & accessibility domain than HBV positive respondents.

From the PSQ questionnaires HBV negative clients thought that the doctor are careful to check everything during treatment and examination and their office had everything needed to provide complete care. This is simply because the negative clients are much more open to the doctors disclosing all their needs making it easier to fulfil. The HBV positive clients have already gone through a stigmatizing life hence they are held back in sharing with the doctors making the encounter with their caregivers less

friendly. In a study by Tran et al. (2015), the scores were high crosswise over Satisfaction with Treatment Interview Scale (SATIS) domains. More established age, advanced education, having any issue in self-care and depression or nervousness were contrarily connected with patient's satisfaction towards the programme. Being that our study was performed in health clinics, Tran's study confirms our high score by mentioning that patients getting MMT at health centres, where more extensive in receiving HBV, HCV, HIV and common health care services are accessible, will probably report an higher and complete satisfaction score (Tran et al., 2015).

From our research findings, HBV negative clients seemed to have greatest satisfaction with on lesser financial burden and also faster and easier accessibility to clinic or hospital this result in a higher score of satisfaction on financial and accessibility domain than those with HBV positive clients. There was a significant linear relationship between HBV and communication and time spent with doctors' domain in our research study. HBV positive clients seems to find the doctors unclear, ignorant and too much in a hurry. This can be explained to the fact that they have other underlying stigmatization problems that make them censored while interacting with their doctors. Thus, the findings that patient satisfaction with treatment is predictive of whether patients have greater opportunity to receive an adequate therapeutic exposure to methadone treatment should provide important impetus to make patient satisfaction a concern of providers.

Our study reveals that HCV negative clients were more likely to be satisfied in all the domains of methadone maintenance treatment modality than those with HCV positive respondents due to similar reasons as HBV negative clients. Client's own views of their gradual progression while under treatment can lead to an improved satisfaction with the treatment. HCV positive clients tend to have stigmatization effects that make them less

open to transparency in their treatment journey. The caregivers then remain with more general treatment rather than meeting the psychological needs of the client.

Study findings from Li et al seconded the complicated nature of satisfaction of clients to methadone maintenance treatment and its relationship to multidimensional factors that are inherently the social demographic characteristics of the clients. It was noted that positivity of the client diseases like HCV greatly impacted the satisfaction of the client to the treatment progress. As opposed to this study, the research by Li et al. (2017) went ahead to give suggestions for assessing the quality of care given by MMT programs and proposes enhancement of MMT clients' satisfaction levels by use of relevant ways (Li et al., 2017)

Number of year's respondents involved in drug use in general domain also showed statistically significant satisfaction towards the program. In particular the study revealed that clients who had been exposed to drug less than 10 years have greater satisfaction towards the program in all four domains compare to those expose more than 10 years. This could be due to the fact that the damages of the addiction character of drug abuse have less impact on the new and lesser year clients. Then, they are able to feel exactly how it felt before they started abusing drugs hence satisfaction by the program. The adverse effects of drug use are much more stringent within the first 10years of drug abuse hence the opiate dependents were able to appreciate the positive changes they were undergoing.

Another significant finding from univariate analysis indicate that the clients who were on employment before joining the methadone maintenance treatment were more satisfied with the modality of treatment at all domains and this was also proven significantly in communication & time spent with doctors and staffs. Normally the employment is related to literacy and literate people tend to be very specific on the

milestones and objectives that they intend to attain from the treatment process. This makes them more satisfied as compared to secondary and lower educational level clients since their needs are met. Torrens et al. additionally demonstrated stamped increment in personal satisfaction in the main year, trailed by lesser however relentless change for the following 3 years (Torrens et al., 1999). Our study has reinforced the conclusion that MMT has an important part in here and now constructive outcome on client's personal satisfaction.

5.4 Employment outcome

Our study found out that a total of 103 unemployed clients grained employment and just a few remained unemployed after starting the methadone maintenance treatment. After starting treatment a total of 533 were employed. There was a small percentage of clients who were employed become unemployed after joining the treatment modality. The underlying positive change in quality of life might be related with less utilization of illicit drugs, having the capacity to get employed, better money related status and in addition better living conditions. Notwithstanding, quality of life might not have been additionally enhanced to expectation potentially because of specific restrictions, for example, level of education, whereby the dominant part of clients in this study have secondary or lower training, or perhaps absence of the relevant skilling which empower them to acquire a superior occupation. Employment sector of the respondents may likewise be influenced because of the constrained kinds of occupation which enables patients to acquire their day by day measurements of methadone and go to standard visits to the centres. Furthermore, social stigma towards the drug dependent clients may restrict their social associations with others and the feel ashamed of uncovering their treatment status to managers may act like a boundary to get a superior occupation.

In our study, male respondents who were not employed before starting methadone treatment were also more likely to report they could find a job after starting the treatment and HIV negative status will lead to an increased likelihood to find a job compared with those with HIV positive. Most research studies stipulate that respondents who were male are more likely to find a job compare to female respondents after joining the treatment.

Males are more likely to secure jobs that female due to their zeal to pursue jobs as compared to their female counterparts. An HIV positive status will further deteriorate the stigmatization of drug abuse hence reduces urge by the positive patients to seek medical treatment. This study is no different form the existing pool of knowledge asserts that there is a significant change in employment status of the unemployed respondents at pre-treatment.

This finding isn't in sync with different assessments demonstrating that MMT had either a nonpartisan or constructive outcome on employment results (Gibson et al., 1999). In spite of the fact that the information introduced here don't give an adequate premise to completely represent this illogical finding, a scope of conceivable clarifications exist. The watched precise contrasts in employment results may conceivably be identified with personal level qualities or conditions that either repress advances to employment and deliberately apply to those people enlisted in MMT or prompt both MMT enlistment and non-employment.

In the similar field of study a research by Backmund et al. (2001) discovered that challenges finding the right methadone dose could defer advances in employment (Backmund et al., 2001). Given the long perception time of this investigation, notwithstanding, we presume that any resultant deferral would not create the treatment

mode-particular contrasts saw here. Likewise, methadone has been appeared to weaken intellectual execution (Darke et al., 2000) and may affect abilities to embrace work.

Somewhere else, clarifications for contrasts in labor advertisement results among individuals with substance utilization bad history bring down their employability levels, things like bad work histories, or inspiration (Svikis et al., 2012), might be lopsidedly predominant among those selected in MMT making them unemployable (Dooley et al., 1996) People may likewise have contrasting limits identified with physical or psychological wellness that repress their capacity to look for and discover employment. At last, the regular nearness of simultaneous and progressing drug use by people selected in MMT (Barnas et al., 1992; De Maria et al., 2000) may block advances into employment or impermanent, casual, or under-the-table wage period.

One such potential hindrance is the likelihood that people who are on social help and selected in MMT confront an "unemployment trap" (Neale & Kemp, 2009), whereby firing social help in like manner ends freely subsidized access to MMT. The huge relationship between social help and changes into impermanent, casual or under-the-table pay period gives some preparatory proof of this sort of disincentive to formal work.

5.4.1 Employment outcome at pre-treatment and after joining the treatment

The numbers of highest employment rate from unemployed to employed status after taking treatment was in year 2007 this followed by year 2012, 2008, 2010, 2009 and 2011 respectively. This is no particular order making it hard to analyse it in any order. Similarly there is no sequence in employment rates before commencing the program i.e. client from year 2009 showed the highest percentage whom were employed before starting the treatment become unemployed after treatment and this followed by year 2007 and year 2012 For those employed pre-treatment and after joining the treatment

were mostly more than seventy 5% in all six years. This can be assumed that people may have contrasting limits identified with physical or psychological wellness that repress their capacity to look for and discover employment.

A great percentage of clients between the age of 20-30 gained employment during the programme with less losing their job and a good number retaining their jobs as compared to all the age groups represented by the respondents. A report by OECD shows that the probability of millennial to get a job at any given moment is higher than any other age group. This is because age group 20 to 30 years old are the doers of the job and they are strongly aggressive in getting a job (OECD, 2018).

HIV negative clients had a better chance to get employed as compared to HIV positive clients at joining and way into the program. HIV positive status will further deteriorate the stigmatization hence reduces urge by the positive patients to seek for jobs. If they do they will keep their status secret and there is hence a lower chance of staying at the job due to less freedom of interaction. This study is no different form the existing pool of knowledge asserts that there is always a higher change in employment status in HIV negative clients as compared to positive.

From our study the years of drug abuse and opiate dependency was not a major factor affecting the determination of employment outcome at pre and after joining treatment. All the groups less than 10years, between 10 and 20 years and more than 20years had averagely the same progression of employment and sacking rates. It can be deduced that social stigma towards the drug dependent clients may restrict their social associations with others and the feel ashamed of uncovering their treatment status to managers may compromise either their employment status or treatment programme.

Normally, there is improvement in employment status at a year after treatment started; and the rate began to reduce when treatment proceeded past a year. A

conceivable clarification is that people long into the treatment will probably drop out of the treatment program, which prompts a declining employment rate among the individuals who continue running with treatment. Further, social relationships of clients are expected to be enhanced over the span of MMT. With decreased addiction side effects, clients can continue family obligations and re-set up associations with other family members. Descriptive studies propose reduced levels of employment among Malaysian population as compared to other drug-utilizing populations (Platt, 1995).

5.4.2 Factors associated with employment status

This research has exhibited enhanced employment rates among MMT clients in Malaysia**.** A Swedish report by Blix demonstrated that more than 80% of individuals with serious heroin dependence acquired new jobs and were reintegrated into society subsequent to accepting MMT. In a different report, Blix studied 345 heroin clients for a long time over the period 1966– 1989 in Sweden; a 70– 80% employment rate among MMT customers was reported (Blix, 1989).

As per our study being male, unemployed before starting treatment and HIV negative made a unique statistically significant contribution to the results. The strongest predictor of reporting employment status after starting treatment was being male. Most research studies stipulate that respondents who were male are more likely to find a job compare to female respondents after joining the treatment. For example a study by Coffman et al. (2018) of Harvard Business School concluded that most employers tend to favour men during the recruitment process not on the grounds that they are preferential against ladies, but rather in light of the fact that they have a perception that men perform better averagely at certain tasks (Coffman et al., 2017). Men are also more likely to secure

jobs that woman due to their zeal to pursue jobs as compared to their female counterparts.

From our study clients who were not employed before starting methadone treatment were more likely to report they could find a job after starting the treatment. This is mainly because the reduced effects of addiction will give those clients good physical, health and psychological ability to search for a job and get employed. Finally, HIV negative status was more likely to find a job compared with those with HIV positive. This is mainly due to stigmatization in the society as well as their health condition.

5.5 Strength and limitation of the study

5.5.1 Strength associated with the research design

Being a survey to gather data might not be considered as rigorous as Randomized Trial. With the vulnerable target population, this approach did provided a most conducive environment for data collection. Secondly, involvement of the principal investigator at the ground level during the period of the data collection developed trust to be established and this enhanced the willingness of the populations to take part in the study. This made the participants felt comfortable at the location and this strengthened participation and resulted in a larger sample size.

Third, Questionnaires used in this research such as WHOQOL-BREF and OTI were familiar among the study population. Both this questionnaires were used when the participants join the methadone program. Fourth, a ground level involvement over a long period of time by the principal investigator allowed trust to be established and enhanced the willingness of opiate users to participate in the survey.

5.5.2 Limitations associated with the Research Design

Limitations associated with this research should be taken account, depending on drug users to answer on extremely personal issues, especially on injecting, sexual and health issues considering the stigma surrounding drug addiction, have proved challenging. Underreporting, over reporting and recall bias is another limitation encountered in this type of survey and study populations. For example, the decrease in drug use might have been overrated, whereas the number of criminal activities might have been undervalued, therefore overstating the benefits of the methadone maintenance therapy program.

Secondly, being a survey incorporating a cross-sectional study design for the satisfaction and current quality of life, the causality of the outcome and factors associated could not be inferred upon. Only an association could be made. Qualitative in-depth interviews could provide more information on how drug users perceive on satisfaction and quality of life and what are the factors that can affect the satisfaction and quality of life of drug users. This could provide insight into new directions for future researches.

Third, limitation is that there is a limited possibility of comparing these results with other studies. This limitation is due to the lack of a common set of variables measured as potential determinants of satisfaction and the use of different set of instrument to measure the concept of satisfaction among methadone clients.

Fourth, the findings may not be generalizable because the sample was restricted to participants from public hospitals and primary health care centres which provide MMT service in Selangor, which may not be representative of other states in Malaysia as well as clients who are taking MMT at private clinics in Selangor. Therefore this limits the generalization of all drug users on MMT.

Fifth, Interviewer bias poses an important problem for the participants (clients). The presence of a researcher may change the responses and actions on the part of research subjects. The quality of the info and data gotten relies on the understanding or relationship established between the clients and the interviewer. Being involved with the clients on a ground level over an extended period may affect the interviewer's ability to remain objective; especially when dealing with a drug addicts. To some extent, the study results might not represent the true effectiveness of the methadone maintenance therapy programs as there were no controls (injecting drug users who were not in the methadone maintenance therapy programs) involved for comparison.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

a) The majority of respondents selected for the study turned out to be in the age group of 31 - 50 years old, male, Malay, married, with no formal education and primary school background. Based on WHOQOL score and OTI scores from our study the application of methadone maintenance treatment program has been considered as an effective for methadone clients. Clients on methadone maintenance therapy had a significantly better quality of life in all domains after joining treatment as compared to before starting the treatment. The trend of scores showed long-term effectiveness of methadone treatment programs in all years between 2007 and 2012.

b) Factors that associated with quality of life of methadone clients included age, gender, race, marital status, education level, employment status, HBV, HCV, HIV, dosage and years of drug use.

c) There is a positive client' perception and satisfaction towards the methadone maintenance treatment program. Treatment satisfactions survey revealed that most have overall satisfaction with health care workers and service. Patient's Satisfaction Questionnaire III measured along general, Technical & interpersonal, Communication & time spent with doctor, Financial & accessibility and the results positively varied with respect to factors that are associated with satisfaction of methadone clients like HCV negative status, HBV negative status and years of drug use.

d) Employment status at intake was low as compared to after joining the treatment. Gender, pre-treatment employment status and HIV status were the significant

factors that determined employment status after joining the treatment program. Few clients seemed to retain their jobs while a number lost their jobs, as a result of stigmatization as found out from other studies.

6.2 Recommendation for public health significance

6.2.1 Recommendation for public health

In a nutshell, the following recommendations are for sure to make the greatest part of ensuring methadone treatment is improved and sustained within Malaysia. From the research it is knowthat methadone is administered as a rare and regulated commodity. Methadone maintenance treatment should be preferably adopted in dedicated office-based centre settings in the Malaysia, with thereafter administering of drug in pharmacies. This will make access to the program much easier for people who would not prefer to go to hospitals and clinics because they are in denial of their addiction. This might require changes in government and, at times, national laws. Policies and regulations ensuring that sensitization programmes on addiction are done well in all the high risk areas are additionally required. Methadone ought to be recorded on the medication models of each and every area within Selangor and made accessible as indicated by the affirmed treatment setting.

Likewise, in Malaysia, both private and public insurance companies should assess the need to cover opioid substitution treatments like MMT so that the programme realises its full wellbeing and monetary advantages. Moreover, the dependence on opioid substitutions treatment should be reduced on addicts whose status is not that great, especially in the less prone areas of drug abuse and for the clients whose addiction is not in a bad state, by reducing the daily dose and this can lead them to abstinence.

The caregivers, doctors and nurses administering this treatment need to evaluate new and rising drug choices to streamline treatment. Restorative affiliations and medical schools should cooperate to advance the wide-scale usage of suitable doctor education to treat opioid reliance.

Concerning societal maintenance with methadone, rules like those utilized as a part of the UK need to unmistakably fortify a recommendation that higher dosages of methadone are more powerful. The way that the organization of methadone measurements and dosages should be regulated ought to likewise be underlined in rules. In several of the scrutinised investigations of methadone maintenance, subjects were required to go to centres every day and the medication was administered by a Pharmacist. Current Malaysian rules recommend that methadone supervision happens after start of treatment as a component of an adjustment phase since the clients are not retained but walk in and out of the clinics.

In Malaysia all MMT clinics follow up and meet the doctor once a month which is a very good practice although there being a government program there are chances of lack of proper planning and regularity because the planning is delegated to the clinics. There should be a steering committee set up to spear head the follow up process and ensure the appointments are regular and done in more frequent times that once a month to reduce the number of clients dropping out of the program.

The treatment of opioids i.e. heroine dependence are practical. At the point when the cost of opioid dependency treatment is contrasted with the advantages in lessened crime, the outcome is uncontested: each resource whether is money, time or people deployed into treatment yields goods results, and in some cases more, in societal advantages. This should motivate the government to dig deeper into the programs, budget and allocate more funds to them and spare more resources for the clinics

orchestrating the programs. Treatment additionally reduces other health costs due to reduced hepatitis and HIV prevalence rates. To put it plainly, the opioid dependence treatment by use of methadone that allows the workforce to jet in for medication and get back to their daily routines is viable and practical.

Unmistakably the government make several moves to ensure extension of the methadone treatment ability. New treatment schedules for the methadone maintenance treatment programme do hold the possibility to decrease a portion of the requirement for guidance and counselling, which makes the biggest share of treatment costs. With policies that ensure reduced general treatment costs, methadone maintenance treatment will end up being considerably more practical.

The study also revealed that harmonious family relationship is an advantage to methadone patients' progress. However, most of the clients' family relationship will be broken when they become drug addict. Thus, social workers must act as a mediator to help the clients rebuild their family relationship to gain support from their family members while in treatment. Furthermore, it is very common that most families do not want their addicted family members to join MMT Program, because the rationale of the program and concept of harm reduction are also unclear to the general public. It is suggested that the government should do program's in the community on the effectiveness and concept of harm reduction to the public, so that families will give support to their addicted family members who join the program with a better understanding on the program.

Findings from social functioning domain from OTI scoring showed that a clean supportive network is essential to methadone clients' progress. However, it is very common that most of the clients' in MMT have lost their friends who are not drug addicts due to their drug habit. It is very challenging for a client to leave all his/ her

former supportive group and to build up a new and clean supportive group immediately. It is very important to help clients' to build up a new and clean supportive group by organizing peer group for ex-addicts and recruitment of volunteers to give them emotional support. Contact with volunteers also can helps the clients' to build up confidence in facing the community.

6.2.2 Recommendation for future research

Our study on methadone maintenance program unearthed various gaps that remain unaddressed in the proof base identifying with the viability of effectiveness of methadone maintenance treatment program in the societal management of opioid dependency. Our research just categorised the respondents without delving much into the rating of care level required for each. Future research needs to assess the viability of maintenance treatment in primary care settings and recognize part of the group of opioid dependent clients for whom primary care-based treatment might be appropriate.

As far as the intensity of treatment is concerned, any further examinations need to research the most suitable beginning dosages of methadone, look at a more broad scope of doses, investigate the viability of less continuous dosing regimens with products of the day by day dosage of methadone, and the long haul adequacy of maintenance with methadone.

Another road for future research is to figure out what intensity and type of medicinal, psychosocial and behavioural administrations given with regards to methadone maintenance at the clinics is best.

In spite of the fact that are covered in this study, other opiate dependency treatment options apart from methadone maintenance treatment, for example, extended release naltrexone or buprenorphine, may likewise enhance quality of life of the clients along

the investigated domains. Buprenorphine has been appeared to be viable with three times per week dosages, which tends to reduce the danger of overdose or preoccupation, and has been related with improved employment related steadiness crosswise over people of both high and low financial statuses. These options speak to choices for opiate dependency treatment that warrant further research and investigation, partially in light of the fact that they may encourage improved employment outcome due to reduced visits to the clinic and it isn't important to take them at a predetermined locations each and every day.

There were indications from the PSQ scoring that minority of clients' not satisfied with the service and health care workers at MMT clinics in terms of communication & time spent with health care workers, technical quality and interpersonal manner. This study did not explore how this might influence treatment effectiveness. An in depth qualitative research should conduct to further investigate and focus on health care providers and its relationship to client outcomes would be a significant contribution for in developing standards of care for MMT program.

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List of Publications and Papers Presented

The following papers have been submitted for publications and presented from this thesis:

Peer Reviewed Journals:

1. Nirmalah Subramaniam, Wong Li Ping, Nasrin Aghamohammadi, Masitah Mohamed (2017). Improvement of quality of life among methadone clients in methadone maintenance therapy program in Selangor state, Malaysia. Submitted to Journal of Substance Abuse Treatment
2. Nirmalah Subramaniam, Wong Li Ping, Nasrin Aghamohammadi, Masitah Mohamed (2018). Predictors of employment outcome: the impact of Methadone Maintenance Therapy Program in Selangor State, Malaysia. Submitted to Journal of Substance Abuse Treatment

Presentation at conference:

1. Nirmalah Subramaniam, Wong Li Ping, Masitah Mohamed. Patient satisfaction on healthcare delivery in Methadone Maintenance Therapy program in Selangor. Accepted for presentation in the 46th Asia Pacific Consortium of Public Health Conference (APACPH), Kuala Lumpur, 16th – 19th October 2014.

2. Nirmalah Subramaniam, Wong Li Ping, Masitah Mohamed. Improvement of quality of life among methadone clients in methadone maintenance therapy program in Selangor state, Malaysia. Accepted for presentation in the 1st Borneo Quality of Life Conference (BQOL), Sabah, 24th -26th January 2018.