

# Treatment Satisfaction Among Clients Enrolled in Methadone Maintenance Treatment (MMT) Program in Myanmar: A Cross-sectional Study

Sun Tun (✉ [suntun1@gmail.com](mailto:suntun1@gmail.com))

Myanmar Medical Association <https://orcid.org/0000-0003-0973-4791>

**B. Vicknasingam**

Universiti Sains Malaysia Centre for Drug Research

**Darshan Singh**

Universiti Sains Malaysia Centre for Drug Research

---

## Research

**Keywords:** methadone, Verona Service Satisfaction Scale, Treatment satisfaction, Myanmar

**Posted Date:** July 30th, 2021

**DOI:** <https://doi.org/10.21203/rs.3.rs-742094/v1>

**License:**   This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

---

# Abstract

## Background

To address the long-standing opioid abuse problem, Myanmar has established the methadone maintenance treatment (MMT) program in 2006. This study aims to determine client's treatment satisfaction towards MMT program in Myanmar.

## Method

A total of 210 clients who have registered in MMT program with a minimum of six-month treatment history were recruited for this cross-sectional study across Myanmar. The Verona Service Satisfaction Scale for Methadone-Treatment (VSSS-MT) was administered to objectively measure methadone treatment satisfaction.

## Result

The majority (89%, n=186) were satisfied with the current methadone treatment program. Specifically, 89.5% (n=187) claimed to be highly satisfied with the clinic staff professional skills (e.g. doctor, nurse, etc.), (91.9%, n=192) satisfied with the basic interventions (instruction between visits, side-effects etc.), and (74.6%, n=156) satisfied with specific interventions (e.g. individual rehabilitation and psychotherapy, group therapy etc.) categories. Among the different characteristics of the respondents, higher quality of life on physical, psychological, social and environmental categories, respondents who satisfied on current marital status and current leisure status, respondents who were on alcohol were associated with higher treatment satisfaction on methadone ( $p < 0.05$ ). The result of stepwise binary logistic regression showed alcohol use and physical health had significantly association with treatment satisfaction.

## Conclusion

Despite the high methadone treatment satisfaction, treatment providers must make an attempt to address service limitations in order to maintain clients' participation in MMT program especially for specific intervention categories (e.g. individual rehabilitation and psychotherapy, group therapy etc.).

## Background

Global Health Observatory data from the World Health Organization (WHO) mentioned in 2014 that 50% of the 152 responding countries have methadone available for maintenance treatment of opioid dependence. Meanwhile, 45% of the 147 responding countries have methadone available for detoxification treatment of opioid dependence (methadone 2014).

World Drug Report 2020 estimated that 57.8 million are opioid users in 2018 around the world and losing 80% of 42 million years of "healthy life lost" by the implication due to opioid drug use. Drug dependence is mentioned as multi-factorial health disorder with relapsing and remitting in nature. Myanmar is still

accounting for 7% of the world's total opium production (UNODC 2020). So, comprehensive intervention packages for harm reduction interventions were also addressed in Myanmar. Methadone programme started and enrolled 260 patients in 2006 in Myanmar according to the report of Drug Dependency Treatment and Research Unit (DDTRU 2015). Since then, 19,991 People who inject drugs (PWID) were treated with methadone for opioid substitution in 2019, which is 21% of estimated 93,000 PWIDs (T. G. Myanmar 2020). Meanwhile, harm reduction works were being advocated to the administrative and legislative community for desensitization of drug uses alongside the expansion of opioid substitution therapy by the National Drug Abuse Prevention and Control Programme. However, it is important to identify the service satisfactory of the methadone programme to assess the performance of the service delivery, clients' experience on each components of services and types of services they received. The identification of satisfaction can be useful in retaining of the clients in the methadone programme and future planning of quality service expansion after identifying service gaps.

Methadone treatment is effective and associated with the less opioid use (YI, et al. 2016) and improved the quality of life of the patients at 6 months after treatment among Malaysian patients (Fei, et al. 2016), as well as 6 month and 12 month follow up among Taiwan patients (Chou, et al. 2013). The methadone program were expanded in China and South East Asia countries like Myanmar and Malaysia after 2000, understanding methadone treatment satisfaction becomes vital to treatment providers. Several validated tools have been designed to assess client's treatment satisfaction. Among the commonly used tools include Client Satisfaction Questionnaire (CSQ-8) (Larsen, et al. 1979), the Service Satisfaction Scale (SSS-30) (Attkisson and Greenfield. 1996) and the Verona Service Satisfaction Scale (VSSS-32) (Rugger, et al. 1996). Furthermore, there are also other modified tools to use in the methadone services like modified (Satisfaction with HIV/AIDS Treatment Interview Scale) SATIS instrument; a 10-item scale instrument to measure three dimensions of methadone services: "services quality and convenience", "health workers' capacity and responsiveness" and "inter-professional care", as well as "confidentially" and "responsiveness" were included in observation. Taking a long-term methadone treatment compared to 3, 6 and 12-month treatment is significantly beneficial and less positive urine drug tests, reducing commercial sex activities among drug users compared to baseline (Zhang, et al. 2013). Historically, a short methadone programme review in 2013, the following challenges were reported; inconvenient operational hours, long distance to travel for MMT patients, lengthy registration process, ongoing injecting among a significant number of patients, long induction period, and lack of confidentiality (U. Myanmar 2015). So, based on different satisfactory assessments, this study used the VSSS-MT because results of VSSS-MT measures would multi-dimensionally suggest methadone patient satisfaction with methadone treatment centres on social worker and psychologist skills, basic interventions and specific interventions respectively. Thus, methadone patients who are at least on 6-month methadone maintenance would identify the service satisfaction on methadone treatment experience in the programme were assessed with VSSS-MT tools to identify the treatment satisfaction comprehensively.

## Methods

# Study design, respondents and location

This study determines the treatment satisfaction situation and parameters associated with the methadone service satisfaction of patients enrolled methadone treatment in Myanmar. Methadone patients who were at least six months on treatment were recruited from all States and Regions where methadone services were provided. Sample collection sites from each State and Region were selected with stratified random sampling. A total of 210 respondents were recruited in the survey with 42 from each selected cities, Yangon, Mandalay, Lashio from Shan State, Kawlin from Saging Region and Mohnyin from Kachin State for primary data and sample collections.

## Inclusion and exclusion criteria

Inclusion criteria of the survey is a) above 18 years of age, b) self-reported as a methadone user who is currently enrolled in a formal methadone programme in Myanmar, and c) must have at least a minimum of six-month methadone treatment history. The exclusion criteria is self-reported to have current psychological problems or were observed to be under serious medical conditions which could ultimately affect the study participation.

## Measures

Primary data and sample data collection was done from May 2017 to July 2017 at the five selected cities. Respondents have to answer a semi-structure questionnaire to evaluate the respondent's service satisfaction on the component of methadone treatment programme with the Verona Service Satisfaction Scale for methadone-treated opioid dependent patients ( (Cobos, et al. 2002)), questionnaires of an abbreviated generic Quality of Life Scale developed through the World Health Organization (WHOQOL-BREF) (WHO 2004), The Addiction Severity Index- Lite (ASI) (McLellan, et al. 1999), and Timeline Follow Back (TLFB survey) (NIDA-CTN 2014) to determine respondents drug use frequency in the last 7 days. The responses were coded with Likert's 5 point scale (1 for the worst satisfaction ranging to 5: the most satisfied situation for each characteristic questions). These satisfactory responses were grouped into 3 categories of the methadone service programme clinic staff professional skills (e.g. doctor, nurse, counsellor etc.), basic intervention (instruction between visits, side-effects etc.) and specific intervention (e.g. individual rehabilitation and psychotherapy, group therapy etc) categories.

## Urinalysis

Urinalysis included identification of methadone and common illicit drugs in the urine. Those respondents who consented for agreement to take part in the study were verified with methadone test kit and confirmed their participation. Further urine tests for illicit drug use status (Morphine, Cannabis, Methamphetamine, Amphetamine, and Benzodiazepine) were processed alongside with physical measurements, interview survey questionnaires to identify demographic data, reported infectious disease

status, methadone treatment profile, their perception on methadone programme and their satisfaction level on methadone treatment.

## Statistical analysis

VSSS-MT Treatment satisfaction was analysed. For identifying association of differences between categorical variables of patient characteristics with VSSS-MT Treatment satisfaction, chi-square test was done. Comparing the differences between mean scores of the interested parameters (VSSS scores) was done with t-tests. Binary logistic regression was done for identifying the predictors to the outcome “VSSS scale” at  $p = 0.05$  to recheck the stepwise regression output while controlling the confounding variables. With the availability of cross-sectional data, treatment satisfaction was further estimated with cox proportional hazard model especially for HIV infection as HIV status is related to dose of methadone (Tun, Vicknasingam and Singh 2018). Data analysis was done using Stata 14.0 software.

## Ethical Measures

The protocol of the research proposal was interviewed and approvals were granted by the Universiti Sains Malaysia (University of Science, Malaysia) Human Ethics Committee (No. USM/ JEPeM/16080269) and Myanmar Ministry of Health and Sports, Department of Medical Research (No: Ethics/DMR/2017/057) (Research 2017). Furthermore, preparatory arrangement were made for the privacy of the individual interview session. Physical measurement and urine sample collection sample collections of the respondents in a confidential way.

## Results

### Demographic Characteristics

Respondents' average age is 33.3 years (ranging from 20 to 76 years). Majority of the respondents were male 98.6% and 1.4% were female. As the majority, 209 took methadone daily from the methadone dispensing sites and 1 (0.48%) had take-home dose and all reported their history of opioid abuse. Majority of methadone patients are their first time of treatment for methadone 173 (83%) and getting more than one time treatment is 35 (17%) and treatment frequency of methadone ranges from 1 to 6 times. The average methadone dose is 83mg (with a range of 20mg to 300mg) and their average duration on treatment is 28 months (range: 6 to 127 months). Meanwhile, almost two thirds (63%,  $n = 132$ ) had methadone dose less than or equal 80mg daily dose while 75 (37%,  $n = 76$ ) had more than 80mg daily dose. Their average Body Mass Index (BMI) is 20.5 (range from 14.0 to 33.3). More than two thirds; 159 (75.57%) had primary through high school education and 45 (21.43%) had college level while only 6 (2.86%) had non-formal education. Almost half; 96 (46.38%) were single/ divorced and 84 (40.58%) were married while 27 (13.04%) were separated. Their historic working status within 3 years showed that the majority; 192 (93.43%) had recent jobs (previous 3-year period) and 18 (8.57%) were in no-job categories (including disabled, students). However, 28 (13.46%) had received their income from the

drug negotiation within 30 days. Twenty-nine (13.81%) were working as outreach workers or peer-educators for drug users. The VSSS scale was mentioned based on responses to each question in Table 1.

Table 1

Table shows VSSS-MT Treatment satisfaction scale among respondents

<b>Variable</b>	<b>Frequency (n and %)</b>	<b>Mean (SD)</b>	<b>Range</b>
Verona Service Satisfaction Scale for Methadone-Treatment (VSSS-MT) scale	209 (100%)	100.22 (14.19)	58– 131
Not much satisfied	23 (11%)		
Much satisfied	186 (89%)		
<b>VSSS Item Categories</b>			
Professional Skills Items	209	3.89 (0.64)	1.5-5
Basic Interventions Items	209	3.83 (0.54)	2.3-5
Specific Interventions Items	209	3.42 (0.68)	1.5– 4.9
<b>VSSS Items Description</b>			
1. Helping patient deal with problem	209	3.77 (0.96)	
2. Doctors' ability to listen	208	3.97 (0.83)	
3. Psychologists' ability to listen	206	3.99 (0.86)	
4. Doctors' manner	208	3.92 (0.84)	
5. Psychologists' manner	204	4.02 (0.77)	
6. Referring to other specialists	201	3.76 (0.87)	
7. Overall satisfaction	208	4.22 (0.76)	
8. Nurses' manner	209	3.91 (0.84)	
9. Social workers' manner	205	3.73 (1.00)	
10. Improving relationship between patient and relatives	208	4.00 (0.84)	
11. Helping family members to understand patient's problems	209	4.01 (0.81)	
12. Nurses' knowledge of patient's medical history	209	3.78 (0.94)	
13. Information on addiction	209	3.72(0.93)	
14. Helping patient in relationships outside the family	209	3.44 (1.04)	
15. Instructions between visits	209	3.79 (0.85)	
16. Helping patient to look after himself	209	3.98 (0.77)	
17. Nurses' ability to listen	208	3.83 (0.84)	

Variable	Frequency (n and %)	Mean (SD)	Range
18. Social workers' ability to listen	209	3.75 (0.92)	
19. Help received for methadone side effects	207	3.88 (0.85)	
20. Individual rehabilitation	209	3.64 (1.07)	
21. Individual psychotherapy	209	3.67 (1.05)	
22. Family therapy	208	4.19 (0.81)	
23. Activities organised by centre	209	3.82 (0.97)	
24. Group psychotherapy	209	3.33 (1.06)	
25. Sheltered work	208	3.03 (1.23)	
26. Help by the centre at home	204	2.51 (1.27)	
27. Help to join in activities separate from the centre	209	3.16 (1.17)	

Treatment satisfaction rating differed with study sites, lower in the big cities (Yangon, Mandalay) and higher in the small cities (Kawlin, Lashio and Mohnyin). Satisfaction with methadone service (VSSS-MT score) was reported as 100 for average and ranging from 58 to 131 whereas over 80 as "much satisfaction"; rated 3 above Likert scale of 5 for all questionnaires. A total of 88.57% (n = 186) were "much satisfied" with methadone service. However, VSSS-MT score rated professional skill items (doctor, nurse, counsellor and worker) as 3.89 out of 5, basic intervention items as 3.83 and specific intervention items as 3.42. Those on high methadone dose with more than 80mg gave higher satisfaction rating than low dose personnel (p = 0.0276).

#### Differences of VSSS scales with respondents' characteristics

There are VSSS domain scale differences with the characteristics of methadone patients as described in Table 2.

Table 2  
Table shows total VSSS-MT scale differences by the characteristics of patients

<b>Respondent characters</b>	<b>Sub groups</b>	<b>Number (n)</b>	<b>Total VSSS-MT score</b>	<b>p value</b>
<b>Methadone dose categories</b>	less than or equal 80mg	132	99	0.0276**
	more than 80mg	76	103	
<b>Methadone duration</b>	less than or equal 2.4 years	120	101	0.4755
	more than 2.4 years	89	99	
<b>Methadone treat time</b>	First time treatment	173	101	0.0120**
	More than first time	35	95	
• less than or equal 80mg	First time treatment	109	100	0.0091**
	More than first time	22	92	
• more than 80mg	First time treatment	63	104	0.4167
	More than first time	13	100	
• less than or equal 2.4 years	First time treatment	95	103	0.0052
	More than first time	24	94	
• more than 2.4 years	First time treatment	78	100	0.6067
	More than first time	11	97	
HIV status (HIV)	Not infected	126	99	0.1351
	Infected	74	102	
Hepatitis C status (HCV)	Not infected	77	103	0.0452**
	Infected	71	99	
Hepatitis B status (HBV)	Not infected	166	101	0.8754
	Infected	15	102	
Tuberculosis (TB) treatment history	Not treated	147	101	0.9021
	treated	54	101	
Sexually Transmitted infection (STI) history	Not infected	164	100	0.7577
	Infected	45	101	
Age	Younger and equal 35 years	128	101	0.4433
	Older than 35 years	81	99	
Independent t-test p value: ** significance < 0.05, *** significance < 0.001				

<b>Respondent characters</b>	<b>Sub groups</b>	<b>Number (n)</b>	<b>Total VSSS-MT score</b>	<b>p value</b>
Body Mass Index (BMI)	Less than mean BMI (20.5)	122	100	0.9412
	More than mean BMI	84	100	
Currently on antiretroviral therapy (ART)	No	141	99	0.0938
	On treatment	68	103	
Education	Up to primary	48	105	0.0110**
	More than primary	161	99	
Recent work	Unemployed	24	97	0.1926
	Employed	182	101	
Current Peer/ Outreach	No	180	101	0.4528
	Peer/outreach	29	98	
ASI for Employment	Low score	102	99	0.4711
	High score	104	101	
ASI for Alcohol Use	Low score	28	106	0.2600
	High score	36	102	
ASI for Drug Use	Low score	162	101	0.1604
	High score	47	98	
ASI for Legal Status	Low score	14	102	0.1590
	High score	14	94	
ASI for Family/ Social Status	Low score	139	101	0.3306
	High score	70	99	
Marital status	Currently married	84	99	0.1568
	Single/separated	122	101	
Income	Lower (than average)	131	100	0.4542
	Higher	77	101	
Current marital status satisfaction	Not satisfied	20	97	0.2375
	Satisfied	189	101	

Independent t-test p value: \*\* significance < 0.05, \*\*\* significance < 0.001

Respondent characters	Sub groups	Number (n)	Total VSSS-MT score	p value
<b>WHO Quality of life (QOL) total score</b>	Low	88	94	0.0000***
	High	121	105	
Physical QOL score	Low	53	89	0.0000***
	High	156	104	
Psychological QOL score	Low	41	91	0.0000***
	High	168	102	
Social QOL score	Low	71	95	0.0001***
	High	138	103	
Environmental QOL score	Low	54	91	0.0000***
	High	155	103	
Current leisure status satisfaction	Not satisfied	29	92	0.0012**
	Satisfied	180	101	
• Current leisure status with family	Not satisfied	119	100	0.8200
	Satisfied	90	100	
• Current leisure status with friend	Not satisfied	135	100	0.3354
	Satisfied	74	102	
• Current leisure status alone	Not satisfied	159	101	0.1123
	Satisfied	50	97	
<b>Abuse encountered within 30 days</b>				
• Psychological abuse	Not experienced	183	100	0.7474
	Experienced	22	101	
• Physical abuse	Not experienced	203	100	.
	Experienced	1	102	
• Sexual abuse	Not experienced	204	100	.
	Experienced	1	111	
<b>Urine illicit drug findings</b>				

Independent t-test p value: \*\* significance < 0.05, \*\*\* significance < 0.001

Respondent characters	Sub groups	Number (n)	Total VSSS-MT score	p value
• Urine Morphine	Absent	93	101	0.7137
	Present	116	100	
• Urine Tetrahydrocannabinol (THC)	Absent	185	100	0.5802
	Present	24	99	
• Urine Methamphetamine	Absent	158	101	0.2034
	Present	51	98	
• Urine Amphetamine	Absent	191	100	0.9167
	Present	18	101	
• Urine Benzodiazepine	Absent	137	101	0.3853
	Present	72	99	
Last heroin injection within 30 days	No	93	102	0.0483**
	Yes	115	98	
Frequency of injection	No or few inj: (mean = 7)	96	102	0.0373**
	Higher	112	98	
Needle sharing within 30 days	Not shared	99	99	0.7169
	Shared	4	102	
Life time sharing of needle and syringes	Not shared	106	99	0.1452
	Shared	102	102	
Independent t-test p value: ** significance < 0.05, *** significance < 0.001				

Among the different characteristics of the respondents, higher quality of life on physical, psychological, social and environmental categories, respondents who satisfied on current marital status and current leisure status, respondents who were on alcohol were associated with higher treatment satisfaction on methadone, over 80 as “much satisfaction”; ( $p < 0.05$ ) as mentioned in Graph 1.

#### Stepwise regression analysis

After considering significant associated characteristics in the model affecting to the VSSS service satisfaction scale, stepwise binary logistic regression was done among the significant parameters in the model to identify final predictors to the outcome group for “VSSS service satisfaction scale” in Table 3.

Table 3  
Table shows correlates of VSSS scale from stepwise regression

Variable	Adjusted Odds Ratio (aOR) (95% CI)	p value
Alcohol	5.57 (1.2, 25.88)	0.029**
Physical quality of life (QOL) score	11.87 (4.29, 32.84)	0.000***
Stepwise binary logistic regression, p value: **significance < 0.05, ***significance < 0.001		

Retention in logistic regression was predicted the associated characteristics which impacted on the VSSS service satisfaction scale.

In the analysis of binary logistic regression, this analysis estimated the association of independent variables to the outcome variable of VSSS service satisfaction scale category of the methadone patients after controlling the potential confounding variables for adjustment. Alcohol alone had 6 times (aOR 5.57, 95% CI; 1.20- 25.88, p = 0.029) while respondents in good physical health (with higher score in physical quality of life) had 12 times (aOR 11.87, 95% CI; 4.29–32.84, P = 0.000) in contributing to the high VSSS service satisfaction scale. When checking for the multi collinearity, mean variance inflation factor (vif) was 1.61 and none of the variable has more than 10. The regression model alpha ratio is set at 0.05.

#### Reported Infection status of the patients

Among the methadone respondents, just above one-third (36.5%, n = 76) received high-dose (more than 80mg/ day) and the rest 63.5% (n = 132) received low-dose on methadone (less than 80mg/ day). Almost half of the respondents reported hepatitis C virus infection (HCV) (47%, n = 71/ 148), 37% reported Human Immunodeficiency Virus (HIV) infection (n = 74/ 200), while 16% (n = 34) reported HIV and HCV co-infection. Forty-five (21.53%) reported that they experienced sexually transmitted infections and Hepatitis B infection by 15 (8.29%). Among HIV infected respondents, 68 (92%) were on antiretroviral therapy (ART) and their average ART duration was 30-months (range: 1 to 132 months). In Myanmar, the most commonly prescribed antiretroviral regimen is the combination of tenofovir, emtricitabine and efavirenz which account for 86% which requires a significant methadone dose adjustment. More than 80mg of high methadone dose is associated with taking antiretroviral therapy (p = 0.039).

#### Treatment satisfaction by methadone dose and infection status

Based on the available cross-sectional data, treatment satisfaction was trying to estimate with cox proportional hazard model assuming the model of in the way of cohort data. Based on estimated model on HIV infection, treatment satisfaction was 2 times higher among HIV negative compared to HIV positive patients after controlling the methadone dose variable (IRR = 0.49, p = 0.000). Similarly for co-infection status (HIV and HCV), satisfaction was 1.7 times higher among non-co-infected patients than co-infected patients (IRR = 0.59, p = 0.000).

Higher rate of satisfaction incidence was 1.49% among HIV negative respondents and 0.72% among HIV positive respondents after adjusting for methadone dose ( $p = 0.000$ ). Higher dose was associated with increased satisfaction scales ( $p = 0.037$ ) in HIV negative respondents.

Difference of higher satisfaction incidence was showed in 1.2% among non-co-infected patients and 0.71% among co-infected patients with adjusted doses. Co-infected patients were less likely to get satisfaction compared to non-co-infected patients ( $p = 0.000$ ).

## Discussion

This study elaborates factors associated with methadone treatment satisfaction VSSS scale. Besides basic methadone services and staff interaction of the methadone service providers, some of the factors that significantly influences on satisfaction of specific service provision of methadone are recent heroin injections, respondents taking benzodiazepine, those infected with HCV, those who had higher addiction severity index on alcohol and family/ social status, etc. So, it is highly important that ancillary services of methadone programme; counselling, medical services, psycho-social services, and psychiatric care will enhance the outcome for methadone treatment. It is also aligned with treatment satisfaction is higher among methadone clinics with other healthcare services than methadone service alone (Tran, et al. 2015). Treatment progression (estimate = 0.227, SE = 0.019,  $p < 0.01$ ) and counselling rapports (estimate = 0.229, SE = 0.016,  $p < 0.01$ ) had positive associations with treatment satisfaction (Li, et al. 2017). Meanwhile, responses from Malaysian clients raised that dosing area; waiting area and staff shortage were most desired changes from the methadone clients (Aziz and Chong 2015). Another analysis result from Spain, multiple linear regression showed methadone satisfaction depended on methadone dispensing hour, influence on methadone dose change, number of patients per centre, perceived frequency of receiving information about methadone dose changes, and social dysfunction subscale of GHQ-28 (General Health Questionnaire-28; lower social dysfunction was related to higher satisfaction) ( $p < 0.05$ ) (Trujols, et al. 2012).

The result of stepwise binary logistic regression showed alcohol use and physical health has significantly associated with treatment satisfaction. So, alcohol usage along with methadone is also an important factor to consider the drug rehabilitation programme and measures. Higher satisfaction was also shown when methadone treatment is provided with other associated healthcare services than treating only with methadone. The satisfaction results from Vietnam reflected that comprehensive care clinics services with physical, psychological and HIV related care are important in the service provision. Meanwhile, treatment satisfaction for “staff category” of methadone treatment was high in Myanmar and it was also seen in Vietnamese study of Tran study which also showed the highest in “capacity of health workers & responsiveness” with lowest proportion in “Quality” (49.0%) and “Convenience” (51.1%) (Tran, et al. 2015).

This study also has a few limitations as the respondents were recruited who are taking methadone currently and those who are not satisfied with the services can be omitted unintentionally from the

recruitment process. Based on the cross-sectional data, estimation of the service satisfaction among patients with infection status has methodology limitation due to the data availability other than the cohort nature. Furthermore, due to the sample size limitation, it is expected that limitations in the conclusion for respondents with specific characteristics. As the respondents are the current patients taking on methadone, the patients can be under Hawthorn's effect and can avoid the unexpected risk of answering pessimistic views although there was a proper explanation for ensuring their confidentiality in answering their opinion.

There were other factors to consider for evaluation of methadone services like early drop-outs and refusals to participate, which could contribute uncertainty of the results obtained and a threat to the internal validity and generalizability of such results.

To ensure the reflective answer for methadone patients, those who were retained at least six-month in the programme were set as a criterion for inclusion in the survey. Meanwhile, in terms of drug efficacy in retention of the patients compared to other opioid substitution, it was reported in the Cochrane review that methadone maintenance is superior in retaining patients in opioid substitution therapy compared to buprenorphine at low fixed dose (Mattick, et al. 2014).

Respondents on methadone were generally satisfied with the services they received. It was clear in the results that specific intervention works were necessary to expand and improved for treatment satisfaction. As the specific intervention works focuses on individual and group counselling, family support, centre supports at home, the methadone intervention is more effective if it integrated with individual and/or group counselling, employment or family services (Opioid Addiction 2018). This finding was higher than a study result from Spain and average total score was 3.4 (SD = 0.6); with Basic Interventions mean scores 3.5 (SD = 0.7), Specific Interventions scores 3.1 (SD = 0.8), Social Worker Skills 3.5 (SD = 1.0), and Psychologist Skills 3.6 (SD = 0.9) (Trujols, et al. 2012).

## **Conclusion**

Pharmacological response from urine drug results also encouraged that optimal dose of methadone based on the clinical profile of patient was also effective in reducing the illicit opioid drug injection among methadone patients. Furthermore, community based approach with the individual rehabilitation with family support, individualized care from the treatment centres are recommended in delivering effective methadone treatment and prevention of further illicit drug use and infections for strengthening of specific intervention category of methadone treatment. Treatment of the people who inject drugs (PWID) and their family members at their place are also important for expansion among harm reduction organizations and early access of interventions will prevent further infections and get the treatment earlier in a social integrated approach.

## **Abbreviations**

aOR: Adjusted Odds Ratio

ART: Antiretroviral therapy

ASI: Addiction Severity Index

BMI: Body Mass Index

DDTRU: Drug Dependency Treatment and Research Unit

HCV: Hepatitis C Virus

HIV: Human Immunodeficiency Virus

IRR: Incidence Rate Ratio

MMT: Methadone Maintenance Treatment

PWID: People Who Inject Drugs

SD: Standard Deviation

VSSS-MT: The Verona Service Satisfaction Scale for Methadone-Treatment

WHO: World Health Organization

WHOQOL-BREF: generic Quality of Life Scale developed through the World Health Organization

## **Declarations**

## **Ethical Approval and Consent to participate**

This research approval was granted from the Human Ethics Committee of the Universiti Sains Malaysia (No:USM/ JEPeM/16080269) (University of Science, Malaysia) and Department of Medical Research (No: Ethics/DMR/2017/057), Ministry of Health and Sports, (Research 2017).

## **Consent for publication**

All authors read and approved final manuscript submission. All authors agree to publish this prepared manuscript and no other submission of this manuscript to other journal.

## **Competing Interest**

All authors declare that there is no competing interest.

# Funding

Authors declared that the research and publication of their article was self-funded for academic purpose.

# Authors' Contributions

Sun Tun contributed in designing, implementation, analysis and wrote the manuscript. B. Vicknasingam and Darshan Singh contributed in designing, analysis and contributed in this manuscript.

# Data Availability

The [.dta] data used to support the findings of this study are available from the corresponding author upon the approval of the Centre for Drug Research.

# Acknowledgments

The authors would like to thank to all survey respondents and Dr. Nanda Myo Aung Wan, Drug Dependency Treatment and Research Unit (DDTRU) Programme Manager in Myanmar who supported in proposal development. Further appreciation goes to Dr. Ohnmar Thaug, U Thet Swe, Dr. Phyo Myat, Dr. Nay Lin, Dr. Myo Min Min and harm reduction organizations in Myanmar (Myanmar Anti-Narcotic Association, Burnet Institute, Asian Harm Reduction Network) for supporting survey data collection.

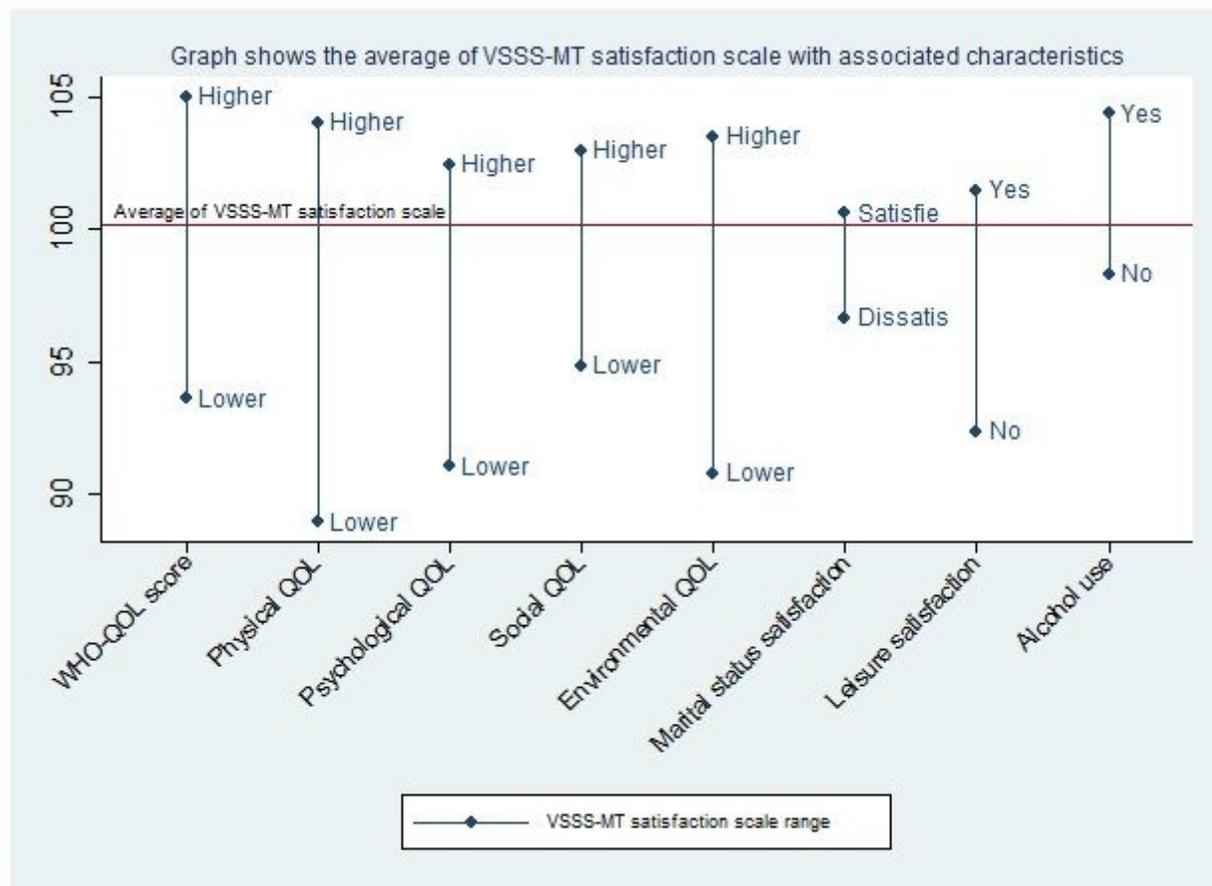
# References

1. "The Client Satisfaction Questionnaire (CSQ) Scales." In *Outcome Assessment in Clinical Practice*, by C. Clifford Attkisson, & T. K. Greenfield., edited by L. L. Sederer , & B. Dickey. Baltimore, MD: Williams & Wilkins, 1996.
2. Aziz, Zorah, and Nyuk Jet Chong. "A Satisfaction Survey of Opioid-Dependent Patients with Methadone Maintenance Treatment." *Journal of Substance Abuse Treatment* (Elsevier) 53 (Jun 2015): 47-51.
3. Chou, Ying-Chun, Shu-Fang Shih, Wei-Der Tsai, Chiang-shan R Li, Ke Xu, and Tony Szu-Hsien Lee. "Improvement of quality of life in methadone treatment patients in northern Taiwan: a follow-up study." *BMC Psychiatry* (Bio Med Central) 13, no. 190 (2013).
4. Cobos, José Pérez de los, et al. "Development and psychometric properties of the Verona Service Satisfaction Scale for methadone-treated opioid-dependent patients (VSSS-MT)." *Drug and Alcohol Dependence* (Elsevier) 68, no. 2 (Oct 2002): 209-214.
5. DDTRU. *National Drug Abuse Prevention and Control Programme*. Yangon: DDTRU, 2015.

6. Fei, Joni Teoh Bing, Anne Yee, Mohamad Hussain Bin Habil, and Mahmoud Danaee. "Effectiveness of Methadone Maintenance Therapy and Improvement in Quality of Life Following a Decade of Implementation." *Journal of Substance Abuse Treatment*, July 2016: 50-56.
7. Larsen, Daniel L., C. Clifford Attkisson, William A. Hargreaves, and Tuan D. Nguyen. "Assessment of client/patient satisfaction: Development of a general scale." *Evaluation and Program Planning* (Elsevier) 2, no. 3 (1979): 197-207.
8. Li, Li, W. Scott Comulada, Chungqing Lin, Julie Hsieh, Sitong Luo, and Zunyou Wu. "Factors related to client satisfaction with methadone maintenance treatment in China." *Journal of Substance Abuse Treatment* 77 (Jun 2017): 201-206.
9. Mattick, Richard, Courtney Breen, Jo Kimber, and Marina Davoli. "Buprenorphine maintenance versus placebo or methadone maintenance for opioid dependence." *Cochrane Database of Systematic Reviews*, no. 2 (Feb 2014).
10. McLellan, Thomas, John Cacciola, Deni Carise, and Thomas H. Coyne. "Addiction Severity Index Lite - CF." 1999.
11. methadone, WHO. *Pharmacotherapy with methadone*. 2014.
12. Myanmar, The Global Fund Programme in. *The Global Fund Programme in Myanmar*. Sep 23, 2020. <https://pr-myanmar.org/en/disease/hiv>.
13. Myanmar, UNAIDS. *Situational Analysis on Drug Use, HIV and the Response in Myanmar: Looking Forward*. Yangon: UNAIDS, 2015.
14. NIDA-CTN. *Instrument: Timeline Followback Method Assessment*. 2014. [https://cde.drugabuse.gov/sites/nida\\_cde/files/TimeLineFollowBack\\_2014Mar24.pdf](https://cde.drugabuse.gov/sites/nida_cde/files/TimeLineFollowBack_2014Mar24.pdf).
15. "Opioid Addiction." In *Principles of Drug Addiction Treatment: A Research-Based Guide (Third Edition)*. 2018.
16. Research, Department of Medical. <http://www.ercdmrlm.org> . April 2017. [http://www.ercdmrlm.org/pdf/2017\\_Certificate\\_List.pdf](http://www.ercdmrlm.org/pdf/2017_Certificate_List.pdf).
17. Rugger, Mirella, Dallagnola Rosa, Giulia Bisoffi, and Tom Greenfield. "Factor analysis of the Verona Service Satisfaction Scale-82 and development of reduced version." *International Journal of Methods in Psychiatric Research* 6, no. 1 (Apr 1996): 23-38.
18. Tran, Bach Xuan, Long Hoang Nguyen, Huong Thu Thi Phan, and Carl A. Latkin. "Patient Satisfaction with Methadone Maintenance Treatment in Vietnam: A Comparison of Different Integrative-Service Delivery Models." *PLOS One* (PLoS One) 10, no. 11 (Nov 2015): e0142644.
19. Trujols, Joan, Inmaculada Garijo, Nùria S ~ nol, Juan del Pozo, Maria J. Portella, and José Pérez de los Cobos. "Patient satisfaction with methadone maintenance treatment: The relevance of participation in treatment and social functioning." *Drug and Alcohol Dependence* (Elsevier) 123 (2012): 41-47.
20. Tun, Sun, B. Vicknasingam, and Darshan Singh. "Increased methadone dose reduces illicit drug injection among HIV negative methadone clients in Myanmar." *Journal of the International AIDS Society* 21, no. 56 (Jul 2018): e25148.

21. UNODC. *World Drug Report 2020*. UNODC, 2020.
22. WHO. "The World Health Organization Quality of Life (WHOQOL)-BREF." 2004.
23. Yi, Hser, et al. "Long-term outcomes after randomization to buprenorphine/naloxone versus methadone in a multi-site trial." *Addiction* 111, no. 4 (April 2016): 695–705.
24. Zhang, Lei, et al. "Methadone Maintenance Treatment Participant Retention and Behavioural Effectiveness in China: A Systematic Review and Meta-Analysis." *PLOSone* (PLOSone), Jul 2013.

## Figures



**Figure 1**

Graph shows the average of VSSS-MT satisfaction scale with associated characteristics