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Positive Emotions and Quality of Life among Malaysian Patients on Methadone Maintenance Therapy and Their Psychosocial Correlates

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Abstract: The main objective of this study was to assess the positive emotions and the quality of life among patients on methadone maintenance therapy (MMT) as well as their associated factors. This is a cross-sectional survey study. Participants undergoing MMT in two major Malaysian hospitals responded to the sociodemographic and clinical information sheet, the Positive Emotion Rating Scale (PERS), and the World Health Organization Quality of Life (WHOQOL)-BREF. Most of the participants (N = 154; mean age = 43.8 ± 9.0 years) were male (97.4%) and Malays (75.3%). Slightly more than half (50.6%) scored above 30 on the Positive Emotion Rating Scale. There was a significant association between being ethnically Malay, married, and employed and positive emotions. After adjusting for potential confounding factors, having positive emotions predicted a better overall, physical, and psychological quality of life. Being non-diabetic also significantly predicted a better quality of life in the overall domain, whilst not being married and family history of mental illness significantly predicted a lower overall and psychological quality of life. Positive emotions significantly improve patients' quality of life in the MMT program, suggesting the inclusion of positive emotions in a holistic treatment approach.

Keywords: methadone maintenance; positive emotions; quality of life; Malaysia

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1. Introduction

Worldwide, 5.3% of the global population between the ages of 15 and 64 years, or an equivalent of about 269 million people, used drugs at least once in 2018. Among them, about 58 million people used opioids, according to the World Drug Report [1]. In Malaysia, there is concern about the growing use of opioids in the country. The Malaysian antidrug agency, Agensi Antidadah Kebangsaan [2], identified 17,474 new cases and 7793 relapse cases of drug abuse in 2018 alone. Of these, 7746 were dependent on opiates. A nationally representative study in 2021 showed that the lifetime prevalence of opiate use was 1% with an estimated population of 109,502 persons, while the current use of opiates was estimated to be 91,889 persons at a 0.8% prevalence [3].

The Ministry of Health initiated the Methadone Maintenance Treatment (MMT), a national harm reduction program in 2005 involving 18 centers. Methadone is an effective

treatment to reduce opiate use through opiate substitution therapy globally [1] and in Malaysia [4]. Undergoing MMT has also been consistently found to improve the quality of life (QoL) of patients in Malaysia [5,6]. Another Malaysia study assessing the long-term outcome of MMT treatment on QoL showed that even though the patients' QoL improved significantly between baseline and a two-year follow-up, the QoL of these participants did not continue to improve significantly beyond follow-up [7]. Factors associated with a poorer improvement in QoL were being above 50 years old, having an HIV-positive status, and the manifestation of physical symptoms [7]. A recent study suggested that not being married and having poorer health status was associated with lower QoL among Malaysian MMT patients [8]. The inclusion of QoL as an outcome assessment for MMT effectiveness is important because drug use affects an individual's life systemically, i.e., in all important areas of life such as physically, psychologically, environmentally, and socially. Therefore, a meaningful impact assessment of treatment success should include a patient's QoL as well [5,6].

There are several factors that could affect the effectiveness of MMT, including comorbid psychiatric disorders such as depression and anxiety [9,10]. A study among Canadian MMT patients revealed that 80% had a comorbid psychiatric disorder and that the usage of tranquilizers (which are commonly prescribed for anxiety disorders) predicted higher rates of continued illicit opioid use [11]. Another study found that about 45% of opiate-dependent patients had lifetime mood disorders, with 19% having a current major depressive episode and 24% of them having at least one episode in the past [12]. This may be due to an effort to avoid negative emotions through the use of opioids, which developed into a pattern of ineffective coping and an increasingly pessimistic view of life [13]. As comorbidity of opioid use disorders and other psychiatric disorders is highly prevalent, treatment of opioid use disorder through MMT is increasingly taking into account mental health treatment or psychotherapy as an adjuvant care component to methadone treatment [14].

There has been a dearth of studies that employed positive emotions in the treatment of addictive disorders [15]. Individuals with lower positive emotions are more likely to be involved in drug abuse [16]. Similarly, a study among women who had experienced domestic violence in the US revealed that difficulty regulating positive emotions was associated with greater drug use [17]. Therefore, emotion regulation strategies and positive emotions play an important role in preventing substance abuse recurrence [16]. Over the past decades, research in positive emotions has grown exponentially with the advancement of positive psychology in the prevention and recovery of depression [15,18,19]. In Malaysia, even though the Positive Emotion Rating Scale was translated and validated in the Malay language [19], there is a scarcity of studies measuring positive emotions in both the general population and among MMT patients.

However, the focus of most studies on MMT in the past was to examine its outcomes in terms of drug-related behavior, criminal behaviors, HIV-risk-related behaviors, transmissions of infections, sexual dysfunction, quality of life, and mortality [5,19–22]. Therefore, this study aims to examine the level of positive emotions among patients on MMT and its association with patients' quality of life, as well as the associated factors of both positive emotions and QoL.

2. Materials and Methods

2.1. Study Design and Settings

This was a cross-sectional study. The study was conducted among patients receiving methadone maintenance therapy (MMT) at Universiti Malaya Medical Centre (UMMC), Kuala Lumpur and Tuanku Ja'afar Seremban Hospital (HTJS), Seremban, Malaysia.

2.2. Participants

The sample size was determined using the following formula $(t^2 \times p\ (1 - p))/m^2$; assuming the confidence interval of 95% (standard value of 1.96), an estimated prevalence from a study of 11.2% [23], and a margin of error at 5% (standard value of 0.05), the

required sample size was 153 subjects. A non-duplicated sample of participants from the two hospitals was recruited via convenience sampling. The inclusion criteria for this study included MMT patients who were aged 18 or above, who fulfilled the diagnosis of opioid dependence based on the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) [24], had received MMT for at least one month, and were literate in the Malay or English language. Individuals diagnosed with intellectual disabilities, cognitive impairments, psychotic symptoms, and behavior disturbances were excluded.

2.3. Data Collection Tools and Procedures

A brief questionnaire was developed to obtain relevant socio-demographic data and clinical information from the participants. The demographic variables obtained were age, ethnicity, marital status, employment status, and family history of substance use or mental illness. Clinical data included the duration and dosage of MMT, any comorbid medical illnesses, and a history of other substance use in the last month.

The Malay version of the Positive Emotion Rating Scale (PERS-M) was used to measure positive emotions among the MMT patients. The questionnaire consists of eight items and covers six domains of positive emotions, which include contentment, interest, love, gratification, activity, and pride. PERS-M showed good internal consistency (Cronbach's $\alpha = 0.89$), parallel reliability, and concurrent validity with the Dispositional Positive Emotional Scale (DPES) and the Malay version of the Snaith–Hamilton Pleasure Scale (SHAPS-M). The optimal cut-off value for PERS-M was 32, with a sensitivity of 0.68, a specificity of 0.63, a positive predictive value of 0.49, and a negative predictive value of 0.79 [19].

The Malay version of the World Health Organization Quality of Life (WHOQOL)-BREF was used to assess the quality of life among the patients on MMT. The domains of quality of life measured included physical health, psychological health, social relationships, environment, overall quality of life, and general health. Compared to WHOQOL-100, the abbreviated, 26-question WHOQOL-BREF is less time-consuming and more practical in daily clinical practice. The Malay version of WHOQOL-BREF showed good internal consistency estimates (ranging from 0.64 to 0.80 for all domains), test–test reliability, and both discriminant and construct validity [25].

Ethical committee approval was obtained from the Malaysian Medical Research and Ethics Committee (Approval No.: NMRR-17-2700-33530) before the data collection commenced. Each potential participant was approached separately. Informed consent for study participation was obtained from all participants. Before obtaining consent, the patients were provided with the Patient Information Sheet, and important information about the study was included. The data collection was conducted between August and October 2020. As the investigator on site (SG) was involved in the treatment of the patients in the unit, she was not involved in the data collection to prevent bias. Hence, prior to the administration of the questionnaire, an assistant medical officer was briefed about the study and trained regarding the questionnaire contents. He was present with the participants throughout the self-administration of the questionnaire to guide the participants if required. The participants took about 15 to 20 min to complete the questionnaire. Participants were referred to the appropriate services for further management if there was a need.

2.4. Data Management and Statistical Analysis

The data were entered into and analyzed using IBM SPSS Statistics for Windows, version 23.0. Descriptive statistics were used to summarize the data. The scores of the PERS-M and each domain of the WHOQOL-BREF were tabulated. The association between demographic factors, clinical variables, and positive emotions was assessed via bivariate analyses, using an independent samples t-test for categorical predictor variables and Pearson's correlation for normally distributed predictor variables. The bivariate analyses were then followed up with multiple linear regression analyses to further explore the association between the significant variables and positive emotions. Subsequently, similar

analyses were repeated to determine the association between PERS, demographic/clinical variables, and QoL. Statistical significance was set at $p < 0.05$ for two-tailed tests.

3. Results

3.1. Demographic and Clinical Background of Participants

A total of 154 patients on MMT participated in this study and their sociodemographic and clinical information were summarized in Table 1. The participants (mean age = 44.1 years, SD ± 9.04) were mainly males (96.1%, *n* = 148), Malays (75.3%, *n* = 116), married (55.8%, *n* = 86), employed (85.1%, *n* =131), and without a family history of substance use or mental illness (87.7%, *n* = 135). The mean duration of MMT was 71.6 months (SD ± 40.1), and the mean daily MMT dose was 63.6 mg (SD ± 31.1). Almost all participants were smokers (97.4%, *n* = 150). Despite being on MMT, about one-tenth of the patients were still using at least one other substance concurrently, which included alcohol (12.3%, *n* = 19), heroin (8.4%, *n* = 13), stimulants (7.8%, *n* = 12), benzodiazepine (6.5%, *n* = 10), and cannabis (4.5%, *n* = 7). Nearly half of the patients (48.1%, *n* = 74) tested positive for hepatitis C and 7.8% (*n* = 12) were HIV positive. Hypertension was the most prevalent comorbid medical illness among the participants (9.7%, *n* = 15), followed by diabetes mellitus (6.5%, *n* = 10), bronchial asthma (5.8%, *n* = 9), other medical conditions (5.8%, *n* = 9), and hyperlipidemia (0.6%, *n* = 1) (Table 1).

Table 1. Sociodemographic and clinical variables of the participants.

Variable	Frequency (*n*) or Mean ± SD	Percent
Mean age ± SD (years)	44.10 ± 9.04	
Gender		
Male	148	96.1
Female	6	3.9
Ethnicity		
Malay	116	75.3
Other ethnic groups	38	24.7
Marital status		
Married	86	55.8
Unmarried	68	44.2
Employment		
Employed	131	(85.1)
Not employed	23	(14.9)
Family history of substance use/mental illness		
Yes	19	12.3
No	135	87.7
Mean MMT daily dosage ± SD (mg)	63.6 ± 31.3	
Mean MMT duration ± SD (months)	71.6 ± 40.1	
Concurrent substance use (answered "Yes")		
Tobacco	150	97.4
Alcohol	19	12.3
Benzodiazepine	10	6.5
Cannabis	7	4.5
Stimulant	12	7.8
Heroin	13	8.4
Comorbid medical illness (answered "Yes")		
Diabetes mellitus	10	6.5
Hypertension	15	9.7
Hyperlipidaemia	1	0.6
Bronchial asthma	9	5.8
Hepatitis	74	48.1
HIV status	12	7.8
Others	9	5.8

3.2. Positive Emotions among MMT Patients and Its Associated Factors

The mean PERS-M score among the MMT patients was 29.10 ± 6.16 (Table 2). Only about one-third (36.4%, *n* = 56) of the participants scored 32 or above, indicating a good range of positive emotion, while the remaining majority (63.6%, *n* = 98) had lower positive emotion scores. Bivariate analyses showed that Malays (p = 0.029) and those married (p = 0.016) were significantly associated with a higher PERS-M score, while alcohol use (p = 0.046) was significantly associated with a lower PERS-M score. Interestingly, neither the dosage nor duration of MMT was found to have any significant relationship with positive emotions. Following multiple linear regression, being married (p = 0.045) was the only factor that remained significant in predicting a higher PERS-M score among the MMT patients (Table 3).

Table 2. PERS-M and WHOQOL-BREF Scores.

	Mean ± SD	***n* (%)**
Positive emotions		
Mean	29.10 ± 6.16	
Score < 32		98 (63.6)
Score ≥ 32		56 (36.4)
WHOQOL-BREF domains		
Physical health	14.55 ± 2.01	
Psychological	14.43 ± 2.36	
Social relationship	13.88 ± 2.86	
Environment	14.19 ± 2.16	
Overall quality of life	3.73 ± 0.80	
Overall general health	3.54 ± 0.74	

Note: PERS-M = Positive Emotion Rating Scale-Malay. WHOQOL-BREF = World Health Organization Quality of Life-Brief Version.

Table 3. Multiple linear regression of factors associated with positive emotions.

Variable	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	***p* Value**
	B	**Standard Error**	**β**		
Malay	1.763	1.217	0.124	1.449	0.150
Other ethnic groups †	0.000				
Married	2.012	0.994	0.163 *	2.025	0.045
Unmarried †	0.000				
Alcohol use—"Yes"	−1.564	1.609	−0.084	−0.972	0.333
Alcohol use—"No" †	0.000				

Note. * $p < 0.05$;. † Reference group.

3.3. Quality of Life and Its Relationship with Positive Emotions and Other Factors

The mean WHOQOL-BREF score among the participants was 14.55 (SD ± 2.01), 14.43 (SD ± 2.36), 13.88 (SD ± 2.86), 14.19 (SD ± 2.16), 3.73 (SD ± 0.80), and 3.54 (SD ± 0.74) for physical health, psychological health, social relationships, environment, overall quality of life, and general health (Table 2). Even after adjusting for all confounders, positive emotions were significantly associated with a higher quality of life in all WHOQOL-BREF domains. All other significant factors (Malay, employed, family history of mental illness, duration of MMT, and type of drug use) associated with each QoL domain of WHOQOL-BREF were summarized in Table 4.

Table 4. Multiple linear regression of factors significantly associated with WHOQOL-BREF domains.

Variable	Standardized Coefficient (β)					
	Domain 1: Physical	**Domain 2: Psychological**	**Domain 3: Social**	**Domain 4: Environment**	**Overall QOL**	**General Health**
PERS-M	0.500 **	0.665 **	0.473 **	0.713 **	0.539 **	0.398 **
Malay Other ethnic groups †			0.193 **			
Employed Unemployed †	0.144 *					
Family history of mental illness—"Yes" Family history of mental illness—"No" †					0.183 **	
Duration of MMT		0.189 **				
Stimulant use—"Yes" Stimulant use—"No" †	−0.188 *		−0.156 *			
Heroin use—"Yes" Heroin use—"No" †				−0.115 *		

Note. * $p < 0.05$; ** $p < 0.01$/MMT = Methadone Maintenance Therapy. PERS-M = Positive Emotion Rating Scale-Malay. WHOQOL-BREF = World Health Organization Quality of Life-Brief Version. † Reference group.

4. Discussion

One of the most prescribed and effective treatments for opioid dependence is MMT. However, studies on positive emotions among MMT patients are rare. Opioid-dependent patients are a vulnerable group with high relapse rates, and the risk of mortality is especially high after a period of abstinence due to loss of tolerance to the drug. As positive emotions are protective factors against substance use, assessing MMT patients' positive emotions and their association with QoL were indeed areas of importance. The main finding of this study was that positive emotions significantly predicted overall and all QoL subdomains among MMT patients after adjusting for potential confounding factors. It has been previously established that high levels of positive emotions can promote well-being and are of paramount importance when it comes to human flourishing, which includes psychological and physical health [26]. Therefore, positive emotions are an integral aspect to be considered and incorporated as a treatment modality in the improvement of the quality of life of MMT patients. A past study on Malaysian working adults has shown that positive emotions were improved through a virtual reality intervention [27]. Unfortunately, when applied to MMT patients in China, a clinical trial showed that a positive psychological intervention among MMT patients was not effective in improving their mental health status [28]. However, the relatively simple treatment of asking the patients to record three good things that happened every day for a fortnight may not be adequate to address the complex life issues that MMT patients faced, and therefore a longer and more innovative treatment was recommended by the authors [28].

This study found that about half of the study participants recorded good positive emotions whilst the remaining half had reduced positive emotions. Eliciting positive emotions as part of the treatment of depression has been shown to reduce the signs and symptoms of depression, as well as prevent substance use relapse [29]. In this study, we did not collect data regarding the patients' depression and anxiety status. However, as 50% of the study participants reported reduced positive emotions, they were highly likely to have a mood disorder or be predisposed to a mood disorder [30]. It must be remembered that being in the MMT program does not systemically resolve other problematic aspects of the patients' lives. They may still face many other underlying problems that were not addressed in MMT. These problems and the lack of resilience were probably the contributing factors to lower

positive emotions [31]. Low positive emotions are a concern, as individuals who failed to regulate positive emotions were found to have a greater risk of drug use [17]. Therefore, there is a need to reinforce positive emotions among opioid-dependent individuals [29].

The significant predictors for good positive emotions were being Malay, married, and a non-alcoholic user. With regard to ethnicity, Malays had higher PERS and social QoL mean scores. The higher prevalence of positive emotions and QoL in this ethnic group could be due to a number of factors. First of all, Malays may have enjoyed a higher social relationship QoL due to larger average family sizes, which provided social support. On the other hand, as most Malays are religiously affiliated with Islam, it may be worth investigating whether religiosity among the Malays contributed to greater positive emotions and QoL. Religion has been widely used as a way to attempt to deal with sickness and a study found that the greater the religious commitment, the better an individual's well-being. The protectiveness of religion against psychological distress and other health-related outcomes has been attributed to religious practices that increase the inclusion of an individual in society and widen their social support network [32]. However, the association between Islam and positive emotions and social QoL remains to be further investigated.

Another significant association was between positive emotions and being married, and it was the only factor that remained significant after adjusting for other confounders. The results are consistent with another study among Malaysian MMT in which lower QoL was reported among those not married [8]. Past studies have found that individuals who were married had better health [33] and men who were living with their spouses had lower incidences of psychiatric illness [34]. Marriage could be a factor influencing positive emotions as it has a "buffering" effect against negative events through the social support provided by a spouse [30]. This improves one's self-esteem and provides them with a strong positive sense of identity and self-worth, which could contribute to positive emotions.

As for comorbid substance use, there was a significant association between alcohol use and reduced positive emotions. There have been studies that indicated alcohol use was associated with symptoms of depression and negative emotions. A study among MMT patients in China noted that 29.0% of the patients reported current drinking, whilst another 10.4% reported hazardous drinking, and that alcohol abuse/dependence was associated with worse depression and anxiety [35]. This may lead to negative MMT outcomes, as past studies have shown that alcohol abuse among MMT patients increased the risk of nonadherence to MMT, opioid relapse, and negative psychological outcomes [36,37]. On the other hand, current stimulant and heroin use among MMT patients contributed to poorer QoL. The increasing prevalence of methamphetamine-type stimulant use among MMT patients may be attributed to a lack of knowledge regarding its dangers and believing that it is a safe drug to be used with methadone [38,39]. MMT patients need to be educated regarding the dangers of concurrent substance use with MMT treatment, especially as it may contribute negatively to a patient's QoL.

Other significant predictors for higher overall QoL and its subdomains were being Malay, employed, and a longer duration of MMT. The findings were consistent with a number of past studies conducted among other populations. For example, being employed was associated with a higher health-related QoL [40]. Unemployment may have a negative association with physical health QoL as it is a stressful condition related to depression and anxiety and predicts lower healthcare utilization [40]. On the other hand, unemployed individuals may have lost or left their jobs due to ill health in the first place [40]. Considering the importance of employment to MMT patients' QoL, the treatment of MMT patients may need to incorporate occupational skills that equip MMT patients to become socially incorporated into the working force after MMT is completed. On the other hand, a longer duration of MMT may have allowed the participant to be less opioid dependent, thus improving their psychological QoL.

There are several limitations to this study. A large majority (96.1%) of the participants were male. In addition, the Chinese population and other ethnic groups in Malaysia were underrepresented in comparison to Malays. Future studies could use sex and ethnic

stratification during data collection to achieve better representativeness in the sample. Next, we did not investigate associations between positive emotion and religious affiliation. While the Islamic worldview may be supportive of positive emotions, it may possibly increase the stigma of being a methadone user and receiving MMT. The nuanced impact of religiosity on the QoL of MMT patients would be worth investigating in future studies. Based on preliminary findings on the significance of demographic and clinical background on positive emotions and the QoL of MMT patients (such as sex, ethnicity, marital status, and the presence of comorbidities), following up with a qualitative study may be fruitful in providing contextual data on how the participants' antecedent characteristics could influence these outcomes.

In conclusion, this study revealed a strong association between positive emotions and quality of life in patients receiving methadone treatment. Positive emotions are important as they contribute to a reduction of psychological distress and improve psychological well-being and overall health [19], which ultimately leads to a better quality of life. The findings should inform mental health providers that it is important to include positive emotions assessment and interventions into the MMT program for a more holistic and comprehensive approach to treatment.

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