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Factors related to client satisfaction with methadone maintenance treatment in China

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ABSTRACT

Background: This study examined clients' treatment satisfaction with the services provided by methadone maintenance treatment (MMT) in China and explored relevant factors that are directly or indirectly associated with treatment satisfaction.

Methods: The study used baseline data from a randomized controlled trial conducted among 2,448 clients from 68 MMT clinics in five provinces of China. The participants reported their demographic characteristics, treatment-related factors, depressive symptoms, treatment progression, counseling rapport, and treatment satisfaction. Structural equation modeling (SEM) was used to test the direct and indirect relationships among various factors and treatment satisfaction.

Results: Clients' demographic characteristics, such as older age, had both a direct effect on treatment satisfaction and an indirect effect mediated by counseling rapport. Depressive symptoms and a lack of social support had a direct negative impact on treatment satisfaction and an indirect effect mediated by treatment progression and counseling rapport. Both mediators: treatment progression (estimate = 0.227, $p < 0.01$) and counseling rapport (estimate = 0.229, $p < 0.01$), showed positive associations with treatment satisfaction.

Conclusion: The findings reiterate the complex nature of MMT clients' treatment satisfaction and its interrelationship with multidimensional factors. The study has implications for evaluating the quality of care provided by MMT programs and suggests several strategies that can potentially improve MMT clients' level of treatment satisfaction.

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1. Introduction

Since 2000, the World Health Organization has strongly advocated the use of client's treatment satisfaction measures to guide program improvement efforts in addiction treatment services (WHO, 2000). Treatment satisfaction indicators provide information regarding clients' views of the program environment, client-provider interactions, and the perspectives of clients receiving treatment services, which can inform program managers and researchers about clients' needs and treatment experiences (Trujols, Iraurgi, Oviedo-Joekes, & Guardia-Olmos, 2014; Simpson, Joe, Rowan-Szal, & Greener, 1997). Sixma, Kerssens, Campen, and Peters (1998) argued that it is more pertinent to measure treatment satisfaction based on clients' expectations or needs for treatment services and their treatment experiences rather than focusing on results or outcomes. A study conducted in Baltimore, Maryland revealed that satisfaction with methadone treatment was predictive of retention independently of clinical severity (Kelly, O'Grady, Brown, Mitchell, & Schwartz, 2010). Another study in California observed that greater

service intensity and treatment satisfaction were positively related to both treatment completion and longer treatment retention (Hser, Evans, Huang, & Anglin, 2004).

Client's treatment satisfaction is a multidimensional concept and a broad measure that can be influenced by various factors, such as client characteristics, environment, treatment duration, and drug use history. Marchand et al. (2015) found that among long-term opioid users, males reported lower satisfaction with their opioid agonist treatment than females did. Older clients were more satisfied with services received as compared to younger clients (McLellan & Hunkeler, 1998). A study in Malaysia reported that being single or married was associated with higher odds of overall treatment satisfaction compared to divorced or separated clients (Aziz & Chong, 2015). Educational attainment was also identified as a significant determinant of treatment satisfaction, with less educated clients reporting greater satisfaction (Hall & Dornan, 1990).

A large body of research has examined the interrelationships among treatment satisfaction and the provider-patient relationship, treatment progress, and treatment outcomes (Gainey, Wells, Hawkins, & Catalano, 1993; Simpson et al., 1997; Carlson & Gabriel, 2001). Joe, Simpson, Dansereau, and Rowan-Szal (2001) incorporated counseling rapport as a predictor of treatment outcome and found that greater counseling

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rapport was related to better outcomes at follow-up, even after adjusting for the duration of and satisfaction with treatment. More recent studies have reported that treatment satisfaction was associated with increased attendance at counseling during the first three months of treatment (Trujols et al., 2012) and that the patient-provider relationship was significantly related to treatment satisfaction and program success (Madden, Lea, Bath, & Winstock, 2008; Tran, Nguyen, Phan, & Latkin, 2015).

In 2004, the Chinese government pilot tested eight MMT clinics to address the dual epidemics of HIV and drug use (Pang et al., 2007). Based on results showing a reduction in heroin use, intravenous injection, and drug-related crime, the national MMT program was scaled up rapidly. A total of 767 MMT clinics were established in 28 provinces by the end of 2014 (National Health and Family Planning Commission of China, 2015). The clinics are generally located in administrative areas with >500 registered opiate users, affiliated with local Center for Disease Control and Prevention (CDC), hospital, psychosocial health center, or voluntary detoxification center (Sullivan et al., 2014). Ancillary services include counseling, testing of sexually transmitted infection, psychosocial support, education, skills training for employment, referrals for related health issues and incentives (Lin & Detels, 2011). Despite its initial success in the first decade of implementation, barriers to achieving optimal clinical outcomes in MMT remain. The identified challenges include concurrent heroin use, reduced adherence, low retention and dropout, insufficient provider-client communication, and a scarcity of additional services (Lin et al., 2010; Li, Wu, et al., 2012; Li, Lin, 2012; Jiang et al., 2014; Zhou & Zhuang, 2014; Zhang et al., 2015; Zhang, Xu, et al., 2016). All of these challenges are potentially related to suboptimal treatment satisfaction. To our knowledge, limited research has directly measured clients' perspectives on their treatment progression, their relationships with providers, and their level of satisfaction with MMT treatment. In this study, we focus on treatment progression and satisfaction from the client's perspective and assess relevant factors that directly or indirectly influence treatment satisfaction outcomes.

2. Material and methods

2.1. Study design

This cross-sectional study used the baseline data of all participants from a randomized controlled intervention trial on MMT care for HIV prevention in five provinces of China (Guangdong, Hunan, Jiangsu, Shanxi, and Sichuan). The five provinces vary in geographic, economic, and drug use conditions. We randomly selected 68 of 110 MMT clinics that had >80 current clients in the five provinces. In each of the 68 clinics, 36 clients were randomly selected, for a total sample size of 2448 clients. Based on China's official guidelines, all MMT clients must be 1) at least 20 years old, 2) opiate dependent based on diagnosis criteria in Chinese Classification of Mental Disorders, Third Edition (CCMD-3; Chinese Society of Psychiatry, 2001), 3) lacking severe psychosis and neurological damage, and 4) not under criminal or civil charges (Ministry of Health of China, Ministry of Public Security of China, & State Food and Drug Administration of China, 2006). This study only included clients receiving MMT services at the participating clinics.

2.2. Participant recruitment

Prospective clients were randomly selected at participating clinics during their daily treatment visits. The project recruiters first explained the recruitment information, including the study purpose, procedure, risks and benefits, to the clients verbally as well as with a printed flyer. The recruiters then informed prospective participants that participation was voluntary and that refusal to participate would not affect their treatment services. Written informed consent was obtained from

every participant before data collection. The refusal rate was <5%. The study obtained ethical approval from the Institutional Review Boards of the participating institutes in the U.S. and China.

2.3. Data collection

The data collection began in September 2012 and was completed in August 2013. The participants were surveyed face to face by trained interviewers not affiliated with the MMT program in a private room of the participating clinic. The Computer Assisted Personal Interview (CAPI) method was utilized to administer the questionnaire, with interviewers reading questions to the participants and recording their responses on computers. Participants took approximately 45 to 60 min to complete the survey. Each participant received 30 yuan (approximately 5 U.S. dollars) for his or her time spent on the survey.

2.4. Measures

2.4.1. Treatment satisfaction

We used a 12-item scale to evaluate clients' treatment satisfaction with MMT treatment based on the Texas Christian University Client Evaluation of Self and Treatment (TCU-CEST) forms. This instrument is comprised of four self-reported assessments: 1) Treatment Needs and Motivation Form, 2) Social Functioning Form, 3) Psychological Functioning Form, and 4) Treatment Engagement Form. These forms have been widely used to monitor the treatment needs and progress of clients and to gauge client changes over time in methadone treatment settings (Davis-Jones, 2008; Moura, Ferros, & Negreiros, 2013; Joe, Broome, Rowan-Szal, & Simpson, 2002; Kelly et al., 2010; Kelly, O'Grady, Mitchell, Brown, & Schwartz, 2011; Simpson & Bartholomew, 2008). For this study, we translated the TCU-CEST forms from English to Chinese and back translated them to English to ensure the meaning was appropriately translated. Several studies previously conducted in China had used the TCU-CEST instrument (Chang, Hsieh, Peng, Li, & Hser, 2014; Wu, 2012). The team has also previously pilot tested the scale among MMT clients in China. We adopted the treatment satisfaction scale from the Treatment Engagement Form that provides a general description of different treatment experiences, such as "You plan to stay in this treatment program for a while" and "This treatment program seems too demanding for you." The participants were asked to rate their levels of agreement with the items (from "1 = strongly agree" to "5 = strongly disagree"). After the positively worded items were reverse coded, an overall score (range: 12–60) was constructed by summing all the items. A higher score indicated higher satisfaction with treatment ($\alpha = 0.81$).

2.4.2. Counseling rapport

The scale measuring counseling rapport in this study was composed of 13 items adopted from the CEST Treatment Engagement Form (Simpson & Bartholomew, 2008). Items demonstrated different aspects of counseling rapport, such as "You trust the service providers in the MMT clinic" and "The service providers in the clinic make you feel foolish or ashamed." The participants were asked to select a response from "1 = strongly agree" to "5 = strongly disagree." A continuous overall score (range: 13–65) was constructed by summing all the items after recoding the positively worded items, with a higher score indicating a better relationship with service providers ($\alpha = 0.92$).

2.4.3. Treatment progression

Clients' perceived treatment progression was measured by a 12-item scale based on the CEST Treatment Engagement Form (Simpson & Bartholomew, 2008). The participants were asked to evaluate how they felt about their treatment participation, such as "You have made progress in understanding your feelings and behavior" and "You have learned to analyze and plan ways to solve your problems." Response categories ranged from "1 = strongly agree" to "5 = strongly disagree." Before the score of each item was summed to generate an overall score

(range: 12–60) for the scale, the positively worded items were reverse coded. A higher overall score indicated better treatment progression ($\alpha = 0.90$).

2.4.4. Social support

The scale of social support included nine items adopted from the CEST Social Functioning Form (Simpson & Bartholomew, 2008). The participants were asked about their levels of agreement (from “1 = strongly agree” to “5 = strongly disagree”) with each item (such as, “You have people close to you who motivate and encourage your recovery” and “You have good friends who do not use drugs”). The items were summed to generate an overall score (range: 9–45) for social support after reverse coding the positively worded items. A higher overall score indicated better social support ($\alpha = 0.86$).

2.4.5. Depressive symptoms

The 9-item scale measuring clients' depressive symptoms was a brief version of the Zung Self-Rating Depression Scale (Zung, 1965), which was previously validated in the Chinese population (Li, Liang, Ding, & Ji, 2011). The participants were asked to report how often they experienced nine different situations (such as “I get tired for no reason” and “I am more irritable than usual”). Responses ranged from “1 = a little of the time” to “4 = most of the time.” An overall score (range: 9–36) was constructed by summing all the items after reverse coding the positively worded items. A higher score indicated a higher level of depressive symptoms ($\alpha = 0.75$).

2.4.6. Demographic and background characteristics

Demographic characteristics, including age, gender, education, and marital status, were collected. Other background information, such as duration of drug use and duration of MMT, was self-reported by the participants.

2.5. Data analysis

All analyses were conducted using Stata version 14 (StataCorp LP, College Station, TX, U.S.). As a first step, we examined the intra-class correlation (ICC) between clients nested within the same clinics for the treatment satisfaction variable (ICC = 0.21) and two mediators, 1) treatment progression (ICC = 0.25) and 2) counseling rapport (ICC = 0.18). The ICC was estimated by fitting separate random-effect models for each measure that included an intercept term and clinic-level random effects. Because the ICC was relatively high across measures, we included random effects in all subsequent analyses through multi-level models.

A structural equation modeling (SEM; Acock, 2013) framework was then used to fit the multilevel mediation models. The models tested pathways for 1) direct effects of demographic and background characteristics on treatment satisfaction and 2) indirect effects as mediated by treatment progression and counseling rapport. We reported coefficients for individual pathways as well as indirect effects that were calculated as the product of pathway coefficients from demographic and background characteristics to mediators and from mediators to treatment satisfaction. The initial model included direct and indirect effects of all demographic and background characteristics. In the final model, pathways were removed for statistically non-significant loadings with a p -value > 0.05 ; however, age and gender were retained regardless of their significance level.

3. Results

The participants' demographic and background characteristics are summarized in Table 1. These characteristics have been categorized to ease interpretation in this table. Continuous measures such as age are retained in their original form for mediational models. At the time of the study, the average age of the participants was 40.3 years old, and

Table 1
Demographic and background characteristics of the sample (N = 2448).

| Characteristics | N | % |
|-----------------------------------|------|------|
| Age (years) | | |
| ≤35 | 615 | 25.1 |
| 36–45 | 1293 | 52.8 |
| ≥46 | 540 | 22.1 |
| Gender | | |
| Male | 1938 | 79.2 |
| Female | 510 | 20.8 |
| Education (years) | | |
| ≤6 | 362 | 14.8 |
| 7–9 | 1224 | 50.2 |
| ≥10 | 853 | 35.0 |
| Marital status | | |
| Single/divorced/separated/widowed | 1077 | 44.0 |
| Married/living with a partner | 1370 | 56.0 |
| Duration of heroin use (years) | | |
| ≤10 | 575 | 23.5 |
| 11–20 | 1466 | 60.0 |
| ≥21 | 403 | 16.5 |
| Duration of MMT (years) | | |
| ≤1 | 632 | 26.0 |
| 2–5 | 1457 | 59.8 |
| ≥6 | 346 | 14.2 |
| Selected scales | Mean | SD |
| Depressive symptoms | 18.2 | 5.4 |
| Social support | 37.3 | 4.8 |
| Treatment progress | 48.7 | 6.0 |
| Counseling rapport | 53.1 | 6.9 |
| Treatment satisfaction | 47.7 | 5.2 |

approximately half (N = 1293; 52.8%) of the participants were between 36 and 45 years old. Most of the participants were male (N = 1938; 79.2%). The average length of education was 9.2 years, with approximately one-third (N = 853; 35.0%) of the participants reporting a high school level of education or above. Slightly more than half of the participants (N = 1370; 56.0%) were married or living as married. The average length of drug use history was 14.9 years, with 60.0% (N = 1466) of the participants reporting heroin use from 11 to 20 years. More than half of the sample (N = 1457; 59.8%) reported attending MMT between two and five years at the time of the assessment, and the average duration of treatment was 3.6 years. Means and standard deviations for each study scale are shown in Table 1.

The final multilevel mediation model is illustrated in Fig. 1. Table 2 presents the estimates, standard errors (SE), and p -values for the path loadings, variance terms, covariance terms, and random effects of the final model. Older age had a direct positive effect on treatment satisfaction (direct effect = 0.038, SE = 0.011, $p < 0.01$) and was mediated by positive counseling rapport (indirect effect = 0.011, SE = 0.004, $p < 0.01$). We did not observe significant evidence that male gender had a direct or indirect effect through treatment progression and counseling rapport on satisfaction. Being married had a direct negative effect on treatment satisfaction (direct effect = -0.533 , SE = 0.160, $p < 0.01$). And there was no significant evidence of an indirect effect through treatment progression or counseling rapport.

Depressive symptoms had a direct negative effect on treatment satisfaction (direct effect = -0.107 , SE = 0.015, $p < 0.01$) that was mediated by a negative association with counseling rapport (indirect effect = -0.014 , SE = 0.005, $p < 0.01$). Significant mediation effects with treatment progression were not found. Social support had a positive direct (direct effect = 0.116, SE = 0.019, $p < 0.01$) and indirect effect on treatment satisfaction that was mediated by both treatment progression (indirect effect = 0.106, SE = 0.010, $p < 0.01$) and counseling rapport (indirect effect = 0.126, SE = 0.011, $p < 0.01$). MMT duration had an indirectly positive association with treatment satisfaction mediated by treatment progression (indirect effect = 0.002, SE = 0.001, $p = 0.01$).

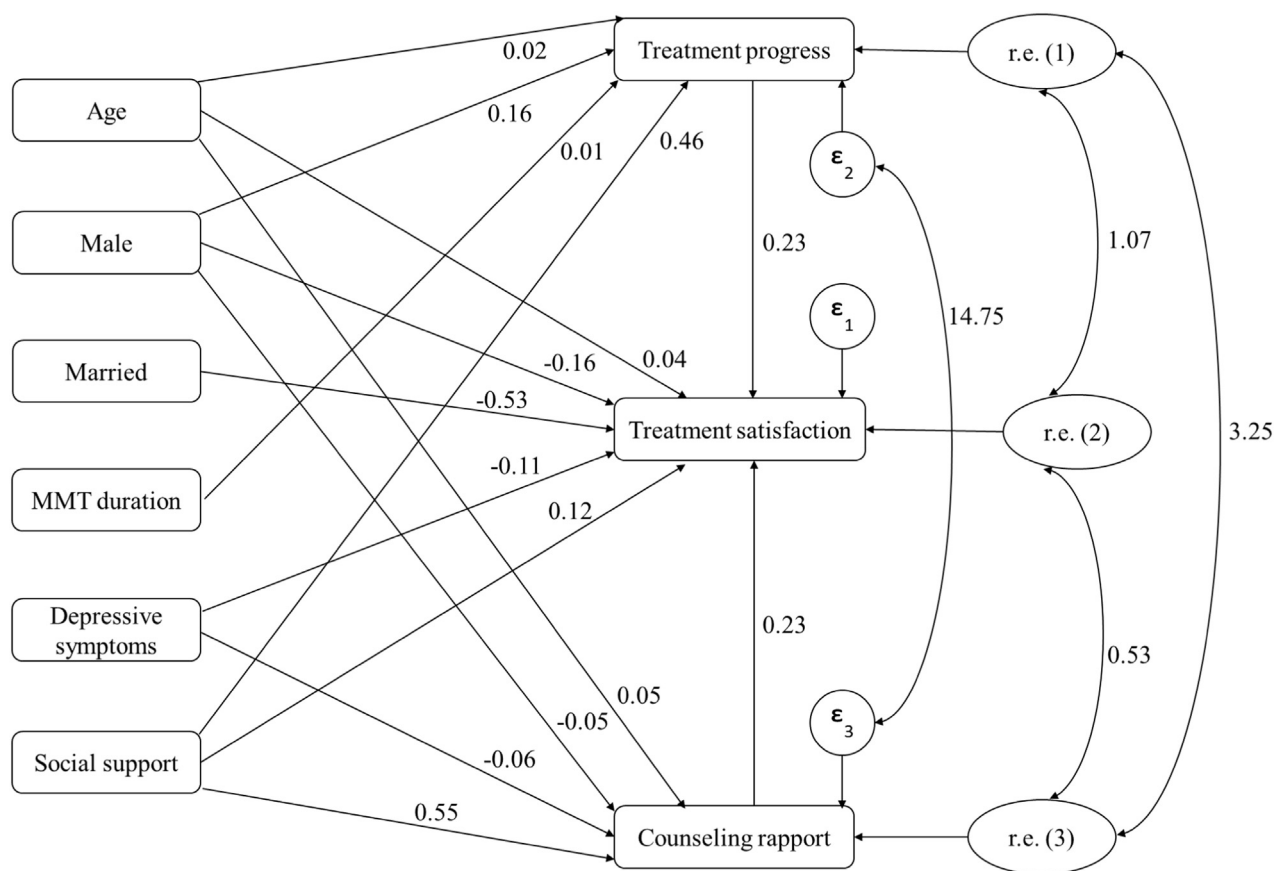


Fig. 1. Multilevel mediational model for direct effects of demographic and background characteristics on treatment satisfaction and indirect effects as mediated by treatment progression and counseling rapport. Loading values are shown for each path. Values of covariance are shown between mediator error terms and between three sets of clinic-level random effects (r.e.) for satisfaction, treatment progression, and counseling rapport.

The two mediators, treatment progression (estimate = 0.227, SE = 0.019, $p < 0.01$) and counseling rapport (estimate = 0.229, SE = 0.016, $p < 0.01$), both showed positive associations with treatment satisfaction in the final model. In addition to the predictors shown in Table 2, years of education and years of heroin use were tested in our initial model but were excluded from the final model due to lack of statistical significance.

4. Discussion

This study reaffirmed that treatment satisfaction with treatment services is a multidimensional concept associated with multiple factors (Ware, Davies-Avery, & Stewart, 1978). In this study, utilizing SEM enabled us to examine the direct and indirect effects of factors whose relationships were not previously well understood. The findings reiterate the importance of understanding the complexity of various factors related to treatment satisfaction with treatment and design programs to improve treatment adherence and outcomes. First, clients' individual demographic characteristics might play a role in their reported treatment satisfaction. For instance, we found that clients who were older reported a higher level of satisfaction than those who were younger, which was consistent with the existing literature (Hall & Dornan, 1990; McLellan & Hunkeler, 1998). Additionally, we were able to observe that positive counseling rapport was a mediating factor for the relationship between older age and treatment satisfaction, whereas treatment progression had no such effect. The higher level of satisfaction and positive counseling rapport in older patients might be due to their maturity and increasingly accepting attitude toward health services due to their age (Hall & Dornan, 1990). Alternatively, service providers might treat older patients in a more respectful, thorough, or

responsive way than they treat younger patients (Hall & Dornan, 1990). This is especially true in the Chinese context where respecting the elderly has always been regarded as a traditional virtue (Li, 2015). It is suggested that service providers should consider clients' individual characteristics when offering services to different subpopulations.

Clients' psychological wellbeing and social functioning might also influence their treatment satisfaction. In this study, we found that depressive symptoms and a lack of social support had a significant correlation with service dissatisfaction among MMT clients. The findings suggest that early detection of depressive symptoms and subsequent psychological counseling and therapies may help to achieve a higher level of treatment satisfaction. Additionally, it is recommended that MMT programs should place greater emphasis on clients' unmet social needs (e.g., lack of support for MMT family members, friends, and coworkers) and provide suitable interventions to address these issues. However, one major challenge faced by MMT program in China is that there are no formally trained counselors in MMT clinics. MMT service providers often play several roles simultaneously including prescribing methadone, providing physical examination and psychological counseling (Lin & Detels, 2011). They have no time nor resources to receive professional training to address mental health problems and improve social support of the clients. Future MMT-related policies in China should strengthen the training of service providers on mental healthcare and encourage MMT clinics to hire specialized counselors.

Another finding of this study involved the important role of treatment-related factors in clients' level of service satisfaction. We observed treatment progression had a mediating effect between social support and treatment satisfaction, suggesting that clients' views on progress toward their treatment goals can lead to greater treatment satisfaction and outcomes. This finding supports certain strategies in client-

Table 2
Results for the final multilevel mediational model (N = 2448).

| Parameters | Estimate | SE | p value |
|---|----------|-------|---------|
| Loadings | | | |
| Outcome: treatment satisfaction | | | |
| Age | 0.038 | 0.011 | <0.01 |
| Male versus female gender | −0.155 | 0.195 | 0.43 |
| Married vs. not married | −0.533 | 0.160 | <0.01 |
| Depressive symptoms | −0.107 | 0.015 | <0.01 |
| Social support | 0.116 | 0.019 | <0.01 |
| Treatment progression | 0.227 | 0.019 | <0.01 |
| Counseling rapport | 0.229 | 0.016 | <0.01 |
| Mediator: treatment progression | | | |
| Age | 0.023 | 0.015 | 0.13 |
| Male versus female gender | 0.162 | 0.253 | 0.52 |
| MMT duration | 0.010 | 0.004 | 0.01 |
| Social support | 0.464 | 0.022 | <0.01 |
| Mediator: counseling rapport | | | |
| Age | 0.049 | 0.018 | <0.01 |
| Male versus female gender | −0.054 | 0.299 | 0.86 |
| Depressive symptoms | −0.061 | 0.020 | <0.01 |
| Social support | 0.549 | 0.026 | <0.01 |
| Variance terms | | | |
| Outcome: treatment satisfaction | 13.799 | 0.402 | – |
| Mediator: treatment progression | 23.296 | 0.678 | – |
| Mediator: counseling rapport | 32.741 | 0.952 | – |
| Random effects | | | |
| Treatment satisfaction | 2.000 | 0.414 | – |
| Treatment progression | 6.657 | 1.259 | – |
| Counseling rapport | 5.105 | 1.039 | – |
| Covariance terms | | | |
| Error terms: treatment progression & counseling rapport | 14.745 | 0.644 | – |
| Random effects | | | |
| Treatment satisfaction & treatment progression | 1.069 | 0.540 | – |
| Treatment satisfaction & counseling rapport | 0.532 | 0.474 | – |
| Treatment progression & counseling rapport | 3.245 | 0.924 | – |

centered treatment programs; for example, clients are more likely to adhere to treatment plans and goals when they are involved in the decision-making process (Zhang, Cai, et al., 2016). Counseling rapport with the provider was associated with treatment satisfaction in our study, suggesting that clients who feel they have open and smooth communication with their MMT providers tend to be more satisfied with the overall services. When clients and providers communicate effectively, they are likely to reach mutually agreed-upon treatment plans, leading to greater treatment satisfaction and treatment adherence (Martin, Williams, Haskard, & Dimatteo, 2005). However, in Chinese cultures where harmony is paramount, MMT providers might be unwilling to engage in open communication with their clients to avoid direct confrontation or potential conflicts (Dimmock & Walker, 2005). Training needs to be implemented in MMT clinics to promote open information-sharing, and to equip the providers with effective communication and rapport-building skills.

The findings from this study may be particularly useful in evaluating the quality of care of MMT programs. In addition to prescribing and dispensing methadone, treatment providers should assess their clients' individual needs and expectations for treatment outcomes to provide the most appropriate services and support to ensure retention. In the context of MMT programs in China, service providers often encounter unrealistic expectations from clients who have difficulty accepting the concept of harm reduction and expect to regain their drug-free status (Lin & Detels, 2011). If impractical expectations are not addressed, treatment satisfaction with treatment may be affected. Our findings suggest that clients' perceived overall social support, counseling rapport with providers, and treatment progression are likely to be related to a higher level of service satisfaction and can be used to improve service delivery.

There are several limitations associated with this study. First, the sample, although large and representative of various clinics in China, may not be representative of all MMT clients and could be subjected

to selection bias. Second, our findings relied entirely on self-reported data, and caution must be used when interpreting the results, which may have issues related to social desirability bias and recall bias. Third, this study used a cross-sectional design, and no causal inference should be drawn from the findings. Fourth, all factors examined in the study were individual level factors. Clinic level factors that might also be related to clients' treatment satisfaction were not measured nor analyzed in this study. Lastly, the SEM approach used in the study could not construct fit statistics for models with random effects (Wu, West, & Taylor, 2009).

5. Conclusions

Future MMT programs need to work on improving relationships between providers and clients to improve clients' treatment satisfaction with the maintenance program. Clients' perceived positive treatment progress and strong positive social support are pertinent to treatment satisfaction. Specifically, programs should aim to motivate clients to set realistic treatment goals and should train providers to guide clients to attain their goals in a positive and progressive manner.

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