Self-concept mediate the relationship between childhood maltreatment and abstinence motivation as well as self-efficacy among drug addicts

Feng-Ying Lu, Si Wen, Gang Deng, Yung-Lung Tang

HIGHLIGHTS

- Childhood maltreatment was negatively associated with self-concept, self-efficacy, and abstinence motivation.
- Self-concept mediated the relationship between childhood maltreatment and abstinence motivation as well as self-efficacy.
- Self-concept mediated the relationship between specific forms of maltreatment and abstinence motivation.

Abstract

Objective: Childhood maltreatment is widely accepted as a risk factor for drug addiction from adolescence to adulthood. However, the influence of childhood maltreatment on drug treatment related variables, such as drug abstinence motivation and self-concept, as well as self-efficacy, remains unclear. This study aims at exploring whether self-concept mediates the relationship between childhood maltreatment and abstinence motivation, as well as self-efficacy, among drug addicts.

Methods: This study involves 816 (550 males, 226 females, mean age = 34.59, range = 16–58 years) drug addicts from compulsory detoxification units. Participants completed questionnaires, including the childhood trauma questionnaire 28 - item short form (CTQ - SF), Tennessee self-concept scale (TSCS), general self-efficacy scale (GSES), and drug abstinence motivation questionnaire (DAMQ).

Results: The structural equation model (SEM) analysis, including total and specific forms of maltreatment scores, showed that childhood maltreatment was negatively associated with self-concept, self-efficacy, and abstinence motivation. Self-concept was positively associated with self-efficacy and abstinence motivation. Conversely, significant association between self-efficacy and abstinence motivation did not exist. An indirect analysis showed that self-concept mediated the relationship between childhood maltreatment and self-efficacy. Critically, self-concept arbitrated the relationship between childhood maltreatment and abstinence motivation. The indirect effect of self-concept between childhood maltreatment and abstinence motivation still existed when the total scores of maltreatment were replaced by the scores of specific forms of maltreatment.

Conclusions: These results demonstrated that self-concept is a critical factor in understanding the relationship between childhood maltreatment and abstinence motivation, as well as self-efficacy, among drug addicts. Improving the sense of self-worth may be an effective intervention therapy among drug addicts with childhood maltreatment history.

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Keywords: Childhood maltreatment, Self-concept, Self-efficacy, Abstinence motivation

1. Introduction

Childhood is the most critical part of the life of an individual in terms of emotional and cognitive development. Childhood maltreatment, including physical, emotional, and sexual abuses, and neglect, is a strong risk factor for psychiatric disorders across the human lifespan (Norman et al., 2012). Increasing evidence showed that childhood maltreatment has several adverse psychological and behavioral consequences, such as anxiety, post-traumatic stress disorder, depression, conduct disorder, attention deficit hyperactivity disorder (Gilbert et al., 2009; Hussey, Chang, & Kotech, 2006; Runyan, Wattam, Ikeda, Hassan, & Ramiro, 2002), drug abuse, and drug addiction (Donohue, Romero, & Hill, 2006; Hadland et al., 2012; Kilpatrick et al., 2000; Longman-Mills et al., 2013; Rosenkranz, Muller, & Henderson, 2012; Tripodi & Pettus-Davis, 2013). The experience of childhood maltreatment is established to
cause the increasing rate of drug addiction (Herrenkohl, Hong, Klika, Herrenkohl, & Russo, 2013). However, it is unclear how childhood maltreatment impact on drug treatment related variables, such as drug abstinence motivation, which have been considered as an effective factor in predicting drug treatment outcomes (Gregoire & Burke, 2004; Longshore & Teruya, 2006).

1.1. Childhood maltreatment and treatment related factors

Previous studies have investigated the association between childhood maltreatment and treatment related variables among drug addicts; however, results were inconsistent. Studies showed that adolescents with a history of maltreatment were positively associated with an awareness of the problem of drug abuse and a strengthened engagement in drug treatment (Rosenkranz, Henderson, Muller, & Goodman, 2012). However, other researchers argued that adolescents with a history of physical abuse need more treatment admission services and have a low likelihood of post-treatment abstinence (Grellia & Joshi, 2003). Cocaine-dependent women with a history of physical abuse have a significantly lower reduction in the severity of withdrawal symptoms than those without a history of physical abuse (Francke, Viola, Tractenberg, & Grassi-Oliveira, 2013). Furthermore, a study explored the association between childhood maltreatment and abstinence motivation, and the result suggested that emotional abuse contributed to the motivation for treatment among girls in compulsory residential treatment facilities (Leenarts, Hoeve, Van de Ven, Lodewijks, & Doreleijers, 2013). Hence, whether a significant association between childhood maltreatment and abstinence motivation exists among drug addicts remains unclear.

1.2. Self-efficacy and abstinence motivation

Relapse prevention theory considers drug abuse as one of the maladjusted lifestyles, and treatment should improve the self-efficacy of drug addicts in building a healthy adaptive lifestyle (Hendershot, Witkiewitz, George, & Marlatt, 2011). Self-efficacy improves drug treatment outcomes (Greenfield, Venner, Kelly, Slaymaker, & Bryan, 2012; Kadden & Litt, 2011; Kelly & Greene, 2014). A high level of self-efficacy results in a low rate of relapse (Pelissier & Jones, 2006). The motivation to change is positively related to abstinence self-efficacy during drug treatment (Majer, Olson, & Johnson, 2015). Abstinence self-efficacy and recovery motivation are interactions that predict drug treatment outcomes (Kelly & Greene, 2014). These findings demonstrate a strong association between abstinence self-efficacy and abstinence motivation. Furthermore, previous studies have investigated specific areas of self-efficacy, such as abstinence self-efficacy (Cropsey et al., 2014; Maisto et al., 2015; Majer et al., 2015). However, limited attention has been given to the association between general self-efficacy and abstinence motivation among drug addicts.

1.3. Childhood maltreatment and self-efficacy

General self-efficacy is an overall sense of perceived self-efficacy to cope with daily hassles stresses and adapt after experiencing all kinds of stressful life events (Zhang & Schwarz, 1995). Self-efficacy heightens with successes and lowers with repeated failures (Bandura, 1982). Childhood maltreatment is related to low self-efficacy among older adults (Sachs-Ericsson, Medley, Kendall-Tackett, & Taylor, 2011). Furthermore, Kim and Cicchetti (2003) demonstrated that the association of childhood maltreatment and self-efficacy is inconsistent in different ages; younger abused children (<8 years) had higher levels of self-efficacy than non-abused children when met with conflicting situations, but this phenomenon was not observed in older children (>8 years). The authors noted that younger children overestimated their own self-efficacy, and older children could assess their own capabilities more accurately. Hence, self-assessment, such as self-concept, is essential in explaining the association between childhood maltreatment and self-efficacy.

1.4. The central role of self-concept

Self-concept is an essential part of the cognitive system of individuals and is involved in regulating ongoing behaviors (Markus & Wurf, 2003). The looking-glass self theory implies that people shape their self-concept based on their understanding of how others perceive them (Cooley, 1992). People with childhood maltreatment history lose necessary support from others in developing their sense of self-worth (Coates, Dinger, Donovan, & Phares, 2013), which partially account for the relation between childhood maltreatment and negative self-concepts (Sachs-Ericsson et al., 2011). Furthermore, the psychosocial development theory of Erikson asserts that self-concept changes because of the new experiences and information that individuals acquire from interactions with others. Children need to develop autonomy, initiative, industry, and identity while avoiding doubt, guilt, authority, and role confusion (Marcia & Josselson, 2013). Support, encouragement, and praise from others are essential in building mental health in children. By contrast, children may feel unpopular and worthless because of childhood maltreatment experience, which has a negative impact on their mentality.

Previous studies have agreed that childhood maltreatment has a negative relationship with self-concept (Devi, Anand, & Shekhar, 2013; Flynn, Cicchetti, & Rogosch, 2014; Gesinde, 2011; Lope & Heffer, 1998). Self-concept is positively related to motivation (Barnett, Vondra, & Shonk, 1996; Downey, Rosengren, & Donovan, 2000) and self-efficacy (Choi, 2005; Tabassam & Grainger, 2002). However, studies on the association between childhood maltreatment, self-concept, self-efficacy, and abstinence motivation among drug addicts are limited. Furthermore, whether self-concept plays a key role in explaining the effect of childhood maltreatment on self-efficacy and abstinence motivation among drug addicts is an area that needs further study.

1.5. Current study

Although association has been found between childhood maltreatment and abstinence motivation, the mechanism underlying this relationship has not been clearly explained. Therefore, the present study aims at exploring the direct or indirect relationships among childhood maltreatment, self-concept, self-efficacy, and abstinence motivation among drug addicts. This study hypothesizes that significant associations among childhood maltreatment, self-concept, self-efficacy, and drug abstinence motivation exist. Because the critical role of self-concept in explaining the association between childhood maltreatment and self-efficacy and abstinence motivation. This study further expects that self-concept mediates the relationship between childhood maltreatment and abstinence motivation; and self-concept also mediates the relationship between childhood maltreatment and self-efficacy.

In addition, previous studies have showed that specific forms of maltreatment in childhood lead to different outcomes (Authors, 2010; Infurna et al., 2016). The different roles of the specific forms of maltreatment should be established from the total scores of maltreatment in producing a general vulnerability toward negative self-concept, self-efficacy, and abstinence motivation among drug addicts. Therefore, this study further tests the direct and indirect associations among the specific forms of maltreatment, self-concept, self-efficacy, and abstinence motivation. This study further explores whether self-concept mediates the relationship among the specific forms of maltreatment and abstinence motivation.

2. Methods

2.1. Participants

Convenience samples were conducted among 816 (550 males, 226 females, mean age = 34.59, range = 16–58) drug addicts recruited from two compulsory detoxification units of Chongqing Province, China. The
characteristics of participants are provided in Supplemental materials (see Table 1). Insignificant differences exist between males and females in the variables below, except for age (male participants were older than female participants).

2.2. Measures

2.2.1. Demographics and drugs related variables

Participants self-reported their demographic information, such as age, gender, years of education, marital status, voluntary or involuntary treatment, times of drug treatment, kinds of drug use, multi-drug abuse status, present physical health status, severity of drugs, addiction duration, and treatment duration. The questions are as follows. Voluntary: “Did you voluntarily take part in this drug treatment?” Times of drug treatment: “How many times did you take part in drug treatments?” Kinds of drug use: “List the kinds of drug you have common abused” Multi-drug abuse: “Did you use multiple types of drug?” Physical health: present physical status on a seven-point scale; scales correlate with the seriousness of health problems. Severity of drugs: self-report present physical status on a seven-point scale; scales correlate with the seriousness of drug addiction. Addiction duration: “How many years were you addicted to drugs?” Treatment duration: “How long have you taken part in this treatment process?”

2.2.2. Childhood maltreatment

Childhood Trauma Questionnaire - 28 Item Short Form (CTQ - SF) is a screening measure for childhood abuse and neglect histories (Bernstein et al., 2003). This survey includes five types of maltreatment, namely, emotional, physical, and sexual abuses, and emotional and physical neglects. This present study used the Chinese vision of CTQ - SF, which has strong reliability and validity (Zhao et al., 2005). CTQ - SF is widely used in assessing childhood abuse histories (Viola et al., 2015). Participants were asked to report how often they experienced maltreatment during their first 16 years of life on a five-point scale, namely, 1 = never, 2 = rarely, 3 = sometimes, 4 = often, and 5 = very often. A sample item on emotional abuse is as follows: “People in my family called me stupid, lazy, or ugly;” a sample item on emotional neglect is as follows: “I felt loved” (reverse-coded). High scores indicate strong exposure to early life stressors. The Cronbach’s alpha of the total scores of CTQ - SF was 0.89, and that for the subscales of CTQ - SF ranged from 0.51 for emotional abuse to 0.87 for physical neglect in the current sample.

2.2.3. Self-concept

The Tennessee Self-concept Scale (TSCS) is a type of self-description questionnaire (Fitts & Roid, 1965). This study used the Taiwan vision of TSCS (Lin, 1980), which is composed of 70 self-descriptive statements that include three subscales: self-identity (ID), satisfaction (SA), and behavior (B). The subscale ID refers to “Who I am,” such as “I am getting on well with others.” The subscale SA represents the degree of being pleased with themselves, such as “I am satisfied with my social ability.” The subscale B indicates how people regard themselves, such as “I can take good care of myself.” Participants were asked in response to what extent the sentence description met their true situation on a scale of 1 (Always false) to 5 (Always true). A high score means a positive level of self-concept and a high value of self-evaluation. The Cronbach’s alpha of the total scores of TSCS was 0.82, and those for the subscales of TSCS were 0.76 (ID), 0.41 (SA), and 0.65 (B) in the current sample.

2.2.4. Self-efficacy

The General Self-efficacy Scale (GSES) is used to assess an overall sense of perceived self-efficacy (Schwarzer & Jerusalem, 1995) and has strong reliability and validity among Chinese people (Zhang & Schwarz, 1995). This scale is composed of ten items. Participant responses ranged from 1 (Always false) to 4 (Always true). A high score represents high level of self-efficacy. The Cronbach’s alpha for GSES was 0.69 in the current sample.

2.2.5. Drugs abstinence motivation

The Drug Abstinence Motivation Questionnaire (DAMQ) is used to measure the level of motivation in abstaining from drug addiction (Zhang, Tang, Gong, & Liu, 2013). This questionnaire is composed of 30 items. Total scores were used in this study. For example, “I want to receive treatment because I want to avoid physical injury.” Participants were asked to report whether the sentences described their true situation on a scale of 1 (Always false) to 5 (Always true); A high score represents a high level of drug abstinence motivation. The Cronbach’s alpha for DTMQ was 0.90 in the current sample.

2.3. Procedures

Drug addicts volunteered to participate in this project, and all participants signed an informed consent. An anonymous questionnaire (i.e., data with no names or any other identifying information) was utilized to increase response accuracy. Participants were required to answer four questionnaires, which took approximately 30 min. All data collection procedures were approved by the Institutional Review Board of Drug Administration in Chongqing.

2.4. Statistical analysis

The $\chi^2$ test was used to examine gender differences. The Pearson correlation coefficient was used to test the associations of the main variables in the current study. The structural equation model (SEM) was used to examine the hypothesis that associations exist among childhood maltreatment, self-concept, self-efficacy and abstinence motivation. The bias-corrected bootstrap method was used to assess the proposed indirect effects of self-concept. In this analysis, 5000 bootstrapped samples were drawn, and 95% bootstrap confidence intervals (CI) were reported. Age and gender were added as covariates into mediated model analyses. Preacher and Hayes (2008) asserted that CI, excluding zero, indicated a significant indirect effect of the independent variable on the dependent variable through the mediators. The scores of the variables were standardized into Z-values in correlation, model estimation, and mediated analyses. Statistical analysis was conducted by SPSS 16.0 and AMOS16.0.

3. Results

3.1. Descriptive statistics

For CTQ - SF mean scores, the full-sample mean was 2.3 ($SD = 0.52$, range = 1.2–4.0). Childhood maltreatment experience with responses of “occasionally” or “sometimes” occurred among addicts before the age of 16. The scores for emotional neglect ($M = 2.82$) and physical neglect ($M = 2.39$) were higher than other types of maltreatment in this sample. Males were the most likely to report exposure to all forms of childhood maltreatment than females. However, females were more likely to report higher levels of self-concept, self-efficacy, and abstinence motivation than males (Table 2).

3.2. Relationship results

The partial correlations were used, and age and gender were regarded as covariates in exploring the relationship among childhood maltreatment, self-concept, self-efficacy, and abstinence motivation. All main variables in this present study were significantly correlated, excluding the relationship between self-efficacy and child abuse variables (Table 3).
3.3. Model analysis

The structural equation model could synchronously estimate multivariate relationships that were more realistic and could reveal more information than estimates from the regression analysis. Thus, the structural equation model was used to investigate the multivariate relationships among the main variables in the current study. The results were showed in Fig. 1. All observed variables significantly related to latent variables (all ps < 0.001). Childhood maltreatment was significantly related to self-concept (β = −0.53, p < 0.001), self-efficacy (β = 0.18, p < 0.001) and abstinence motivation (β = −0.21, p < 0.001). Self-concept was significantly related to self-efficacy (β = 0.34, p < 0.001) and abstinence motivation (β = 0.30, p < 0.001). However, self-efficacy was insignificantly linked to abstinence motivation (β = 0.02, p = 0.64). In this model, absolute fit measurements: CFI = 0.98, AGFI = 0.96, RMSEA = 0.01, RMSEA = 0.05. Incremental fit measurements: NFI = 0.96, RFI = 0.95, IFI = 0.98, TLI = 0.97, CFI = 0.98. Parsimonious fit measurements: PGFI = 0.55, PNFI = 0.66. It can inferred that this hypothesis model was a good fit with the actual model. It demonstrated that this hypothesis model was a good fit with the actual model.

A sample of 200 participants was randomly selected from the full dataset to obtain more reliable results from model estimation. Results were consistent with the full data and with good fit indexes (Fig. 2). These results suggested that correlations existed among child maltreatment, self-concept, self-efficacy and abstinence motivation in drug addicts.

In order to examine whether the effects of specific forms of childhood maltreatment played different role from the overall maltreatment in the model of the study variables. The total scores were replaced by specific forms of maltreatment scores in the entire sample of the current study. Results showed that specific forms of maltreatment were consistent with the total scores of maltreatment in the structural equation model (Supplemental materials Figs. 3–7). These results suggested that strong correlations exist among the various types of maltreatment, self-concept, self-efficacy and abstinence motivation in drug addicts.

3.4. Mediating analysis

In indirect analysis, age and sex were entered as covariates into the mediating model. The mediating model was utilized to test whether self-concept mediated the relationship between childhood maltreatment and self-efficacy or abstinence motivation. A negative direct association exists between childhood maltreatment and abstinence motivation (β = −0.26, p < 0.001). The mediating test of the indirect effects revealed that self-concept mediated the association between childhood maltreatment and abstinence motivation (indirect effect IE: −0.08, CI: −0.12, −0.05, adjusted R² = 0.31). Self-concept played a mediated role between childhood maltreatment and self-efficacy (IE: −0.12, CI: −0.17, −0.07, adjusted R² = 0.06), but self-efficacy did not play a mediated role between childhood maltreatment and self-concept (IE: 0.004, CI: −0.1, 0.02, adjusted R² = 0.27). Accordingly, self-concept mediated the relationship between childhood maltreatment and self-efficacy. Critically, self-concept mediated the relationship between childhood maltreatment and abstinence motivation. Tests of indirect effects suggested that the links between childhood maltreatment and self-efficacy or abstinence motivation were partially explained by self-concept.

Furthermore, this study explored whether self-concept mediated the relationship between specific forms of maltreatment and abstinence motivation. Results showed that indirect effects could also be found when total scores of TQ-SF were replaced by specific forms of maltreatment scores. Specifically, self-concept mediated the relationships between (1) emotional abuse and abstinence motivation (IE: −0.08, CI: −0.12, −0.05, adjusted R² = 0.30), (2) physical abuse and emotional neglect and abstinence motivation (IE: −0.17, CI: −0.22, −0.13, adjusted R² = 0.32).

### Table 2
Descriptive statistics of variables.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total (N = 816)</th>
<th>Males (n = 550)</th>
<th>Female (n = 266)</th>
<th>t</th>
<th>df</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional abuse</td>
<td>2.090 (0.793)</td>
<td>2.216 (0.767)</td>
<td>1.829 (0.784)</td>
<td>6.659***</td>
<td>513</td>
<td>0.273 to 0.501</td>
</tr>
<tr>
<td>Physical abuse</td>
<td>1.966 (0.889)</td>
<td>2.107 (0.865)</td>
<td>1.674 (0.865)</td>
<td>6.717***</td>
<td>524</td>
<td>0.307 to 0.561</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>2.249 (0.5269)</td>
<td>2.294 (0.503)</td>
<td>2.155 (0.562)</td>
<td>3.432**</td>
<td>475</td>
<td>0.059 to 0.219</td>
</tr>
<tr>
<td>Emotional neglect</td>
<td>2.824 (0.539)</td>
<td>2.892 (0.514)</td>
<td>2.684 (0.562)</td>
<td>5.086***</td>
<td>484</td>
<td>0.128 to 0.288</td>
</tr>
<tr>
<td>Physical neglect</td>
<td>2.389 (0.685)</td>
<td>2.486 (0.658)</td>
<td>2.190 (0.700)</td>
<td>5.780***</td>
<td>495</td>
<td>0.195 to 0.397</td>
</tr>
<tr>
<td>CM</td>
<td>2.304 (0.519)</td>
<td>2.399 (0.498)</td>
<td>2.106 (0.501)</td>
<td>7.824***</td>
<td>814</td>
<td>0.219 to 0.366</td>
</tr>
<tr>
<td>ID</td>
<td>3.552 (0.494)</td>
<td>3.486 (0.501)</td>
<td>3.690 (0.448)</td>
<td>−5.847***</td>
<td>579</td>
<td>−0.272 to −0.135</td>
</tr>
<tr>
<td>SA</td>
<td>3.233 (0.343)</td>
<td>3.194 (0.340)</td>
<td>3.314 (0.334)</td>
<td>−4.811***</td>
<td>532</td>
<td>−0.1704 to −0.071</td>
</tr>
<tr>
<td>B</td>
<td>3.416 (0.474)</td>
<td>3.348 (0.454)</td>
<td>3.557 (0.485)</td>
<td>−5.908***</td>
<td>494</td>
<td>−0.279 to −0.140</td>
</tr>
<tr>
<td>Self-concept</td>
<td>3.400 (0.359)</td>
<td>3.342 (0.352)</td>
<td>3.520 (0.343)</td>
<td>−6.853***</td>
<td>536</td>
<td>−0.228 to −0.126</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>3.514 (0.440)</td>
<td>2.494 (0.430)</td>
<td>2.535 (0.459)</td>
<td>−1.826***</td>
<td>493</td>
<td>−0.127 to 0.005</td>
</tr>
<tr>
<td>Motivation</td>
<td>3.570 (0.616)</td>
<td>3.370 (0.530)</td>
<td>3.984 (0.575)</td>
<td>−14.695***</td>
<td>487</td>
<td>−0.697 to −0.532</td>
</tr>
</tbody>
</table>

Note. Two tailed test. Adjusted age and gender.

* p ≤ 0.05.
** p ≤ 0.01.
*** p ≤ 0.001.

### Table 3
Correlation matrix.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Emotional abuse</th>
<th>Physical abuse</th>
<th>Sexual abuse</th>
<th>Emotional neglect</th>
<th>Physical neglect</th>
<th>Self-concept</th>
<th>Self-efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical abuse</td>
<td>0.740***</td>
<td>0.536***</td>
<td>0.156***</td>
<td>0.310***</td>
<td>0.847***</td>
<td>−0.215***</td>
<td>−0.245***</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>0.519***</td>
<td>0.265***</td>
<td>0.303***</td>
<td>0.310***</td>
<td>0.847***</td>
<td>−0.215***</td>
<td>−0.245***</td>
</tr>
<tr>
<td>Emotional neglect</td>
<td>0.302***</td>
<td>0.354***</td>
<td>−0.232***</td>
<td>−0.215***</td>
<td>−0.434***</td>
<td>0.215***</td>
<td>0.071***</td>
</tr>
<tr>
<td>Physical neglect</td>
<td>0.499***</td>
<td>0.029***</td>
<td>0.012***</td>
<td>0.017***</td>
<td>0.034***</td>
<td>0.294***</td>
<td></td>
</tr>
<tr>
<td>Self-concept</td>
<td>−0.139***</td>
<td>−0.248***</td>
<td>−0.219***</td>
<td>−0.126***</td>
<td>−0.245***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivation</td>
<td>−0.021***</td>
<td>−0.219***</td>
<td>−0.126***</td>
<td>−0.245***</td>
<td>0.294***</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Two tailed test. Adjusted age and gender.
abstinence motivation (IE: $-0.08$, CI: $-0.11$, $-0.05$, adjusted $R^2 = 0.31$), (3) sexual abuse and abstinence motivation (IE: $-0.06$, CI: $-0.08$, $-0.04$, adjusted $R^2 = 0.30$), (4) emotional neglect and abstinence motivation (IE: $-0.05$, CI: $-0.10$, $-0.04$, adjusted $R^2 = 0.29$), and (5) physical neglect and abstinence motivation (IE: $-0.07$, CI: $-0.10$, $-0.05$, adjusted $R^2 = 0.31$). These results indicated that self-concept mediated and could partly account for the relationships between specific forms of maltreatment and abstinence motivation of drug addicts.

4. Discussion

To the best of our knowledge, this study was the first to investigate the relationships among childhood maltreatment, self-concept, self-efficacy, and abstinence motivation among drug addicts. Results were consistent with the hypothesis that childhood maltreatment was negatively related to self-concept, self-efficacy, and abstinence motivation. Self-concept was positively related to self-efficacy and abstinence motivation. Conversely, self-efficacy was not significantly related to abstinence motivation. Furthermore, indirect effect analysis showed that self-concept mediated between childhood maltreatment and abstinence motivation, and between childhood maltreatment and self-efficacy. Furthermore, the various types of maltreatment, including emotional, physical, and sexual abuses, and physical and emotional neglects, were all negatively related to self-concept, self-efficacy, and abstinence motivation. Self-concept mediated the relationship among the different forms of maltreatment and abstinence motivation. The results extended the previous studies and highlighted the important role of self-concept in explaining the relationship between childhood maltreatment history and abstinence motivation. These results provide basic research evidence for drug addiction treatment.

Both overall childhood maltreatment and various types of maltreatment were negatively associated with abstinence motivation among drug addicts. These results conformed and extended the previous study (Chen, Yang, & Liu, 2011). Previous studies have noted that drug addicts with childhood maltreatment history conceived strong feelings of guilt, sin, and shame (Rosenkranz, Henderson, et al., 2012; Webb, Heisler, Call, Chickering, & Colburn, 2007). These feelings could compel the addicts to participate in drug treatment (Rosenkranz, Henderson, et al., 2012); however, they did not benefit in improving drug treatment outcomes. Drug addicts with childhood maltreatment history needed more extensive services, relied more on external resources, and became excited more from drug treatments than those without such maltreatment history (Grella & Joshi, 2003). According to the current and previous results, childhood maltreatment experience was unfavorable for the motivation of drug addicts and was related to poor treatment outcomes.

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**Fig. 1.** The model of the study variables. Note. ***$P \leq 0.001$. Except self-efficacy to motivation ($\beta = 0.02, p = 0.64$), all other paths in this model were significant (all $ps < 0.001$).

**Fig. 2.** The replication model. Note. ***$P \leq 0.001$. Except self-efficacy to motivation ($\beta = 0.02, p = 0.68$), all other paths in this model were significant (all $ps < 0.001$). Replication model indexes: GFI = 0.95, AGFI = 0.92, BMR = 0.04, RMSEA = 0.05, NFI = 0.93, RFI = 0.91, IIF = 0.98, TLI = 0.97, CFI = 0.98, PGFI = 0.54, PNNI = 0.64.
The indirect effect analysis showed that the relationship between childhood maltreatment (including specific forms of maltreatment) and abstinence motivation was partially explained by self-concept; this finding demonstrated that experiences of childhood maltreatment lowered the level of abstinence motivation through a negative self-concept. This result replicated and extended the previous study (Lu, 2015). Studies have suggested that childhood maltreatment lowered the level of self-concept and was detrimental to self-esteem development (Flynn et al., 2014; Shen, 2009). Self-esteem reflects the overall subjective emotional evaluation of a person of his own worth, which is the central character of self-concept (Smith & Mackie, 2007). Further evidence showed that low level of self-esteem led to mental health problems, such as depression and anxiety (Tuijl, Jong, Sportel, Huliu, & Nauta, 2014). The current results indicated the low level of self-concept results in a weak level of abstinence motivation. All external forces influenced the self-worth of individuals and then affected the psychologies and behaviors. This indirect effect demonstrated that childhood maltreatment history was harmful for individuals in developing healthy self-worth systems, such as low self-esteem and low level of self-concept (Choi, 2005; Flynn et al., 2014); low self-worth systems were detrimental in building a high level of abstinence motivation among drug addicts. The mediating results suggested the critical role of self-concept in treating drug addiction. Moreover, improving self-value to build a healthy self-concept may be a potential therapeutic strategy for drug addicts.

Results showed that self-concept mediated between childhood maltreatment and self-efficacy, which extended the results from previous studies (Flynn et al., 2014; Hawkins, 2012; Sachs-Ericsson et al., 2011; Tabassam & Grainger, 2002). Self-concept is a key role in self-system and regulating ongoing behavior (Markus & Wurf, 2003). Thus, the link between childhood maltreatment and self-efficacy being mediated by self-concept is understandable. Previous studies have shown that self-cognitive development may be an essential factor to explain the relationship between childhood maltreatment and self-efficacy (Kim & Cicchetti, 2003). These mediating results further verified this assertion.

The relationship between self-efficacy and abstinence motivation is insignificant in this study, which is inconsistent with previous research (Greenfield et al., 2012; Kelly & Greene, 2014; Majer et al., 2015). The three reasons for this inconsistency are as follows. First, previous studies have used special self-efficacy; however, the present study used general self-efficacy, which refers to the beliefs of individuals about their capacity to exert control over their own function and events that affect their lives. Second, the age of the participants of the present study had a larger range (from 16 to 58), which indicated more information. Third, the correlation between self-efficacy and abstinence motivation among the participants of the present study was insignificant.

As far as we know, this is the first study to investigate whether the various types of maltreatment played different role from the overall maltreatment in the model of main variables in this study. This result provided new evidence that similar results emerged between total scores of TQ-SF and the various types of maltreatment scores, regardless of the structure equation model or mediating analysis. These results indicated that a high degree of comorbidity exists among the various types of maltreatment, such that a large number of children experience more than one type of maltreatment and presented common consequences (Muela, Arana, Barandiaran, Larrea, & Vitoria, 2012). These results demonstrated the combination effects of various types of maltreatment on the self-value system and abstinence motivation among drug addicts.

5. Limitations and future research

The results of the current study help us to delve into the relationships among childhood maltreatment, self-concept, self-efficacy, and abstinence motivation among drug addicts. Admittedly, the current study has several limitations. First, although self-report is widely used to acquire childhood maltreatment history, this type of reporting may introduce reporting biases. Second, the sample of this study consists of drug addicts; the results may be difficult to generalize to other population subsets. Therefore, the results could be replicated in other addicted samples, such as alcohol- and smoking-addicted population, for future studies. Third, the cross-sectional design indicated that the relationship between childhood maltreatment and abstinence motivation was mediated by self-concept. However, a cross-sectional design failure revealed a causal relationship: prospective longitudinal assessment studies are needed to explore the potentially causally-related associations among childhood maltreatment, self-efficacy, and abstinence motivation. Fourth, abstinence motivation is different from drug treatment outcomes; a more effective measurement variable of treatment outcomes should be utilized in future studies. Fifth, results showed that self-concept mediated the relationship between childhood maltreatment and abstinence motivation; future studies could explore whether improving the self-value of drug addicts could improve drug treatment outcomes in clinical adults with a history of childhood maltreatment. Multiple factors affect drug addiction treatment outcomes, therefore, multivariable assessment studies are needed to explore how interaction of multiple variables influence drug addiction treatment outcomes among drug addicts.

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Contributors

Dr. Yung-Lung Tang designed this study. Feng-Ying Lu conducted the statistical analysis and wrote the entire manuscript. Si Wen helped to modify the language of the manuscript. Gang Deng collected the data of this study. All authors contributed to and have approved the final manuscript.

Conflict of interest

The authors report no conflict of interest.

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Appendix A Supplementary data

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.addbeh.2017.01.017.

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