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Evaluating an intervention for family members of people who use drugs in Vietnam

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1. Introduction

Chronic substance dependence places an enormous strain on families, and family members of people who use drugs (PWUD) face many psychosocial challenges (Mattoo et al., 2013; Morita et al., 2011; Nebhinani et al., 2013; Zielinski et al., 2019). Literature has documented that family members typically experience a variety of mental stress, such as chronic depression, guilt, denial, shame, anger, and grief (Gethin et al., 2016; Oxford, Velleman, Copello, Templeton & Ibanga, 2010; Schafer, 2011). Substance use poses notably more substantial psychological burdens on families in a collective-oriented culture in Asian countries, such as Vietnam, because the stigmatized identity of substance abuse could bring dishonor and shame to the entire family (Go et al., 2016; Rudolph et al., 2012; Salter et al., 2010; Tomori et al., 2014). Societal stigma and isolation could significantly exacerbate family members' mental health challenges and jeopardize their quality of life (Dao et al., 2018; Salter et al., 2010; Tomori et al., 2014; Vederhus et al., 2019). A recent study revealed that mild to extremely severe depressive symptoms are prevalent among family members of HIV-positive PWUD in Vietnam (Dao et al., 2018). Female family members, in particular, are more prone to mental health challenges because of their expected role as family caregivers (Shafer and Pace, 2015). Spousal role and lower monthly income were also found to be factors associated with mental stress (Noori et al., 2015; Xiao et al., 2019). Intervention efforts to address the mental health challenges of families impacted by drug use are urgently needed.

Existing literature suggests that family support is beneficial in prompting PWUD's service seeking, enhancing treatment retention, and reducing relapse (Lin et al., 2011; Lin et al., 2013; Lung et al., 2016; Mehta et al., 2012; Sanchez-Hervas et al., 2012). Vietnamese tradition is featured by Confucian doctrine, which underlines family as the primary source of support for PWUD in multiple areas, including medical care, employment, housing, financial assistance, and emotional support (Rudolph et al., 2012; Salter et al., 2010; Tomori et al., 2014). However,

substance addiction issues could impair family members' mental health and disturb family structure by creating mistrust and conflict among family members (Akram et al., 2014; Barnard, 2006). Financial and emotional burden result from PWUD's unemployment and illness often pose an enormous impact on all aspects of the family relation and result in family dysfunction, violence, and abandonment (Feizi et al., 2019; Haggerty et al., 2008). Lack of family cohesion could greatly compromise a family's capacity to provide support for PWUD's harm reduction and behavioral change (Feng et al., 2018; Li et al., 2013; Li et al., 2014; Morita et al., 2011). It is suggested that intervention strategies should focus on establishing a harmonious family relationship to mobilize the family support and facilitate the recovery process for PWUD (Bortolon et al., 2017; Jackson et al., 2011; Lander et al., 2013).

Within the literature, however, there is a noticeable absence of intervention research focusing on the wellbeing of family members and simultaneously addressing drug use-related challenges facing the family as an organic entity (Bortolon et al., 2016; Jackson et al., 2011). In the family-centered context of Vietnam, intervention programs that include family members of PWUD could be an effective strategy to provide support for PWUD and improve the wellbeing of every individual in the family. Based on the Social Action Theory, which emphasizes social interdependence and the impact of relationships on personal health (Ewart, 1991), our team developed and implemented an intervention to target PWUD and their support systems in Vietnam. Unlike typical family-based interventions that directly involve family members in addiction treatment support (Hernandez et al., 2015), this intervention was delivered to PWUD and their family members through trained commune health workers (CHW). The intervention outcomes of CHW and PWUD were published elsewhere (Li et al., 2018). This paper describes the outcomes of CHW-delivered intervention on family members. The purpose of this study was to assess the intervention effect by comparing family members' mental health and family functioning between the intervention condition and the control condition.

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2. Method

The study was a clustered randomized controlled trial conducted between October 2014 and October 2016 in 60 communes of Vĩnh Phúc and Phú Thọ Provinces of Vietnam. The 60 communes were paired based on the number of registered PWUD in each commune. Then the two communes in each pair were randomized into either an intervention condition or a control condition, yielding 30 communes in each condition. The participants were not notified of their intervention allocation status. The intervention group CHW received project-specific training and then delivered pre-designed intervention activities to PWUD and family members of PWUD in their commune (Li et al., 2018). The intervention outcomes on family members were evaluated from baseline to the 12-month follow-up.

2.1. Participants

During the recruitment period, study flyers were posted in the local healthcare facilities and commune culture centers where PWUD regularly gathered. The flyers described the project as a “Health Service Study” to recruit PWUD in the community. After a PWUD was recruited, he/she was asked to invite one family member to participate in the study. The family member was chosen based on the closeness level, e.g., from spouse, mother, father, adult child, to sibling. The family member had to 1) be at least 18 years of age, 2) be a family member of the PWUD participant in the study, 3) know the PWUD participant’s drug-using status, and 4) live with the PWUD in the selected study commune. Based on participating PWUD’s recommendation and consent to contact, our project recruiters approached the prospective family members to confirm their eligibility. Family member participants were informed of the purpose, procedures, and voluntary and confidential nature of the study. Written informed consent was obtained before data collection. This study was approved by the institutional review boards of the University of California, Los Angeles, and the Vietnam National Institute of Hygiene and Epidemiology. Ten family members were recruited from each commune, resulting in a total of 600 members from the 60 study communes.

2.2. The intervention

The intervention was delivered in two consecutive steps. The first step was to provide intervention group CHW with training in basic behavioral change theories and skills to communicate with PWUD and their family members effectively. The CHW training was conducted in an active learning format guided by the collaborative research team and local health educators. A more detailed description of the intervention development and implementation among CHW is available elsewhere (Li et al., 2018). The second step was to have the trained CHW deliver group intervention sessions to family members of PWUD in the communes. Detailed instructions on family members’ intervention activities, sequence, format, and transitioning languages were provided to the trained CHW. Each CHW practiced facilitation of the proposed intervention activities through role-play, pair-share, group demonstration, and discussion.

Upon completion of the training, the CHW in each intervention commune jointly conducted two group sessions with all of the ten family members of PWUD in their commune. Each session was about 1 h in length and was held in a private room in the local commune health center. The contents of the family member’s group sessions focused on developing a healthy family routine, coping with caregiver burden, shifting perspectives to manage negative emotions, forming coalitions among family members, and facilitating a positive behavioral change of PWUD. The group sessions also served to address societal stigma facing family members of PWUD and develop social support links for the families to integrate into their community (Kok et al., 2016). The group sessions with family members were filled with interactive activities such

as games, pair-share, and role-play. These activities were designed to encourage the participants’ full involvement. Family members’ participation rate in these group sessions was higher than 95%. After each session, the family member participants received simple homework, such as documenting other members’ emotions on a rainbow chart, engaging in a conversation with the PWUD to encourage their harm reduction service seeking, and utilizing community services and resources. The homework was shared with the CHW and other family members in the commune to solicit feedback.

2.3. Data collection

The family members were surveyed at baseline using Audio Computer-Assisted Self-interview (ACASI) methods. The assessment took about 60 min and was conducted in a private office at a commune health center. Project staff was available to clarify the assessment questions and provide instructions for using ACASI. The same assessment procedures were used at 6- and 12-month follow-ups. For each assessment, participants received 80,000 đồng (US\$4.00) for their time. A strong effort has been made to retain participants in the study. At baseline, each participant was asked to fill out a “tracking form” that listed their current address, phone number, emails, and other contacts of their relatives and friends. At each of the follow-up waves, the project staff contacted each participant using all of the provided contact information at least five times during different days and hours before the participant was deemed dropout for the particular wave. We used the same protocol to follow-up every single participant; that is, the same effort was made to reach both control and intervention participants. The 6- and 12-month follow-up rate for family members in intervention group were above 95% (95.3%, $n = 286$ at 6-month and 95.0%, $n = 285$ at 12-month) and above 88% in control group (88.3%, $n = 265$ at 6-month and 88.0%, $n = 264$ at 12-month).

2.4. Measures

Family functioning was examined using an adapted version of the Family Functioning Scale (Bloom, 1985; Bloom and Naar, 1994). This scale has been validated in our previous pilot study for PWUD and their family members in Vietnam (Li et al., 2014). The original scale has 75 items comprising 15 subscales, measuring family relationships in various dimensions. In this study, three subscales with 13 items were used: cohesion (4 items), conflict (4 items), and family sociability (5 items). For each item, participants were asked to rate how true each statement was for their family on a 4-point Likert scale from 1 = very untrue to 4 = very true. After reversing some items, the 13 items were summed to generate an overall score (range: 13–52), with a higher score indicated better family functioning (Cronbach’s $\alpha = 0.82$).

Depressive symptoms were measured using a short version of the Zung Self-Rating Depression Scale (Zung, 1965), which includes ten items assessing how often the participants feel a particular symptom of depression. This scale was also used in our previous study among family members in Vietnam (Li et al., 2014). Each of the ten items was answered using a scale ranging from 1 = a little of the time to 4 = most of the time. A score of depressive symptoms (range: 10–40) was generated by summing all the ten items. A higher score indicated a higher level of depressive symptoms ($\alpha = 0.83$).

As suggested by the literature, family members’ background characteristics, such as gender, age, income, and family role, are particularly salient to the outcome of interests (Noori et al., 2015; Shafer and Pace, 2015; Xiao et al., 2019). Thus, we collected family members’ demographic characteristics, including age, gender, marital status, education, and annual family income (đồng). The participating family members’ family role regarding their relationship with the PWUD (e.g., parent, spouse, adult child, sibling, or other relatives) was recorded as well.

2.5. Statistical analysis

The study participants' demographics and family-background characteristics at baseline were summarized using descriptive statistics. Group differences were compared using two-group *t*-tests for continuous characteristics (age and education) and Chi-squared tests for categorical characteristics (gender, marital status, annual family income, and family role). Even though the overall completion rates for the cluster-randomized study were slightly different between conditions, 90% of pairs of communes (27 out of 30 pairs) were balanced in their completion rates. Multiple logistic regression was used to further investigate the study dropouts. We found that the probability of dropping out from the study was not associated with any the covariates, except for age (i.e., covariate-dependent missingness). However, when the three pairs of communes with unbalanced completion rates were excluded, age was no longer significantly associated with the probability of dropping out. To handle the potential imbalance of dropout between the intervention conditions, we adjusted all of the covariates mentioned above in the analyses (Fitzmaurice et al., 2009; Little and Rubin, 2002).

An intent-to-treat approach was used for all the analyses. A linear mixed-effects regression model (main model) for continuous outcome measure was used to assess the intervention effect on each of the outcome measures: family functioning and depressive symptoms. Each regression model included all of the following fixed-effects: pre-selected demographic characteristics (age, gender, education, and annual family income), family role, intervention condition, visit, and two-way intervention-by-visit interaction. Variables such as age, education, and family incomes were categorized in the model based on interpretability and our previous knowledge. For example, based on our prior experiences, age was unlikely to be linearly associated with the outcomes of interest. Thus, we categorized the age variable based on the cutoff values suggested by the local field experts. Education was also treated as a categorical variable given its meaningful cut points, i.e., ≤ 6 years as elementary school and below; seven to 12 years as middle school; and ≥ 13 years as high school completion and above. Each of these models also included two levels of random effects, that is, commune- and participant-levels, to account for the dependence within a commune and correlations among repeated observations for each individual, respectively. At each follow-up visit, the mean change score of each outcome measure (i.e., mean change from baseline) for each condition was estimated. A difference-in-difference approach was used to estimate the intervention effect on each outcome measure; that is, the difference in change scores between intervention and control was calculated through model contrasts. We have conducted the following sensitivity analyses to evaluate the robustness of the study results (see supplemental tables): (a) age and education were treated as continuous covariates, (b) baseline scores were further controlled, and (c) missing responses were imputed using multiple imputation methods (Graham, 2009). All statistical analyses were performed using the SAS System version 9.4 (SAS Institute Inc., Cary, NC, USA).

3. Results

Table 1 presents the participant's demographic characteristics, annual family income, and family role at baseline for both the control and intervention conditions. Among the 600 participating family members, the average age was 45 years, and approximately 77% were female. More than 90% of the family members were married or living with partners. The average years of schooling were over nine years. Around 25% of the participants reported having an annual family income of 75,000,000 đồng (equivalent to USD 3290) or more. Of all the participating family members, 32% were parents of PWUD, 40% were spouses, and the rest were adult children, siblings, or other relatives. None of these characteristics was significantly different between the intervention and control conditions.

Intervention effects on family functioning and depressive symptoms,

Table 1

Sample characteristics of family members by intervention conditions ($N = 600$).

Variable	Control <i>N</i> (%) or Mean (<i>SD</i>)	Intervention <i>N</i> (%) or Mean (<i>SD</i>)	<i>p</i>
Age, Mean (<i>SD</i>)	45.1 (14.4)	44.8 (14.7)	0.831 ^a
Less than 35 years	93 (31.0)	88 (29.3)	
35–50 years	95 (31.7)	109 (36.3)	
More than 50 years	112 (37.3)	103 (34.3)	
Female	237 (79.0)	226 (75.3)	0.285 ^b
Marital status			0.209 ^b
Single	10 (3.3)	18 (6.0)	
Married/Living with a partner	277 (92.3)	264 (88.3)	
Divorced/Separated/Windowed	13 (4.3)	17 (5.7)	
Education, Mean (<i>SD</i>)	9.1 (3.2)	9.4 (3.5)	0.308 ^a
Six years and below	55 (18.3)	54 (18.0)	
7–12 years	217 (72.3)	202 (67.3)	
13 years and above	28 (9.3)	44 (14.7)	
Annual family income (đồng)			0.333 ^b
< 30,000,000	73 (24.5)	56 (18.7)	
30,000,000 to < 50,000,000	61 (20.5)	60 (20.1)	
50,000,000 to < 75,000,000	98 (32.9)	106 (35.5)	
$\geq 75,000,000$	66 (22.2)	77 (25.6)	
Family role			0.392 ^b
Parents	91 (30.3)	99 (33.0)	
Spouse	130 (43.3)	110 (36.7)	
Adult children	9 (3.0)	6 (2.0)	
Siblings	40 (13.3)	47 (15.7)	
Other relatives	30 (10.0)	38 (12.7)	

^a Two-group *t*-test was used.

^b Chi-squared test was used.

adjusting for the pre-selected characteristics, are shown in Table 2. The intervention group's family members reported a slightly lower level of family functioning at baseline than those in the control group (estimated mean: 38.3 vs. 39.0, respectively; $p = .011$). The two-way intervention-by-visit interaction term was found to be significant ($p < .001$); the estimated variances of the commune- and participant-level random intercepts were 2.21 and 1.03, respectively. A significantly greater improvement in family functioning was observed for the participants in the intervention condition compared to the control condition at the 6-month follow-up (estimated difference in change scores: 1.42, $SE = 0.33$, $p < .001$) (Cohen's *d* effect size = 0.39, Brysbaert and Stevens, 2018). The intervention effect on family functioning remained at the 12-month follow-up (1.45, $SE = 0.33$, $p < .001$; Cohen's *d* effect size = 0.40). The family role as non-spouse was associated with a higher level of family functioning than parents ($p = .003$). All sensitivity analyses we conducted on family functioning agreed with those from the main analysis; that is, we observed significant intervention effects on family function at both follow-ups ($p < .001$; see Supplement Tables A1 & A2).

No significant difference in the reduction of depressive symptoms from baseline between intervention and control was observed. A lower level of depressive symptoms was significantly associated with male vs. female family members ($p = .003$), higher education (7–12 years vs. six years or less, $p = .041$), and higher annual income (p -values $< .001$). Those in family roles other than parents/spouses experienced a lower level of depressive symptoms compared to parents ($p < .001$).

4. Discussion

This paper presents the promising outcome of a randomized controlled intervention that supported Vietnamese families impacted by drug use to confront the psychosocial challenges. Instead of directly targeting the PWUD or their families, this intervention took a capacity-building approach to enhance the role of local community health staff in conducting brief behavioral interventions to improve the wellbeing of

Table 2
Adjusted linear mixed-effects regression models on intervention outcomes.

	Depressive Symptoms		Family Functioning	
	Estimate (SE)	p	Estimate (SE)	p
Baseline (Intervention-Control)	-0.250 (0.575)	0.663	-0.721 (0.282)	0.011
Intervention Effect ^a				
At 6-month	0.011 (0.449)	0.981	1.418 (0.327)	<0.001
At 12-month	-0.333 (0.450)	0.459	1.447 (0.328)	<0.001
Covariate				
Age (REF: < 35 years)				
35–50 years	0.011 (0.300)	0.970	0.123 (0.207)	0.551
≥ 51 years	0.495 (0.394)	0.209	0.253 (0.261)	0.334
Female	0.900 (0.303)	0.003	-0.249 (0.202)	0.218
Marital status (REF: Single)				
Married/Living with partner	0.014 (0.614)	0.982	-0.203 (0.414)	0.623
Divorced/Separated/Windowed	-0.152 (0.801)	0.850	0.345 (0.543)	0.525
Education (REF: ≤ 6 years)				
7–12 years	-0.609 (0.297)	0.041	0.361 (0.225)	0.108
≥ 13 years	-0.462 (0.451)	0.306	0.103 (0.310)	0.739
Annual family income (REF: < 30,000,000 đồng)				
30,000,000 to < 50,000,000	-0.703 (0.334)	0.036	0.629 (0.229)	0.006
50,000,000 to < 75,000,000	-1.009 (0.322)	0.002	0.432 (0.218)	0.048
≥ 75,000,000	-1.301 (0.356)	<0.001	0.715 (0.243)	0.003
Family role (REF: Parents)				
Spouse	-0.523 (0.379)	0.167	0.081 (0.266)	0.761
Others	-1.870 (0.381)	<0.001	0.655 (0.240)	0.006

Note. The two-way intervention-by-visit interaction term for depressive symptoms was not significant ($p = .92$), whereas that for family functioning was found to be significant ($p < .001$). The estimated variances of the commune- and participant-level random intercepts for depressive symptoms were 7.66 ($SE = 1.57$) and 2.61 ($SE = 0.43$), respectively. The estimated variances of the commune- and participant-level random intercepts for family functioning were 2.21 ($SE = 0.47$) and 1.03 ($SE = 0.21$), respectively. ^{an} Intervention effect = Estimated difference in change scores from baseline between the intervention and control.

families impacted by drug use. This study suggested that the families benefited from the intervention by showing improved family functioning (see Table 2). This intervention has implications on the provision of harm reduction services. The deliverers of the intervention, CHW, are considered as frontline healthcare experts by community residents of Vietnam (Nguyen and Cheng, 2014). They are in a unique position of authority to improve family relationships by mediating potential conflict between PWUD and their family members. Such an intervention model could be integrated into CHW's regular medical services. Furthermore, the families with improved overall functioning and strengthened engagement with the local healthcare system could be better positioned to provide more support for PWUD's service seeking and treatment adherence monitoring.

The results of this study showed that there was no significant difference in the change of depressive symptoms observed between the intervention conditions (see Table 2). The reasons for the null intervention effect on family members' mental health are manifold. First, the family intervention activities in this study were primarily designed to rebuild a healthy family routine and promote family member interaction and support, with relatively less emphasis on family members' depressive symptoms. Secondly, evidence-based depression-control

psychotherapy strategies, such as cognitive-behavioral therapy, are too lengthy and labor-intensive to be incorporated into a brief two-session intervention (Lepping et al., 2017). The low dosage of depression-specific intervention activities might contribute to the lack of intervention effect. The finding suggests that more intensive and concentrated intervention efforts are required to improve family members' mental health. Third, as part of the intervention components, family members were encouraged to engage in communications to support PWUD's behavioral change and treatment-seeking. As this effort might be favorable to PWUD's outcomes, it could pose additional psychological burdens on family members. Future family interventions should strike a balance between family caregivers' support and their mental health burdens.

The levels of depressive symptom and family functioning varied by family members' demographic and background characteristics (see Table 2). The lowest level of depressive symptoms and the best family functioning was reported by the family members with the highest income. Low family income represents inadequate healthcare resources and a lack of access to social services, which may influence a family's ability to cope with substance dependence-related financial and psychosocial burdens (Xiao et al., 2019). We have also observed gender disparity in depressive symptoms between female and male family members. Additionally, parents bore a higher level of depressive symptoms and lower family functioning than non-spousal families. Future interventions should consider family members' diverse background characteristics and family roles to address their specific needs and challenges.

4.1. Limitations

This study has limitations. First, our recruitment criteria and strategies could result in a sample with selection bias. The study findings may not be generalizable to families who had no contact with PWUD or those who did not know PWUD's drug-using status. Second, because the data were collected from two provinces in northern Vietnam, caution must be taken in generalizing the findings to other geographic areas. Third, the study's measures relied on self-reported data, which were subjected to social-desirability bias and recall bias. Fourth, the improvement in family functioning may serve as a potential mediator along the pathway to PWUD's behavioral change (e.g., drug use). However, in our study, the PWUD and family members could not be linked; thus, we would not be able to examine the mediating effect from family members' improvement to PWUD's outcomes. Nonetheless, it could be a direction for future studies.

5. Conclusions

Our study findings indicate that the intervention strategy that focuses on family interaction and support has the potential to improve family functioning of families impacted by drug use. The findings shed light on future addiction treatment programs in Vietnam and other countries with similar cultural environments. Substance use disorders have devastating mental and socio-economic consequences not only for PWUD but also for their families. Addiction therapeutic processes should be broadened from individual to the family. With proper training, community health providers could operate a much-needed function of involving family members and improving family relations. However, mitigating family members' mental stress would require a more intensive and concentrated effort.

Credit author statement

Li Li was responsible for conceptualizing and designing the study, analyzing and interpreting the outcomes, and writing the article. Chunqing Lin participated in overseeing the implementation of the intervention trial and writing the article. Li-Jung Liang and Nan Feng

contributed to analyzing and interpreting the data. Loc Pham assisted with summarizing the literature and data report. Nguyen Tran Hien monitored filed data collection and project implementation. All authors contributed to the article.

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Declaration of competing interest

None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.socscimed.2020.113238>.

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