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A community approach to promote healthcare services for people living with HIV who use drugs in Vietnam

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Abstract

Background: People living with HIV who use drugs (PLHWUD) face enormous challenges to access antiretroviral therapy (ART), addiction treatment, and other healthcare services. This study evaluated the effect of a community capacity-building approach on PLHWUD's access to healthcare services.

Methods: A cluster randomized controlled trial was conducted in four provinces of Vietnam. Trained commune health workers in the intervention condition were encouraged to provide services to PLHWUD in the community and engage them in HIV/addiction treatment and care using learned knowledge and skills. A total of 241 PLHWUD participated in surveys at the baseline and every three months for one year. The primary outcome was PLHWUD's reported barriers to seeking healthcare. A linear mixed-effects regression model with a difference in difference approach was used to estimate the intervention effect on the primary outcome.

Results: Adjusted analyses indicated that significant intervention effects were observed at the Sixth and ninth month follow-ups for those on ART at the baseline and increased motivation to engage in treatment at the 3-month follow-up (60.2% vs 34.4% for the intervention and control groups, respectively).

Conclusions: The community capacity-building intervention had shown promising yet limited outcomes among a subset of PLHWUD in the community, that is, PLHWUD who had already initiated ART.

Keywords

HIV, substance use, community care, capacity building, Vietnam

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Introduction

People living with HIV who use drugs (PLHWUD) face significant individual, structural, and societal challenges in treatment access and adherence.^{1,2} The healthcare barriers faced by PLHWUD are multifaceted, including punitive policies, widespread discrimination and stigma, financial difficulties, and mental health burdens.^{3–7} Previous studies reported a disproportionately low proportion of antiretroviral therapy (ART) initiation and retention among PLHWUD.^{8–11} The challenges exist in ART and addiction-related treatment and care.^{12–14} There is an urgent need to understand the intersecting vulnerabilities related to the population. The goal of ending the HIV epidemic could not be achieved without addressing the service gaps in the current service delivery for PLHWUD.^{6,15}

Studies have suggested that the centralized specialty care delivery model may not be ideal for providing treatment services for PLHWUD due to limited accessibility.^{16,17} An

alternative community-based integrated service delivery model has been demonstrated as a more efficient strategy to expand HIV and addiction services.^{18–21} Primary care providers, nurse practitioners, and community pharmacists have been actively involved in substance use and HIV-related service provision, including community drop-in centers and integrated treatment services.^{7,22–24} However, evidence suggests pressing training needs for community health providers on HIV and substance use prevention, identification, treatment, and care.^{25–27}

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In Vietnam, public health faces severe challenges from the scourge of HIV infection intertwined with drug use.^{28,29} Statistics from 2019 show that HIV prevalence among people who inject drugs reached 12.7%. Among those living with HIV, only 56.4% were aware of their HIV status, only 64% received ART, and opioid substitution therapy coverage was merely 27.4%.³⁰ Like patients in other countries, PLHWUD in Vietnam also suffer from stigma and disparities in service accessibility, which are impacted by their gender, geographic location, and socioeconomic status.^{31,32} Poor relationships with service providers and insufficient information about treatment services contribute to suboptimal treatment adherence and retention among Vietnamese PLHWUD.^{33–36} Comprehensive services and support from commune health workers (CHW) have been suggested as vital ingredients in improving Vietnam's drug- and HIV-related service satisfaction levels.^{37–39}

To strengthen community capacity in providing accessible treatment services for PLHWUD, our team developed and implemented an intervention program in Vietnam to equip CHW with communication skills and tools to motivate PLHWUD in the community to seek and retain in healthcare services. We hypothesized that PLHWUD in the community will indirectly benefit from CHW's strengthened capacity to deliver treatment services tailored to the needs of PLHWUD. This study assessed PLHWUD's reports on barriers to seeking healthcare services over a 12-month follow-up period. We also investigated PLHWUD's treatment enrollment status and its relationships with the reported changes in perceived barriers to seeking healthcare.

Methods

Study design

This study was a cluster randomized control trial conducted in Vietnam's four provinces (Bac Giang, Hai Duong, Nam Dinh, and Nghe An). Sixty commune health centers (CHC), one from each commune, were selected and pair-matched based on the caseloads of people living with HIV and the numbers of registered people who use drugs (numbers obtained from Provincial CDC and Provincial AIDS Centers) and the commune's location. After baseline assessment, each paired CHC was randomized into intervention or control conditions. The Institutional Review Boards of the participating agencies approved the study protocol. The trial was registered in the [ClinicalTrials.gov](https://www.clinicaltrials.gov) protocol registration system (NCT03293355).

Participants

The participants in this study were Vietnamese PLHWUD who resided in the catchment area of the 60 CHC. They were recruited in 2018–2019 through flyers posted in local CHC. The flyers contained contact information to guide

interested PLHWUD to reach out to the study recruiters, who would screen their eligibility and perform further informed consent and recruitment procedures. The inclusion criteria were (1) age 18 and above; (2) being HIV seropositive; (3) currently using opiates or having a history of opiate use; and (4) either not receiving ART or not receiving methadone maintenance treatment (MMT) at the time of the baseline data collection. The targeted sample size of 240 (120 per condition) was initially powered to detect an intervention effect on treatment initiation. However, most of the PLHWUD in Vietnam had already initiated ART at the time of the study. Among 241 eligible study participants, 182 (75.5%) were on ART, and 59 (24.5%) were not on ART (16 on MMT only and 43 on neither ART nor MMT at the baseline assessment).

Data collection

Before any data collection, written informed consent was obtained from all participants. The participants completed baseline and follow-up assessment questionnaires in a private office at the local CHC. The trained interviewers administered the assessment in a one-on-one, face-to-face format using a computer-assisted personal interview method. The interviewers administered the assessment to the respondents and keyed in their answers directly on computers. All questions were asked in Vietnamese, and participants spent approximately 45–60 min completing the assessment. Each participant received 200,000 VND (equaling 8 USD) as compensation for their time and effort.

As shown in [Figure 1](#), the assessments were conducted at baseline and 3-, 6-, 9-, and 12-month follow-ups, with 121 PLHWUD participants in the intervention group and 120 in the control group. The average percentages of follow-up in the intervention and control groups were 89.3% and 94.6%, respectively. Reasons for loss to follow-up included death, being arrested, being out of the country, or losing all social contact in any round of follow-up.

The intervention

The intervention program was designed to target CHW and included those who worked at CHC in the intervention condition. The intervention program included in-person training sessions, virtual group discussions, and in-person reunion sessions to improve CHW's knowledge and skills in HIV and drug use-related service delivery. The intervention was piloted, and a more detailed description of the intervention development and implementation among CHW is available elsewhere.⁴⁰ The recruited PLHWUD participants were linked to CHW in their community by the study recruiters. CHW in the intervention group were asked to use the knowledge and skills learned from the intervention sessions to perform a series of tasks, including motivating PLHWUD to seek HIV and addiction-related services,

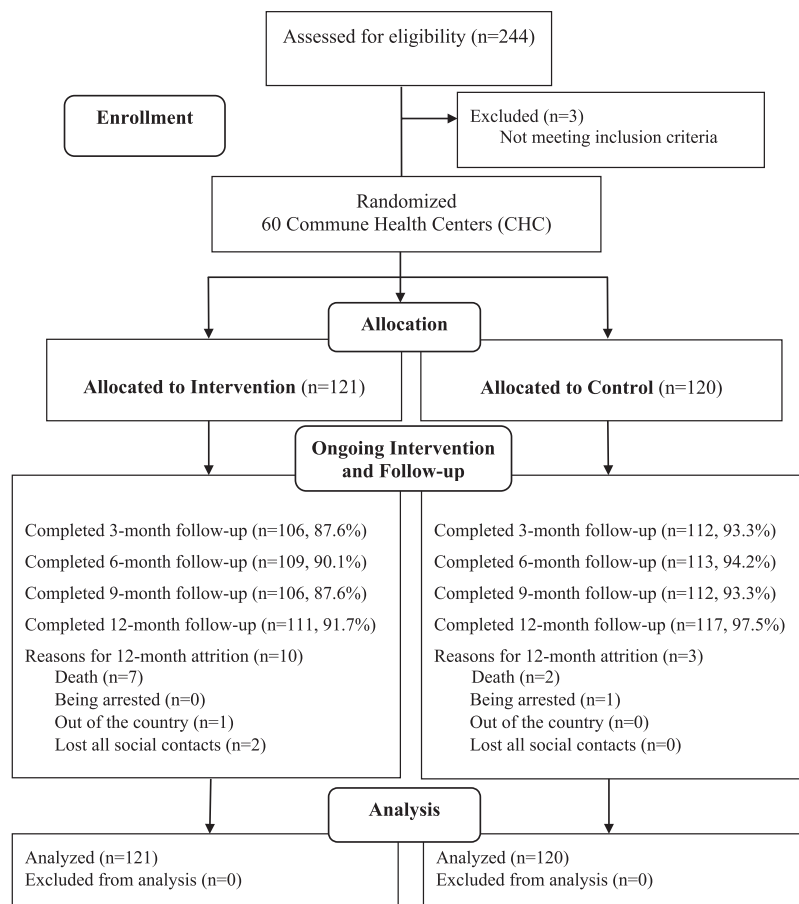


Figure 1. CONSORT for the cluster randomized controlled trial in Vietnam (2018–2019).

evaluating their comprehensive service needs, linking them to specialty care, and supporting their treatment adherence for those who were in treatment. The intervention training for CHW and designed health services delivery for PLHWUD happened after the baseline assessment and were carried out ongoing throughout the 12-month follow-up period. For the control condition, CHW only received a one-time didactic lecture on HIV and substance use treatment basics, and services as usual were provided for PLHWUD.

Measures

Barriers to seeking healthcare were examined using an adapted version of the Barriers to Access to Care Evaluation, developed by Clement and colleagues.⁴¹ Ten out of the original 36 items that were most relevant to this study were selected, including (1) being unsure about where to go to get professional care, (2) thinking the problem would get better by itself, (3) having problems with transport or traveling to appointments, (4) not being able to afford the financial costs involved, (5) thinking medical appointments take too much time or are inconvenient, (6) thinking that treatment probably would not help, (7) having concerns

about treatment-related problems (e.g., medication side effects), (8) having concerns that other people might find out about your disease, (9) having experience of unfair treatment previously, and (10) having been refused services previously. Participants rated their experience on a 4-point Likert scale for each item from 1 = “not at all” to 4 = “a lot.” The 10 items were summed to generate an overall score (range: 10–40), with a higher score indicated more reported barriers to seeking healthcare (Cronbach’s alpha = 0.71).

Depressive symptoms were measured using a short version of the Zung Self-Rating Depression Scale,⁴² which includes 10 items assessing how often the participants feel a particular symptom of depression. This scale was also validated in our previous study in Vietnam.²⁸ Each item was answered using a scale ranging from 1 = “a little of the time” to 4 = “most of the time.” An overall scale score was computed by summing all 10 items (range: 10–40), with a higher score on the scale indicating a higher level of depressive symptoms (Cronbach’s alpha = 0.83).

Other measures comprised participants’ demographic characteristics (gender, age, marital status, years of education, employment status, and annual family income) and drug use-related characteristics (years of heroin use).

Statistical analysis

Descriptive statistics of PLHWUD's demographics, drug use and treatment-related characteristics, and baseline measures of interest were summarized by intervention condition at the baseline. Baseline group comparisons of continuous and categorical characteristics were performed using two-sample *t*-tests and Chi-squared tests, respectively.

An intent-to-treat approach was used for all the analyses. A linear mixed-effects regression model (main model) was used to assess the intervention effect on the perceived barriers to seeking healthcare. The fixed-effects in the main regression model included the following: group (intervention vs control), visit, ART initiation at baseline (yes vs no), three two-way interactions (group-by visit, group-by-ART initiation, and ART initiation-by-visit), and three-way interaction. The pre-selected characteristics were also added to the above model to assess whether the intervention effects remained after controlling these characteristics. Each model also included two levels of random effects, commune- and participant-level, to account for dependence within communes and correlations between each individual's repeated observations. A single model with the difference in difference approach was used to

estimate the intervention effect on the primary outcome measure, that is, the difference in change scores between intervention and control, through model contrasts. The comparisons of interest were the intervention effects on primary outcome measure at the follow-up visit for those who had started the ART at baseline versus those who had not. Since the baseline barrier scores were significantly different between the intervention and control conditions (see Table 1), the baseline barrier score was included in the final adjusted analysis. An exploratory analysis was conducted to explore whether the PLHWUD have been motivated and supported to initiate or stay in their treatment at the 3-month follow-up, using a two-way modeling approach (a simplified version of the primary analysis). A graphical presentation of the results is shown. All statistical analyses were performed using the SAS System version 9.4 (SAS Institute Inc., Cary, NC, USA).

Results

Table 1 presents the characteristics of PLHWUD at baseline. There was no significant difference in demographic and background characteristics between the intervention and control groups. The average age was 39.2 years (SD = 6.0),

Table 1. The characteristic of people living with HIV who use drugs at baseline.

	Control (N = 120)	Intervention (N = 121)	<i>p</i>
Age (years), mean (SD)	39.2 (6.0)	39.2 (6.6)	0.985
35 or younger	33 (27.5)	29 (24.0)	
36 to 45	70 (58.3)	75 (62.0)	
46 and older	17 (14.2)	17 (14.1)	
Marital status, N (%)			0.944
Single	35 (29.2)	37 (30.6)	
Married/living with partners	71 (59.2)	69 (57.0)	
Divorced/separated/windowed	14 (11.7)	15 (12.4)	
Education (years), mean (SD)	8.1 (3.82)	7.5 (3.41)	0.243
Primary school or less (≤ 6)	36 (30.0)	44 (36.4)	
Middle and high school (7–12)	77 (64.2)	69 (57.0)	
Above high school (> 12)	7 (5.8)	8 (6.6)	
Annual family income (million đồng), N (%)			0.667
50 or less	42 (35.0)	40 (16.6)	
51 to 100	44 (36.7)	51 (42.2)	
Greater than 100	34 (28.3)	30 (24.8)	
Currently working, N (%)	97 (80.8)	90 (74.4)	0.230
Length of heroin use (years), mean (SD)	7.6 (5.7)	8.8 (6.4)	0.124
5 years or less	52 (43.3)	48 (39.7)	
6–10 years	42 (35.0)	39 (32.2)	
More than 10 years	26 (21.7)	34 (28.1)	
ART initiation at baseline, N (%)			0.107
No	24 (20.0)	35 (28.9)	
Yes	96 (80.0)	86 (71.7)	
Baseline measures, mean (SD)			
Barriers to seeking healthcare	13.5 (3.4)	14.8 (4.2)	0.008
Depressive symptoms	21.0 (6.6)	22.3 (6.6)	0.142

Two-group *t*-tests or Chi-squared tests were used.

and about one-third of the participants were single at baseline. The majority of the participants had between primary to less than high school education. The annual family income of over 100 million đồng was reported by 24.8% of the participants in the intervention group vs. 28.2% in the control group. The average years of heroin use were 8.8 in the intervention group and 7.6 in the control group. The average number of years since HIV diagnosis was 6.0 (SD = 4.2). Among those treatment naïve participants at baseline, 44.2% initiated ART, 9.3% initiated MMT, and 4.7% initiated both ART and MMT after the baseline assessment. None of the above characteristics were statistically significant between groups at baseline.

Intervention effects on barriers to seeking healthcare reported by participants, adjusting for the pre-selected demographic and drug use characteristics, baseline barrier score, and depressive symptoms, are shown in Table 2. No significant intervention effects on the barrier score were observed for the participants who had not initiated ART at baseline. However, for those who were on ART at baseline, intervention group PLHWUD showed a significantly greater reduction in barriers to seeking healthcare than those in the control group at 6-month (estimated difference = -0.92, SE = 0.47, $p = 0.049$), and 9-month (-0.94, SE = 0.47, $p = 0.047$). No differences in intervention effects on the barrier scores were observed between those who had and those who had not initiated ART at baseline. Participants with above high school education had a significantly less reduction in the barriers score than those with lower levels of education ($p < 0.05$). Baseline depressive symptom was positively associated with the barriers score (estimate = 0.047, SE = 0.017, $p = 0.007$).

Figure 2 shows the estimated mean reduction in the barriers scores over time among the intervention participants by ART initiation status at baseline. For those who reported initiating ART at the baseline, the mean reduction

in barrier score increased over time from 3- to 9-month and decreased slightly at 12-month. By contrast, the reduction in barrier score for participants who were not on ART was greater than those who had already started ART at baseline, and the difference was statistically significant at the 12-month follow-up (estimated reduction: 2.72 vs 1.19, $p = 0.047$).

Figure 3 presents the results from the exploratory analysis, that is, the percentage of participants with increased motivation to initiate or stay in treatment by intervention condition and baseline ART initiation status. For the participants who had initiated ART at baseline, a significantly greater odds of reporting increased motivation to engage in treatment was observed for the intervention group than the control group (60.2% vs. 34.4%, respectively; aOR (95% CI) = 1.31 (1.09, 1.59); $p = 0.006$), which is similar to the results from the primary analysis.

Discussion

This study used the capacity-building approach to train CHW in HIV and substance use-related services delivery. We anticipate intervention CHW's improved service knowledge and skills to be translated to improved access to HIV and substance use services and reduced environmental contributors to health disparity, especially in resource-limited settings like Vietnam.^{43,44} However, when examining the patients' outcomes, we did not observe an across-the-board improvement in service seeking among all PLHWUD. The PLHWUD who were already on ART at baseline benefited from this intervention by showing promising outcomes in reduced perceived barriers to healthcare services and increased motivation to engage in treatment. The intervention effect in the ART-initiated participants may be attributed to the established stable relationships between patients on ART and their service

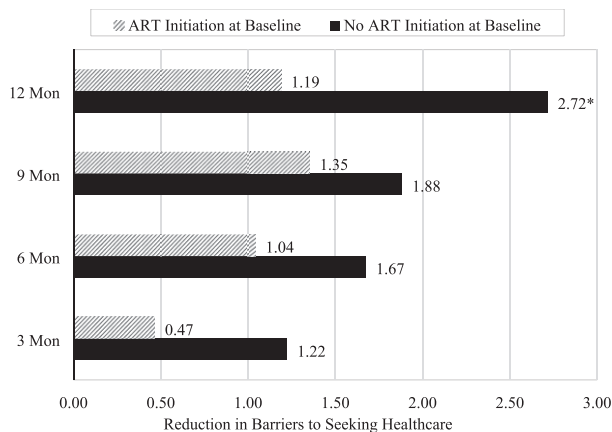
Table 2. Adjusted^a intervention effects on barriers to seeking healthcare.

ART initiation at baseline	Comparison of interest (intervention – Control)	Estimate (SE)	<i>p</i>
No	Baseline	0.718 (0.648)	0.268
	Intervention effect ^b		
	3-month	-0.945 (0.927)	0.308
	6-month	0.453 (0.901)	0.615
	9-month	0.212 (0.882)	0.810
	12-month	0.079 (0.872)	0.928
Yes	Baseline	0.518 (0.356)	0.145
	Intervention effect ^b		
	3-month	-0.513 (0.470)	0.276
	6-month	-0.924 (0.469)	0.049
	9-month	-0.941 (0.473)	0.047
	12-month	-0.765 (0.468)	0.103

Note: Linear mixed-effects regression model with a 3-way interaction term was used.

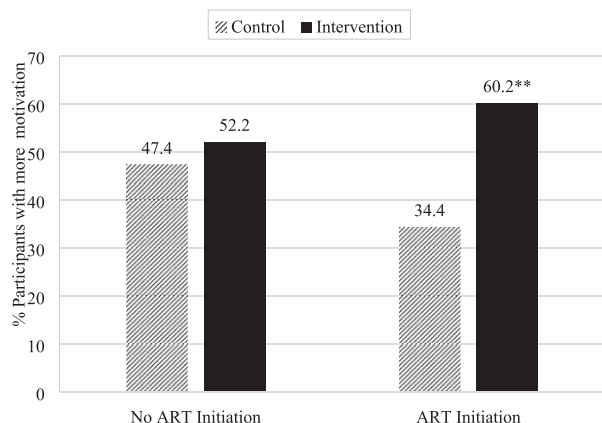
^aAdjusted for age, education, income, marital status, work status, years of heroin use, barriers to seeking healthcare, and depressive symptoms at baseline.

^bIntervention effect = difference in change scores between intervention and control.



*Adjusted p = 0.047

Figure 2. Reduction in barriers to seeking healthcare among intervention group PLHWUD by baseline ART initiation status. Note: PLHWUD: people living with HIV who use drugs; ART: antiretroviral therapy.



**Adjusted p = 0.006

Figure 3. Percent of PLHWUD with increased motivation to initiate or stay in treatment by intervention and baseline ART initiation status at 3-month. Note: PLHWUD: people living with HIV who use drugs; ART: antiretroviral therapy.

providers through regular check-ins and medication refills.⁴⁵ These patients are more likely to be receptive of CHW-initiated outreach, counseling, and referral efforts. The study finding suggested that ART can serve as a gateway to overall healthcare services, and the health promotion campaigns should fully utilize the ART “treatment for all” policy⁴⁶ to engage patients in primary healthcare, especially the community care system.

Among patients who were not on ART at baseline, although there was no significant difference between the intervention and control groups in terms of changes in reported barriers, it is counterfactual to claim that the intervention did not benefit this subgroup of patients. The intervention group participants who were not on ART at

baseline also demonstrated a reduction in healthcare-seeking barriers over time, although less evident, statistically speaking, than those on ART. We consider this reduction in barriers among those not on ART attributable to repeated assessment once every three months for 12 months during the study. For each assessment, the PLHWUD participants were asked repeatedly about their physical/mental health and service utilization. These questions could serve as triggers for the patients in both intervention and control conditions to self-examine their service needs and explore accessible healthcare services. This “practice effect” has been documented by psychological research, which indicated that repeated assessment with the same test often leads to performance improvement and obscures actual change brought by interventions.⁴⁷ In light of the differentiated intervention outcomes by ART status found in this study, future interventions to promote service delivery should attend to the various stages of PLHWUD in their treatment-seeking to provide personalized care. On a related note, many ART-naïve PLHWUD at baseline had initiated ART during the 12-month follow-up period, which is a study contribution to be acknowledged. The lack of statistically significant between-group difference in the ART initiation is likely due to the engagement of CHW in both intervention and control conditions through repeated assessment in HIV/addiction-related knowledge (a similar “practice effect” as discussed above).

There are several limitations to this study. First, the study results cannot be extrapolated to PLHWUD who lived outside of the study areas or those unwilling to be reached by CHW or our study recruiters. Second, social desirability and recall biases could have occurred in this study.^{48,49} Specifically, the PLHWUD could have falsely under-reported their motivation to stay in treatment. Objective measures of community-based service quality and service utilization among PLHWUD were lacking. Third, among the PLHWUD who were on ART at baseline, the between-group difference in the reduction of barrier score, although reached statistical significance, may not practically reflect the enhancement of access to care. Fourth, the study was initially designed to evaluate the intervention outcome on CHW, so there was some variability in the number of PLHWUD across communes. In some of the participating communes, there were limited eligible PLHWUD to be recruited. Fifth, the original sample size was estimated based on PLHWUD’s treatment initiation. Since we switched our focus to the barriers to seeking healthcare in this study due to implementation adjustment, the findings from this study should be interpreted cautiously and be confirmed in future studies with sufficient sample size. Lastly, we did not evaluate intervention outcome on MMT initiation due to the small numbers of participants who initiated MMT during the study period. Another consideration was that other substance use treatment options might be more suitable for some of the

PLHWUD, but the reception of these treatment services was not captured in the study.

In conclusion, this study reported the indirect intervention effects among PLHWUD by training providers in local community healthcare settings. The association between ART initiation and reduced barriers to seeking healthcare was highlighted. It is suggested that ART status should be considered to guide personalized service provision for PLHWUD. The current universal ART policy should be utilized as PLHWUD's entry point into the healthcare system.

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Declaration of conflicting interests

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Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent

Informed consent was obtained from all individual participants included in the study.

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