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An Intervention Pilot to Facilitate Harm Reduction Service Decentralization in Vietnam

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Abstract

Introduction: Harm reduction services, including methadone maintenance therapy (MMT), have been decentralized to Vietnam's community healthcare settings. This study aims to pilot test an intervention to facilitate decentralized harm reduction service delivery in Vietnam.

Methods: An intervention pilot was conducted between August 2020 and May 2021 with six community MMT distribution sites in Thai Nguyen Province of Vietnam. We recruited five commune health workers (CHW) from each center (N=30). In-person intervention training included content to correct misconceptions about harm reduction and reduce stigmatizing attitudes towards patients who use drugs and teach CHWs to self-examine and improve their service provision process. The study team developed a web-based platform to streamline CHW's patient monitoring and referral efforts. The intervention outcomes were assessed at baseline, 3-, and 6-month. CHWs in the intervention group provided acceptability ratings and feedback on the intervention at 6-month.

Results: CHWs in both intervention and control groups had similar background characteristics and outcome measures at baseline. CHWs in the intervention group, compared to those in the control group, showed a significantly higher level of improvement in adherence to service delivery protocol at 3-month. CHW in the intervention group had a significantly lower level of management-related stress compared to the control group at 6-month, although the intervention effect measured by the difference in change from baseline was not statistically significant. CHWs who participated in the final focus group reported high acceptability of the intervention.

Conclusion: This intervention pilot demonstrated acceptability and promising outcomes on community-based harm reduction service delivery. Similar intervention strategies can be applied to enhance the decentralization of other chronic disease treatment services.

Keywords

Service decentralization; quality improvement; harm reduction; Vietnam

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1.0. Introduction

Decentralization of healthcare services from specialty care settings to community-based, primary care settings has long been advocated as a desirable strategy in resource constraint settings (Gilks, 2006; Saltman et al., 2007). With proper planning and implementation, health service decentralization can offer several advantages in HIV harm reduction and substance use treatment services (Abimbola et al., 2019). It is unarguable that service decentralization can improve access to health services, especially in geographically remote areas (Bilinski et al., 2017; Oleribe et al., 2016). Decentralization of treatment and care at the community level reduces inequalities between rural and urban areas by reducing the travel burden and cost for rural residents (Zhang et al., 2011). Integrating substance use treatment and HIV care into primary care settings also addresses labeling, reduces the risk of disease status disclosure, and increases patients' service satisfaction and retention in care (Nyblade et al., 2019; Odeny et al., 2013; Reidy et al., 2014; Suvorova et al., 2015).

The public health system in Vietnam is burdened with dual epidemics of substance use and HIV/AIDS (UNAIDS, (2018)). Since 2011, Vietnam has been taking a leading role in decentralizing HIV and harm reduction services to community-based healthcare systems (Nguyen Bich et al., 2016; Ministry of Health of Vietnam, 2014). The decentralized plan mainly involves the commune-level health settings, namely commune health centers (CHC), to provide daily methadone maintenance therapy (MMT) doses to stabilized patients; at the same time, CHC-based methadone distribution sites also provide basic HIV prevention and care services, including HIV testing, counseling, routine CD4/viral load testing, antiretroviral therapy (ART) administration, and identification and management of comorbidities (Bui, 2011; Nguyen et al., 2020; Tran & Nguyen, 2012). Such a community-based service delivery approach significantly facilitates universal access to comprehensive HIV services and reduces major logistic barriers to service seeking (Nguyen et al., 2018; Tran et al., 2015).

Healthcare services decentralization is a complicated process, characterized by multiple handoffs among healthcare providers and changes in patients' treatment plans; therefore, service decentralization could be challenging, especially in low- and middle-income countries (Dwicaksono & Fox, 2018). Many CHCs in Vietnam have insufficient capacity and experience to handle substance use and HIV-related care and treatment (Matsumoto et al., 2020). Commune health workers (CHW) have widespread misconceptions about the purpose of harm reduction, as it conflicts with the prolonged domination of abstinence-oriented treatment philosophy in the country (Edington & Bayer, 2013; Lin et al., 2018). Methadone diversion is a major concern in Vietnam that hinders the service providers' acceptability of decentralization and deters the implementation of more patient-centered, harm reduction approaches, such as allowing compliant patients to take methadone home (Nguyen et al., 2019; Nguyen Bich, 2020). CHWs also face challenges including increased administrative burden and difficulties in engaging patients with substance use disorders, which might reduce their motivation to provide services (Hoa et al., 2020; Ministry of Health., 2014). In addition, decentralization of services requires CHWs to communicate frequently with other health sectors, including MMT clinics and infectious disease/

psychiatric specialty settings, to respond to patients' various health needs (Li et al., 2020). However, due to CHWs' inadequate training, mental health and infectious comorbidities screening and diagnosis are inconsistently implemented in CHCs, thus representing a missed opportunity to identify patients' comprehensive health needs and link them to appropriate services (Chau et al., 2021; Ng et al., 2011). Patients seeking decentralized harm reduction services also express concerns regarding confidentiality protection if they regularly visit local clinics to receive addiction and/or HIV-related services (Tran et al., 2019). Without proper planning and coordination, harm reduction service decentralization could not achieve the desired benefit; moreover, it may result in delayed treatment and even a breakdown in the continuum of care (Abimbola et al., 2019; Tarrant et al., 2015).

This study was an intervention pilot focusing on improving the process of service decentralization. Guided by the Theory of Constraints (Goldratt, 1990), the study team first conducted process evaluations of the service decentralization in Vietnam to identify process gaps and inefficiencies in service workflows. We then developed the intervention to streamline the CHW's workflow so that the decentralization services can be provided in a consistent and efficient manner without adding unnecessary burdens to the CHWs. This paper describes the preliminary outcomes of CHWs' adherence to harm reduction service delivery protocol and perceived administrative burden related to decentralized service provision, as well as their feedback on the intervention.

2.0. Methods

2.1. Study design and setting

The study was conducted between July 2020 and May 2021 in Thai Nguyen Province, Vietnam. We first employed community participatory approaches to develop the intervention contents and delivery plan to be pilot tested in six CHC-based MMT distribution sites in Thai Nguyen. All of the six CHCs are located in rural areas, and their distance to centralized MMT clinics ranges from 5 to 50 kilometers (on average 29 kilometers). At the time of the study, the six CHCs serve a total of 441 (range: 18–129) patients who were on MMT. In addition to MMT distribution and HIV testing, some of the CHCs also provided ART medication distribution (5 CHCs), sexually transmitted infection (STI) testing (1 clinic), HBV/HCV testing (3 CHCs), brief mental health counseling (5 CHCs), and social services (2 clinics) before baseline of the study. In this study, the six CHC distribution sites were first pair-matched based on the number of patients receiving MMT in each clinic, and each pair of CHCs was randomized into an intervention and a control condition. The randomization procedure was conducted after the completion of baseline data collection. The intervention pilot was registered in the [ClinicalTrials.gov](https://clinicaltrials.gov) protocol registration system (NCT04798534).

2.2. Participants

The study participants were CHWs working in the CHC distribution sites. There were, on average, five CHWs, including doctors, nurses, and pharmacists, providing harm reduction services at each site, and all of them were recruited. CHWs had to be 18 years or older and provide harm reduction-related medical services for patients in the participating CHC. We recruited a total of 30 CHWs between August 28 and September 4, 2020. Study

recruiters informed the CHW participants about the study procedures, intervention activities, confidentiality, and voluntary participation, and they provided written informed consent. As part of the study, we also recruited patients who were receiving MMT in the CHCs and will report patient outcomes in a separate paper.

2.3. Intervention development and delivery

Researchers, local health administrators, service providers, and patient representatives collaboratively developed the intervention. In the first phase of the project, we conducted formative studies with CHC distribution site directors, service providers, and MMT patients to 1) understand the overall service decentralization process and sequential steps to provide a continuum of care, 2) identify the responsible party, decision points, and cross-agency collaborations to perform each clinical task, 3) document occurrence of errors and repetition for each of the tasks, and 4) investigate perceived challenges and additional training needs to better perform tasks in each step (Lin et al., 2018). These formative studies revealed CHWs' insufficient knowledge in harm reduction and lack of skill training to engage patients. We identified system and procedural inefficiencies in providers' efforts to validate multiple resources of medical records from CHCs, MMT clinics, and other hospitals, and service providers reported these tasks to be redundant and error-prone. In light of these findings, a multidisciplinary workgroup consisting of government officials, agency stakeholders, service provider representatives, and researchers developed the intervention under the intervention-mapping framework (Bartholomew et al., 1998; Bartholomew, 2016). The workgroup went through a series of meetings to debrief the identified challenges, discuss the determinants behind the challenges, determine change objectives, review evidence-based intervention strategies and tools, and lay out intervention implementation and evaluation plans.

The intervention, which aimed to improve efficiency and the quality of decentralized harm reduction services, included in-person training for CHWs and an online support platform. The CHWs in the intervention group first attended three consecutive weekly group training sessions. The first session, entitled "*Safeguarding the community*," served preparation purposes to motivate the CHWs to promote the health and wellbeing of the community, dispel their concerns working with patients with substance use disorders, clarify misconceptions of harm reduction, and encourage non-stigmatized service attitudes. The second section, "*Optimizing the workflow*," taught several quality improvement tools and strategies for CHWs to self-examine and optimize their harm reduction service provision workflow. For example, through a "process rearranging game", the CHWs realized the importance of periodically examining their work process to identify steps with most delays and errors, which added to the overall processing time; then the CHWs were taught to use a "tree diagram" to translate their major tasks into achievable sub-tasks and then use a "priority matrix" to prioritize competing tasks; finally, CHWs learned to use a "fishbone diagram" to identify the root causes of mistakes and devise targeted error prevention strategies. CHWs received homework to reexamine their workflow, identify issues, and make improvement plans using the tools taught in the sessions. In the third session, "*Utilizing new technology*", we introduced a web-based platform specifically designed by the study team to the CHWs. The HIPAA-compliant web-based platform was housed in

the Vietnamese collaborative institute's server. The platform included three major features 1) education, with which the study team, health specialists, and CHWs could share harm reduction literature, the latest guideline, and local resources; 2) patient tracking, which was designed with the intention for CHWs and MMT specialists to consolidate patients' health data, such as MMT dosage and testing results, and to receive notification for patient no-shows and/or positive urine drug testing; and 3) provider networking, which was designed to facilitate CHW's communication with other providers, for example, the CHWs could request a quick consultation from a specialist and/or refer a traveling patient to another MMT distribution site. Before the 3- and 6-month follow-ups, the CHWs in the intervention group participated in two in-person booster sessions (approximately 60 minutes each) for collective problem identification and problem-solving. The booster sessions were non-manualized but generally started with a brief review of the knowledge and skills learned from the intervention sessions, followed by discussions to report challenges encountered in service provision for patients who use drugs since the last session and exchange potential solutions to tackle these challenges. All of the in-person sessions were interactive in nature and comprised role-plays, pair-shares, games, and mini debates to engage providers' full attention. CHWs in the control group continued to receive their routine in-service training and provide harm reduction services as usual.

2.4. Outcome assessments

CHW in both intervention and control conditions self-administered computer-assisted surveys at baseline, 3-, and 6-month follow-ups. The surveys were completed in private CHC offices and project interviewers were available to provide technical support and clarify survey questions if any. The computer-assisted survey system had built-in features to perform range and logic checks to provide real-time feedback to clarify inconsistencies. Each survey took approximately 40 minutes to complete. CHW participants received 200,000 VND (approximately 10 USD) for each survey. The survey procedure was the same for baseline and follow-up surveys, and 100% of the CHWs were successfully retained over the 6-month follow-up period.

2.5. Measures

CHW participants' demographic and working-related characteristics, including age, gender, education, and working duration at the current CHC, were documented at the baseline. In addition, we collected two outcomes of interest at each of the assessment points.

The CHWs' level of adherence to harm reduction protocols was measured using the Primary Care Behavioral Health Provider Adherence Questionnaire (Beehler et al., 2013), adapted based on local decentralization guidelines (Ministry of Health of Vietnam, 2015). The scale has 20 items evaluating if a CHW provides decentralized services in accordance with clinical protocol. The items include measures of essential service provision (e.g., “*you prescribe or recommend regular HBV/HCV/STI testing for your patients*” and “*You administer brief validated measures for an initial screening of mental health symptoms*”), individualized healthcare (e.g., “*You work together with your patients to develop a plan to help them manage their concerns*”), continuum of harm reduction services (e.g., “*You walk your patients through the steps to receive testing, treatment, and referral services*”),

as well as undesired clinical practice (e.g., “*during clinical encounters, you see patients for five minutes or less*”). CHW participants evaluated their level of agreement with each item using a 5-point Likert scale from 1= “never” to 5= “always”. The overall score, ranging from 20–100, was constructed by summing the scores of all items, with undesired clinical practice items being reversely coded. A higher score reflects CHWs’ better adherence to harm reduction-related service delivery protocol in their practice (Cronbach’s alpha=0.86).

A 5-item subscale of the Primary Care Provider Stress Checklist (Gould et al., 2012), was adapted to evaluate CHWs’ practice management-related stress levels due to inefficient workflow in harm reduction service provision. CHW participants rated the extent to which each of the five situations was stressful for them using a 0–6 scale from 0= “not stressful” to 6= “extremely stressful”. Sample items include “*Your working schedule is too tight*”, “*Patients wait for too long because of office workflow problems*”, and “*You have to deal with interruptions and other annoyance during workdays*”. A higher summary score indicates a higher level of stress due to a lower level of efficiency in practice management (Cronbach’s alpha =0.82).

2.6. Feedback seeking

During the 6-month survey, CHWs in the intervention group rated the acceptability of the in-person sessions and the online platform using a 5-point scale. Upon completion of the 6-month follow-up period, we conducted a final focus group among conveniently sampled CHWs who participated in the intervention groups to solicit their feedback on the intervention. Due to the COVID case surge in Vietnam at the time of the data collection, the focus groups were held virtually using Zoom. The topics included CHW’s general impression of intervention, experiences with various intervention components, and suggestions for improvement.

2.7. Data analysis

The statistical analyses were performed using SAS (version 9.4; SAS Institute Inc., Cary, NC, USA). We first descriptively summarized the CHW participants’ demographics and worked-related characteristics at baseline. The baseline characteristics were compared between the intervention and the control condition. We generated plots of outcome measures over time to graphically present the outcomes at different follow-up points. An intent-to-treat approach was used for the intervention outcome analyses. Linear mixed-effects regression models were used to fit each outcome measure, and covariates included CHW’s demographic and background characteristics, intervention condition (intervention vs. control), visit (baseline, 3-, or 6-month follow-up), and intervention-by-visit interaction. The models also included commune- and participant-level random effects to account for dependence within each CHC and correlations between repeated observations for each individual CHW, respectively. At 3- and 6-month follow-ups, the mean change score of each outcome measure from baseline was calculated for intervention and control conditions. We used a difference-in-difference approach to estimate the intervention effect by comparing the differences in change scores between intervention and control through model contrasts. The qualitative data collected in the final CHW focus group was analyzed using a rapid

qualitative analysis approach (Hamilton, 2013) to identify themes related to intervention acceptability, usability, and areas for improvement.

3.0. Results

3.1. Participant characteristics

Table 1 shows the demographics and background characteristics of the participating CHWs at baseline. The majority of the CHWs were female (76.7%). Their average age was 37.0 (SD=9.5) at the time of the baseline. Half (n=15) had Bachelor level medical training, and 20% had graduate or higher degrees. Approximately one-third (n=11; 36.7%) were doctors or assistant doctors, 40% were pharmacists, and others were nurses or social workers. The average duration of working at the current CHC was 8.3 (SD=8.2) years. We did not observe any differences in the baseline characteristics between the intervention and the control groups (all p-values > 0.05; Table 1).

3.2. Outcome measures

The CHWs in both intervention and control groups reported comparable levels of adherence to protocol (49.9±11.7 and 48.4±12.8 for control and intervention, respectively; p=0.757) and management-related stress (9.1±5.8 and 7.4±5.7 for control and intervention, respectively; p=0.436) at baseline. Fig. 1 presents the changes in outcome measures from baseline to follow-ups. For the intervention group, the adherence to protocol measure increased to 59.0±14.4 at 3-month and remained at a stable level (59.1±5.6) at 6-month; we did not observe an increase in the level of adherence to protocol for the control group at 3-month (50.1±13.3), but the control group also caught up for this measure at 6-month (55.9±12.7). In terms of management-related stress, we observe an increasing trend for the control group (from 9.1±5.9 at baseline to 9.8±7.5 at 3-month and 16.3±7.7 at 6-month). The score remained relatively stable for the intervention group (7.4±5.7 at baseline, 9.1 ±5.3 at 3-month, and 11.1±5.7 at 6-month).

Intervention effects on outcome measures, adjusting for CHW's background characteristics in the linear mixed-effects models, are shown in Table 2. Compared to the control group, CHWs in the intervention group reported a significant improvement in adherence to protocol at 3-month (estimated difference in improvement from baseline between intervention and control was 10.33; SE=5.12; P=0.048); the estimated difference in improvement became insignificant at 6-month (estimated difference in improvement was 4.60; SE=5.03; P=0.364). CHWs in the intervention group showed a significantly lower level of management-related stress compared to the control group at 6-month (estimated difference=-4.95; SE=2.14; p=0.024) after controlling for gender, age, college degree, profession, and employment history. However, the intervention effects as measured by the difference in reduction from baseline were not statistically significant at either 3- or 6-month. When other covariates were controlled, female CHWs had a higher level of management-related stress (estimated difference=4.25; SE=2.02; p=0.040), and pharmacists reported a lower level of stress than other professions (estimated difference=-0.63; SE=2.07; p=0.033).

3.3. Acceptability and feedback

During the 6-month survey, 100% of the CHWs in the intervention group indicated that they liked or very much liked the intervention activities. The majority (n=14; 93.3%) of the CHWs reported that the knowledge and skills they have learned from the in-person training sessions were helpful or very helpful, and 13 (86.7%) perceived the difficulty level of the homework to be about right. Thirteen (86.7%) CHWs rated the online platform to be helpful or very helpful to study harm reduction-related materials, communicate with providers in other sectors, interact with patients, and track patients' progress. Due to the small sample size, we did not identify differences in the acceptability rating by CHW characteristics. A total of seven CHWs in the intervention group participated in the final focus group discussion. Since the study coincided with the COVID pandemic, the CHWs mentioned the impact of COVID on their workflow during the study period since some task forces had to be shifted to COVID prevention efforts, such as temperature taking, enforcing mask-wearing/social distancing in the clinic, collect samples for COVID testing, etc., which resulted in a prolonged waiting time for patients and heightened workload for providers. However, the CHWs perceived the intervention as a "meaningful endeavor" to support their decentralized service provision during this unusual time. Some of the prioritization tools guided the CHWs to "arrange their work more scientifically" and "save time in handling work", and the CHWs applied the process improvement philosophy "not only in MMT distribution but also in other clinical tasks". The CHWs particularly appreciated the interactive activities in the group sessions, including the process rearranging games and the fishbone chart, which were easy to understand and provided an innovative direction to guide planning and problem-solving when handling complex tasks. The CHWs indicated their willingness to participate in similar intervention activities in the future; however, they would want to learn more knowledge and skills about addiction-related psychology and patient counseling skills in future sessions. In terms of the web-based platform, the CHWs perceived it as a new novel approach to share information with other providers and patients. However, the platform's usage dwindled by the complicated sign-in procedures and some patients' lack of technical skills to use the platform. The CHWs suggested integrating direct calling features to make the platform more user-friendly for both providers and patients.

4.0. Discussion

This paper describes an intervention focusing on operational excellence and process improvement of harm reduction service decentralization in Vietnam. The study team developed the intervention using structured process mapping methodologies to optimize working procedures, reduce system waste, and create effective collaboration. Similar quality improvement strategies have been increasingly used in healthcare management in recent years (Hunter et al., 2017; Ji et al., 2021; Johnson & Sollecito, 2018). The study advanced the understanding of healthcare service decentralization and potential strategies to improve the process of community-based substance use prevention, care, and treatment services.

The intervention showed promising positive outcomes in CHW's service delivery. Having received training in self-examination of their workflow and strategies to consciously identify and reduce process inefficiencies at work, CHWs in the intervention group demonstrated

a higher level of compliance to protocol at 3-month. However, the intervention group did not show additional improvement in their level of compliance at the 6-month follow-up, suggesting the need for continued refresher training to augment the intervention effect. Interestingly, CHWs in the control group also caught up in the level of protocol compliance over time, and thus the intervention effect became insignificant at 6-month. We consider the diminishing intervention effect attributable to the “practice effect” documented in psychological research (Falleti et al., 2006), that the CHWs in the control group participated in repeated surveys assessing their service provision, and these questions triggered the providers’ self-evaluation of their clinical practice and eventually led to performance improvement.

The study period coincided with the COVID pandemic in the winter of 2020 and spring of 2021, which had a devastating effect on resource-constraint community healthcare settings in Vietnam (Nguyen et al., 2021). As indicated in the final focus group, many CHWs were drafted to perform COVID prevention tasks during the time of the study. These additional workloads, compounded by the fear of being exposed and limited psychological support at work, can cause accumulative psychosocial stressors in healthcare providers (Quang et al., 2021). We anticipate the COVID-related work and mental health burdens to explain the increasing trend in the management-related stress observed in both intervention and control conditions in this study. However, there are encouraging signs that the CHWs in the intervention group showed a relatively steady level of stress during the study’s cause, which could be ascribed to the reduced redundant work and improved efficiency in collaboration resulting from the intervention.

Although the CHWs in the intervention group generally reported high acceptability of the intervention program during the 6-month survey and the final focus group, they pointed to a few areas for future improvement. With a primary focus on process enhancement, the intervention incorporated limited knowledge and skill training components, e.g., disseminating addiction treatment knowledge and clarifying common misconceptions around harm reduction in both in-person sessions and web-based platforms. However, the CHWs voiced their needs and eagerness to gain a deeper understanding of psychological counseling and improve behavioral therapy skills. Although we could not achieve this goal through this study’s brief training period, we recommend that future interventional studies exploit an integrated approach with a dual focus on harm reduction skill training and process improvement to produce supplementary intervention outcomes. Moreover, we suggest tangible tokens and regular booster intervention sessions in order to reinforce the intervention effect over time. During the final focus group, the CHWs rated the in-person learning and practicing of performance improvement tools as most useful and reported the web-based platform to be less frequently used due to inconvenience to log-in and technical difficulties. Due to the pilot nature and constraint budget of this study, the online platform, which was developed back in 2018, was not as comprehensive or user-friendly as some of the well-established mobile phone applications that are available nowadays, and thus its impact on the intervention outcomes might be limited. As mobile technologies are being increasingly advanced and used to support healthcare providers’ communication and collaboration (Goncalves-Bradley et. al 2020), we recommend future process improvement projects to utilize some of the existing mobile platforms, such as

“MyChart”, to facilitate data consolidation and enhance cross-sectional communication/collaboration. Future healthcare application designers should consider incorporating voice features to improve the easiness of use and making technical support for both providers and patients to enhance utility. Lastly, the majority of the CHWs in the study were female, and the gender profile was comparable to that reported in previous studies among CHWs in Vietnam (Lin et al., 2018). In contrast, people who use drugs and patients receiving MMT in Vietnam are predominantly male (Nguyen et al, 2018). Although a study in the U.S. suggested that provider-patient gender concordance was not associated with patients’ experience ratings (Takeshita et al., 2020), it is important to take into account the culture-specific norms females experience in Vietnam (Maheshwari & Nayak, 2020). Future training should incorporate additional components to equip CHWs with skills and resources to build rapport and handle potential conflict when providing decentralized MMT services to gender-discordant patients.

The study has several limitations. First, this pilot study had a small sample size. Therefore, although some differences in outcome measures between intervention and control groups showed an encouraging trend, they did not provide conclusive evidence of the intervention’s efficacy due to limited statistical power. Second, this study was conducted in one province of Vietnam with a favorable policy for service decentralization. Cautions must be used in generalizing the findings to other geographic areas with different treatment policies, regulations, and community-based service capacities. Third, the outcome measures relied on self-reported data, which were subject to social-desirability biases. For example, CHWs might have over-reported their adherence to service protocol, and their changes in working procedure and process efficiency were not objectively measured in this study.

5.0. Conclusion

This study contributes to the literature on designing and implementing a process improvement intervention to facilitate harm reduction service decentralization in Vietnam. The intervention strategies are applicable for addiction treatment in Vietnam and have implications for the global research communities to promote service decentralization in general. We suggest stakeholders of healthcare settings consider incorporating similar process examination and streamlining in their routine practice to improve the efficiency of service decentralization. Future process improvement intervention, if combined with harm reduction knowledge and skill training supported by continued refresher sessions as well as mobile technologies, can potentially achieve more desirable and sustainable outcomes.

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Highlights

- The intervention pilot combined in-person groups and an online platform to improve the process of harm reduction service decentralization in commune health clinics in Vietnam.
- Commune health workers in the intervention group showed a promising trend in the primary outcome indicator, which was adherence to decentralization service protocol.
- Commune health workers in the intervention group showed a relatively stable level of stress despite the COVID-related work burdens.
- The in-person intervention components were well-accepted by commune health workers, but the utility of the online platform was relatively limited due to technical challenges.

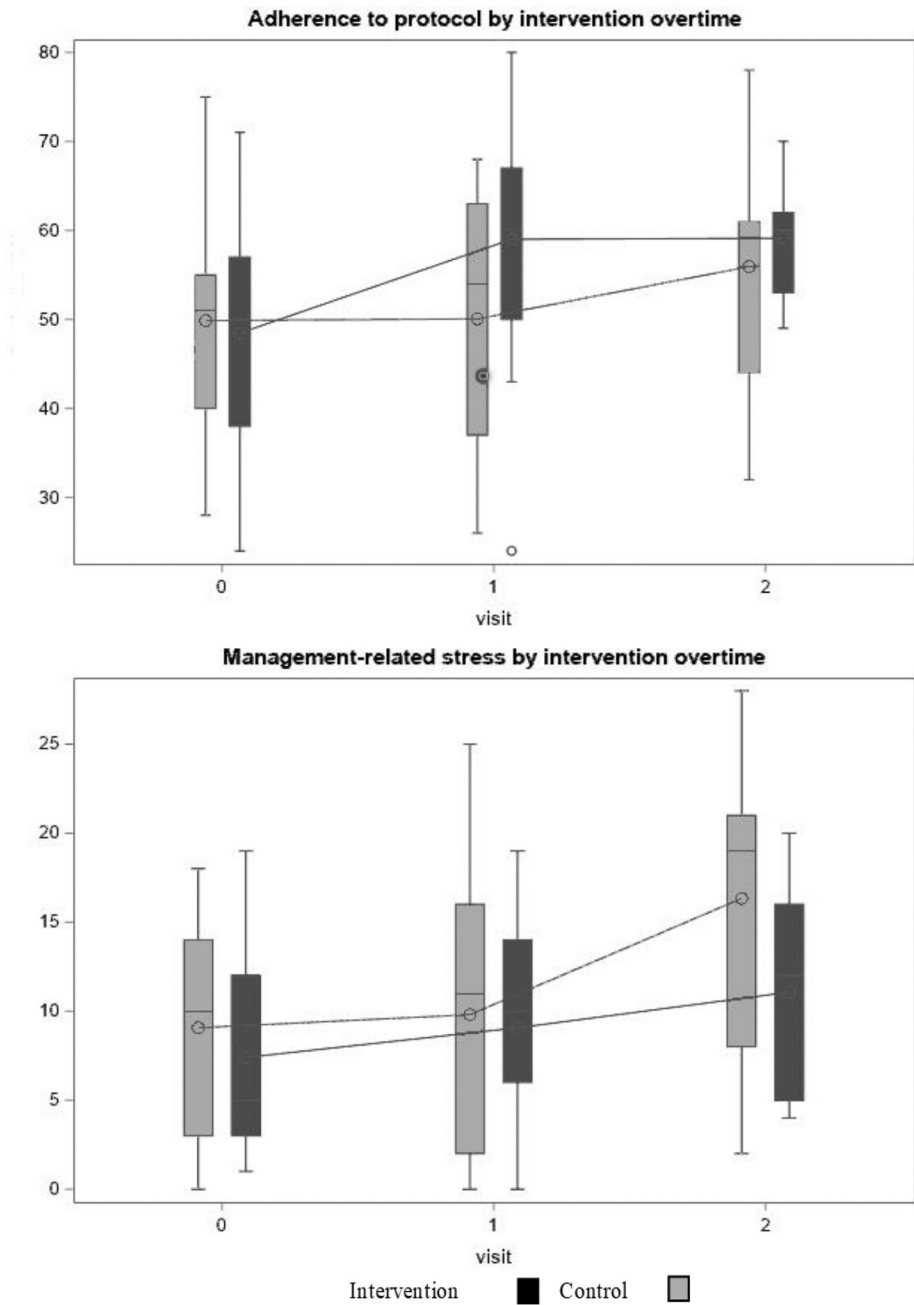


Fig. 1. Plots of Outcomes of Interest (Mean \pm 2SD) at Baseline and Follow-up Points

Table 1.

CHW Participants' Characteristics at Baseline

| Characteristics | Control | | Intervention | | <i>P</i> |
|---------------------------------|-------------|-----------|--------------|-----------|----------|
| | N | % | N | % | |
| Gender | | | | | 0.667 |
| Female | 12 | 80.0 | 11 | 73.3 | |
| Age (Year) | | | | | 0.915 |
| 29 or younger | 3 | 20.0 | 3 | 20.0 | |
| 30–39 | 7 | 46.7 | 8 | 53.3 | |
| 41 or older | 5 | 33.3 | 4 | 53.3 | |
| Highest medical training | | | | | 0.449 |
| Graduate or higher | 3 | 20.0 | 3 | 20.0 | |
| College | 6 | 40.0 | 9 | 60.0 | |
| Associate | 6 | 40.0 | 3 | 20.0 | |
| Profession | | | | | 0.890 |
| Doctor or assistant doctor | 5 | 33.3 | 6 | 40.0 | |
| Pharmacist | 6 | 40.0 | 6 | 40.0 | |
| Nurse, counselor, social worker | 4 | 26.7 | 3 | 20.0 | |
| Years working at the CHC | | | | | 0.740 |
| Less than 4 years | 6 | 40.0 | 5 | 33.3 | |
| 4–9 years | 5 | 33.3 | 4 | 26.7 | |
| 10 years or more | 4 | 26.7 | 6 | 40.0 | |
| Outcome measures | Mean | SD | Mean | SD | |
| Adherence to protocol | 49.9 | 11.7 | 48.4 | 12.8 | 0.757 |
| Management-related stress | 9.1 | 5.8 | 7.4 | 5.7 | 0.436 |

Table 2.

Linear Mixed-Effects Regressions on Outcome Measures

| | Adherence to protocol | | Management-related stress | |
|--|-----------------------|-------|---------------------------|-------|
| | Estimate (SE) | P | Estimate (SE) | P |
| <i>Intervention effect¹</i> | | | | |
| 3-months | 10.33 (5.12) | 0.048 | 0.93 (2.25) | 0.681 |
| 6-months | 4.60 (5.03) | 0.364 | -3.60 (2.69) | 0.186 |
| <i>Covariate</i> | | | | |
| Female | 0.54 (4.24) | 0.899 | 4.25 (2.02) | 0.040 |
| Age (per year change) | 0.06 (0.31) | 0.847 | -0.01 (0.14) | 0.928 |
| Having college or above training | -0.93 (4.22) | 0.825 | -0.18 (2.01) | 0.927 |
| Being a pharmacist | 1.56 (4.33) | 0.720 | -0.63 (2.07) | 0.033 |
| Working history at the CHC (per year change) | 0.48 (0.36) | 0.179 | 0.00 (0.17) | 0.963 |

¹ Intervention effect = Estimated difference in change scores from baseline between intervention and control conditions.