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Networking community health workers for service integration: role of social media

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ABSTRACT

Community health workers (CHW) can play an active role in providing integrated HIV and harm reduction services. We used social media to create a virtual network among Vietnamese CHW. This paper reports CHW's social media engagement and the relationships with other work-related indicators. Sixty CHW participated in an intervention for integrated HIV/drug use service delivery. Following two in-person sessions, Facebook groups were established for CHW to share information, seek consultation, and refer patients. CHW's levels of online engagements were tracked for six months and linked to their service provision confidence, interaction with patients and other providers, and job satisfaction. The CHW made 181 posts, which received 557 comments and 1,607 reactions during the six months. Among the 60 CHW, 22 (36.6%) had three or more posts, 19 (31.7%) had one or two posts, and 19 (31.7%) had no post. Comparing the baseline and 6-month follow-up data, we observed that those who posted three or more times showed better service provision confidence ($p = 0.0081$), more interaction with providers in other settings ($p = 0.0071$), and higher job satisfaction ($p = 0.0268$). Our study suggests using social media to engage CHW in virtual communications to improve service provision in communities.

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Networking; community health worker; service integration; social media

Introduction

Decentralization and integration of HIV treatment and harm reduction services in community health settings have been established in many countries (Bemelmans et al., 2010; Boyer et al., 2010; Chan et al., 2010; Duc et al., 2012; Fayorsey et al., 2013; Reidy et al., 2014). Previous studies have shown the association between the service decentralization and improvements in patients' service enrollment and retention (Bilinski et al., 2017; Reidy et al., 2014; Suthar et al., 2014). As community health workers (CHW) play an increasingly active role in service integration and decentralization, they need to be equipped with relevant knowledge and supported by their professional network and peers (Mukherjee & Eustache, 2007; Mwai et al., 2013; Perry et al., 2014; Rosenthal et al., 2010). Among all the challenges related to community-based HIV/drug use service provision, CHW's lack of specialized knowledge and skills interacting with HIV impacted patients have been reported as one of the main gaps (Allen et al., 2016; Celletti et al., 2010; Haq & Hafeez, 2009; Lin et al., 2018). Previous studies have identified the importance of creating a learning environment with ongoing training and

support for CHW (Allen et al., 2016; O'Donovan et al., 2018).

Mobile-based strategies have become promising to strengthen CHW's capacity and quality of care (Agarwal et al., 2015; Braun et al., 2013). Social media platforms have become pivot to virtual events to connect health professionals in clinical practice, training, and professional collaboration (Chan & Leung, 2018; Li et al., 2019). For instance, mobile instant messages have shown effects to improve CHWs' peer communication and support (Bertman et al., 2019; Henry et al., 2016; Pimmer et al., 2017). These communications not only help with clinical work but also provide psychological benefits for healthcare staff in low-resource settings (Bertman et al., 2019). With the fast development of mobile technology and coverage, social media could be further utilized as a networking tool to promote CHW's capacity building and HIV/drug-related service integration.

As in other developing countries, Vietnam is integrating and expanding HIV and addiction treatment services to communities. In 2012, Vietnam started pilot testing the *Treatment 2.0* model, which focused on scaling-up and providing universal access to

antiretroviral therapy (ART) through community mobilization (Duc et al., 2012). By the end of 2017, ART has been available at the community level in almost all provinces in Vietnam (VMOH, 2018). The decentralized and integrated models have been well-received by most patients with great satisfaction (Bich et al., 2016; Tran et al., 2015; Tran & Nguyen, 2012). However, Vietnam faces similar challenges in service integration and decentralization as in other countries, including the gap in CHW's service provision capacity (Lin et al., 2018; UNAIDS, 2016). Our previous study has demonstrated the feasibility of using social media in network building among HIV and addiction treatment specialists in Vietnam (Li et al., 2019). Based on the previous successful experiences, we further expanded the social media-based virtual networking to CHW to tackle the challenges associated with service integration. In this study, we aimed to (1) describe CHW's level of engagement as members of a professional virtual-network and (2) explore the relationships between network engagement and the change of their service provision confidence, work-related communication, and job satisfaction. The findings could shed light on future CHW training and capacity building for service improvement.

Methods

Parent study and the participants

This study used the data collected at the baseline and 6-month follow-up of an ongoing intervention trial in four provinces (Bac Giang, Hai Duong, Nam Dinh, and Nghe An) in Vietnam. From March 2018, CHW from 60 communes with the highest numbers of people living with HIV (PLH) or people who use drugs (PWUD) were selected. The inclusion criteria of CHW were: 1) at least 18 years old, and 2) being a CHW (could be a doctor, assistant doctor, nurse, midwife, or pharmacist) who regularly provide health services to community residents in the selected communes. The intervention's primary goal was to enhance CHW's network and communications with other treatment providers and equip them with tools to provide optimal care for PLH and PWUD. A total of 120 CHW were recruited in the trial, and they were surveyed at baseline and follow-ups. The 60 CHW, who were randomized to the intervention condition, participated in multiple in-person sessions and joined a Facebook group for professional networking. For this study, we analyzed the data collected from those 60 CHW in the intervention group. All study procedures were approved by the Institutional Review

Boards of the participating agencies in the United States and Vietnam.

Facebook activity and engagement measures

As part of the intervention, four Facebook groups established for CHW, once in each study province. The CHW were encouraged to use Facebook groups to disseminate new policies, share research findings, and discuss/refer patient cases related to HIV/addiction treatment and care. Health specialists were included in the Facebook groups to provide HIV and addiction treatment-related technical support and consultation for CHW. Details regarding Facebook group management and monitoring were described elsewhere (Li et al., 2019).

To measure CHW's *Facebook engagement*, we used group discussions between the baseline and 6-month follow-up. A Microsoft Access database was built to monitor the group discussion activities. Each post in the Facebook groups formed a record in the database containing data regarding its URL, post initiator's username, posting date, and the total number of comments and reactions received, and topic areas.

Survey measures

The CHW were surveyed privately at baseline before the intervention initiation and 6-month after using a computerized self-interview method. Each survey took 40-60 min to complete, and the participants were paid 200,000 VND (approximately 10 USD) as an incentive. The CHW's Facebook engagement data were linked to their survey measures using a unique study participant ID. The baseline survey captured CHW's demographic and professional characteristics, and the following work-related indicators were measured at both baseline and follow-up surveys.

Provider-patient interaction was measured with 10 questions adapted from the previous study among service providers of drug treatment in Asia (Li et al., 2013). Sample questions included, "Do you provide counseling spontaneously to your patients?" And "Do you make an effort to make sure your patient adheres to the medical instructions?" Each question was measured on a 5-point scale with 1 = not at all and 5 = very much likely. A higher score (range = 10-50) indicated better client-provider interaction (Cronbach's alpha = 0.86).

Confidence in HIV/drug-related service provision was measured by a 6-item scale developed based on the qualitative work exploring health providers' perception and experiences treating PWUD (McLaughlin et al.,

2006). The participants were asked to rate their confidence level in providing services to PLH and PWUD in various areas, including getting in touch, providing consultation, engaging patients in treatment, supporting treatment adherence, promoting positive behavior change, and providing long-term care. Answers to each of the areas ranged from 1 = “not confident at all” to 5 = “very confident.” A higher score (range 6–30) indicated a higher level of confidence in service provision to PLH and PWUD (Cronbach’s alpha = 0.90).

Interaction with service providers in other healthcare settings was measured by a scale developed specifically for this study. It was adapted from a measure of relationship quality validated in previous studies (Lages et al., 2005). Participants were asked to report their frequency of interaction with providers in other settings in eight aspects, for example, discussing work-related issues, sharing work-related documents, working together on certain patient cases/tasks, and making referrals. The responses ranged from 1 = “none of the time” to 5 = “all of the time.” A total score was calculated by summing up all the items, and a higher score (range = 8–40) indicated better interaction with service providers in other healthcare settings (Cronbach’s alpha = 0.91).

Job satisfaction was assessed via a 17-item scale adapted from Bellingham’s job satisfaction survey (Bellingham, 2004). The original survey has 30, and 17 items related to motivation and interaction with colleagues were selected to measure job satisfaction. Sample items included “You look forward to going to work on Monday morning,” “You feel valued and affirmed at work,” and “Most interactions at work are positive.” A 5-point Likert scale was provided for participants to rate their degree of agreement with each statement (1 = “strongly agree” to 5 = “strongly disagree”). Responses to all items were reversed and summed to create a summary score, with a higher score indicating a higher level of job satisfaction. The possible score range was 17–85 (Cronbach’s alpha = 0.91).

Data analysis

Descriptive statistics of participants’ demographic and professional characteristics were conducted. Content analysis was conducted to summarize the topics of Facebook group posts (Hsieh & Shannon, 2005). Participants’ Facebook engagement was evaluated by their total number of posts during the 6-month follow-up period from the intervention initiation to 6-month follow-up. The CHW were then categorized into three groups: a group of participants who made no post (Group 1), a group with one or two posts (Group 2),

and a group with three or more posts (Group 3). Within each CHW subgroup, the changes in CHW’s work-related indicators (e.g., Provider-patient interaction, confidence in HIV/drug-related service provision, interaction with service providers in other settings, and job satisfaction) from baseline and 6-month follow-up were analyzed using paired t-tests.

Results

The sample characteristics are presented in Table 1. Of the 60 CHW in the study, the majority were female (78.3%), and approximately half were aged 44 years or younger. About 22% of the CHW were doctors, 43% were assistant doctors, and the others (35.0%) were nurses, midwives, or pharmacists. Near three-quarters (73.3%) of them received less than four years of medical training. More than 48% of the CHW reported working in the current CHC for more than 20 years. In terms of Facebook engagement, 19 CHW were categorized in Group 1 because they made no post, 19 were in Group 2 because they made one or two posts, and 22 made three or more posts and were included in Group 3.

The CHW in total made 181 posts during the six months. The posts were responded with 557 comments and 1,607 reactions. By summarizing the main contents, the posts were classified into two broad categories of patient-related posts (e.g., Treatment and care, laboratory testing, adherence support, etc.; 37 posts) and provider-related posts (e.g., Policies, in-service training, and career opportunities, etc.; 135 posts). Among all the 181 posts, patient support was the most frequently posted among patient-related topics ($n = 31$), and group communication was the most frequently posted among provider-related topics ($n = 117$).

CHW’s work-related indicators at the baseline and 6-month follow-up by the three groups are presented in Table 2. At baseline, there was no difference across the groups regarding all scales (data were not shown). Comparing the baseline data to the 6-month measures, we observed significant increases in the level of confidence in service provision to PLH and PWUD (mean difference = 2.8, $P = 0.0081$), in the level of interaction with service providers in others settings (mean difference = 3.2, $P = 0.0071$), and in job satisfaction (mean difference = 4.7, $P = 0.0268$) among CHW participants in Group 3 (with three or more posts). There was also an increase from the baseline to the 6-month follow-up in provider-patient interaction for the group; however, the difference was not statistically significant. We did not find significant differences between baseline and the 6-month follow-up within Group 1 (with no post) and

Table 1 . Characteristics of CHW in the Study (N = 60)

	All (N = 60) N (%)	Group 1 (No post; N = 19) N (%)	Group 2 (1-2 post; N = 19) N (%)	Group 3 (≥ 3 posts; N = 22) N (%)	<i>P</i>
Gender					0.7958
Male	13 (21.7)	3 (15.8)	5 (26.3)	5 (22.7)	
Female	47 (78.3)	16 (84.2)	14 (73.7)	17 (77.3)	
Age (years)					0.2973
34 or younger	13 (21.7)	2 (10.5)	5 (26.2)	6 (27.3)	
35–44	16 (26.7)	5 (26.3)	3 (15.8)	8 (36.4)	
45 or older	31 (51.6)	12 (63.2)	11 (57.9)	8 (36.4)	
Mean (SD)	42.7 (8.7)	44.4 (6.6)	43.7 (9.7)	40.5 (9.14)	0.2981
Medical training					0.1620
Less than 4 years	44 (73.3)	8 (42.1)	3 (15.8)	5 (22.7)	
At least 4 years	16 (26.7)	11 (57.9)	16 (84.2)	17 (77.3)	
Medical occupation					0.5102
Doctor	13 (21.7)	6 (31.6)	3 (15.8)	4 (18.2)	
Assistant doctor	26 (43.3)	9 (47.4)	9 (47.4)	8 (36.4)	
Nurse/midwife/pharmacist	21 (35.0)	4 (21.1)	7 (36.8)	10 (45.5)	
Length of working in the current CHC					0.4700
Less than 10 years	15 (25.0)	3 (15.8)	6 (31.6)	6 (27.3)	
10–20 years	16 (26.7)	4 (21.1)	4 (21.1)	8 (36.4)	
More than 20 years	29 (48.3)	12 (63.2)	9 (47.4)	8 (36.4)	
Mean (SD)	17.9 (9.4)	20.3 (7.7)	17.3 (10.5)	16.4 (9.7)	0.3888

Group 2 (with one or two posts) in any of the work-related indicators.

Discussion

The integration and decentralization of HIV and drug use services in communities require collaborations among service providers from various treatment settings. The online group's virtual property increases opportunities for CHW to interact with different service providers and enables timely communication and information sharing. In this study, more than one-third of the CHW participants posted three or more times during the 6-month follow-up. The level of engagement seemed to be lower than similar Facebook groups organized among HIV/addiction specialists, where over 90% of the specialists initiated at least one post during one year (Li et al., 2019). The quietness in the CHW group might be partially due to CHW's lower technology competence and accessibility than health specialists. Also, the Facebook group was created with a specific purpose for HIV/drug treatment-related information exchange. CHW, who did not see many PLH or PWUD in their clinical practice, might feel the topics somewhat

irrelevant or unconnected. A similar low engagement phenomenon was reported in the literature, as most healthcare providers demonstrated low posting behaviors but more frequent reading behaviors (Rolls et al., 2016; van Van Mierlo, 2014). However, those who posted less can still benefit from the group because they can learn from other people's issues or figure out solutions for similar problems (Kaur et al., 2019; Nonnecke et al., 2006).

This study identified the relationship between online engagement and post-intervention positive changes in work-related indicators for CHW. We observed that, in general, those CHW who were more actively involved in social media communication reported improvement in their work-related indicators. Similar beneficial effects of social media engagement were supported by previous studies (Grinberg et al., 2016; Kaur et al., 2019; Li et al., 2015; Nabi et al., 2013). Specifically, the participants who posted three or more times in the Facebook groups reported a significant increase in interaction with service providers in other healthcare agencies. Although the CHW could interact with other healthcare professionals or via phone during various occasions such as regional conferences, the virtual

Table 2 . Comparisons of Baseline and 6-month Work-related Indicators Stratified by CHW's Facebook Engagement (N = 60)

	Group 1 (No post; N = 19)			Group 2 (1 or 2 posts; N = 19)			Group 3 (≥ 3 posts; N = 22)		
	Baseline Mean (SD)	6-month Mean (SD)	<i>P</i>	Baseline Mean (SD)	6-month Mean (SD)	<i>P</i>	Baseline Mean (SD)	6-month Mean (SD)	<i>P</i>
Provider-patient interaction	41.3 (5.2)	39.4 (5.0)	0.2099	40.4 (5.9)	38.8 (4.4)	0.3295	38.0 (5.1)	40.1 (4.5)	0.1124
Confidence in providing HIV/ drug-related services	20.9 (5.4)	21.6 (3.8)	0.6112	21.9 (5.0)	22.2 (3.9)	0.8613	20.4 (3.5)	23.2 (3.5)	0.0081
Interaction with providers in other healthcare settings	28.2 (6.7)	28.6 (4.0)	0.8064	27.3 (5.3)	28.3 (3.3)	0.4873	26.5 (6.0)	29.7 (4.0)	0.0071
Job satisfaction	72.8 (6.5)	73.2 (6.8)	0.8637	71.1 (7.3)	71.1 (8.8)	1.0000	69.7 (5.9)	74.4 (7.5)	0.0268

group may become a comfortable environment for discussion and connection for CHW due to its convenience and flexibility. On a related note, the CHW who posted actively demonstrated improved confidence in providing HIV/drug-related services, because posing a question or sharing an idea with other members of the virtual network could be the first step of receiving support from the experts/peers. Previous studies have reported that healthcare professionals can gain confidence through training in job-essential knowledge and skills or social support (Hofmann-Broussard et al., 2017; Selman et al., 2016; Terry & Cutter, 2013). The virtual groups and networks can form antecedents of professional confidence by creating and strengthening provider relationships, immediate communication for problem-solving, and external support (Holland et al., 2012; Moorhead et al., 2013). Having a network of peers may provide psychological benefits. As shown in this study, CHW who actively initiated posts in the Facebook group reported a higher level of job satisfaction than those who were less active in network engagement. Previous studies showed that posting in social media is one strategy to cope with stress (Rus & Tiemensma, 2018), associated with job satisfaction (Cooper et al., 1989; Hosseinabadi & Etemadinezhad, 2018). Furthermore, participants may feel more positive when having someone “standby” and receiving help when needed (Vogel et al., 2007).

The study findings should be interpreted with some limitations. First, work-related indicators were all self-reported, therefore subject to social desirability. Additionally, engagement in a virtual network group can be reflected in multiple aspects, such as sharing other people’s posts or private chatting. However, these measures were not captured in this study. Also, we only monitored Facebook activities for 6-months. Factors associated with the sustainability of virtual networks need to be measured and considered in future studies to capitalize on this promising approach for training in healthcare settings. Lastly, the study findings may not be generalizable to other study areas with different internet accessibility levels and Facebook popularity.

Conclusion

The study reported an intervention with online-based networking for service integration in resource-limited community-based healthcare settings. In light of the improvement in service delivery confidence, cross-agency communication, and job satisfaction found in active social media participants, this study calls for targeted strategies to engage CHW in social media-based

networking to enhance HIV/drug-related service integration.

Conflict of interest

All authors included on this manuscript declare that he/she has no conflict of interest.

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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Disclosure statement

No potential conflict of interest was reported by the author(s).

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