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Using Social Media to Enhance Provider Network for HIV and Harm Reduction Service Integration in Vietnam

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Abstract
Social media can potentially serve as a platform to coordinate medical care among fragmented health sectors. This paper describes procedures of using social media to enhance antiretroviral therapy (ART) and methadone maintenance treatment (MMT) providers' virtual network for integrated service for HIV-positive people who inject drugs (PWID) in Vietnam. A total of 88 ART and MMT treatment providers participated in person group sessions followed by online virtual support to improve service integration. In-person reunions were held to reinforce Facebook participation and network activities. Content analysis was used to identify keywords and topic categories of the online information exchange. Both MMT and ART providers were actively engaged in online communications. Referral and treatment adherence were the two most frequently discussed topic areas by both the MMT and ART providers. Frequent cross-agency connections were observed. Online provider networks and communities could be built and useful to support treatment providers to improve service integration.

Keywords Social media · Treatment providers · Service integration · Network · Vietnam

Resumen
Los medios sociales pueden potencialmente servir una plataforma para coordinar atencion medica entre los sectores de salud fragmentados. Este documento describe los procedimentos de uso de las redes sociales para mejorar proveedores red virtual de proveedores de terapia antiretoriviral (TARV) y la tratamiento de mantenimiento con metadona (TMM) para el servicio integrado para personas VIH positivas que se inyectan drogas en Vietnam. Un total de 88 proveedores de tratamiento de TARV y TMM participación en sesiones grupales en persona siguiendo un ayuda virtual web para mejorar integracions de servicio. Se llevaron reuniones en persona para reforzar la participación en Facebook y en las actividades de la red. El método de análisis se utiliza para identificar palabras y categorías de intercambio de información en línea. Los proveedores de TMM y TARV participaron activamente en las comunicaciones en línea. La referencia y la adherencia al tratamiento fueron las dos áreas temáticas más discutidas por los proveedores de TMM y TARV. Observaron conexiones frecuentes entre agencias. Las redes y comunidades de proveedores en línea podrían ser construidas y útiles para apoyar a los proveedores de tratamiento para mejorar la integración del servicio.

Palabra claves Medios sociales · Proveedores de tratamiento · Integración del servicio · La red · Vietnam

Introduction

In recent years, the concept of healthcare service integration has received increasing attention as an essential element of primary care for many diseases, especially conditions with comorbidities [1–3]. For example, opioid addiction, as a chronic condition, requires long-term multi-pronged healthcare services, among which harm reduction services [e.g., methadone maintenance therapy (MMT)] and HIV treatment services [e.g., antiretroviral therapy (ART)] are

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two most essential services needed by HIV-positive people who inject drugs (PWID) [4–7]. The intertwined MMT and ART services are usually provided in geographically isolated locations under separated care systems [8]. Provision of multiple services during a single point of contact is challenging as service providers in a certain healthcare agency often lack expertise in all aspects of concern [9, 10]. Thus, one of the critical barriers to delivering integrated services for HIV-positive PWID lays in the fragmented healthcare system [11–13]. Seeking services repeatedly from multiple health sectors poses a burden on HIV-positive PWID and often causes treatment incompletion or even attrition [14, 15]. Improving communication and networking among service providers from different health sectors is suggested as an essential strategy to overcome the barriers associated with fragmentation of the healthcare system and to provide integrated care for those in need [11, 12, 16].

With the fast-growing of the internet and mobile technology in the last two decades [17], social media platforms have been increasingly used both personally and professionally for instant communication, education, knowledge sharing, network, and coordination [18, 19]. In the medical field, Facebook, as one of the most popular social media platforms, has been used extensively in a variety of research and service provision activities, ranging from recruiting hard-to-reach study participants [20, 21], enhancing patient-provider communications [22], conducting health promotion intervention [23], engaging/linking patient to care [24], to providing medical education and training [25–27]. Social media could also be utilized to overcome the barriers associated with geographic distance and system fragmentation to promote cross-agency communication. However, there is limited literature reporting the adoption and procedures of using social media to connect health professions [28, 29].

In Vietnam, there is a concentrated HIV epidemic driven by injecting drug use, yet HIV-positive PWID generally have significantly less access to care and poorer quality of services as compared to other key populations impacted by HIV [30]. Although the MMT and ART programs have been established and expanded rapidly nationwide [31, 32], late initiation of ART is still common among HIV-positive PWID due to the inconvenience of using separated services [33, 34]. An integrated HIV and harm reduction service model was suggested by researchers to improve the care continuum for HIV-positive PWID [33, 35]. The internet penetration and a large number of Facebook users in Vietnam [36, 37] have made the country an ideal site to investigate the use of social media as a virtual online platform to enhance communications among service providers of HIV and drug treatment agencies. This study, entitled Vietnam Providers Network (VPN), aimed to strengthen the network among MMT and ART providers by using Facebook groups to facilitate effective communications and information exchange, and to enhance cross-agency collaborations. The procedure, usage patterns, discussion topics, and cross-agency interactions of the closed Facebook group are described in this paper.

Methods

In-person Preparation Sessions

The study was conducted during January 2017 and March 2018 in four provinces of Vietnam. The intervention started with two in-person groups with treatment providers from ART and MMT clinics in each region. The sessions were interactive, each last approximately 90 min. The first session, which focused on the theme of "working together," covered common challenges and solutions for engaging HIV-positive PWID, discussed strategies to work together, and emphasized the importance of effective communication and collaboration. The second session, themed "making connections," was a preparation session for online virtual group establishment and usage. Facebook was chosen as the online network platform because it is the most accessible, easy to use, and popular social media in Vietnam [38]. The facilitator first introduced the closed Facebook group and then guided the participants to apply its standard features to communicate and connect with the participating providers. For example, the providers were encouraged to use the group platform to post new policies and research findings, discuss patient cases, seek consultation, and share resources and training opportunities, etc. Each group discussed and established its group rules. The group rules included but not limited to (1) not to post topics that are not relevant to HIV or addiction treatment; (2) not to reveal any personal identifying information in the group; (3) not to disclose any personal information (especially patients' information) to people outside of the group; (4) be respectful to other group members' opinions' and thoughts. Each member was requested to follow the agreed rules. To administer Facebook activities and enforce the group rules, a Facebook group leader was elected in each province, either by self-recommendation, participant election, or group facilitator nomination. Challenges in using the Facebook group to connect were discussed, and solutions were generated at the end of the session.

Online Group Discussions

Immediately after the second in-person session, four Facebook groups were formed, one in each study province. The reasons for establishing one Facebook group per province is three-fold. First, the providers in the same region usually share similar administrative policies, infrastructures, and challenges when providing services to patients in the province. Therefore, it is more meaningful for them to share

information and discuss in one group. Second, having providers in the same province in one Facebook group can facilitate integrated service provision and referrals within the area. Third, we considered a group size of about 20 is more efficient in terms of information diffusion compared to smaller group sizes. At the same time the group size allows for more manageable and interactive conversations compared to have all of the participants in the four provinces in one group. All groups were made "closed," meaning the members could only join the group upon approval by a group administrator (a project staff), and the contents of the group discussion were only viewable by current group members. Each participant was encouraged to initiate a post at least once every 2 weeks. The participants were also encouraged to respond to other group members' posts using "comment" and "reaction" (reacting using one of six animated emotions including like, love, ha–ha, wow, sad, and angry) features. The elected Facebook group leaders were responsible for offering technical assistance in Facebook account setup and usage and taking the lead to initiate posts and facilitate discussions. Group administrators monitored the group discussions. Any irrelevant or inappropriate contents, such as disrespectful language and materials that might potentially disclose patients' confidentiality, were instantly removed from the group forum. No other actions were taken by the group administrator to ensure the autonomy of the group participants.

In-person Reunions

In-person reunion gatherings were held with the providers 1 month after the in-person group sessions and every 3 months during the 12 months (approximately 60 min each session). The Facebook groups were used to notify the time and location of upcoming reunions. At each reunion session, verbal praise and modest awards were given to active group members (identified based on the number of posts and level of engagement with other participants' posts). Intervention facilitators also organized other interactive activities, in which the group rules were reemphasized, barriers were discussed, and all members were encouraged to participate in the future Facebook online communications actively.

Data Collection

The study obtained ethical approvals from the Institutional Review Boards of the participating agencies in the United States and Vietnam. The study team did not collect any individual data from the participating treatment providers except for their agency type, e.g., whether they worked in an ART or an MMT clinic. The providers were informed that their Facebook discussion would later be analyzed for research purposes.

All Facebook group discussions that happened within 12 months of the group establishment were saved in a Microsoft Word document and translated into English. A Microsoft Access database was established to monitor group activities. Each post in the Facebook groups formed a record in the database containing data regarding its URL, posting date, format (text, photo, video, link, or others), type of initiator (MMT providers, ART providers, or group administrators), total number of comments and reactions received, and number of comments/reactions from of each type of members. The Facebook post review and data entry were performed on a bi-weekly basis.

Data Analysis

Content analysis [39] was used to identify keywords and generate topic categories of the Facebook group posts. The posts were reviewed carefully by three researchers with knowledge in HIV/drug use treatment. The three researchers agreed on a list of keywords to describe the content of the post after an initial qualitative review. Then the three researchers independently coded each post using up to five keywords. New keywords emerged during the process of coding were added to the keyword list. After all of the posts were coded and the final keyword list was developed, the posts were reviewed again to examine if the assignment of keywords was accurate and inclusive. Also, the three researchers jointly summarized each post into a primary content category based on the coded keywords and actual contents.

Upon the completion of coding, Facebook group activities were analyzed descriptively by keywords, primary content category, and type of initiator agency. Cross-agency communications between MMT and ART providers were reported using the percentage of posts commented by those from a different kind of treatment agency. The quantitative data analysis was conducted using SAS 9.4 (Statistical Analysis Software, Cary, NC).

Results

Online Group Activities

The four Facebook groups consisted of a total of 88 members, among whom 28 were MMT providers (31.8%), 44 were ART providers (50.0%), and the others were group administrators (18.2%). A vast majority of the members (n = 82; 93.2%) posted at least once, among whom, 31 (37.8%) posted less than 10 times, 36 (43.9%) posted between 10 and 29 times, 11 (13.4%) posted between 30 and 49 times, and 4 (4.9%) posted more than 50 posts. There was one ART provider who posted 115 posts. All members

were engaged by commenting on other members' posts. The average number of comments made by the members was 90.1 (SD = 69.0). There are ten members made more than 200 comments on other people' posts, and six of them were MMT providers, three were ART providers, and one was a group administrator. There were a total of 1496 posts written in the four Facebook groups over the study period, and they received 8466 comments and 13,362 reactions. The majority (n = 1185; 79.2%) of the posts received at least one comment. Most of the posts (n = 1117; 74.7%) were in text format. Other formats included photos (n = 277; 18.5%), links (n = 43, 2.9%), and videos (n = 37; 2.4%). About one-third of the posts (n = 482; 32.2%) were made in the first 3 months, and the number of posts gradually reduced to 256 (17.1%) during the last 3 months of the study period. Figure 1 presents the number of post by the type of initiators over time.

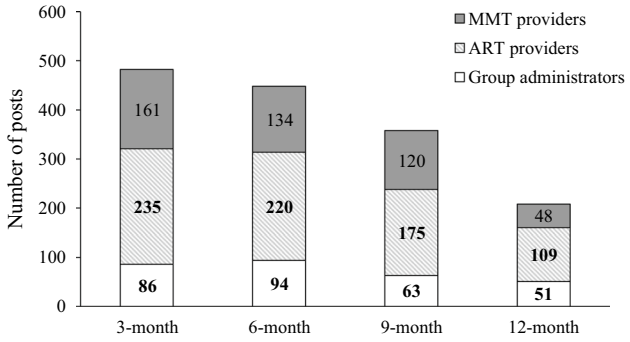

Fig. 1 Number of posts by type of initiator over time

Keywords of the Posts

A total of 50 keywords were identified from the posts. The 25 most frequently mentioned keywords are presented in Fig. 2. The five keywords with the highest counts were referral (n = 166), policy/regulation (n = 133), psychological counseling (n = 117), MMT adherence (n = 108), and group activities (n = 106). The top five keywords of the posts initiated by the MMT providers and those by the ART providers varied. For MMT provider-initiated posts, MMT-related issues, such as MMT adherence, MMT dosage, and MMT initiation received the most attention. However, ART provider-initiated posts laid more focuses on ART adherence,

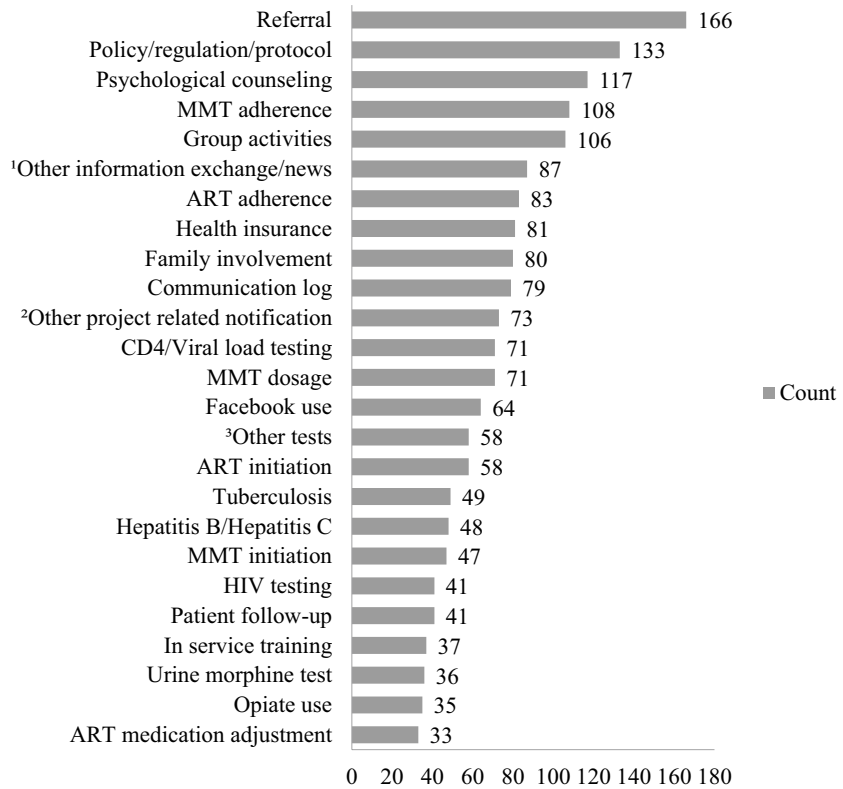

Fig. 2 Top 25 most frequently posted keywords

[1] Other information exchange/news: Information changes between providers besides policy/regulation/protocols, new treatment/prevention strategies, new research findings, and current HIV/drug epidemic;

[2] Other project related notification: Project-related notification besides group activities, Facebook use, homework, communication log;

[3] Other tests: Test besides HIV, CD4/Viral load, and urine morphine tests.

policy/regulation, health insurance, and CD4/viral load testing. Aside from the differences, "referral" was in the top five most frequent keyword lists for both MMT and ART provider-initiated posts (Table 1).

Content Categories of the Posts

By summarizing all the keywords and the contents, the posts were classified into two broad categories of patient-related posts and provider-related posts. The patient-related posts covered issues related to patient care provisions, such as treatment referral, adherence monitoring, laboratory testing, comorbidity management, side effect, and patient support for other social services. Patient-related posts (n = 669) made up 44.7% of all posts. Among them, patient support (n = 208; 31.1%), referral, (n = 155; 23.1%) and adherence (n = 112; 16.7%) were the top three most frequently posted topic categories (Fig. 3). An example of the patient-related post was that an MMT provider consulted other providers about the probability of HIV transmission between serodiscordant couples, and the post received five answers from other providers regarding how to provide patients with information on prevention of marital HIV transmission in different occasions.

Approximately 38% (n = 565) of the posts were provider-related posts, referring to work-related information exchange, such as training and career opportunities, current policies and regulations, peer support and networking among providers. The provider-related posts were comprised of four main topic areas, including group communication (n = 310; 54.9%), policies/regulations, (n = 95; 16.9%), provider peer support (n = 88; 15.6%), and resources/opportunities (n = 72;

Table 1 Top five most frequent keywords by type of initiator

	MMT provider-initiated posts		ART provider-initiated posts	
Rank	Keywords	Count	Keywords	Count
1	MMT adherence	93	Referral	95
2	Referral	67	ART adherence	72
3	MMT dosage	58	Policy/regulation/protocol	69
4	Psychological counseling	54	Health insurance	67
5	MMT initiation	39	CD4/viral load testing	62

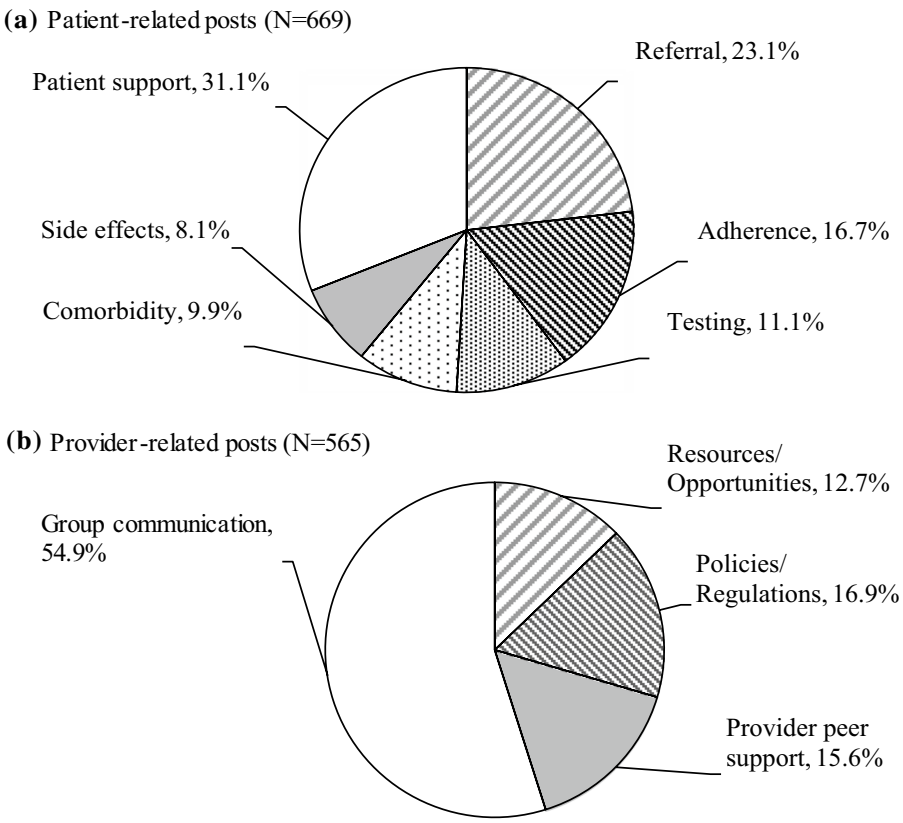

Fig. 3 Number of posts by topic categories among patient-related posts and provider-related posts

12.7%; Fig. 3). An example of provider-related posts was that a provider posted a thread to celebrate the 8th anniversary of his MMT clinic along with several historical photographs. The post received 10 congratulation comments and nine likes.

Cross-Agency Communications Between MMT and ART Providers

Table 2 presents the topics and number of posts initiated by MMT and ART providers and commented by providers from a different type of agency. Among the 1496 total posts, 31.0% were initiated by MMT providers, and 49.4% were started by ART providers. Among the MMT provider-initiated posts (n = 463), 55.9% were commented by the ART providers. Specifically, posts related to peer support (71.4%), side effects (71.4%), and policies/regulations (69.2%) received most comments from ART providers. MMT providers commented 38.0% of the 739 ART provider-initiated posts, with adherence (55.8%), comorbidity (46.3%), and patient support (45.3%) being the top three most commented topics.

Discussion

Our study demonstrated the process of using social media to build and strengthen MMT and ART providers' professional network. The design of online communications is practical and feasible as observed through the high activity levels within the Facebook groups. On average, there were over one hundred posts in a variety of formats in the Facebook groups each month during the study period. The online activities did not concentrate on several group leaders or administrators, as the majority of the group members were engaged in writing posts and making comments/reactions. The feasibility of online professional network was also reflected by the richness of relevant contents emerged during the online discussions. The discussions covered a wide range of topics from testing and diagnosis, treatment adherence, side effect monitoring, comorbidity identification, referral, to patient support/care, which covered all aspects along the HIV and addiction care continuum [6]. During the study, we did not encounter issues related to mobile phone ownership and computer literacy [40]. All of the provider participants in the study owned a personal mobile phone, and very few (less than 5%) requested technical assistance in Facebook account setup or usage.

In this study, frequent cross commenting was observed between providers from two distinct treatment service sectors. This finding confirmed that popular social media platforms like Facebook could be leveraged effectively to facilitate transdisciplinary and interagency information exchange because providers with different areas of expertise could share knowledge and seek advice from various agencies spontaneously and instantly [19, 41]. An interesting finding was that, although MMT providers and ART providers had different focuses of attention during the online discussions due to their specific areas of expertise, service referral was a common interest being frequently mentioned by both MMT and ART providers. Since nowadays the healthcare system is characterized by high sub-specialization, the needs for service coordination among different types of providers is substantial [42]. The finding implies that social media

Table 2 Cross-agency communications by topics and initiators

Topics	MMT provider-initiated posts		ART provider-initiated posts	
	Number of posts	Commented by ART providers N (%)	Number of posts	Commented by MMT providers N (%)
Patient-related topics				
Referral	77	49 (63.6)	75	25 (33.3)
Adherence	66	39 (59.1)	43	24 (55.8[b])
Testing	22	11 (50)	48	13 (27.1)
Comorbidity	18	10 (55.6)	41	19 (46.3[b])
Side effect	14	10 (71.4[a])	31	11 (35.5)
Patient support	62	38 (61.3)	128	58 (45.3[b])
Provider-related topics				
Group communication	54	19 (35.2)	126	44 (34.9)
Policies/regulations	26	18 (69.2[a])	49	14 (28.6)
Resources/opportunities	11	2 (18.2)	35	14 (40.0)
Provider peer support	35	25 (71.4[a])	126	44 (34.9)

[a]Top three topics most commented by ART providers among MMT provider-initiated posts

[b]Top three topics most commented by MMT providers among ART provider-initiated posts

can be used to meet such needs to expedite service referral across-sites.

There are some critical lessons learned during the implementation of the study. First, one of the unique features of the study was a combination of online and offline components. The online networking activities, throughout the study period, were accompanied by in-person sessions. The between-agency providers' initial contact and connections were established through "face time" during the in-person preparation sessions. The reunion sessions, which came subsequently, were continuous efforts to reinforce the intervention contents and encourage active use of the online platform. The format of the in-person meetings was interactive to attract greater attention and engagement of the participants. Thus, in-person sessions were more appropriate for knowledge acquiring and skill building than online learning [43]. On the other hand, online education has widely recognized benefits, such as accessibility, convenience, flexibility, and low cost [44]. The two formats have added value to supplement one other, as observed in this study. Second, each Facebook group had chosen one group leader from the participating providers. The group leaders were elected and nominated because they were regarded as active and trustworthy peers, who could potentially influence other group members' behaviors [45]. Our group leaders contributed to the smooth implementation of the Facebook discussion by writing posts during the initial period and quiet times. The posters initiated by the group leaders served as a springboard to boost further debate. Considering sustainability, the group leaders could also take over the administrative duties of the group administrators after the research period. Last, establishing and adhering to group rules are essential for the online groups to function successfully. We used the in-person intervention session to allow the participants to set their own group rules, and the rules were strictly enforced at all times to ensure a friendly and supportive environment in the virtual community.

As confidentiality protection for both treatment providers and their patients remains the utmost concern [46, 47], we took several measures to safeguard the confidentiality of online discussion in this study. First of all, to protect the privacy of the participating providers, we did not collect any individual data from them. Second, the Facebook groups were formed in a private nature, that group memberships had to be authorized by one of the group administrators and non-members would not be able to view the contents. Third, as mentioned earlier, group rules specified stringent privacy protection and ethics in social media use. Confidentiality protection was emphasized repeatedly both online and during in-person group sessions. Finally, yet importantly, we had group administrators in place to closely monitor the discussions and to remove any contents that may result in a direct or indirect breach of private information. In future studies, several additional strategies could be used to heighten confidentiality protection. For example, provider participants could benefit from more thorough and intensive cyber-security training to enhance their digital literacy. The strategies to prevent potential breaches of data, such as using a strong password to protect their phones, avoiding using public open-WiFi networks, adjusting their privacy status in various digital platforms, deleting sensitive information from their phones, etc., could be taught in training [47, 48]. Providers could have the choice to set up a separate Facebook account to participate in online professional networking activities [29].

Some limitations of the study need to be acknowledged. Since no individual-level data were collected from the providers, we were unable to determine if any demographic and work-related background characteristics were correlated with the activity level of participation in the group, neither could we identify the associations between the level of Facebook engagement with the providers' service knowledge, attitudes, and previous social media using behaviors. Although the providers from different agencies communicated actively in the Facebook groups, we were unable to determine if the online communications among providers were translated to improved services for patients because there was no objective measure of between-agency service referrals. Lastly, the study was conducted in Vietnam, where mobile phone data and WiFi services are widely available throughout the country. One should be cautious about generalizing the lessons learned from this study to areas and populations with limited internet accessibility.

Conclusion

Findings from this study suggest that online provider networks have the potential to support treatment service integration. Our online-offline combination builds a virtual community for continuous interagency communication and professional networking. Although our study was conducted with MMT and ART providers in Vietnam, the social media-enabled network approach among treatment providers has implications for service integration for a variety of diseases and in different healthcare settings.

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Compliance with Ethical Standards

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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