WhatsApp as a Platform for Continued Professional Development

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Contents

Acronyms

HTSP	Healthy Timing and Spacing of Pregnancy
GHeL	Global Health eLearning Center
KMTC	Kenya Medical Training College
USAID	U.S. Agency for International Development

Introduction

Health workers play a substantial role in a health-care system's ability to provide access to high-quality health services and information. The World Health Organization (2006) estimates that there is a worldwide shortage of 4.3 million health workers, and it strongly advocates for increased training of community health workers to address this crisis. Health workers' influence in improving people's health is also recognized in the new Sustainable Development Goals, which explicitly state the intention to "substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States" (World Health Organization, n.d., goal 3.c.; Dolphyne & Mwaikambo, 2016).

To provide quality health care, health care providers need access to up-to-date technical information. Challenges to improving knowledge among health workers include lack of technical skills, low motivation to improve knowledge and skills, and poor support networks. Traditional training and resources available to health workers, such as conferences and workshops, can pose logistical challenges for those in remote areas who must arrange both for travel and for work coverage during their absence. Paper resources, such as textbooks and manuals, eventually become outdated, and it can be costly to update, publish, and distribute new versions. In recent years, online and mobile learning platforms have emerged as possible solutions to these training challenges (Sissine et al., 2014).

Growth in Mobile Platforms

WhatsApp Messenger is a cross-platform mobile messaging app that allows users to exchange messages without having to pay SMS charges. The messaging platform connects users across all cellular network providers and mobile devices. Because WhatsApp Messenger uses the same internet data plan used for email and web browsing, there is no cost for a user to send a message to friends and contacts. WhatsApp is available for all major smartphone devices, including Android, iPhone, BlackBerry, Windows Phone, and Nokia. In addition to basic messaging, users can create groups and send unlimited images and video and audio media messages (Henry et al., 2016).

WhatsApp was launched in 2009. According to Facebook's earnings report for the fourth quarter of 2016, the platform now has 1.2 billion monthly active users (Chaykowski, 2017). A 2014 survey conducted by Jana Mobile revealed that 49% of all mobile phone users in Kenya use WhatsApp (Adika, 2014).
The WhatsApp Group Chat feature allows up to 256 users to connect within a closed group. A group administrator creates a group, and users can access it only after the administrator invites them. User messages are posted in real time. While there currently is no feature that provides a daily summary of posted messages, any user in the group can download the full Group Chat transcript from the time when the group was created.

K4Health WhatsApp Activity

In August 2016, the USAID-funded Knowledge for Health (K4Health) Project tested the WhatsApp Messenger platform as a mode to deliver family planning continued professional development training content to Kenyan health workers and promote knowledge exchange and discussion. A seven-week training program on healthy timing and spacing of pregnancy (HTSP) was designed and delivered to 160 participants comprised of students recruited from Kenya Medical Training College (KMTC) in Kitui and Outspan Medical College, and health care providers recruited from nursing facilities at the Kitui District Hospital; Nairobi University; University of Eastern Africa, Baraton; Moi University; and Masinde Muliro University of Science and Technology. These participants were recruited through a Kenya-based K4Health consultant's professional network. They were selected because they provided family planning counseling and services at the time or were expected to provide such services after completing their degree program, had expressed a desire for additional professional training opportunities, and had an interest in online and mobile learning platforms.

Intervention

The overall purpose of K4Health's WhatsApp HTSP Training activity was to test the acceptability and feasibility of the WhatsApp Group Chat feature as a learning platform.

Training Topic and Content Selection

K4Health surveyed students at KMTC Kitui about the family planning and reproductive health topics that most interested them. HTSP ranked highest in a list of topics that included the following:

- ☐ Engaging men and boys in family planning
- ☐ Family planning workforce
- ☐ HTSP
- ☐ Integrating family planning and HIV services
- ☐ Integrating family planning and maternal, newborn and child health services
- ☐ Linking family planning and global development
- ☐ Preventing adolescent pregnancy

K4Health adapted the WhatsApp training content from K4Health's "Healthy Timing and Spacing of Pregnancy" topic page (K4Health, 2017). K4Health chose to use its topic page as the primary content source because it provides a highly curated selection of diverse resources.

Working with a Kenya-based K4Health consultant who has experience in instructional design and eLearning and was familiar with the audience, the K4Health team selected four different resource types to use for the training curriculum: blog posts, videos, infographics, and journal articles. The team chose these resource types for the following criteria:

- ☐ Estimated time needed to read (or watch) the material
- ☐ Ease of sharing the material as a link to the original source
- ☐ Ease of creating an offline version of the material that could be shared as an attachment, or ability to directly embed the material on the WhatsApp Group Chat platform

Additionally, 10 questions from the Global Health eLearning Center's Healthy Timing and Spacing of Pregnancy eLearning course final exam were selected and adapted for the pretest and post-test knowledge assessment survey. The survey was created using Google Forms and was posted as a link in the WhatsApp Group Chat platform.

Training Format

The WhatsApp HTSP Training employed WhatsApp Group Chat, a group messaging feature that is easy to create and set up. A group administrator creates and adds group members using their phone numbers. There is no limit to the number of WhatsApp groups an administrator can create; however, each group is capped at 256 members. Only group administrators can add or remove participants and grant other participants administrative capabilities. Individual members can remove themselves from a group but must contact the group administrator to join again. Once added, any participant can send text messages, images, video, or audio to the entire group. Members can see if their messages have been sent and read, indicated by two blue checkmarks on the screen.

K4Health's Kenya-based consultant created four WhatsApp groups and invited 40 participants to each group. In total, 160 participants volunteered for this activity: 80 students and 80 health-care providers (Table 1). Participants were recruited from KMTC Kitui, Outspan Medical College, and nursing facilities at the Kitui District Hospital; Nairobi University; University of Eastern Africa, Baraton; Moi University; and Masinde Muliro University of Science and Technology.

Table 1. WhatsApp HTSP Training Groups and Participants

Student Group 1 (n=40)	Student Group 2 (n=40)	Provider Group 1 (n=40)	Provider Group 2 (n=40)
Students	Students	Providers	Providers

In planning for the training, K4Health first considered employing different instructional design models and varying group sizes. However, in informal conversations with KMTC lecturers who use WhatsApp Group Chat messaging features to communicate with their students for class reminders and academic purposes, they said that the instantaneous, real-time posting of messages can be overwhelming for a group administrator. Based on this information, K4Health decided to use one simple training design and to cap the group size at 40 participants—approximately the size of a face-to-face class.

The WhatsApp HTSP Training was ultimately designed as a seven-week workshop. To earn a certificate of completion, participants had to complete a pretest and post-test knowledge assessment survey, as well as a usability survey. Table 2 provides a timeline of the training.

Table 2. WhatsApp HTSP Training Timeline and Content

Week	Content
Weeks 1 and 2	☐ Introduction and instructions ☐ Pretest knowledge assessment survey
Week 3	☐ Video introduction to HTSP ☐ Journal article providing evidence on women's growing desire to limit births in sub-Saharan Africa
Week 4	☐ HTSP case study videos providing training on counseling clients on HTSP (5 videos)
Week 5	☐ Infographic explaining why Christian values support family planning ☐ Blog post on why family planning is consistent with Christian values
Weeks 6 and 7	☐ Wrap-up ☐ Post-test knowledge assessment survey, usability survey

Role of Facilitator

K4Health's Kenya-based consultant served as the WhatsApp Group administrator for all four groups of participants. In this role, he promoted knowledge exchange and learning around specific HTSP resources assigned to each group.

His responsibilities included the following:

- ☐ Recruit and add group members to their respective groups
- ☐ Encourage members to invite colleagues to join the K4Health WhatsApp groups
- ☐ Provide group members with technical support for using WhatsApp
- ☐ Monitor the activity within the groups—mostly for troubleshooting purposes and to monitor the appropriateness and accuracy of posts

Additionally, the K4Health consultant in Kenya worked with the K4Health project lead to design the training. This included work to select the training content, review the assessment questions for appropriateness and understandability, and draft the discussion questions.

Methodology

Study Design

K4Health measured the acceptability and feasibility of using the WhatsApp Group Chat feature for continued professional development by analyzing responses to a usability survey, by conducting a qualitative analysis of the Group Chat transcripts, and by comparing pretest and post-test knowledge assessments.

The study sought to answer the following research questions:

- ☐ Did participants understand the training instructions?
- ☐ Were participants able to access the training content?
- ☐ Did participants actively participate on the platform?
- ☐ Did participants report experiencing technical issues with the platform?
- ☐ How did participant learning outcomes compare between pretest and post-test knowledge assessments?

Participants

K4Health's consultant in Kenya recruited health workers and students through in-person presentations at KMTC Kitui, Outspan College, and nursing facilities at the Kitui District Hospital; Nairobi University; University of Eastern Africa, Baraton; Moi University; and Masinde Muliro University of Science and Technology. From those who attended these presentations, 160 health-care providers and students volunteered to participate in the WhatsApp HTSP Training by providing their phone number to be added to a WhatsApp Group.

Data Collection Instruments

Usability Survey

Participants were asked a mix of multiple choice and open-ended questions about how they liked participating in a training via the WhatsApp Group Chat feature. The survey was created using Google Forms and a link to the survey posted to the four WhatsApp groups. Of the 160 enrolled participants, 107 (67%) completed the survey. Data was analyzed using Microsoft Excel.

Pretest and Post-test Knowledge Assessment Surveys

Participants were asked 10 questions on HTSP at the beginning of the training and at the end of the training. The knowledge assessment tests were created using Google Forms, with a link to the survey posted to the four WhatsApp groups. Of the 160 enrolled participants, 83 (52%) completed both the pretest and post-test. Data was analyzed using Microsoft Excel.

Qualitative Analysis

The WhatsApp Group Chat feature allows group members to download the full chat transcript. The K4Health consultant downloaded the full transcript for all four WhatsApp groups at the end of the seven-week training. These chat transcripts were reviewed to determine the following:

- ☐ Participants' understanding of the training instructions
- ☐ Participants' ability to access the training materials
- ☐ Participants' engagement with the group administrator and other participants
- ☐ The technical issues that participants encountered during the training

Each Group Chat transcript was qualitatively analyzed and the results aggregated by common themes across the four groups using Microsoft Excel.

Limitations

The study design did not control for participants' access to other HTSP trainings and resources during the implementation period.

Results

Comprehension of Training Instructions

Qualitative analysis of the WhatsApp Group Chat transcripts showed that the group administrator provided instructions on the structure of the training and on how participants could earn a certificate by completing the pretest and post-test knowledge assessments. After explaining the purpose of the training, the group administrator provided links to the selected HTSP resources along with discussion questions for participants to answer according to the schedule outlined in Table 2 on page 5. In each group, the administrator had to repeat instructions and resend resource links several times before participants responded. This was often related to the fact that participants were added to the training on a rolling basis, which was a result of some technical difficulties with adding participants to the groups, explained in greater detail in the Discussion and Recommendations section of this report. In addition, one health-care provider who was participating wrote that their response was delayed because of a busy schedule at the hospital where they work:

> 8/2/16, 12:54 PM – [Provider Group 2 Participant 1]: Am very busy in maternity with 5 clients in labour

Training Content

Overall, both providers and students found the WhatsApp HTSP Training to be useful, especially in improving their knowledge of the topic (Table 3).

Table 3. Participants' Reasons for Finding the WhatsApp HTSP Training Useful

Reason	Provider (n=36)	Student (n=71)	Total (n=107)
It helped improve my knowledge of HTSP	24 (66%)	46 (65%)	70 (65%)
It clarified HTSP concepts for me	18 (50%)	27 (38%)	45 (42%)
I think it will help to improve my counseling skills on HTSP	5 (13%)	32 (45%)	37 (35%)
It provided me with access to resources and tools that I was unaware of	22 (61%)	32 (45%)	54 (50%)
It provided me with an opportunity to ask questions that I had on the subject	10 (28%)	22 (31%)	32 (30%)

A participant from the Provider Group 1 explained how the training content, specifically the video, helped to improve his knowledge and clarify HTSP concepts:

> 8/2/16, 9:41 AM – [Provider Group 1 Participant 3]: Great to learn that after a life birth one need to wait for 24 months to get pregnant to prevent deaths. After miscarriage to wait for 6months before the next pregnancy and a lady need to be 18 years of age to prepare for pregnancy if I did hear it or got it right.

Videos, research articles, and discussion questions were the content types reported as being the most useful in improving knowledge, whereas the infographic and blog post were the least useful (Table 4).

Table 4. Participants' Responses on Usefulness of Different Content Types for Improving HTSP Knowledge

Content Type	Provider (n=36)	Student (n=71)	Total (n=107)
Blog Post			
Very useful	24 (67%)	52 (73%)	76 (71%)
Somewhat useful	12 (33%)	17 (23%)	29 (27%)
Not useful	0	2 (3%)	2 (2%)
Video			
Very useful	35 (97%)	60 (85%)	95 (89%)
Somewhat useful	1 (3%)	11 (15%)	12 (11%)
Not useful	0	0	0
Infographic			
Very useful	24 (67%)	43 (61%)	67 (63%)
Somewhat useful	12 (33%)	28 (39%)	40 (37%)
Not useful	0	0	0
Research Article			
Very useful	35 (97%)	61 (86%)	96 (90%)
Somewhat useful	1 (3%)	10 (14%)	11 (10%)
Not useful	0	0	0
Discussion Question			
Very useful	31 (86%)	62 (87%)	93 (87%)
Somewhat useful	5 (14%)	9 (13%)	14 (13%)
Not useful	0	0	0

A number of participants highlighted how nicely the videos answered the pre-test questions:

> 8/25/16, 10:30 AM – [Student Group 2 Participant 1]: …that video is making the understanding so easy.

However, the video also elicited discussion around challenges faced in the Kenyan context and the role that community health workers can play.

> 8/25/16, 10:35 AM – [Student Group 2 Participant 2]: But checking on the video ideally as it outline the various goal of achieving HTSP, I would like to point out a concern on how possible it is to the idea of reaching out for the women, because to me i thing a bigger challenge than the picture portrayed in the video. i would love to know what others think in the group.
>
> 8/25/16, 10:40 AM – [Student Group 2 Participant 3]: I think they can carry out campaigns with the help of community health workers,, in order to reach out to women who are not informed.
>
> 8/25/16, 10:44 AM – [Student Group 2 Participant 4]: Yeh cultural activities r things which need to b delt with very closely there's a big gap there
>
> 8/25/16, 10:45 AM – [Student Group 2 Participant 5]: Yeap marto we truly need to check that area.
>
> 8/25/16, 10:45 AM – [Student Group 2 Participant 6]: Some cultures and practices like FGM and early marriages play a very big and sad role
>
> 8/25/16, 10:45 AM – [Student Group 2 Participant 5]: Yeap marto we truly need to check that area.

Platform Participation

The majority (74%) of provider and student participants reported in the self-reported usability survey that they had posted a message to their WhatsApp Group, while 26% reported that they did not post a message. The most frequently mentioned reason why they did not post was they did not have additional comments or questions to add to the discussion.

The K4Health team counted the number of messages in the four WhatsApp Group Chat transcripts (Table 6). About half of all messages posted to the WhatsApp groups were posted by the administrator. The remaining messages were posted by both students and health-care providers.

Table 6. Number of Messages Posted by Administrator and Participants

	Student Group 1 (n=40)	Student Group 2 (n=40)	Provider Group 1 (n=40)	Provider Group 2 (n=40)
Administrator Messages	179 (56%)	129 (48%)	211 (46%)	131 (50%)
Participant Messages	139 (44%)	142 (52%)	248 (54%)	129 (50%)
Total Messages	318 (100%)	271 (100%)	459 (100%)	260 (100%)

These messages included responses to the discussion questions posted by the administrator as described on the next page as well as participant introductions and sharing related to why they were interested in the training. Below are some examples as to what motivated participants to take part in the training:

> 7/26/16, 1:50 PM – [Student Group 1 Participant 2]: Am pursuing a course in Environmental Health Sciences in KMTC Kitui campus. This course will be of great benefit to me as well as the country at large because I will know how to space the number of children in future in order to educate them easily at the correct interval without any problem of fees, more far correct number of children through correct spacing will also give children to grow health because good care and services offer to them by mothers , will also reduce incidences of anaemia to mother due loss of blood during delivery.
>
> 7/27/16, 9:14 AM – [Provider Group 1 Participant 1]: This is an awesome platform since I have always had great intrest in reproductive health specifically mother baby and family planning.
>
> 8/2/16, 8:11 AM – [Provider Group 1 Participant 2]: Greetings friends. I am a nurse in a leadership and governance position in a hospital setting. I am interested in HTSP because I like supporting the other nurses in family planning.
>
> 8/3/16, 12:12 AM – [Provider Group 1 Participant 4]: Hi members, I am a health care provider. I am so much interested in this HTSP because i find it so educative and relevant to me as a young parent intending to bring up a healthy family.

The administrator posted one to four discussion questions each training week related to the specific content being delivered. The number of discussion questions and the response rate in each group are shown in Table 7 (only accurate responses were counted; each participant could only be counted once). Not all discussion questions were asked in each group, as noted in Table 7.

Table 7. Participant Response Rate by Group, Content Type, and Discussion Question

	Number of Participants Responding (%)				
	Student Group 1 (n=40)	**Student Group 2 (n=40)**	**Provider Group 1 (n=40)**	**Provider Group 2 (n=40)**	**Avg. % Responding by Question**
Week 3					
Video: https://youtu.be/UpkItFvBAXI					
Q1: What do you understand by the abbreviation HTSP?	6 (15%)	1 (3%)	6 (15%)	5 (13%)	**11%**
Q2: What are 2 benefits of HTSP?	4 (10%)	6 (15%)	24 (60%)	5 (13%)	**24%**
Q3: How does family planning policy respect human rights?	N/A	N/A	0 (0%)	N/A	**0%**
Q4: How long should a woman wait after giving birth to have another child?	4 (10%)	2 (5%)	N/A	1 (3%)	**6%**
Journal Article: http://www.ghspjournal.org/content/1/1/97.full					
Q5: Discuss the Van Lilith (2013) article about unmet family planning needs among young women in relation to your country's family planning needs.	5 (13%)	2 (5%)	8 (20%)	5 (13%)	**13%**

Week 4					
Videos (5 in total): http://bit.ly/2oFG0nS					
Q6: Watch the Pakistan case study video and reflect on the role of husbands in enhancing HTSP.	2 (5%)	1 (3%)	6 (15%)	9 (23%)	**11%**
Q7: The presenter in the Nigeria video has clearly articulated the professional behaviors of the health worker in communicating the HTSP message. Succinctly highlight five of them.	2 (5%)	1 (3%)	3 (8%)	7 (18%)	**8%**
Q8: Teenage pregnancy is a time bomb in Kenya according to the video. Which HTSP messages should we be giving our teenage boys and girls?	2 (5%)	1 (3%)	8 (20%)	6 (15%)	**11%**
Q9: Highlight the challenges of passing HTSP message to victim of miscarriage or induced abortion.	2 (5%)	1 (3%)	1 (3%)	4 (10%)	**5%**
Week 5					
Infographic: http://www.ccih.org/Christian-Values-Support-FP-Infographic.pdf					
Q10: What are some other forums (non-family planning) where we can disseminate HTSP messages?	1 (3%)	N/A	4 (10%)	1 (3%)	**5%**
Blog Post: https://www.k4health.org/blog/post/why-family-planning-consistent-christian-values					
Q11: Reflect on the relationship between Christian values and family planning.	2 (5%)	7 (8%)	13 (33%)	11 (28%)	**21%**
Avg. % Responding by Group	**8%**	**6%**	**18%**	**14%**	

According to the Nielsen Norman Group's 90-9-1 rule of participation inequality, it is common for 90% of participants in online communities to be passive observers, with 9% of participants posting moderately, and 1% of participants posting a considerable amount to the group (Nielsen, 2006). Given this context, all four WhatsApp groups can be considered engaged communities by Nielsen Norman standards. The student and provider response rates in Table 7 show that participants in the provider groups had higher post rates. However, more recent Pew research suggests that since many forms of online participation that now exist did not exist when the 90-9-1 model was first formulated, an updated version is needed to reflect current online and mobile platforms and the many ways that users interact with content (Hampton, Goulet, Marlow, & Rainie, 2012). We try to address this in greater detail in the Discussion and Recommendation section of this report.

The discussions that were initiated by participants were first related to the HTSP pretest knowledge assessment questions. Once the training was in full-swing, participant-initiated discussions included questions about lactation amenorrhea, the minimum age for a woman trying to get pregnant, how to educate women about HTSP, the difference between the demand to limit births and the demand to space births, and emergency pill use among teens.

For example, two participants discussed breastfeeding as a family planning method:

> 7/27/16, 1:54 AM – [Student Group 1 Participant 1]: Absolutely [Participant 2] what is mmmm....lactating amenorrhea???
>
> 7/27/16, 6:24 AM – [Student Group 1 Participant 2]: Well, [Participant 1] that is method of family planning used after childbirth and involve breast feeding for at least six months

Participants also stressed the importance of accessibility to family planning services:

> 8/11/16, 10:28 AM – [Provider Group 1 Participant 5]: The trouble with our fp services is that they are not very accessible to the most needy members of our society hence the continue populating our streets with poor children who have remained a social dilema. lets the aouthorities be aware of the issues raised by this good article.
>
> 8/11/16, 10:37 AM – [Provider Group 1 Participant 2]: The urban poor have been left outin all health issues and their accessibity to fp services is wanting. they need them too.
>
> 8/11/16, 10:38 AM – [Provider Group 1 Participant 6]: I agree with both of you. Access really is the tie breaker.. The awareness and promotions of healthy family planning would go a long way in addressing this gaps.

Technical Issues

The qualitative analysis of the transcripts showed that a few participants encountered technical issues, such as difficulty opening resource links or viewing videos. In response to these issues, the group administrator sent new resource links and suggested other platforms for viewing videos. In most cases, the administrator's suggestions resolved the issues.

> 8/19/16, 11:49 AM – [Group 2 Participant 2]: [Group Admin], I am unable to open the link for video no.4
>
> 8/19/16, 11:53 AM – [Group 2 Participant 3]: Hi the video is not opening can't access it ooppssss

Knowledge Assessment

Of the 160 participants, 83 completed both the pretest and post-test knowledge assessment surveys. Out of a possible 10 points, the average pretest knowledge assessment score was 6.72, and the average post-test knowledge assessment score was 7.10, indicating an average knowledge gain of 0.38 points. Table 8 shows the average scores by participants' status as student or health-care provider. The average scores at post-test for both providers and students improved slightly. Given the small sample sizes (especially for the provider group), we did not run any analysis to test for statistical significance.

Table 8. Average Pretest and Post-test Knowledge Assessment Scores

	Provider (n=28)	Student (n=55)
Average Pre-test Score	7.32	6.25
Average Post-test Score	7.91	6.77

Discussion and Recommendations

The findings from this training activity reveal that WhatsApp is well received as a platform for continuing professional development. However, implementation of this activity also led to a number of lessons learned around training setup, facilitation, and active participation.

Training Setup and Timeline

The group administrator experienced some technical difficulties in adding participants to the WhatsApp groups. Multiple attempts were required to successfully add some phone numbers to the groups. To help those who were added to the groups late, the administrator delivered the training content to each group multiple times.

Some participants who were new WhatsApp users and unfamiliar with the platform needed more hands-on assistance. Also, some had difficulty completing the pretest and post-test knowledge assessments because the Google Forms were slow to load in low-bandwidth settings. As a result, the training timeline was extended by two weeks to give participants more time to complete the knowledge assessments. Additionally, to help those who were experiencing these challenges, the group administrator traveled to meet some participants to provide more in-person, hands-on assistance and to provide high-speed internet via an Airtel hotspot.

Facilitation

The group administrator's active facilitation was critical to maintaining active participation in the groups and to push the training timeline forward. The administrator periodically checked in on participants' ability to access the resources and on their progress in completing the week's content. He encouraged group members to respond to discussion questions, responded to member posts, and congratulated members who posted correct answers and/or made interesting points.

For the pretest and post-test knowledge assessments, the group administrator not only provided hands-on assistance to some participants (as described earlier), but also personally called and messaged individuals to encourage them to complete the assessments. He also encouraged those who had completed the assessments to encourage their fellow group members to complete the assessments as well.

Participation

While the training was designed with the assumption of a five-day workweek, the participants were more active on the weekends. Participants also informed the group administrator that they needed more time to read or watch some content types, such as the journal article and the HTSP counseling videos. In response, the schedule was adjusted to a seven-day workweek.

Dips in engagement (i.e., participant responses to discussion questions) were seen for the content types that had higher estimated times for completion. In particular, participants responded five days after the resource and discussion questions were posted for the journal article, compared to a response time of one to two days after initial content delivery for other content types, such as the blog post.

In other time-bound online learning activities explored by K4Health, such as the Global Health eLearning Center (GHeL) study groups, active participation (i.e., participants posting their own content or questions in a group so others can see) decreased as the training progressed. However, in the WhatsApp HTSP Training, active participation was related more to content type than to week of the training. For example, posts responding to discussion questions following video content had similar response rates whether the video content was delivered early or later in the training.

Traditionally, K4Health has used the 90-9-1 rule as a benchmark for level of participation on the online discussion forums hosted on the Knowledge Gateway, as well as for GHeL study groups. This rule is based on the Nielsen Norman Group's research that suggests that in most online communities, 90% of members are passive learners, while 9% of members contribute a little and 1% of members account for most of the contributions and interactions (Nielsen, 2006). However, as mentioned earlier, given the plethora of new technologies and changes in online behavior, a new model or benchmark for online participation is needed. Pew research conducted in 2012 indicates that 'power-users' of Facebook, typically a proportion of around 20%-30%, account for a disproportionate amount of activity but within that there are different power users depending on the activity - one group dominates friending, another dominates 'liking' activity, and another dominates photo tagging for example (Hampton et al. 2012). Recall Table 6 on page 10, which outlined the number of messages posted by the administrator and participants. Across the four groups, participants accounted for 44%, 52%, 54%, and 50% of the total messages posted.

In addition, Henry et al. (2016) published their findings of the use of WhatsApp to increase communication and document the work between community health workers and their supervisors in two districts in Kenya. There was no fixed schedule for posting new content and all members of the group were encouraged to send messages to the group at any time. It was envisioned that the WhatsApp group would serve as a collaborative learning forum for: (1) team building between the two districts; (2) additional communication with supervisors; and (3) troubleshooting and sharing experiences related to use of the mCHW mobile learning application. They found that a total of 41 individuals joined the WhatsApp group and posted at least 1 message during the first 6 months of deployment. The group was used extensively, with a total of 1,830 posts made during the 6-month study period. This study highlights the more typical use of WhatsApp as a communication platform and not necessarily one for facilitated, cohort-based learning, which is what we attempted to test.

However, based on these findings, the average number of messages would be about 76 messages per week, assuming 4 weeks in a month. Recall the intervention period for this activity exploring the usability and acceptability of WhatsApp as a learning platform was 5 weeks. Across the four WhatsApp groups, there was a total of 1,308 messages posted by the administrator and participants, as presented in Table 6 on page 10. This would equate to about 261 messages posted per week. The average number of messages posted by group per week are presented in Table 9. In comparison with Henry et al. (2016), one group (i.e., Provider Group 1) surpassed the number of messages posted based on a weekly average, while three groups did not meet the weekly average. This is our attempt to find potential benchmarks within the published literature for interventions using newer media, such as Facebook and WhatsApp. More research is needed in this area to determine appropriate benchmarks for participation using these types of media.

Table 9. Average Number of Messages Posted by Administrator and Participants per Week

	Student Group 1 (n=40)	Student Group 2 (n=40)	Provider Group 1 (n=40)	Provider Group 2 (n=40)
Administrator Messages	36	26	42	26
Participant Messages	28	28	50	26
Total Messages per Week	64	54	92	52

In addition to the demonstrated need for an active and skilled group administrator, it was found important to align the format of the training content and the WhatsApp platform to the goals of the activity. Training activity goals can range from simply promoting knowledge exchange to assessing usability and knowledge gained, and different goals result in different structural considerations for both technical capacity and training content. Table 9 provides a few recommendations for the future use of WhatsApp as a platform for continued professional development.

Table 9. Key Findings and Recommendations

Finding	Recommendation
Although participants found the video resources to be quite useful, a number of participants reported technical issues in opening videos.	Provide a mix of resource types including nonmultimedia resources, such as PDF files that can be downloaded and printed, for participants to respond to if they are unable to access the multimedia versions.
Participation by discussion question varied widely.	- Decrease the number of questions asked of participants. - Allow more time for participants to answer questions. - Provide easy-to-access resources (e.g., nonmultimedia resources) for participants to respond to.
There were few participant-initiated discussions.	If the goal is to promote knowledge sharing and not simply to increase knowledge around a particular topic, it is important to rethink the structure of the training content. Instead of including only fact-based questions that are right or wrong, it would be useful to present scenarios and ask participants to reflect on those and share how they have responded and/or would respond in the future.

Conclusion

Technologies like WhatsApp offer potential solutions to training challenges related to access to face-to-face learning events or updated technical content. Setup and installation is simple and free as the WhatsApp app is available on device app stores, such as Google Play Store or Apple Store. Also, many health providers already use the platform professionally and personally on their own mobile devices, so convincing new users to download and install the popular is easy, and costs related to training participants on how to use the technology are minimal.

Designing a structured training using the Group Chat feature is relatively facile. However, identifying training content, attention to content formats, and employing a group administrator trained in fostering learning communities are key considerations to include in the training activity planning phase.

Finally, further study and evidence is needed to understand best practices for facilitating and fostering productive learning environments on the WhatsApp Group Chat messaging feature.

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