Kita Banget Application: Developing a Smartphone-based Mobile Application for Better Access to Key Population's HIV Test and Treatment

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Abstract

Background: Active case finding is essential in HIV prevention and treatment. Recently, the outreach program held by health facilities and community-based organizations faces some obstacles to reach men sex with a man (MSM) and transgender women (TGW) groups due to their unique characteristics that mostly hide their identity during the COVID-19 pandemic as they also limit physical and social activities. Nowadays, the use of the Internet and social media among MSMs and TGWs to socialize and find a sexual partner is becoming a trend. Thus, a mobile application was developed to provide better HIV tests and treatment access among these groups.

Aims: This study aimed to assess the Kita Banget Application development feasibility.

Settings and Design: The study was participatory action research, consisted of the need for assessment, prototype development, and field testing.

Methods and Material: There were 165 MSMs and TGWs involved as the participants in this study. First, they were involved in FGDs (Focused Group Discussion) about what type of information was needed in the mobile application. Then, the prototype was developed and field-tested. A 7-scale Post-Study System Usability Questionnaire (PSSUQ) was given to evaluate the prototype. The prototype was classified as Good if the mean score of PSSUQ was > 4 (median).

Statistical analysis used: A thematic analysis was performed to identify the type of information needed in the mobile application and the strength as well as the weakness of the mobile application's development. A descriptive statistical analysis was also performed to calculate the PSSUQ score using STATA 12.

Results: The HIV test and treatment in the form of a mobile application was supported by all of the participants. From the FGDs result, it was found there were six main features that were expected to be inputted in the mobile application. The six main features were HIV test services, ARV/ART services, health information, counseling service, personal health record, and emergency call. The Kita Banget's logo and the application design were also explored to make a user-friendly mobile application for the MSM and TGW groups. The PSSUQ showed that the mean score was 6.28 (SD=0.95). Therefore, the prototype developed was classified as Good. This prototype is still tested to a wider MSM/TGW population and is expected to gain more

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insight into further development and implementation. **Conclusions:** The Kita Banget application consisted of six features, which mostly about the information on HIV and the testing locations. The Kita Banget App had positive feasibility as a tool to provide better access to HIV tests and treatment among MSM/TGW groups. Before implementing this prototype into a real setting, it is necessary to provide more features that benefit the targeted population to gain more users.

**Keywords:** HIV/AIDS, key population, mobile application, feasibility study

**Key Messages:**
The Kita Banget Apps prototype has potential for better access to HIV test and treatment, but further research need to be conducted before made available for users.


**Introduction**
HIV is one of the public health problems in the world. Currently, 38 million people from around the world are living with HIV. Along with this, 24.5 million people are accessing antiretroviral (ARV). Not to mention that HIV issues continue to be a public health problem in Indonesia. According to the Joint United Nations Programme on HIV/AIDS or UNAIDS, Indonesia is one of the countries with the fastest epidemic growth in the Asia Pacific. In 2018, the estimated number of HIV cases in Indonesia was 640,000 people.¹ However, the total number of cases found is 377,564 people, or 65.5% of the 90% estimated people living with HIV.² The HIV prevalence in Indonesia was still concentrated in the key affected population with a prevalence of 0.5% in the general population.¹ Although the prevention of HIV among the general population is still low, the prevalence of HIV among key affected populations is over 15%, particularly for men who have sex with men (MSM). According to the result of the Integrated Biology and Behavioural Survey 2018-2019, the prevalence of HIV among sex workers was 8%, for transgender was 25%, men who have sex with men (MSM) was 25%, and among injection drug users were 28%, the prevalence of HIV among MSM was 36%.³ HIV prevention effort among MSM is crucial, as its prevalence is already more than one-fourth of the population. One factor contributing to the high prevalence of HIV among the population is sexual risky behavior.

The UNAIDS declares one strategy to halt HIV’s spread of HIV named the fast-track strategy to accelerate the 90-90-90 by reducing the new cases under 200,000 in 2020.⁴ The accelerated approach is focused on HIV prevention that has a high impact, which will improve the number of tests, those who receive HIV treatment, and those people who receive treatment can retain in the treatment and the viral suppression. Some of the programs focus on stigma and discrimination reduction.⁴ To achieve the acceleration program’s goal, there was a need to improve the strategy for better access to the test and treatment of MSMs. In addition to this, there is a call for HIV service providers and NGO to innovatively adopt their strategy to continuously serve the clients.⁵ ⁶

HIV prevention and treatment using the Internet is a promising way to improve access to HIV tests and treatment, particularly during this COVID-19 pandemic.⁷ A study shows that 99% of MSM

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have access to the Internet every day. The Internet has been the favorite of the MSM since it provides anonymity when communicating with others, and the Internet also offers a private space for the MSM compared to offline space such as park and gay bar. Internet for the YMSM is vital, particularly in relation to building networking, seeking sexual partners, and seeking information. For YMSM, it is more secure to seek new people on the Internet compared to meeting them face to face in a public area such as a park or another hidden place since they frequently experience verbal and physical bully.

There are many types of smartphone-based applications and web-based programs to optimize HIV prevention and treatment available on the Internet. The apps and web programs are used for various purposes: improving access to test and treatment using Electronic Health Record (EHR), improving the acceptability of pre-exposure prophylaxis, improving HIV test scale-up, and for an HIV test campaign among MSM. An Internet-based HIV education called Connect has also developed in Mexico using an educational and psychological approach to improve protective sexual behavior of the adolescence. The Integrated Biomedical and behavior survey informed a low percentage of MSM that used the Internet for HIV prevention and services, including joining an HIV-support group. The current study was a further study of another thesis entitled 'Creating Space for the Ideas of YMSM to Develop HIV-based Internet in Bali'. This participatory action research was carried out together with nine YMSMs to explore YMSMs' ideas on the best fit of Internet-based HIV prevention. The study developed a concept of YMSM called Kita Banget, a smartphone-based application for improving access to HIV test and services. In this study, a prototype of the Kita Banget application was developed and to test feasibility of the apps as a tool to improve access of the YMSM to HIV prevention and services.

**Subjects and Methods**

**Recruitment**

Eleven participants consisted of MSMs or TGWs, 18 years of age or older, were recruited via a community-based organization in Bali Province, Indonesia, to participate in a series of FGDs during the development of the Kita Banget Application. These activities were conducted from July to August 2020. After the prototype was ready to be tested, 165 participants were recruited via social media (Facebook, Line, WeChat, and the like), and MSMs or TGWs communities. We encouraged the participants to experience the Kita Banget Application prototype and give feedback regarding the prototype. The field test for the prototype was conducted from August 2020 to September 2020.

**Procedures**

This multi-phase study consisted of five sessions of FGD to identify the application features, prototype development, and field testing to achieve feedbacks for the prototype. The participants of the FGD were MSM aged 18-24 years, the outreach workers, health staff, and HIV program leader from the District Health Office. Following the FGDs, an online survey via Google Form with 165 respondents was conducted. The FGDs evaluation used a participatory method to collect information on the usability and acceptability of the application. The second stage of measurement used was using the PSSUQ to measure the system's usefulness, information quality, and interface quality.
The app prototype development was conducted parallel with the five sessions of FGD involving the same participants for each session. During the first and second FGDs, we asked the participants about their experience on HIV test and treatment, the type of information they had accessed, sources of the information, and their expectations about the features and contents of the Kita Banget application. On the third and fourth sessions of the FGD, we asked the participant about the design, logo, and the potential strengths and weaknesses of the developed prototype. The revision of the application prototype was also conducted along with the third and fourth FGD sessions. The application prototype was created using web-based prototyping software (https://marvelapp.com/).

After 5-session of FGDs, we had the final prototype for the Kita Banget application. This prototype was available online through the link of https://bit.ly/KitaBangetApp. The field testing for the Kita Banget application prototype was conducted by sharing the before-mentioned link to the MSM or TGW communities, both via social media (WhatsApp, Facebook, Twitter, WeChat, Line, and the like) and in-person (community-based organization). The participants were asked to access the prototype and test each feature in the application. We developed a video to assist the respondents in operating the prototype and linking it to a private WhatsApp number to address any respondents' questions. After they tried out all of the features, we asked them to give feedback regarding the prototype. A Post-Study System Usability Questionnaire (PSSUQ) were given to the participants. The PSSUQ was available on https://bit.ly/Tes_KitaBanget. The PSSUQ was a common framework to evaluate the system's usefulness, information quality, and interface quality of the prototype (1). It was a 7-scale Likert consisted of 19 questions. At the end of the study, we get 165 responses. The ethical clearance of this study was approved by the Ethics Commission of Faculty of Medicine, Udayana University, Number. 1 3 3 5/UN 1 4 2 .2 VII.1 4 I T 1 2 0 2 0.

Data Analysis

The FGDs were conducted through the Zoom application and had been recorded. The recordings were then transcribed and reviewed for accuracy. The thematic analysis was performed to identify the participants' experience on HIV test and treatment, type of information they had accessed, sources of the information, and their expectations about the features and content of the Kita Banget application. The participants' feedback regarding the design of the application prototype was also analyzed using thematic analysis. Furthermore, a descriptive statistical analysis using STATA 12 was performed to describe the participant's socio-demographic characteristics and calculate the PSSUQ score. The prototype was categorized as Good if the means score of PSSUQ was > 4 (1).

Results

Demographic Characteristics of the Participants

Table 1 showed the demographic characteristics of the participants (N=165). According to the table, the youngest participant was 18 years old, and the oldest participant was 56 years old. The participants' mean age was 30 years old, with a median age of 29 years old. Most of the participants (70.30%) were from Denpasar, while only 1.21% were from Gianyar and Karangasem. According to the participants' occupation, most of them were private sector staff (53.33%).
Table 1. Demographic Characteristics of the Participants (N=165)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>18</td>
</tr>
<tr>
<td>Max</td>
<td>56</td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>30.02 (6.57)</td>
</tr>
<tr>
<td>Median (IQR)</td>
<td>29 (9)</td>
</tr>
<tr>
<td><strong>Domicile</strong></td>
<td></td>
</tr>
<tr>
<td>Denpasar</td>
<td>116 (70.30)</td>
</tr>
<tr>
<td>Badung</td>
<td>35 (21.21)</td>
</tr>
<tr>
<td>Gianyar</td>
<td>2 (1.21)</td>
</tr>
<tr>
<td>Buleleng</td>
<td>10 (6.06)</td>
</tr>
<tr>
<td>Karangasem</td>
<td>2 (1.21)</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
</tr>
<tr>
<td>Freelancer</td>
<td>6 (3.63)</td>
</tr>
<tr>
<td>NGO officer</td>
<td>4 (2.42)</td>
</tr>
<tr>
<td>Online diver</td>
<td>2 (1.21)</td>
</tr>
<tr>
<td>Private sector staff</td>
<td>88 (53.33)</td>
</tr>
<tr>
<td>Student</td>
<td>3 (1.82)</td>
</tr>
<tr>
<td>Government employees</td>
<td>1 (0.61)</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td>30 (18.18)</td>
</tr>
<tr>
<td>Unemployment</td>
<td>31 (18.79)</td>
</tr>
</tbody>
</table>

**Kita Banget Application Features**

The information regarding the features of the application was collected from the series of FGD. According to the FGDs result, six main features were expected to be available in the *Kita Banget Application*. There were (1) HIV test services, (2) ARV/ART services, (3) health information, (4) counseling service, (5) personal health record, and (6) emergency call. The information about the application design that the participants expected, including the color choice, symbols, and language, was collected. The detail of the features and participants' preferences are provided in Table 2.

Table 2. Participants' Feedback on *Kita Banget Application* Features

<table>
<thead>
<tr>
<th>Features</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
</table>
| HIV test service   | ![Symbol] | The feature provided information about health facilities with HIV test services. The health facilities include hospitals, community health centers, and private clinics. Furthermore, participants expected this feature to contain:  
- Schedule for the service.  
- Contact for reservation.  
- List of physicians for consultation.  
- Price for the service.  
Participants also expected that this feature was integrated into the GPS to easily find the nearest health facilities for the HIV test service. They also expected that integrating the *Kita Banget Application* could increase HIV test accessibility among the users.  
Recently, as the HIV test also available for self-testing, the participants also expected that this feature would
provide information about where they could get or buy the test kit. This feature also provided information about HIV self-testing step by step and how to read the result (in the form of articles, images, and video tutorials). This feature contained information about a list of health facilities that provide ARV/ART services. Participants also expected that this feature should be integrated with the GPS and contained information like the HIV test feature.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARV/ART services</td>
<td>This feature contained some information about: HIV/AIDS and sexually transmitted diseases, Transmission and prevention, Early detection and treatment, News related to HIV and STDs, Health programs and information from government or health facilities, Success stories from survivors (HIV/AIDS and STDs), Stigma prevention and social support tips.</td>
</tr>
<tr>
<td>Health information</td>
<td>This feature contained information about HIV/AIDS and sexually transmitted diseases, Transmission and prevention, Early detection and treatment, News related to HIV and STDs, Health programs and information from government or health facilities, Success stories from survivors (HIV/AIDS and STDs), Stigma prevention and social support tips.</td>
</tr>
<tr>
<td>Counseling service</td>
<td>This feature provided a list of peer supports and counselors available from health facilities or community-based organizations. The users could make an appointment for counseling.</td>
</tr>
<tr>
<td>Personal health record</td>
<td>This feature provided the test and treatment history. The users could record their health information. Therefore, they also could monitor and control their health. This feature was also equipped with a smart reminder about a medical check-up, medication reminder, and health tips related to the user's health status. The users also could share their personal health records with the physician in terms of treatment purposes.</td>
</tr>
<tr>
<td>Emergency call</td>
<td>In case of an emergency situation (such as complication due to the adverse side effect of ARV/ART), the user could contact an ambulance or health service call-center for help. This feature was expected to reduce the users' fear of HIV tests and treatments.</td>
</tr>
<tr>
<td>Login and system security</td>
<td>As confidentiality become a significant issue in HIV, the user expected that the application had an advanced security system, especially for the login option. Participants suggested that the application adopted a banking application's security system, such as using email, password, PIN, or even biometric (fingerprint, face, or voice recognition) for the login option.</td>
</tr>
<tr>
<td>Logo of the app</td>
<td>The participants expected that this application could reach a broader target population. Therefore, the logo should be the representative for the MSM or TGW groups. Participants also suggested using dark blue color for the application's background design as they believed that a dark blue color was neutral and more user friendly. The symbol, color choice, and word &quot;Kita Banget&quot; were considered a suitable logo that encouraged the targeted population to download the app and for sustainable use.</td>
</tr>
</tbody>
</table>
Figure 1 showed the system workflow of the *Kita Banget* app. The login option would be different for the new users and the users that already registered. The new users would need to register by filling the personal identity and creating an account using email and password. After the account had activated, then they could access all features of the *Kita Banget* application.

**Kita Banget Application Feasibility**

The feasibility of the application prototype was evaluated using the PSSUQ framework. The PSSUQ questionnaire consisted of 19 questions, with a maximum value of each dimension was 7.0. The value of the system’s usefulness, information quality, and interface quality can be seen in Table 3.
Table 3. PSSUQ Values

<table>
<thead>
<tr>
<th>System's Usefulness</th>
<th>Information Quality</th>
<th>Interface Quality</th>
<th>Average Score</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.293</td>
<td>6.295</td>
<td>6.215</td>
<td>6.277</td>
<td>Above the median (4) is considered good feasibility</td>
</tr>
</tbody>
</table>

Based on the PSSUQ value, the mean score for the system’s usefulness was 6.293, the information quality was 6.295, the interface quality was 6.215, and the total average score was 6.277. According to these results, the field testing showed that the *Kita Banget* application prototype was considered Good. Therefore, the development of the *Kita Banget* application had good feasibility according to users' acceptance. Furthermore, most of the participants (49.7%) stated that the health information feature was their favorite feature, followed by HIV test service (15.76%), ART/ARV service (15.15%), and counseling service feature (13.33%). Only 3.64% of participants chose the personal health record feature, and about 2.42% of participants chose the emergency call as their favourite feature on the *KitaBanget* application (Figure 2).

Figure 2. Favorite Features of *Kita Banget* Application
Discussion

This study aimed to design a smartphone-based application prototype to improve access to the MSM to HIV test and service in Indonesia. This smartphone-based application could also be used by the health provider and outreach workers to provide services to the clients during the pandemic of COVID-19. Therefore, a participatory method was employed in order to capture the voice of the MSM communities, outreach workers, and health providers in order to be able to meet user expectations for usability. The research process was conducted through five FGDs with two iterative FGD processes together with the MSM community. FGDs were used to open a space to the participants to participatively measure the usability of the application and know whether the development had met the perceived utilization level of the Kita Banget application. Therefore, the FGDs aimed to help the researchers carry out the Kita Banget application's intended functionality. The participants' insight on the first round had been addressed, and then in the second round, the participants were asked to test the application. The next round was with the outreach workers and the health staff to gather their views to improve the application's use and check if it met the providers' needs. Insights on how to keep the privacy of the users, such as having password protection and the type of medical information that could be stored in the apps, were achieved.

The finding of the study suggested that the Kita Banget application had the potential to facilitate better access for MSM to test and treat HIV as well as to provide services by the health providers or community-based outreach workers. It was particularly acceptable during this COVID-19 season. The Kita Banget application has the potential to address the ongoing concern about the low rate of HIV test among the LSL population, to improve knowledge of the MSM about HIV prevention, to connect the users to HIV services, and to reduce the number of lost to follow up and to improve psychosocial of the users. The application also had provided information about the ARV services, such as a reminder to the clients and the ARV services nearby. Overcoming the barrier to HIV tests and ARV services was believed to give better access to HIV tests and services (ref). The promising benefit of the Kita Banget was in line with the key to ending HIV by improving knowledge of the MSM community on HIV prevention, improving the number of HIV tests, the number of MSM under ARV treatment, the number of people who retain on ARV.

The Kita Banget application consisted of six features, namely: 1) Health Information, 2) ART/ARV Services, 3) Counseling Services, 4) HIV Test Services, 5) Emergency Calls, and 6) Personal Health Record. The respondents' favorite was the HIV information feature from all of the features, with 49.7% of respondents who voted for it, followed by the HIV test services, ARV, and counseling services. For the HIV information, the Kita Banget would provide basic information on HIV/AIDS, sexually transmitted disease transmission and prevention, early ARV detection and treatment, updated news about HIV and STDs, current health programs and information from government or health facilities, success story on how to manage healthy behaviour of people living with HIV and tips for the stigma prevention and social support. For many years, the Internet has been the primary source of information for many people with stigmatizing illnesses such as HIV. Compared to those without stigmatizing illness, the Internet has been used more frequently and lengthily to seek health information, have communicated with clinicians about their condition, and have increased utilization of health care. Interestingly, the
current study's finding showed that one of the most cited information finding in the Internet by the MSM was the sign of HIV. It shows that there is still a lack of knowledge that people who got infected by HIV could not physically identified.

Another information provided was information on how to conduct HIV self-testing and where to buy the self-testing kit. As suggested by the users, Kita Banget would provide a video on HIV self-testing tutorial step by step and how to read the result. Using an application to explain the procedure of the HIV test has been applied in many studies. A similar development with the application called SMARTtest shows good acceptability of the MSM in the use of INSTI Multiples for self-partner-testing. The application has been used to facilitate HIV and Syphilis Self and Partners-Testing and prove that the application can provide information on how to use self-testing correctly.19

The MSM and the health providers suggested providing health map facilities with the HIV test service nearby. These health facilities included information on hospitals and community or private health centers. The information on the HIV clinics' working hours and contact person to book an appointment with a health officer would also be provided. The application would also provide information on a list of physicians for consultation and the services' fees. For many participants of this research, finding the HIV facilities nearby sometimes were a nuisance. Therefore, integrating the application with GPS to the nearest health facility with the HIV test service would be available. Another feature was related to access to personal health records in the application. Providers and the outreach workers had questioned the personal health records privacy. A study mentions that many strategies can be applied to address privacy issues in accessing the personal health record system by using an application. One of the strategies is by developing a virtual machine to protect the security of the application20 and by increasing awareness of the users on the risk associated with keeping the personal medical information in a personal device.21 Considering this issue, a decision on which information should be kept on the phone and how to ensure the application's security had to be made carefully. Not only could be used by the people living with HIV (PLWH), the remainder could also be accessed by family members or friends who are always follow up on the treatment.

The findingsof this study have provided valuable insight into the feasibility of the prototype of the Kita Banget application to improve knowledge of the MSM on HIV, HIV tests and services, as well as to link with HIV services, family members or friends, and LSL community. However, it is important to note the limitation of this study. First, the Kita Banget application was still a prototype, had been developed from the insights of many different types of MSM communities, outreach workers, HIV specialized health staffs from Community Health Centre (CHC), and the program leader of the HIV unit both in the Denpasar and in Badung regency. The result might not be applicable for all of the MSMs who may differently view mobile features. Second, the application was still a prototype that needed to be tested in real life. Third, the potential user might not be limited to the MSMs, but also for the transgenders, the injection drug users, and the sex workers.

Conclusion

The application consisted of six features, which were Health Information, ART/ARV Services, Counselling Services, HIV Test Services, Emergency Calls, and Personal Health Record. From all of...
the features, the respondents' favorite was HIV information, followed by the information on the geolocations of the HIV test service, ARV service, and counseling service. This application would also provide information on the contact person in Ngo-based HIV, health services, and family members or friends. For the HIV information, the LSL wanted the information on HIV/AIDS, sexually transmitted disease, transmission and prevention, early detection and treatment, news related to HIV and STDs, health programs and information from government or health facilities, success story form HIV survivors, and tips for the stigma prevention and social support. The *Kita Banget* application had positive feasibility as a tool to provide better access to HIV tests and treatment among MSM/TGW groups. Another further study to see its efficiency in the real situation was required to implement this prototype into a real setting.

This study provided a technical procedure for designing them-Health application since the research in Indonesia was still limited in this area. A participatory method was employed to grasp the insights of the MSMs, HIV community-based outreach workers, health staff of the HIV clinics, and HIV program leader at the District Health Office (DHO). Practically, this research was expected to inform the ministry of health, particularly the HIV unit, regarding the information, quality, interface quality, and system quality in developing an m-Health application to improve access to the marginalized community, such as MSMs to HIV tests and services. Finally, this research was expected to add information to the body of the literature in Indonesia and Asia to design and further develop m-Health applications to improve access to the marginalized community.

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