Developing Prototype of the Nasu Suwoho Application for Rabies Case Reporting in Endemic Areas, North Sumatera, Indonesia

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Abstract

Delays in the handling of cases including rabies will affect the severity level caused by the inaccurate handling and detection of cases and tends to be slow. Considering that the era of digital technology is now developing so rapidly, almost all information can be accessed easily today. The purpose of this activity is to provide knowledge or socialization of the plan for a rabies self-reporting program by the community through the Nasu Suwoho application. Community service activities are carried out using a Participatory Action Research approach where the community as the subject and object of this community service activity plays an active role in planning to implement the use of the rabies reporting application. A qualitative approach with in-depth interviews was conducted to the respondents by the research team. Service activities consist of opening, giving material, delivering videos and testing applications. With the Nasu Sowoho application, it is hoped that the signals of rabies cases, humans and animals infected with rabies in the community, health center staff and animal health centers can be properly monitored. This application displays questions in the form of self-diagnosis of the general public about the clinical symptoms of bite cases of rabies-transmitting animals. These clinical symptoms are adapted to general and typical signs that are easily recognized by the public so they can be reported easily.

Keyword: Rabies, Digital Health, Qualitative Study

INTRODUCTION

Rabies remains a public health issue due to the tendency for cases to be underreported (Ministry of Health of the Republic of Indonesia, 2017). The consequence of the high indicator of the early warning system is that outbreak investigations can be traced very quickly, within less than 24 hours. Delayed case handling, including rabies, affects the severity caused by inadequate and slow case handling and detection (Sitepu et al., 2019).

Considering the rapid development of the digital technology era, almost all information can be easily accessed nowadays. The social society of the 4.0 era can now easily upload information that almost everyone can know. Indonesia has utilized digital technology (software) in conducting surveillance for disease prevention and control (Dewi et al., 2018).

The developme nt of the Nasu Suwoho application is carried out by strengthening the function and role of independent rabies case reporting by the community. This Android-based application supports the independent reporting system by the community and is connected to health centers (Kipanyula et al., 2016; Lushasi et al., 2020). Therefore, independent reporting activities need to be promoted to the community to actively participate in the early warning

system for rabies and reduce the morbidity and mortality rates caused by rabies (case fatality rate) (Swathi et al., 2020). The increasing trend of smartphone users over the last few decades has become an important asset in supporting communities in rabies-endemic areas. The aim of this study is to provide knowledge or socialize the rabies self-reporting program plan by the community through the Nasu Suwoho application.

METHODS

This study was conducted in North Tapanuli Regency, The Province of North Sumatera, Indonesia which has a high number of rabies-transmitting animal bites and a significant population of rabies-transmitting animals. The RE-AIM (Reach-Evaluation-Adoption-Implementation-Maintain) approach was used to determine the extent of the benefits of the application that will be educated to the community so that self-reporting of rabies-transmitting animal bite cases can be assessed and evaluated. This research was conducted using the Participatory Action Research approach, where the community serves as both the subject and the object of the research (Vizeshfar et al., 2021). The community plays an active role in the plan to implement the rabies reporting application. A qualitative approach with in-depth interviews was conducted with respondents by the research team. The in-depth interview guide included probing questions such as suggestions, inputs, improvements, and the usefulness of the application demonstrated during the activity.

A total of 30 respondents were involved in this study, consisting of community members, cadres, community leaders, healthcare workers, the general public, and local government officials. They were gathered in one location to discuss and participate in preparing the application that will be used. Respondents received material about rabies (clinical symptoms in humans and animals), rabies transmission from humans to animals and animals to animals, and watched a demonstration of how to use the planned application.

A demonstration of the application was provided to respondents to enhance their understanding of the planned application. The data analysis used in this activity is thematic analysis, and this activity has passed the research ethics review by the Faculty of Medicine, Universitas Islam Sumatera Utara, Indonesia.

RESULTS

Field findings revealed that the community could identify the parties involved as both subjects and objects in the planning of the application. However, not all respondents provided comprehensive answers; some only mentioned the community and related agencies without specifying which agencies were involved in the application planning. Four out of 30 respondents mentioned that local government officials, such as village heads, were involved in the application implementation due to the location of the area and the coordination level with neighborhood heads or local environments where patients were bitten. This is because of the potential for conflicts among residents caused by bites from virus-transmitting animals that infect others.

> *"Health office, health centers. Basically, any government agencies. So that handling (rabies) is easier (A1, Female)."*

> *"Healthcare workers, BKKBN, social services, cadres, neighborhood heads, village midwives, and we, the community, can also play a role in the development and utilization of the application (A10, Female)."*

Medical respondents answered that health centers and hospitals play a role in providing care to rabies patients and should be included in the application as parties that can provide services to rabies victims. Some respondents also mentioned the involvement of private clinic doctors and private practice midwives to speed up medical treatment besides the government.

> *"Government agencies, health office, and livestock office (A2, Female)."*

Respondents indirectly mentioned the involvement of the livestock office and tourism office, which can indirectly influence rabies patient management. They stated that the livestock office is responsible for the health of animals and how to handle animals that could potentially transmit rabies, especially stray animals in the community.

> *"It will definitely be easier to track cases. And action can be taken quickly if we get bitten by a rabies-transmitting animal, like a dog (A3, Male)."*

> *"We won't have to go to the health center if we get bitten by a dog (A7, Female)."*

In-depth interview findings showed that respondents believe this application will be very beneficial for both the subjects and objects of the application. The community, as the object of the application, can avoid the potential spread of rabies. Full support from all parties can positively impact the application's utilization. Respondents stated that they would actively participate in promoting the application massively to its subjects and objects so that the

program's reach can be widely felt by the community.

> *"If they download the application, it means we have successfully invited them (A8, Female)."*

> *"Maybe if they download it (A5, Female)."*

The community understands that the effectiveness of this program's implementation can help reduce rabies cases in both humans and animals. Twenty-five out of thirty respondents stated that this application would be very beneficial for the community and reduce the negative impact of rabies.

> *"It's easier; the average person is no longer clueless, so if anything happens, they can just say 'hey, just use the application' (A1, Female)."*

However, respondents particularly noted the challenge of network issues that will arise with communication devices or mobile phones, as the application depends heavily on the internet. Fifteen respondents mentioned that the biggest challenge for the application's effectiveness is the internet connection, although they also noted that communication media could assist medical treatment as an alternative to the application.

> *"Network issues, lack of socialization. Sometimes the community is also somewhat apathetic (A12, Female)."*

> *"Like the lack of socialization. Many older people don't understand (A7, Female)."*

Respondents understand that this application can be implemented in similar contexts in different environments or utilized in other endemic areas. Although the application can be adopted, respondents understand that there must be a key institution or leading sector with full authority to operate the application.

> *"There are no specific characteristics. The important thing is local government and government agencies, like village heads, livestock offices, health offices (A14, Female)."*

> *"Everyone in the government field can join. It doesn't have to be just the health sector (A15, Female)."*

Respondents also noted the need to improve the content and display to fit where the application will be adopted. This would greatly benefit a broader community.

> *"Add information on the nearest health center (A1, Female)."*

> *"The information should be expanded to include prevention and reporting on rabies-transmitting animals. So it's not just focused on humans (A2, Male)."*

Respondents have not provided clear responses regarding implementation. This may be because the community has not yet used the application in daily life, so they stated that the application would be very useful if used routinely, allowing the community to understand it fully.

> *"Community support. For example, by downloading the application, not just downloading but also using it (A20, Female)."*

> *"If it has to be offline, I don't think it will work because reporting will be difficult, so it must remain online. But if the application doesn't work, we have to go directly to the health center (A10, Female)."*

However, respondents placed limits on the use of medical terminology, which could affect the application's implementation.

> *"The application can stay as it is. If the network is down, they can cooperate with the village head or the nearest healthcare worker (A1, Female)."*

The program's ability to adapt to technological advancements is one of the respondents' concerns to ensure the application is sustainable.

> *"The use of the application. If no one uses it, it can't develop (A15, Female)."*

> *"It depends. If there's a lot of response, it should continue, but if only 2 out of 30 respond, it seems it can't continue (A2, Male)."*

Respondents understand that there will be significant changes in technology and information, so the application must adapt and be updated as needed.

> *"Applications always have shortcomings, especially new ones. So the obstacle will likely come from the application itself, which must be developed further (A21, Female)."*

> *"It should be continuously developed and updated. Because this application is very much needed in endemic areas (A8, Female)."*

DISCUSSION

Nasu Suwoho is an application designed to address the health issue of rabies in Indonesia. Nasu Suwoho, which means "Mad Dog" in the local Nias language, is an application developed for the early warning system for rabies. With the Nasu Sowoho application, it is expected that rabies cases in humans and animals in the community, health centers, and animal health centers can be well monitored. This application features questions for the general public to self-diagnose clinical symptoms of rabies-infected animal bites. These clinical symptoms are adjusted to common and distinctive signs that are easily recognized by the community, making reporting simple. In addition to educating the public about rabies, this application is

also expected to assess the sensitivity and specificity of reporting cases of rabies-infected animal bites. The implementation of the rabies application has a positive impact on reducing cases (Abbas et al., 2011; Häsler et al., 2014).

The development of technology and information, such as digital health, correlates positively with the changing times, which tend to be fast and practical (Silalahi et al., 2020). Health issues between doctors and patients will be more easily resolved with digital health. The wider reach of digital applications in healthcare services includes regular health information, online consultation services, drug information services, and online appointment bookings at hospitals (Bokolo, 2021; Haleem et al., 2021).

The current development of digital health in rabies management involves the use of online expert systems for diagnosing rabies (Gibson et al., 2018; Micklin, 2014). However, dependency on internet connectivity remains a challenge in the use of the application. The reliance of the application on internet connectivity affects its performance, and user trust in the application may decline. Research conducted by Mardiana in 2019 shows that application failure impacts the low trust of the public in adopting information technology, leading many to believe that the use of applications cannot influence the community's health levels (Mardiana et al., 2019). This underscores the importance of managing the shortcomings of health interventions through digital systems.

CONCLUSIONS

The community's need for a tool to address rabies issues is very high. Strong community support, contributions from local government, and collaboration with universities can be important strengths in empowering the community regarding rabies control. The improvement of the utilization of the Nasu Suwoho application in the future is highly anticipated to provide faster and more effective rabies management in the community.

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