

Low Utilization of Telemedicine in the First Year Trial: A Case in the Province of West Papua, Indonesia

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ABSTRACT

West Papua is the second biggest province in eastern part of Indonesia. Availability and accessibility of health care services are among the priority problems in this province. Telemedicine Indonesia (TEMENIN), a telemedicine pilot project from the Ministry of Health, has been implemented in 4 health care facilities in West Papua since 2018. This paper aims to evaluate the implementation and challenges of TEMENIN in respected health facilities in West Papua province. We applied a descriptive study using qualitative and quantitative approaches. Focus group discussion and interviews with participants emphasized the high demands of well running telemedicine. However, several difficulties and challenges have contributed to the low utilization of the TEMENIN during the pilot project. Those include unstable Internet connection, limited ease of use and lack of suitable features that meet local health problems. Several recommendations are suggested to increase the utilization and improve the pilot project in the coming years.

Keywords: telemedicine, utilization, West Papua

1. INTRODUCTION

West Papua is the second biggest province in eastern part of Indonesia. With an area of 99.617,63 square kilometres, however, it is the province with the lowest population density in the country (8,96 person/km²). This province consists of 12 regencies and one municipality, namely Manokwari as the provincial capital [1]. Health services to the community are provided by 14 hospitals and 154 public health centers. However, access to the primary health centers and referral hospitals is challenged with the geographical barriers and transportation routes.

Inequity of health services is among the biggest challenge in this province. Nationally, the ratio of primary health care (PHC) facilities per sub-district in Indonesia is 1.36., West Papua has the lowest ratio of 0.69 PHC facilities per sub-district [2]. Moreover, 26.4% of PHC lacked physicians. Misdistribution of healthcare providers and health facilities, also geographical barrier are the major problem for Indonesia that violates Law No. 36 of 2009 on Health, article 5, which states “Everyone has equal rights to access health care”.

Innovation to improve welfare in West Papua by utilizing technology has been instructed by the President of the Republic of Indonesia through Presidential Instruction No. 9 of 2017. In the instruction, the Minister of Health was given task to increase the access and quality of health services in remote areas by utilizing communication technology (telemedicine).

Telemedicine has been developed by the Ministry of Health since 2012. Until 2017 several changes and developments have been completed both in technical and clinical including cooperation with third parties. In 2017, the Ministry of Health developed telemedicine under the name Telemedisin Indonesia (TEMENIN). TEMENIN uses the Application Web Browser Platform, and can be accessed freely from all regions of Indonesia at www.temenin.kemkes.go.id. TEMENIN consists of tele-radiology, tele-electrocardiography (tele-ECG), tele-ultrasound and teleconsultation services. The TEMENIN program already has 46 telemedicine sites involving 17 central hospitals and 29 primary health centers.

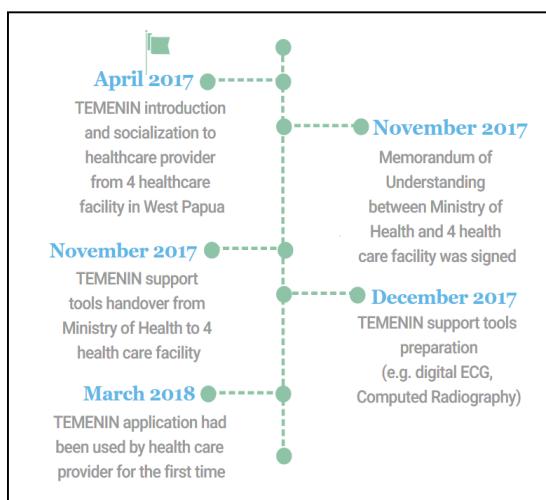


Figure 1. TEMENIN implementation in West Papua

In 2017, by Minister of Health Decree number HK.01.07 / MENKES / 650 / 2017 TEMENIN pilot project was implemented all around Indonesia, including 4 health care facilities in West Papua. Sorong Hospital (Type C Hospital) as regional administrators was managing 3 remote sites, Raja Ampat Hospital (Type D Hospital), Oransbari PHC and Sausapor PHC. Moreover, Dr. Wahidin Sudirohusodo Central Hospital was appointed by the Ministry of Health as a National Referral Hospital. When there is a case that requires consultation via telemedicine in the assisted health facility (e.g. tele ECG), the ECG examination results will be sent to Sorong Hospital. If there is no response within 2 hours from Sorong Hospital, then the ECG will be forwarded to Dr. Wahidin Sudirohusodo Central Hospital. The implementation of TEMENIN in West Papua had been evaluated in 2018. The evaluation was only limited to whether TEMENIN was active or inactive and how many telemedicine services were implemented in the healthcare facilities. From the Ministry of Health's evaluation, it was found that telemedicine utilization was low, 16 times in Oransabari PHC, 2 times in Sausapor PHC and had never been used in Raja Ampat Hospital. The result of the evaluation has not been followed by any recommendation and plan for TEMENIN's system improvement.

One of the obstacles for this pilot project was the technology. In this case, the procurement of technology in such as medical tools and software must have been carried out before conducting the TEMENIN pilot project. Things that have not been considered are the acceptance and perception of technology users (health workers, patients, administrative staff and IT staff) about the technology innovation for healthcare in the form of telemedicine. The lack of understanding the urgency of why telemedicine was developed in these facilities and the lack of understanding the use of telemedicine tools led to low utilization of TEMENIN[3].

The use of TEMENIN considered as a complicated and time-consuming process, although in fact if this process is

fully understood, the health service will be more effective, efficient and precise for patient management. Therefore, it is necessary to evaluate this aspect. Assessment can be done using the Technology Acceptance Model (TAM) to determine the factors that influence the acceptance of a new information system [4]. This paper aims to report the utilization of TEMENIN implementation in West Papua based on the findings in the field using quantitative and qualitative approach.

2. METHOD

The data was collected using qualitative and quantitative approaches. The research protocol was approved by the Faculty of Medicine, Public Health, and Nursing ethical committee by the number KE / FK / 0390 / EC / 2019 on 11 April 2019. Qualitative research was done with focus group discussions (FGD) and in-depth interviews to health care providers and hospital management in 4 health care facilities. FGD guideline refers to the Model Application Assessment of Telemedicine (MAST) and Telemedicine Patients Satisfactory Questionnaire (TPSQ).

The research instruments was modified based on Technology Acceptance Model (TAM) and Tele-Health Usability Questionnaire (TUQ) questionnaires. TAM is a questionnaire to assess information systems that can explain the acceptance of the technology and how society can accept and use technology as users. TUQ is a questionnaire used to assess the perception of acceptance of the technology by the user. The questionnaire in this study combines existing domains in both the questionnaire with a few modifications to the content. Final questionnaire for the study consisted of 7 domains and 5 point-Likert scale with gradations from strongly disagree with 1 points to strongly agree with 5 points. Research team also create a questionnaire to assess the access to the internet by the user. Questionnaire was modified by team to assess the internet access in West Papua.

Table 1. Health Care Facilities Characteristics

Characteristics	Health Care Facilities			
	Sorong Hospital	Sausapor PHC	Raja Ampat Hospital	Oransbari PHC
Health Care Type	Type C Hospital	Hospitalization service PHC	Type D Hospital	Hospitalization service PHC
Morbi -dity (in the last 1 year)	The most health cases	Obstetri, and Surgery	Upper Respiratory Tract Infection (URI)	Gastritis, Malaria, Hypertension
	The most referral cases		High risk Pregnancy, Traffic crush, Tuberculosis (TB)	URI, Malaria
Internet Provider	Indihome	VPN from Pusdatin	VPN Indihome	GSM Mobile Network

A coordination was done with the Provincial Health Department of West Papua and Health Care Facilities before data collection. A field visit to West Papua Province held on April 29th until May 4th, 2019 by three researchers from Faculty of Medicine, Public Health and Nursing Universitas Gadjah Mada. On the first day, the team visited Sorong

Hospital and met with the hospital management team, Cardiology Specialist Physician, IT personnel, and representatives of the Provincial Health of West Papua.

Table 2. Respondents Characteristics

Respo ndent	Total respo ndent	Age		Work Institution			Occupation			
		20- 40 y.o	41- 60 y.o	Health Departm ent	Hosp ital	Public Health Car	Physician	Nurse	Hospital/P HC Manageme nt	IT Staffs
User	8	8	1	1	7	4	4	4	3	2
Non- User	11	7	4	1	6	4			3	6

The team performed a group discussion forum and questionnaire study. On the second day, the team visited the Sausapor PHC in Tambräu District. In Sausapor PHC, the team did discussion and interview to the head of the clinic, physicians, nurses, and health analysts. In Raja Ampat Hospital, the team directly met the Director of Raja Ampat Hospital. On the last day, team visited Oransbari PHC located in South Manokwari District.

3. RESULTS AND DISCUSSION

A. Health Care Facilities Characteristic

Sorong Hospital located in Sorong district is a referral hospital in West Papua Province. In Telemedicine, Sorong Hospital is a regional administrators and manage 3 remote sites, Raja Ampat Hospital, Oransbari PHC and Sausapor PHC. Raja Ampat hospital is located in Waigeo Island, 2 hours sea travel with ship from Sorong. Sausapor PHC is located 117km away from Sorong or 4 hours land travel with 4WD car. The farthest health care facility from its referral hospital is Oransbari PHC that located 472km away. It can be reach by plane (1 hour) or land travel (± 16 hours). Telemedicine has purpose to reducing the geographical and time obstacles incurred in the receipt of care in traditional modalities with the same or greater effectiveness[5].

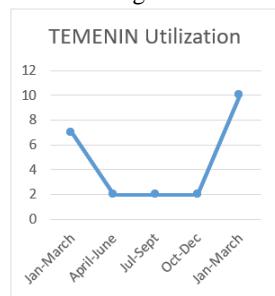


Figure 2. The Utilization of TEMENIN from March 2018 to April 2019

B. Field Visit Results

Qualitative data collection includes discussions and in-depth interviews with provincial health departments, health professionals and technical personnel who have been involved and use TEMENIN. The collection of quantitative data there were 19 respondents from 4 health care facilities. From the 19 respondents, only 8 respondents who ever used the TEMENIN or will be referred to as 'Users'. While the other 11 are medical workers and technical staff who have not used the TEMENIN or will be referred to as 'Non-User'. Researcher did not do the statistic analysis because of limited respondents. However, descriptive analysis used in

this research. TEMENIN was used 23 times since it was implemented in March 5th 2018. At least 19 times consultation comes from Oransbari PHC to Sorong Hospital and the 4 others from Sausapor PHC. There were a lot of factors that affect the consultation process in TEMENIN. The example is about the internet connection. Several area in Papua Barat, especially in Tambräu District, still have poor connection so it disturb the health data exchange. Telemedicine is a program that depends on a good internet network for the consultation process[5]. Although physicians in West Papua mentioned that telemedicine services are needed in this place, from the interview with healthcare providers in Papua, internet network is the most challenge in West Papua.

From the interview with health care provider in Sausapor PHC, internet network is the most critical problem when it come to use the TEMENIN application. From graphic 1, we can see that the healthcare provider in West Papua prefer to use Whatsapp (or other options) rather than TEMENIN. *"Because sometimes it (the consultation) failed to use TEMENIN, so we use Whatsapp, but they (the consultant) still give feedback too"*

Other than that, physician in PHC said that TEMENIN is not easy to use. About 3 from 8 users agree on statement "Using TEMENIN is not as easy as other applications to consult with another health worker", and another 3 users said that they were uncertain on this statement. In the same domain, 50% users agree that they need more time to learn how to use TEMENIN application. It's more easy to 'send and receive' consultation with Whatsapp compare to TEMENIN. Although data or consultation in Whatsapp can't be recorded systematically, healthcare providers still use it as an alternative consultation media. So, there is a challenge to optimized TEMENIN to be more user friendly.

Tele-ECG is the only one feature that ever used in TEMENIN. Another feature such as tele-Consultation, tele-Radiology and tele-USG have not been used at all. Physician from Oransbari PHC said that there is a need for another 'tele' aspect such as tele-psychiatry. *"Psychiatric cases often occur (in PHC). There was a psychiatric patient act violently yesterday. We can't handle it so his family took him back to Java (island), because there is a lack of Psychiatrist in West Papua"*

However, the consultation for this case, until now, could not be facilitated in TEMENIN. Concerns about regulations regarding the mechanism for giving Physician who provide consultations also appeared in interviews.

DISCUSSION

C. The Utilization of Telemedicine Application in Rural Area of Indonesia

The Telemedicine utilization is still low because of not every cases handled by physicians required referrals, considering the cases handled are still accordance with local physicians and specialist competence. For example is

consultation on results of radiology examination for radiological interpretation that is clear and the rapid response has not done, because the local physician must immediately make a decision for the follow-up of medical management. In addition, there is a mismatch between the current health service needs and telemedicine. For example is the malaria cases are the highest cases in West Papua. There is psychiatry cases that require consultation can be facilitated by tele-consultation with psychiatric specialist. Tele-consultation for psychiatry cases is most useful because it can reduce financial factors such as transport for physicians and patient who is poor [6].

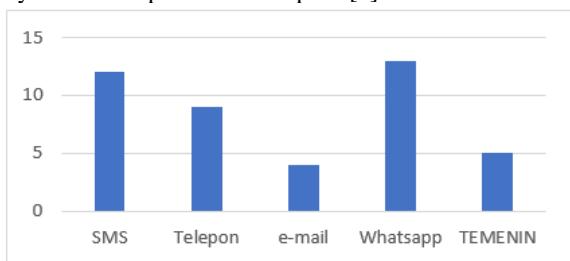


Figure 3. Communication media used for health consultation

Tele-consultation is needed between nurses or midwives in public health center where there are no permanent general practitioner physicians in the regency (horizontal referral using telemedicine) and need to be flexible between administrator and capable in consulting. Telemedicine has the potential to reduce space and communication barrier [7]. At present, TEMENIN facilitates consultation between healthcare facilities in vertical referral system but not between facilities in the same level.

D. Implementation Challenge

Internet network infrastructure in addition to conventional internet networks, GSM (3G / 4G) mobile networks are also very potential to be used in telemedicine services. Healthcare providers in Oransbari PHC tends to utilize GSM networks in accessing Telemedicine applications. With limited numbers of physicians in the area, increasing telemedicine access for nurses or midwives might beneficial, so that they can consult with doctors or specialists (task shifting).

Also, collaboration between Ministry of Health and Ministry of Communication and Information (Kominfo) is highly recommended, because Kominfo has *Badan Aksesibilitas Telekomunikasi dan Informatika* (BAKTI) program to increase internet network infrastructure in rural area all around Indonesia [8].

4. CONCLUSION

There is a good potential of TEMENIN utilization to increase healthcare access for people in West Papua. But there are some challenges that could be addressed by the Indonesian government to improve TEMENIN utilization in terms of its feature and its easiness to use. Researchers

found a big need on tele-psychiatry consultation to be added in TEMENIN. Some other benefit in the use of TEMENIN are it could improve communication between health providers, it increasing awareness among across sector (ministry of communication and information, regional government, health services) on healthcare needs of people in rural areas, and it is potential for local physicians capacity building related to complex cases.

ACKNOWLEDGMENT

This research was funded by the Ministry of Health grant number HK.03.01/1/1183/2019. Provincial Health Department of West Papua, Health Department of Sorong District, Health Department of Tamrauw District, Health Department of Raja Ampat District, Health Department of South Manokwari District Direktur Jenderal Layanan Kesehatan Kementerian Republik Indonesia.

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