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# Perceptions of Nursing Care for Cardiovascular Cases, Knowledge on the Telehealth and Telecardiology in Indonesia

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## ABSTRACT

**Background:** Nowadays, the life-style displacement promotes the increasing of degenerative disease, such as cardiovascular disease, which since 1995, has been stated as the main cause of fatality in Indonesia. Telehealth was defined as the use of the telecommunication technology to support the health information and increase the health service. Telehealth in developed countries can improve the behavior of healthy living. Telehealth in Indonesia is expected to increase healthy lifestyles that can reduce the risk of cardiovascular disease and other degenerative diseases.

**Objectives:** This study aimed to explore perceptions of related experience in the nursing care of cardiovascular cases, experience in the use of telehealth and hopes in telehealth implementation in Indonesia.

**Study Design:** This study used a qualitative study with focus group discussions approach. Participants in this study are 64 nurses. The selection of participants was carried out using purposive sampling. The data of this research, which were in the form of transcript and field report from each group discussion of the FGD, was analyzed using the phenomenology method developed by Collaizi.

**Results:** The theme of nursing care was divided into 4 sub-themes that were: assessment, diagnosis, planning, implementation and evaluation. The subtheme of definition and hopes to telehealth was stated, "As far as I know, the heart hospital has used online system, so that if we want to do referral, the patient can consultation directly, but t I don't know about the system. With Telehealth, nurses could observe the sign and symptoms from patient's home.

**Conclusion:** The results of qualitative studies show that telehealth In Indonesia was limited. Expectations for the development of telehealth/telecardiology is to further facilitate consultation, communication and education can support the patient or a nurse.

**Keywords:** Cardiovascular, Nursing care, Telehealth, Tele-cardiology

# Introduction

Indonesia is a developing country, at this moment health was one of the central issues in which becoming the focus of the national development. The high percentage in the number of communicable diseases, like DHF and TBC, still became the problem; it was worsen by the sedentary lifestyle which caused the number of degenerative diseases increased significantly. Based on Domestic Health Survey in 2001 conducted by the health department of Indonesia, the proportion of mortality caused by incommunicable diseases increased from 25.41% in 1990 to 48.53% in 2001. Whilst the proportion of mortality caused by cardiovascular diseases grew from 9.1% in 1986 to 26.3% in 2001.[1]

In 2020, it had been estimated that cardiovascular diseases will be the cause of death for at least 25 people per year. Coronary heart disease was also the leading factor of death and disability for the countries in the whole world. In developing countries, started from 1990 to 2020, the death rate caused by coronary heart diseases was estimated would increase 137% in males and 120% in females.[1]

Patients with degenerative case should have been detected in community health center or *Puskesmas*, nevertheless the lack of detection devices such as electrocardiograph (ECG) and other monitoring devices, the lack of human resources' ability in treating the patients and implementing the preventive function, and the lack of coordination system between *Puskesmas* and hospital. All of these factors caused the lateness in diagnosing the patients. This situation made the treatment became more difficult and usually was too late to handle. The same situation happened after the treatment in hospital, since the discharge planning/DP function to release the patient to their community had not being well organized.[2] Patient with degenerative disease was more likely to visit the emergency unit, being hospitalized more often, thus the medical fees they had to pay would be higher than others. During the discharge period from hospital to patient's house, they usually needed support, including the medication, treatment, symptom management, and how to improve the healthy lifestyle.[2]

Post hospital discharge condition should be observed, especially the symptom control and management, and also the support to do the healthy lifestyle. Telehealth technology allowed the health provider to monitor the patient's daily activity and to deliver health intervention. Early intervention such as vital sign observation and pacemaker observation could help increasing the symptom management and healthy lifestyle, and monitoring the medication management, and also decreasing the hospitalization and emergency visit rate.[3]

Telehealth was defined the used of the telecommunication technology to support the health information and increase the health service, and also to solve the geographical, time, social and cultural problems.[3] Telenursing was a part of Telehealth. Telenursing (distance nursing care) was the used of communication technology in nursing to fulfill the nursing care toward the client, using electromagnetic wires (magnetic, radio, and optic waves) in transmitting the communication signals of sound, data, and video. It could also be defined as distance communication, using electric and optic transmission, between human and/or computer.[4]

Another definition from telenursing was a delivery, an organization, and a coordination of service using telecommunication technology.[5] The technology mentioned was including electromagnetic channel such as wire, radio, and optical to transmit the sound, data and video communication signal. In other words, it was a distance communication using

electrical or transmission between human and/or computer.[5]

Tele-homecare was one of the applications available in telehealth nursing. With tele-homecare, one could regularly monitor one's own weight, blood pressure, heart rate and other emergency potential symptoms. Besides that, they could do home care and treatment connected with the health provider. Based on cost effectiveness study with n = 171 Diabetes Mellitus patients, where there were 85 patients who used telehealth, while the other 86 were using traditional homecare, it could be concluded that the estimated hospitalization fee for the telehealth group was $ 87,327; while for the counterparts group the fee was about $232,872.[6]

Home Nursing agency (2004) assessed 31 patients with telehealth and 176 patients without telehealth facility, and the result showed that the hospitalization rate of those who used the telehealth system was 1. On the contrary the rate for those who had not used the telehealth system was 30. The hospital visit for the telehealth user was 355. Meanwhile the non-telehealth user hospital visit was 2888. The patient's average hospital visit was 11.45 for the telehealth patients, while for those who had not used the telehealth; their average hospital visit rate was 16.41.

Telehealth system could be used by the help of the internet or optical fiber, which was including medical reservation system, video conference system, e-consultation, e-examination, e-carte, e-medical certificate, e-medical consent form, e-prescription, and e-commerce.[7] Another invention telemedicine used the telecommunication system with audio and video that allowed their users to communicate by interactive real time or asynchronous with the tele-presenter played as the analyst.[8]

Another form of invention patent was a method to monitor the physical condition of an individual, including the capturing images to define the body parts, measure the health parameter based on normal images, store the data, identify the potential of change and tag the physiology changes.[9]

This telehealth system had been used in abroad, and it gave more efficiency both from the financial side and the convenient. However, the research and development of telehealth in Indonesia was still parochial. Based on the background statements mentioned before, in order to develop the telenursing system with cardiography case in Indonesia, the researcher conducted a preliminary study related with telenursing in Indonesia.

## Objectives of Study

The objectives of this research included:

1) To explore the perception and the significance of nurse's experience in delivering nursing care to the patients with cardiovascular cases

2) To explore the nurse's experience in conducting the continuity care between *Puskesmas* and hospital

3) To explore the knowledge and hope of the nurse toward the telehealth, telenursing and telecardiology innovation in terms of patient care.

## Method of Research

This research used the qualitative study with phenomenology approach. The phenomenology approach aimed to gain and explore the understanding of the participant by

considering the experience of the participant subjectively and uniquely. Descriptive phenomenology was chosen in this study to do a direct exploration, analysis, and description toward a certain phenomenon.[10]

This study was a study to explore the perception of the health provider, especially the nurse's perception, toward the nursing care that had been given to the cardiovascular clients; the continuity nursing care between *Puskesmas* and hospital; and also the knowledge and the expectation toward the telenursing.

### Participant

The participants of this research were 64 nurses, consisted of 22 males and 42 females. The participants were the representatives from hospital. *Puskesmas,* and local health department in Jakarta, Bogor, Depok, Tangerang, and Bekasi. The participants were divided into 6 groups, each groups consisted of 6 to 12 people.

The selection of the hospital and *Puskesmas* was carried out using purposive sampling, meaning that the participants in this research were determined by several terms and conditions made by the researcher.[11] The criteria for the chosen hospital were the hospital located in Jabodetabek area which implemented cardiography case treatment, and the hospital which had possibility to be exposed with the telehealth innovation. On the other hand, the selection of *Puskesmas* was based on the reachable visible distance between the *Puskesmas* and the chosen hospital. The reachable distance was one of the factor that allowed the continuity care between *puskesmas* and hospital.

## Ethical Issue

All the research content and ethical clearance problems had been gone under review and had gained approval by the Indonesian Ministry of Research and Technology Foundation. The ethical clearance also had been approved by the ethical committee of Faculty of Nursing University of Indonesia.

In this study, the beneficence principal was implemented by publishing the advantages of this research where it was expected that this study could be used as basic data for developing the telenursing, which in the end could improve the nursing care service. The respect for person was related with the rights to gain the thorough information and the autonomy from the participant to deliver their opinion and experience based on the real condition. Before following the FGD, all the participants had been given explanation about the research, and all the participants had given their inform consent as a proof of their willingness to become the participant in the FGD.

## Data Collecting

The method to collect the data used the Focus Group Discussion/ FGD method. A focus group is a group interview of approximately six to twelve people who shared similar characteristics of common interests. A facilitator guided the group based on a predetermined set of topics. The facilitator creates an environment that encourages participants to share their perceptions and points of view. Focus group are a qualitative data collection method, meaning that the data is descriptive and cannot be measure numerically.[12]

In this study, the participants were divided into 6 groups of FGD where in each group consisted 8 to 12 participants. The grouping was based on the location between the hospital

and *Puskesmas* which allowed the referral process. Each group was led by a facilitator, assisted by an observer who observed and noted the non-verbal responds, and a technician who facilitated the audio-visual used during the research process. Each participant in every group had the same opportunity to deliver their experience related with the nursing care toward the cardiovascular cases, the continuity of care, and the telenursing innovation.

Before conducting the real research, an experimental test toward the key instrument had been carried out. All the facilitators, observers, and technicians had followed the experimental process and had equated their perception toward the expected goal of the research and the questions in which will guide the facilitator in conducting the FGD. After the FGD had been conducted, the focus discussion notes was then being informed toward the participant to clarify whether the notes was matched with what was being delivered by each participant.

## Data Analysis

The data of this research, which were in the form of transcript and field report from each group discussion of the FGD, was analyzed using the phenomenology method developed by Collaizi.[13] The steps in the data analysis process included transforming the FGD voice record into verbatim form, after that the researcher re-read the narrative script so that they could choose the appropriate word and the key point which were related with the phenomenon which was being researched. The next process then to formulize, based on the significant key point, and classify into category and subcategory. The category and subcategory which had correlation will be classified under the same theme. The next step was to integrate the whole idea into a complete description.

## Research Result

The results of the study showed that based on the meanings each of the participants attributed to: 1) cardiovascular case, 2) nursing care on the cardiovascular case, 3) problem in the continuity process of nursing care, 4) the knowledge about the telehealth/telenursing, and 5) the expectation toward the telehealth/telenursing.

### 1) Cardiovascular Case

This theme was the illustration of the cardiovascular case which had been handled in hospital and *Puskesmas*. This theme was divided into subtheme of cardio case and vascular case.

a) Cardio case: cardiovascular diseases treated by the hospital and *Puskesmas* were varied. The referral hospital usually handled several cardiovascular disorders which were more variative than the *Puskesmas* could handle. The heart disorders that were mentioned by the participants were MCI (Myocard Cardio Infark or Myocardial Infarction), congenital heart disease, infection, and dysryhtmia. This kind of cardiovascular diseases was mentioned by the participants as: *...if we're talking about cardiovascular case, we've met almost all kind of cases, and if we're talking about the frequency, the most common case are the history of infark, failure, valve disorder in children ..... there is also hypertension, CVD (Cardio Vascular Disease) ...., Acute Coronary Syndrome. When being examined in Puskesmas, it may be not known as*

*heart disorder, but when being checked in heart hospital, it was detected as MCI, CHF (Congestive Heart Failure).....*

b) Vascular case: this theme emerged from the sub theme and category of vascular disorder and its complication. The vascular disorder was illustrated by the participants as:

"*Most hypertension....., .... Essential hypertension..... Oh, hypertension crisis.... Hypotension crisis.... High cholesterol or post-hypertension like stroke. Yes, DVT... (Deep Vein Thrombosis)*".

**2) Cardiovascular Nursing Care**

The theme of nursing care on the cardiovascular client was divided into 4 sub-themes that were: assessment, diagnosis, planning, implementation and evaluation.

a) Assessment sub-theme was including the sub-sub themes of anamnesis, health examination, and diagnosis. The sub-sub themes of anamnesis were identified through the main complaint and clinical history. The main complaint was illustrated by the participants as:

"… what's your complaint, since when did you feel that, perhaps it's in family medical history… assessment, what's the pain scale, where the pain is distributed."

Medical history and treatment were illustrated by the participants as below:

"… previous medical history, the probable history, and we also need to assess the risk factor…"

"… particular medicine, was the heart attack happened during activity or while he rested…"

The sub-themes of health assessment were illustrated in the assessment category: physical, psychological, and supporting. The physical assessment was illustrated as:

"Physical assessment… measuring the vital signs

…assessment related with circulation system… consciousness…

Measuring the blood pressure, usually along with heart rate…

…the heart rate, from their breathing…

…the conjunctiva looks pale, or the patient has difficulty to breath.

…the signs of the heart disorder, the pain, the capillary refill…

…body height, body weight, abdominal circumference … with total cholesterol level…

The category of psychological assessment was illustrated as below:

"…mostly the patients were anxious……terrified…"

The category of supporting assessment was illustrated as below:

"…usually, we conduct the ECG examination…

…every patient who is more than 40 years old undergoes the ECG examination.

The ECG devices, x-ray devices have been available in *Puskesmas Kecamatan*.

b) Sub theme of Nursing Diagnosis

The sub theme of nursing diagnosis was identified from the sub-sub themes of nursing problem. Furthermore, it was

mirrored in the categories of: comfort; rest & activity; coping/ tolerance to stress; oxygenation disorder; fluid imbalance, in which illustrated by the participants as:

"Comfort Disturbance: Pain…"

... Activity intolerance…Anxiety……Fear…

Ineffective breathing pattern…fluid…more than.....Fluid balance….

c) The sub theme of planning was explained by the sub-sub themes of intervention which identified from two categories, which were the nursing care plan and the standard operating procedure (SOP). The nursing care plan was described by the participants as:

"… we advised them, that when he released from hospital, he should seek for the nurses again, so that we can make him another nursing care plan…"

The SOP was illustrated as:

"Medical SOP was existed; so was the nurse's."

d) The sub theme of implementation was illustrated in the sub-sub theme of independent intervention, divided into several categories: Monitoring/ observation; oxygenation; positioning; fluid balance; mobilization; nutrition/ diet; activity daily living; wound care; soothing; health education; reduction of psychological stress; exercise/ activity/ rehabilitation; promotion; and discharge planning. The category of monitoring/ observation and oxygenation was illustrated by participants as:

"… its nursing care plan, usually we strictly observed the vital signs…

… monitor the client's complain…

While the category of positioning and fluid intake was illustrated as:

"… semi-fowler or using a pillow.

… the intake-output… the fluid balance… we give breast-milk or milk…"

Meanwhile the category of mobilization and nutrition/ diet was stated as:

"Started from bed-rest until the patient could walk.

… the diet appropriate with patient's condition…

And then, what is it called, diet… the diet we suggested usually low sodium diet.

The category of ADL and wound care was mentioned by:

"Started from the daily routine like bathing…

For the surgery-cases, it depends on the case whether it needs wound care, activity, and medicine treatment."

The category of health education was defined by the statement as below:

"When the patient was about to be released, we give the health education.

... explained about their medication, the dosage.

For cardiovascular case, perhaps, whenever the patient goes, they should bring the medication in their bag.

The education related with risk factor".

"For the psycho... their mental, we advise the client not to think the things that could make them stress...

The category of exercise/ physical activity/ rehabilitation was stated by the participants as:

"Teach how should be a normal breathing...

What can be done, what should not be done.

...don't do hard task yet...

...related with their rehabilitation...

...further intervention".

The health promotion category was defined as:

"Counseling of healthy life style... like Sanitary and Healthy Behavior... lifestyle and life pattern..... not smoking.....and then the exercise that can be practice at home".

The category of discharge planning was explained as:

"For the pacemaker case, since the beginning they had been observed the planning... we give relevant books to the patients because they have to be independent, what should be done because a device was installed inside them. For example, they should be able to count their heart rate.

We have told them clearly about their illness, and motivated them that they could be recovered.

Don't forget for the next check up...

e) The sub theme of supervision was identified through evaluation with the evaluation category during the hospitalization and the evaluation post-hospitalization. The category was illustrated by the statement below:

"Well, maybe evaluation. After we have done all the implementation...

And then in hospital, we also have a program to ask about patient condition after returned home. So, we called the patient and asked their condition, or asked if there is something that can be helped, and reminded the patient for their upcoming check-up".

**3) Hindrance of the caring process and continuity of care between hospital and *puskesmas***

The hindrances toward the caring process were identified through the theme of: the synergy of care in *puskesmas* and hospital had not been working out and the continuity system between hospital and *puskesmas.*

a) The synergy system had not worked out yet

".... patient that has been released from the hospital should have checked themselves in *puskesmas*, but the fact is they went straight to the hospital for the check up...

. Well... it really depends from the society, we just received their aspiration.

...patient came from urban are usually just come to *puskesmas* only to ask for reference letter for the hospital, without going through the assessment first. Sometimes they just complain of having arythmia, or chect pain, and they asked for reference to the heart hospital, it looks like a giant hospital."

b) The continuity of service system

"They said that the service in *puskesmas* is not to the point, there is no system which allows the patient to consult the specialist... the service was slow.

...currently now, the one from Slipi to Cipto Mangunkusumo hospital, the ones from Menteng are referred to Heart hospital. It

should have been a networking between hospitals, so that it would be faster.

**4) Knowledge and expectation toward the innovation of telehealth and telenursing technology**

The knowledge and expectation toward the innovation of telehealth and telenursing technology could be identified through two themes which were the theme of knowledge and expectation.

a) Knowledge

The theme of knowledge was identified through 8 sub themes, which were the subtheme of definition of telehealth; subtheme of the types of telehealth; the usage of telehealth; the benefit from telehealth; and the subtheme of nurse's role on telehealth.

The subtheme of definition of telehealth was identified from the general exposure, the participants' statements were as below:

"As far as I know, the heart hospital has used online system, so that if we want to do referral, the patient can administer directly, but then I don't know about the system...

... I don't know about it, but I've heard before.... I've heard about telemedicine. We didn't know that it was telehealth

... the nursing evaluation and intervention without face to face

... in *puskesmas* we don't have the system yet because we only carry out a basic assessment

The subtheme of types of telehealth was identified from the category of phone/fax, MMS, cardiography screening, internet/website, teleconference, distance health education, and telecardiography.

"... nowadays it has been common by using phone and fax

... not using internet, but phone

... in *puskesmas,* just phone

... use the MMS, for fracture patient, we send the image...

... communication via internet...

... through web site. Usually in question form, then the doctor will answer

.... I've heard about it... the teleconference model... the operation was abroad. The camera was installed, the training was in our country."

The category of telecardiography was stated as:

"... it looks like monitor, if there is complaint, it was put on the chest, then being monitored from the hospital...

... if arrhythmia occur, we will give instruction

I had been working in Harapan Kita Heart Hospital, the device is small. There were once patient who lived in Bogor with device. Then we attached the device, and then we just observe in monitor for less than a minute, and then print the image. Then, we can consult to specialist and then we returned it to the sender.

The subtheme of the advantages of this program was identified from the category of coordination, information provider, consultation inter-profession, client could discuss about their problem, and observe the patient. Those coordinated category was informed in the participants' statement as below:

"... there's a good coordination between hospital system and basic health service.

... the information provider, using internet, phone, etc

... we can consult it to another health professional..."

... even the doctor could consult the sub-sub specialist.

... if I were the client... well... I can discuss about my problem...

... so the patient does not need to go to heart hospital.

... if they need medication, we can let them know first.

... the result had been read by the doctor, what are the instructions, we can tell them that

... their child was in fever, then we were called... we listened to them... then we advise them to give the antipyretic drug, drink a lot of water, or just simply come to the puskesmas".

**5) The expectation toward telehealth**

The sub theme of expectation toward telehealth was identified from the sub theme of beneficiary, identified from the category of whether there was a good preparation and the expectation to improve the health service.

The category of good preparation was including: socialization, facilities support, and training.

"... if there's new system, the socialization has to be done according to the protocol...

... for the implementation, we need training for the individual who will use it

... the knowledge from the human resource had to get training...

... the continuity of education..... support in facilities...

The expectation related with the implementation of telehealth was identified from several sub categories, including:

Connectivity, practical for the society and fast-service

"... there's connectivity between *puskesmas* and hospital...

... there's networking between hospital. So that it can be faster...

... patient could get a fast-service, and also avoid risk...

... they don't need to go far, for example if it can be treated at home...

... patient could get the answer of their complaints from their own place...

... nurses could observe the sign and symptoms from patient's home...

such as for the patient with heart disease, their blood pressure can be

observe in distant"

# Discussion

The result of this study informed some categories of cardiovascular disease, which numbers were prone to increase both in *puskesmas* and hospital. The tendency of the growth in cardiography case was in sync with the statement that in 2020 it was approximated that the cardiovascular disease would become cause of death of 25 people each year.[1]

The characteristic of the patients who came to the *puskesmaas* were different than those who came to the hospital. Generally, patients came to the *puskesmas* with complaint of the

increase in blood pressure and the other light general symptoms; meanwhile the patients who came to the hospital usually had varied complaint. One of the most common illnesses found was acute coronary syndrome. Acute coronary syndrome (ACS) is one of the most common life-threatening types of cardiovascular disease worldwide as well as in Indonesia. In the United States, more than 50% of the 1.2 million people suffered an acute coronary syndrome died each year before reaching a hospital, while in the United Kingdom, the mortality rate was approximately 33%.[14] Delays of treatment played a great contribution to the coronary death and heart dysfunction since the survival outcomes significantly depend on the time elapsed between the onset of symptoms and the initiation of thrombolysis therapy as the definitive treatment of acute coronary syndrome.[15]

The nursing care implemented by the nurses started from the assessment, both independently and collaboratively. The assessment started with the complaint and clinical history and family clinical history. The general complaints stated by the patients usually were breathing difficulty symptoms and chest pain. The physical assessment carried out were the measurement of blood pressure, heart rate, respiration rate, and assessment from head to toe. The supporting assessment which usually carried out in the cardiology case were ECG and complete blood count laboratory, CK, CKMB, Troponin, and D-Dimer. This protocol was appropriate with the theory that there were four major diagnostic tools used in the diagnosis of UA and STEMI in the clinical history, the electrocardiography (ECG), cardiac markers, and stress testing.[16]

The ECG itself was one of the expertise needed in assessing, diagnosing, and monitoring clinical outcome of the acute coronary syndrome patients. Familiarity with the wide range of patterns seen in the electrocardiograms of normal subjects and an understanding of the effects of non-cardiac disorders on the trace are prerequisites to accurate interpretation.[16] In this study, not all the health provider were able to interpret the ECG result, generally the result was being consulted to the doctor using fax, scan or phone calls.

The most common nursing diagnosis in the cardiovascular case were comfort status: pain, mobilization, fluid imbalance, and breathing pattern disturbance. From the diagnosis emerged, the intervention that was carried out independently by the nurses were positioning, rest and activity, and health education in order to prepare the patients before they were discharged. Health education is needed for patients. Last studies have shown that patients are not uniformly committed to receiving advice and the need therefore of targeted interventions. These trained professionals could ensure need based and individualized advice in a streamlined manner to bring about the desired behavioral change.[17]

The hindrance in continuity of care from hospital to home and to puskesmas was found in this research. Usually, the patients preferred to seek medical service in the hospital, therefore the hospital became 'Giant *puskesmas*'. The lack of trust toward the human resources and facilities were also the cause of the preference in medical service chosen, and these problems could have been solved using the telehealth/telenursing system. There should be an information system which managed the report process and the flow of information so that it could guarantee the continuity of care. Continuity of care was defined as the relationship and continuity of the patient with the health service as service and information provider for the patient.[18] The post-hospitalized patients should get the information of the further care and the simplicity to get the immediate service in

emergency condition; nevertheless this condition had not been preceded. One of the key successes of the continuity of care is the information system. The nursing information system held a role in the process of continuity of care.[19]

Based on the nurses' experience of telehealth and telenursing, some of them stated they had heard of, had known of but had not implemented yet, and there were also some of them who stated that they had implemented it, for instance by consulting via phone or fax.

Theoretically, telehealth system could be used using internet; optical fiber, including the medical reservation system, videoconference system, e-consultation, e-examination, e-carte, e-medical certificate, e-medical consent form, e-prescription, and e-commerce.[7] The other invention telemedicine usually used the telecommunication with audio and video, in which enabled them to communicate by interactive real time or asynchronous with telepresenter as its analysis.[8] Another form of invention patent was a method to monitor one's physical condition, including capturing image to define body parts, observing the health parameter using the normal image, saving data, identifying the potential of change and giving alert of the physiology change.[9]

The expectation toward the development of telenursing was by the establishment of telenursing, the health service could be delivered faster, the nurses could give health education to the patients, and the nurse's knowledge and the quality of care could be improved. A lot of preparation needed to be done in order to develop this system, the preparation needed including human resources, infrastructure, regulation, and also socialization system.

# Recommendation

Telehealth and telenursing could be one of the solutions to implement the preventive function, help the early warning system, and also hold a role in the continuity of care between hospital and *puskesmas*. The development of telenursing for cardiography case was started with exploring the cardiovascular illness common in Indonesia, and also the most common nursing care given to those patients related with cardiovascular case. This research aimed in order to make a system that fulfills the need and the condition in Indonesia. The form of telenursing could be web-based, phone, fax and also teleconference. The training was needed before the implementation of the system, furthermore the socialization in the implementation of the system was also needed in order to make the system ran well.

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