



## The Influence of Electronic Discharge Planning in Patients with Heart Failure: A Literature Review

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### ABSTRACT

The application of electronic discharge planning in heart failure patients is considered important because it offers the right treatment to patients by making it easier for patients to record patient complaints from home and then send them electronically for doctors to see and follow up. This review aims to determine the effect of implementing electronic discharge planning in patients with heart failure. Systematic review was reviewed using journal articles of the last five years from 2015-2020 and full text. The 3 databases used are PubMed, Cochrane and Google Scholar using the keywords electronic discharge planning, electronics, mobile, smartphone, application, CHF, HF and heart failure. From a total of 487,676 journal articles that have been identified, 7 journal articles have been submitted. A total of 2 articles state that the application of electronic discharge planning does not affect the patient's quality of life, while 3 other journal articles stated that there was an effect on the patient's quality of life. 2 articles say the implementation of electronic discharge planning has an effect on self-care, 2 other articles show that electronic discharge planning increases knowledge, and 1 other journal article shows that electronic discharge planning has an effect on medication adherence. Electronic discharge planning to facilitate workers health in the monitoring of patients from a distance away, the app is also able to improve the quality of life, care of self, knowledge and adherence to take the drug on patients with heart failure.

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## Pengaruh Elektronik Discharge Planning pada Pasien Gagal Jantung: Review Literature

### ABSTRAK

Penerapan electronic discharge planning pada pasien gagal jantung dinilai penting karena menawarkan penanganan yang tepat kepada pasien dengan memudahkan pasien mencatat keluhan pasien dari rumah kemudian mengirimkannya secara elektronik untuk dilihat dan ditindaklanjuti oleh dokter. Review ini bertujuan untuk mengetahui pengaruh penerapan electronic discharge planning pada pasien gagal jantung. Tinjauan sistematis menggunakan artikel jurnal lima tahun terakhir dari 2015-2020 dan teks lengkap. 3 database yang digunakan adalah PubMed, Cochrane dan Google Scholar menggunakan kata kunci electronic discharge planning, electronics, mobile, smartphone, aplikasi, CHF, HF dan gagal jantung. Dari total 487.676 artikel jurnal yang telah teridentifikasi, 7 artikel jurnal telah diajukan. Sebanyak 2 artikel menyatakan penerapan electronic discharge planning tidak berpengaruh terhadap kualitas hidup pasien, sedangkan 3 artikel jurnal lainnya menyatakan ada pengaruh terhadap kualitas hidup pasien. 2 artikel menyebutkan implementasi electronic discharge planning

#### Kata kunci:

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berpengaruh terhadap perawatan diri, 2 artikel lainnya menunjukkan electronic discharge planning meningkatkan pengetahuan, dan 1 artikel jurnal lainnya menunjukkan electronic discharge planning berpengaruh terhadap kepatuhan minum obat. Electronic discharge planning dapat memudahkan petugas kesehatan dalam memantau pasien dari jarak jauh, aplikasi ini juga mampu meningkatkan kualitas hidup, perawatan diri, pengetahuan dan kepatuhan minum obat pada pasien gagal jantung.

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## INTRODUCTION

Heart failure is a major healthcare problem with significant morbidity and mortality whose progression is characterized by frequent hospitalizations (Werhahn et al., 2019). Heart failure (HF) is a constantly expanding health problem worldwide with more than 20 million people affected, leading some to call it a global pandemic (Carbo et al., 2018). In 2015 shows that 70% of deaths in the world are caused by non-communicable diseases (39.5 million out of 56.4 deaths). Of all deaths caused by non-communicable diseases (NCD), 45% were caused by heart and blood vessel disease, namely 17.7 million out of 39.5 million deaths (WHO, 2015). It showed that the prevalence of heart disease based on doctor's diagnosis in Indonesia was 1.5%, with the three highest prevalence rates in North Kalimantan with 2,733 cases (2.2%), Yogyakarta with 14,602 cases (2%) and Gorontalo with 4,547 cases (2%) (RISKESDAS, 2018).

Chronic hypertension, coronary artery disease, and valve abnormalities are some of the causes of heart failure (Brunner & Suddarth, 2015). Planning of management in heart failure patients can use discharge planning, discharge planning or discharge planning is a systematic planning process starting from the time the patient enters until the time he leaves the hospital. Discharge planning is centered on the patient's problem which includes preventive rehabilitative and nursing care which aims to prepare the patient and family to understand the disease and nursing actions that must be carried out at home, explain the patient's needs and ensure that referrals are needed for further care (Nursalam, 2016).

Many electronic discharge planning applications are found on smartphones, one of which is mHealth and web-based telemonitoring, which indirectly changes the way patients and health workers carry out or monitor the health condition of patients. The application of electronic discharge planning in heart failure patients is considered important because it offers appropriate treatment to patients by makes it easy for patients to log clinical data at home, and then sent via technology for doctors to view and follow up on. Smartphone are ubiquitous, low cost, and offer a unique opportunity with automated interactive features for text messaging, data gathering, reminders, and alerts (Dang et al., 2017). The use of applications on smartphones is believed to make planning easily accessible and cost-effective (Ware et al., 2018).

Self-control is a behavior of awareness of symptoms that can be done through measurement, recording, and observation, which is an indicator of chronic disease management. Electronic-based applications also make it easier to access health information and solve health problems (health care facilities) (Heiney et al., 2020). The literature review of this study is to determine the effect of

implementing electronic discharge planning in heart failure patients.

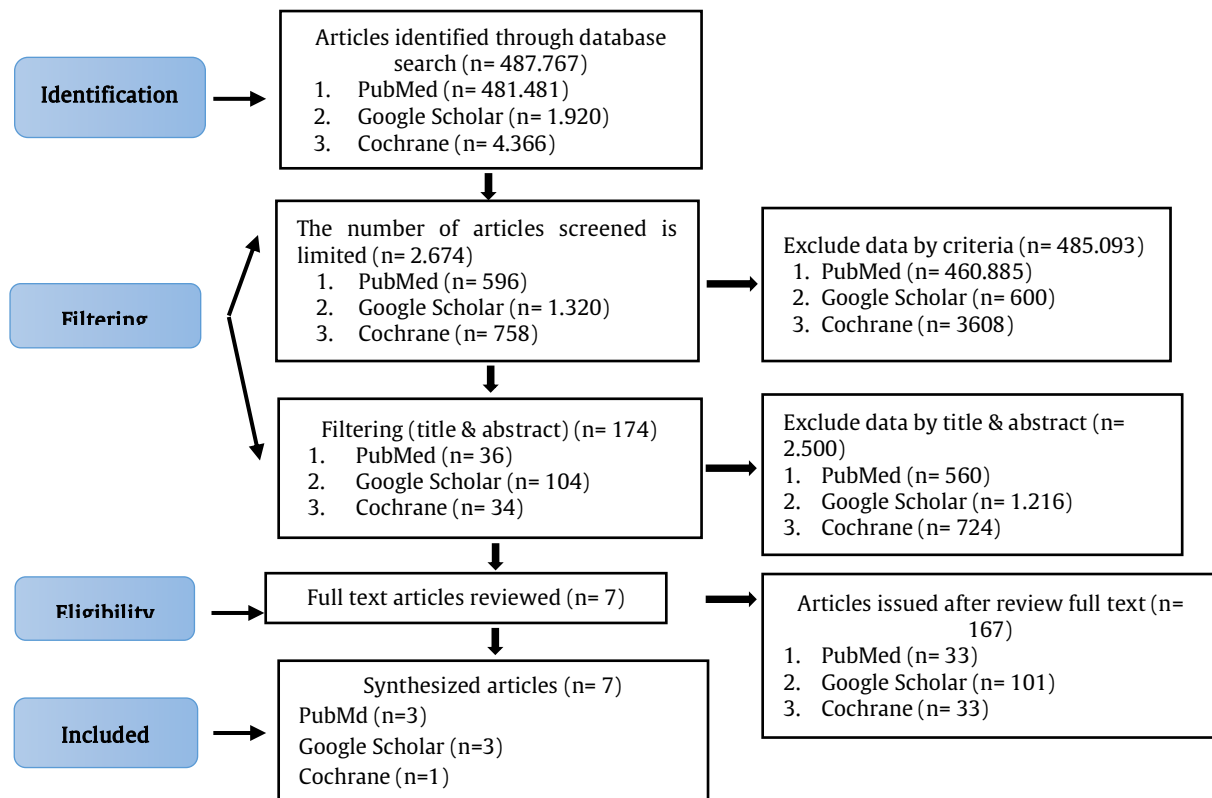
## METHOD

All journal articles for the last five years from 2015-2020 and full text are all accessed using electronic media. The database used to search for journal articles, both national and international, namely PubMed, Cochrane and Google Scholar, uses the keywords electronic discharge planning, electronics, mobile, mobile, smartphone, application, CHF, HF and heart failure. The inclusion criteria in the literature review were all electronic-based interventions in heart patients, journals for 2015-2020, free, Indonesian and English journals, the exclusion criteria were journal articles that were not accessible to full text. Titles and abstract files of all articles were identified and filtered according to the inclusion criteria, exclusion and duplicate articles were omitted or one was taken. Each article that is included in the review, the researcher will review and in this literature review the researcher uses the critical appraisal tool from JBI to assess the quality of the article to be reviewed whether or not it is worthy of review.

## RESULT AND DISCUSSION

From the three search databases used, there were 481,481 articles from PubMed articles, 4,366 Cochrane articles and 1,920 Google Scholar articles, a total of 487,767 articles were identified and screened. To organize articles, researchers use computers to help organize articles from searches. Researchers created special folders on the computer that were named according to the name based on the database used to store articles. Where there are 2,500 articles that have been screened for titles and abstracts that do not meet the inclusion and exclusion criteria, 167 articles that have been reviewed in full text and do not meet the criteria and these articles have been deleted and finally 7 articles were reviewed, which is presented in the following table.

The results of this literature review show that as many as 2 articles state that the application of electronic discharge planning has no effect on the patient's quality of life, while 3 other journal articles stated that the patient's quality of life had improved. 2 articles show that the application of electronic discharge planning has an effect on self-care, 2 other articles show that electronic discharge planning increases knowledge, and 1 other journal article shows that electronic discharge planning has an effect on medication adherence.



**DISCUSSION**

Online-based applications used by health workers for remote monitoring are now starting to be widely applied, according to Ware et al., (2018) a mixed method study which states that there have been 4, 2018, 166 patients have been registered using the medly application for health. Research Heiney et al., (2020) is a quasi-experimental study in which the application of healthy heart did not significantly improve the quality of life (P = 0.15), but obtained accurate results for the maintenance and self-care of patients.

According to Athilingam et al., in 2017 stated that the application of HeatMap had no effect on the quality of life of patients in both groups with a P value of 0.18. This study also shows that it affects the level of knowledge of heart failure patients with a P value = 0.04, and patients self-care with a P value of 0.01. This is not in line with the research of Ong et al., (2016), namely an RCT study conducted in California where the quality of life after 180 days experienced a significant increase between the 2 groups.

Other studies have also shown that systematic telephone support and non-invasive home telemonitoring have also shown changes in quality of life and cardiovascular health, self-care knowledge and behavior. (Inglis et al., 2017). This result is also supported by research Rosu et al., (2020) which is an RCT study where the results of Rosu's study on the MLHFQ score assessed for 45 days experienced changes in the quality of life in both groups.

The results of a literature study in 1 article show that the application of this application also affects medication adherence in heart failure patients using a quantitative telephone survey instrument which is an RCT study in which patients who were given an intervention using the mHealth + CP application reported taking medication according to the

prescription at 6 months with P = 0.02 and measurements for 12 months with P = <0.01 (Piette et al., 2015).

The results of this literature review show that there are several types of electronic-based applications that can be used to assist patients in remote care for heart failure patients after discharge from the hospital. This electronic-based application also has many benefits, as described in the literature review, which include improving the quality of life in heart failure patients, increasing knowledge, self-care and adherence to medication in heart failure patients.

Several studies reported that the use of applications for intervention in heart failure patients had no effect on the quality of life of patients (Heiney, et al 2020; Athilingam, et al 2017). Meanwhile, in another study it was reported that the application of interventions in heart failure patients based on electronic applications could significantly improve the patient's quality of life (Ong, et al 2016; Inglis, et al 2017; Rosu, et al 2020). In fact, there are several factors that might affect the results of the study, where factors that can influence include the type of technology used, low levels of compliance, lack of patience for involvement before release or handling values that exceed the threshold variable. (Ong et al., 2016).

Differences in research results between one another can be caused by the different number of samples in each of these studies. Where the sample size can affect the results of the study. A small number of samples can affect the strength of the study to determine the effect and can also increase the possibility of Type II error (error) i.e. condensing the null hypothesis when, in the end, the alternative hypothesis is correct (Faber & Fonseca, 2014). These findings indicate that further research is still needed that pays attention to the appropriate number of samples and also the selection of the type of electronic application that will be used in the study.

Author	Title	Method	Result
Heiney, et al (2020)	A Smartphone App for Self-Management of Heart Failure in Older African Americans: Feasibility and Usability Study	Quasi experiment using one group pretest-posttest design. Using the mHealth app. The intervention consists of using all the features of the application continuously for 4 weeks. 3 messages sent every day: (1) reminders to weigh, (2) educational messages, (3) motivation.	The application of a Healthy Heart did not significantly improve the quality of life (P = 0.15), but accurate results were obtained for patient self-care and maintenance.
Athilingam, et al (2017)	A Mobile Health Intervention to Improve Self-Care in Patients with Heart Failure: Pilot Randomized Control Trial	randomized controlled trial (RCT) 12 heart failure patients divided into 2 intervention and control groups Participants were trained on the characteristics of the HeartMap, in the form of weight measurement, symptoms, responses to warnings, vital sign control with BioHarness-3, HF education, and doing breathing relaxation and walking exercises. for 4 weeks patients are advised to use HeartMap from home every day.	The results showed significantly the mean score of self-care management using HeartMap (P = 0.01), and HF knowledge (P = .04) Quality of life decreased between the two groups, even more so control group (P = .18)
Ong, et al (2016)	Effectiveness of Remote Patient Monitoring After Discharge of Hospitalized Patients with Heart Failure: The Better Effectiveness After Transition-Heart Failure (BEAT-HF) Randomized Clinical Trial	randomized controlled trial (RCT) this study combines health telephone calls and telemonitoring. telemonitoring uses electronic devices that collect daily blood pressure data, heart rate, symptoms, and weight.	After 180 days there was an improvement in quality of life between the two groups.
Inglis, et al (2017)	Structured telephone support or non-invasive telemonitoring for patients with heart failure	Systematic review compare structured telephone support or non-invasive home telemonitoring to traditional ones	There was a change in quality of life, knowledge and self-care behavior.
Piette, et al (2015)	A Mobile Health Intervention Supporting Heart Failure Patients and Their Informal Caregivers: A Randomized Comparative Effectiveness Trial	randomized controlled trial (RCT) mHealth services (standard mHealth) or included services feedback to patient Care partners (mHealth + CP).	It was reported that at 6 months (P = .02) and 12 months (P < 0.01) patients were taking medication as prescribed after being given mHealth and CP.
Ware, et al (2018)	Implementation and Evaluation of a Smartphone-Based Telemonitoring Program for Patients with Heart Failure: Mixed-Methods Study Protocol	Mixed Methods Smartphone based TM program with algorithm for HF patients	As of April 4, 2018, 166 patients have registered for the Medly program.
Rosu, et al (2020)	Heart Failure Self-Management Using a Mobile Web-Based Telemonitoring System: Impact on Hospital Readmission and Quality of Life	randomized controlled trial (RCT) Doctors monitored and recorded blood pressure, heart rate, and weight of patients in group A. In group B, patients measured their weight independently. after being discharged for 45 days Both groups had physician telephone support.	In the MLHFQ score that was assessed for 45 days there was a change in the quality of life in both groups.

The results of the literature review found that there was an effect of implementing this electronic-based application on increasing knowledge of heart failure patients, this was due to the exchange of information between patients as recipients of services and nurses from patients entering to patients leaving the inpatient room. hospital, if someone gets a lot of information then they tend to have a lot of knowledge (Agustin, 2017).

Self-care and medication adherence have also been reported to increase where the process of formation and behavior change is influenced by factors contained in the individual. According to Prihatiningsih & Sudyasih, (2018) Self-care or self-care in patients with heart failure include taking medication regularly, reducing salt consumption in the diet, exercising regularly, and monitoring symptoms regularly. This is reflected in the patient's compliance with the program provided by health workers to patients.

#### LIMITATION OF THE STUDY

In this literature review we take all the articles related to electronic discharge planning without specifying the type of electronic discharge planning used in the article so as to allow differences in the results from one article to another.

#### CONCLUSION AND SUGGESTION

Based on the results of a literature review, there are benefits that can be obtained from this application, in addition to making it easier for health workers to monitor patients remotely, this application can also improve quality of life, self-care, knowledge and also medication adherence in heart failure patients.

Further research is needed by paying attention to the type of electronic discharge planning used and the large number of samples to determine the effect of electronic discharge planning on heart failure patients.

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#### Conflict of Interest Statements

The author declares that in this study there is no conflict of interest and no relevant or material financial interest.

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