

## The Effect Of Information Technology-Based Discharge Planning On Readiness To Go Home In Congestive Heart Failure

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### ABSTRACT

Congestive Heart Failure (CHF) is a disorder of the cardiovascular system characterized by the decreased ability of the heart to pump blood to meet the body's oxygen needs, with clinical signs including fluid overload and poor tissue perfusion. The high rate of readmission or rehospitalization occurs due to a lack of self-care and non-compliance with medical treatment, which affects the quality of life. The provision of IDEAL discharge planning from the moment the patient is admitted to the hospital until the patient is ready to go home is very important to provide education in order to enhance the patient's readiness to go home. This study aims to determine the effect of providing discharge planning based on information technology media on the readiness of CHF patients for discharge. The research design is a quasi experimental post-test only non-equivalent control group. In this research design, the measurement of discharge readiness is conducted only after the discharge planning is provided. The sample size in this study was 54 respondents divides into two groups using purposive sampling technique. The instrument used was the Readiness for Discharge Scale (RHDS) questionnaire. The result of this study were determined based on the Independent t-test and obtained a p-value <0.05 (0.0001), meaning that discharge planning significantly affects the readiness for discharge in CHF patients at RSUD dr. Loekmono Hadi Kudus. The recommendation from this study is that healthcare professionals should utilize information technology as one way to provide discharge planning to improve the discharge readiness of CHF patients. For future research, the implementation of IDEAL discharge planning can be used as a reference, and it is advisable to expand the scope of variables studied that may influence the discharge readiness of CHF patients.

## INTRODUCTION

*Congestive Heart Failure* (CHF) is a public health problem that continues to increase in developed and developing countries, characterized by a decrease in the heart's ability to pump blood to meet the body's oxygen needs (Laksmi et al., 2020). In addition, CHF is a complex clinical condition with signs of excess fluid and poor tissue circulation (Apriliani et al., 2020). Despite advances in prevention and treatment, CHF patients still frequently experience hospitalization with low rates of illness, death, and quality of life (Sinaga et al., 2016).

According to the World Health Organization (2021), cardiovascular disease is the number one cause of death in the world with 17.8 million deaths or 31% of total deaths. The results of *a literature review* in the study of Savarese et al., (2022) stated that CHF is a global pandemic with a total of 64.3 million cases in the world in 2017 and this figure is estimated to continue to increase. The American Heart Association (2023) records 17.3 million deaths per year from heart disease with CHF prevalence from NHANES data collected between 2015 and 2018 amounting to about 6.0 million people in the U.S. aged  $\geq 20$  years. In Indonesia, heart disease sufferers are expected to continue to increase to reach 23.3 million by 2030 and rank 5th with the number of CHF cases of 1,017,290 population (Risksdas, 2018). In Central Java Province, the prevalence of heart disease is 1.4% with the number of CHF cases as many as 2.6% or around 132,565 people (Central Java Health Office, 2023). In Kudus City, the number of cases of heart disease aged  $>15$  years was 232,914 people or 26.85 of the entire population (Kudus Health Office, 2023).

Data at dr. Loekmono Hadi Kudus Hospital shows that the number of patients hospitalized in 2024 is 706 patients or around 59 every month.

The results of a preliminary study conducted by the researcher after conducting an interview with the Nursing Coordinator found that the implementation of *conventional discharge planning* from the hospital was only carried out when the patient was said to be allowed to go home by the doctor and was not carried out since the patient was hospitalized. The *discharge planning* method used is still manual or through EMR which includes RM No., name, room, DPJP, nurse in charge, primary diagnosis, secondary diagnosis, patient needs such as *daily activity* (with rehabilitation consultation options, need prosthetic limbs, need limb movement and others), nutrition education (nutrition consultation), chronic pain management (pain team consultation, independent treatment, education about medicine), sustainable disease management (the destination item is disease management and the item where there is a choice of practicing doctors, *homecare*, hospitals, orphanages/halfway houses and health centers) and other needs of patients such as consultations with doctors or other medical personnel.

In CHF patients, they often experience relapses or readmission due to non-compliance with therapy, such as not complying with medical follow-up, violating dietary rules, non-adherence to medication, excessive exercise or not recognizing relapse (Khasanah et al., 2020). In addition, CHF patients who have poor self-care management can lead to *increased rehospitalization*. It is necessary to monitor self-care management to reduce *rehospitalization* and recurrence (Pratiwi et al., 2021). To increase knowledge and readiness to go home to patients and their families, it is necessary to provide *discharge planning* that is carried out on patients from the beginning of hospitalization until the patient will be discharged from the hospital (Hidayah et al., 2021). According to Hidayah et al., (2020)

*discharge planning* is a systematic process that begins when the initial patient enters the hospital and continues until the patient will go home/out of the hospital.

According to Henke et al., (2017) *discharge planning* is a health service process that involves patients and families in preparing for the patient's return so that they can maintain their health status. *Discharge planning* must focus on the patient's problems, such as nursing care and rehabilitation. The goal is to inform patients about their illness and what they should do at home, as well as provide information about the patient's needs (Sagala & Hasibuan, 2020). In addition, the patient's health problems or the family's unpreparedness to return to the hospital can also be influenced by the family's ignorance or inability to carry out treatment independently at home. This increases the likelihood of complications and leads to *rehospitalation*. For this reason, in improving the patient's condition and quality of life, a *discharge planning program can be given* that starts from the moment the patient enters the hospital (Dewi, 2019).

By providing *discharge planning* to families, it can increase readiness to treat patients at home. *Discharge planning* given to patients and families can contain a detailed picture of the patient's illness and monitoring of treatment while at home such as diet, weight control, physical exercise, lifestyle and control of medications taken by the patient, as well as being able to recognize signs and symptoms related to the worsening of CHF (Grady & Gough, 2018). The patient's readiness to go home is one of the indicators in the success of *discharge planning* with a *discharge planning process* involving the level of readiness, awareness of patients and families (Jannah et al., 2019).

In accordance with research conducted by Cheyne & Bowers (2016) states that *discharge*

*planning* can shorten the length of the treatment day or *Length of Stay* (LOS) from 36 hours to 30 hours. Another study conducted by Rahmawati et al., (2024) stated that CHF patients who had a *Length of Stay* (LOS) of  $\geq 4$  days had a 3,105 times greater risk of readmission compared to patients who had a length of treatment  $>4$  days. In addition, patients with cardiovascular comorbidities (such as hypertension and DM) had a 4.3-fold higher risk of remission than patients without such comorbidities.

It is also in line with Clifford's (2014) research that the implementation of *discharge planning* is sustainable from the time the patient enters the inpatient room until they are ready to go home meaningfully and is able to significantly reduce anxiety in patients and increase patient and family knowledge about the health conditions of patients with heart problems which can speed up the treatment process in the hospital.

*Discharge planning* requires identifying patient needs. In this case, the provision of structured *discharge planning* methods such as IDEAL *discharge planning* can help health services in improving the process of discharge patients and result in a decrease in the number of readmissions (Adhistry et al., 2018).

IDEAL *discharge planning* consists of several stages, namely: *Include*, *Discuss*, *Educate*, *Assess*, *Listen* (Adhistry et al., 2018). In the *Include item*, which is always involving patients and families as full partners in the process of planning for their return home by asking about the patient's current condition, current disturbing complaints, obstacles experienced during treatment and expectations after going home, *Discuss*, which is to have discussions with parents and families to prevent problems at home such as life patterns at home, drug use, etc. *Educate* is providing education to patients and families in a simple

way about information related to the patient's condition, education on medicines and if there is an emergency for the disease, the first action taken. *Assess* is assessing how well the doctor and nurse explain the nurse's next steps at home and *Listen* is listening to what the patient and family will worry and complain about after returning home.

*Discharge planning* is very important in improving the quality of life of patients before going home and to prepare patients for going home and improve patient safety. The implementation of *discharge planning* in this modern era can be achieved by taking advantage of technological developments in the health sector, namely by planning who to go home using a simple *digital-based discharge planning* in the form of a *website* that can be accessed via *smartphones* to make it easier for patients and nurses to prepare for their discharge.

Therefore, the purpose of this study is to determine the effect of *discharge planning* based on information technology media on the readiness of CHF patients to go home using the IDEAL method.

## **METHODS**

This study is a quantitative research with a *quasy experiment post test only non equivalent control group design*. The instrument used is a homecoming readiness questionnaire in the form of the *Readiness of Hospital Discharge Scale* (RHDS). Data analysis used the Independent T test to determine the effect of *discharge planning* on the readiness to go home in CHF patients using information

technology media in the form of *websites* and the IDEAL *discharge planning method*.

The number of samples in this study was 54 respondents which were divided into two groups, namely the intervention group and the control group. The sampling technique used is *purposive sampling*.

## **RESULT AND DISCUSSION**

### **RESULTS**

The results of this analysis are as follows:

The distribution of characteristics in two groups, namely the intervention group and the control group with a total of 54 respondents divided into two groups, each consisting of 27 respondents. Most of the respondents in the intervention group were male (23 respondents) (85.2%) as well as in the control group of male respondents were 16 respondents (59.3%). Age-related data in the intervention group was in the category of early elderly aged 46-55 years (44.4%) by 12 respondents (44.4%) while in the control group most of the respondents were in the age category of the late elderly aged 56-65 years. According to the education level in both intervention and control groups, the average education in elementary school was 15 respondents (55.6%) in the intervention group and 20 respondents (74.1%) in the control group. In terms of CHF classification, most of the respondents in both groups were in NYHA III with 18 respondents (66.7%) in the intervention group and 19 respondents (74.1%) in the control group. And finally, based on the length of suffering from CHF, most of the respondents in both groups were at the level of  $\leq 5$  years of 18 respondents (66.7%) in the intervention group and 19 respondents (70.4%) in the control group.

Table 1  
Respondent Characteristics  
(n=54)

No.	Variabel	Total			
		Kelompok Intervensi		Kelompok Kontrol	
		n = 27	%	n = 27	%
1.	Jenis Kelamin				
	Laki-laki	23	85.2	16	59.3
	Perempuan	4	14.8	11	40.7
2.	Usia				
	Remaja akhir (18-25 tahun)	0	0	0	0
	Dewasa awal (26-35 tahun)	0	0	0	0
	Dewasa akhir (36-35 tahun)	1	3.7	0	0
	Lansia awal (46-55 tahun)	12	44.4	7	25.9
	Lansia akhir (56-65 tahun)	8	29.6	14	51.9
	Manula (>65 tahun)	6	22.2	6	22.2
3.	Pendidikan				
	SD	15	55.6	20	74.1
	SMP	6	22.2	2	7.4
	SMA	6	22.2	5	14.8
	Perguruan Tinggi	0	0	0	96.3
4.	Klasifikasi CHF				
	NYHA I	0	0	0	0
	NYHA II	6	22.2	4	14.8
	NYHA III	18	66.7	19	74.1
	NYHA IV	3	11.1	3	11.1
5.	Lama Menderita CHF				
	≤5 tahun	18	66.7	19	70.4
	>5 tahun	9	33.3	8	29.6
	<b>Total</b>	<b>27</b>	<b>100.0</b>	<b>27</b>	<b>100.0</b>

Table 2  
Overview of CHF Patient's Readiness to Go Home After Being Given Discharge Planning  
(n=54)

Variabel	n	Kesiapan Pulang		
		Mean	SD	Min-Max
Post Discharge Planning Kelompok Intervensi	27	186.59	8.741	166 - 203
Kesiapan Pulang Pasien CHF Kelompok Kontrol	27	166.85	13.093	144 - 195

Table 3  
The Effect of Information Technology-Based Discharge Planning on Readiness to Go Home  
in Congestive Heart Failure (CHF) Patients (n = 54)

Discharge Planning Kesiapan Pulang	Mean	df	P value	Nilai t
Post test kelompok intervensi	186.56			
Post test kelompok kontrol	166.85	52	0.0001	6.516

The distribution of characteristics in two groups, namely the intervention group and the control group with a total of 54 respondents divided into two groups, each consisting of 27 respondents. Most of the respondents in the intervention group were male (23 respondents) (85.2%) as well as in the control group of male respondents were 16 respondents (59.3%). Age-related data in the intervention group was in the category of early elderly aged 46-55 years (44.4%) by 12 respondents (44.4%) while in the control group most of the respondents were in the age category of the late elderly aged 56-65 years. According to the education level in both intervention and control groups, the average education in elementary school was 15 respondents (55.6%) in the intervention group and 20 respondents (74.1%) in the control group. In terms of CHF classification, most of the respondents in both groups were in NYHA III with 18 respondents (66.7%) in the intervention group and 19 respondents (74.1%) in the control group. And finally, based on the length of suffering from CHF, most of the respondents in both groups were at the level of  $\leq 5$  years of 18 respondents (66.7%) in the intervention group and 19 respondents (70.4%) in the control group.

Based on Table 2, the average level of readiness to go home in the intervention group after discharge *planning* was 186.59 and in the control group was 166.85.

Based on table 3, the results of the statistical test using *the Independent T Test Sample* were obtained with a *p value* of  $<0.05$  (0.0001) so that  $H_a$  was accepted and  $H_0$  was rejected, meaning that there was a significant influence of the provision of *information technology-based discharge planning* on the readiness to go home in CHF patients. With a *t value* of 6,516, it shows that there is a difference between the *intervention post test* group and the *control post test*.

## DISCUSSION

### Respondent Characteristics

Based on the results of the study, the majority of patients who experienced CHF in both groups were men, with 23 respondents (85.2%) in the intervention group and 16 respondents (59.3%) in the control group.

In accordance with what is stated by Muti (2021) quoted by Priandani et al., (2024) that men are at higher risk of cardiovascular disease compared to women, due to unhealthy lifestyle behaviors such as smoking and consuming alcoholic beverages. In line with Prahasti & Fauzi (2021), men have a higher susceptibility to CHF disease than women and the death rate due to CHF in women is lower than in men. In addition, according to Daersa & Nurbaeti (2023), it is stated that in general, men have a higher prevalence of heart failure than women. This condition is caused by the presence of the hormone estrogen in women which is influential in the process of fat metabolism and the control of cholesterol levels in the body.

The results showed that most of the respondents in the intervention group who suffered from *Congestive Heart Failure* (CHF) aged 46 – 55 years were 12 respondents (44.4%). Meanwhile, the control group showed most of the responses in vulnerable 56-65 years old as many as 14 respondents (51.9%).

According to Putri & Hudiyawati (2022), it is stated that as they age, a person is at higher risk of developing CHF due to decreased heart function. In line with research conducted by Priandani et al., (2024) that patients aged >40 years are more at risk of heart failure than patients aged ≤40 years. This is because at the age of >40 years is still classified as productive age where in the productive age group there is a greater tendency to suffer from CHF and increasing age causes structural and functional changes in the heart and blood vessels.

In addition, according to Adirinarso (2023) quoted by Sari (2024), the elderly often experience anatomical, physiological, and pathological changes that can affect heart function. For example, even if blood pressure is normal, the left ventricular wall may thicken, accompanied by fibrosis and classification of the heart valves, especially in the mitral annulus and aortic valves as well as a reduced number of cells in the sinoatrial nodule (SA Node) that have the potential to disrupt the heart's electrical delivery system. These conditions will continue to increase the risk of CHF in the elderly. According to Aisyah et al., (2023) along with age, a person's risk of developing heart disease also increases. Aging can lead to a decrease in the elasticity of connective tissue as well as a decrease in the ability of blood vessel smooth muscles to relax. As a result, blood vessels become less able to stretch, so the heart has to work harder to pump blood throughout the body.

The results showed that most of the respondents in both groups were elementary education, where in the intervention group as many as 15 respondents (55.6%) and in the control group as many as 20 respondents (74.1%).

In line with Safetyka's (2019) research cited by Sari (2024), CHF patients tend to have a limited level of education at the elementary level. According to Khasanah et al., (2020) states that

a person's level of education can affect their health condition. A person with a low level of education tends to have limitations in acquiring knowledge and information, so the motivation to maintain health is lacking.

In contrast, individuals with higher education will have easier access to information and broadened insights that encourage them to care more about their health and work to improve their quality of life. A person's level of education also plays a role in heart disease control efforts, such as in terms of recognizing symptoms, as well as understanding factors that can help control the condition in patients. In addition, a person's ability to understand *discharge planning* education, especially when delivered through *leaflet* media, is also influenced by the teaching stick on a person (Aisyah et al., 2023).

The results of this study show that the majority of respondents in both groups are classified as NYHA III. In the intervention group there were 18 respondents (66.7%) and in the control group as many as 19 respondents (74.1%). NYHA III is a classification of heart failure levels with obvious activity limitations due to the onset of symptoms, even when doing light activities such as walking for 20-100 meters and comfort is obtained when the patient rests (New York Heart Association, 2023).

Research by Lim et al., (2019) cited by Ryandini & Karsanah (2024) states that CHF patients with NYHA III and IV degrees have a high risk of undergoing retreatment or rehospitalization due to suboptimal self-care management. According to Ryandini & Noviyanti (2020), the quality of life in CHF sufferers is affected by left ventricular dysfunction, which can be assessed using the NYHA (New York Heart Association) scale. This scale classifies severity ranging from mild to severe based on the physical complaints felt by the patient as well as the heart pump

function measured through the LVEF (Left Ventricular Ejection Fraction) value.

Hasil penelitian didapatkan dari kedua The group showed most of the respondents had CHF disease for  $\leq 5$  years. In the intervention group there were 18 respondents (66.7%) and in the control group as many as 19 respondents (70.4%).

This is in line with the research of Audi et al., (2017) cited by Ryandini & Karsanah (2024) which states that patients with a long period of suffering for 2-5 years and 6-10 years have lower scores of mental states than patients who have only suffered for less than one year. However, in a study conducted by Audi et al (2017), it was also found that some respondents with a sick period of more than 5 years still have a good quality of life, because they have been able to adapt to changes in their physical condition and the support of their families as a support system.

#### The Effect of Discharge Planning Based on Information Technology Media on Readiness to Go Home in CHF Patients

Readiness is a psychological condition that a person has before taking certain actions, including when leaving a health care facility. This attitude can be influenced by internal and external factors. Therefore, the patient's readiness to go home from health services will be closely related to the level of patient satisfaction with the services he receives (Black & Hawks, 2014) in Sagala & Hasibuan (2020). In CHF patients, it is said that they are ready to go home when the patient and family have the knowledge, skills and attitudes to provide various types of care between hospitals and communities and they are able to improve and maintain their health status (Nursalam, 2016).

In addition, according to Holm et al., (2014) in Kusumawardhani et al., (2024) stated that the

patient's return is highly dependent on several criteria, including the patient's ability to dress himself, in and out of the bedroom, pain, the ability to sit and stand from a chair or toilet, independence in self-care, mobility with walkers, as well as adequate oral medication to reduce pain (NRS  $<3$  during activity).

According to Weiss et al., (2007) in (Kusumawardhani et al., 2024) CHF patients are said to be ready to go home have several influencing factors, including patient characteristics, hospitalization factors, and nursing factors. Patient characteristics consist of age, gender, race, socioeconomic status, treatment payment method and solitary status. For hospitalization factors, hospitalization factors are transitional factors including patient experience when entering the hospital, entering the planned inpatient room, previous hospitalization with the same diagnosis, and length of hospitalization. Then the nursing factor is a factor in the treatment strategy to rearrange the patient's home, which includes discharge instructions and treatment arrangements that all stages of care must be taught and all important things must be repeated (Rajala et al., 2018).

One of the efforts that can be made to improve knowledge of self-care management and readiness to go home in CHF patients is by providing health education. The provision of health education can be provided through discharge *planning*. One of the strategies used in *discharge planning* is carried out in a structured manner in accordance with research conducted by Jannah et al., (2019) that *discharge planning* that is applied systematically, structured and applicative can provide benefits in maintaining continuity of follow-up care, especially for patients with palliative diseases with a *discharge planning* format which needs to be arranged in a structured and integrated manner to ensure the continuity of health services runs optimally.

According to Cui et al., (2022) the measurement of patient readiness to go home can be done using *the Readiness for Hospital Discharge Scale (RHDS)*, which is an instrument developed by Weiss & Piacentine (2006). This measurement tool consists of 21 items that assess patients' perceptions of their readiness to return to the home environment based on four main dimensions, namely personal status, knowledge, coping ability and support. Personal status refers to the physical and emotional condition of the patient shortly before discharge. Knowledge refers to the patient's view of the adequacy of information needed to overcome problems during the recovery period at home. Meanwhile, support is interpreted as the hope for emotional and instrumental support that can facilitate the transition process to home-based care

The results of the study based on the Independent T Test showed a p-value of  $<0.05$  (0.0001), which showed that  $H_a$  was accepted and  $H_0$  was rejected which indicated that Information Technology Media Based Discharge Planning had a significant effect with a positive direction on the readiness to go home in Congestive Heart Failure (CHF) patients at dr. Loekmono Hadi Kudus Hospital compared to the control group.

Discharge planning is an ongoing process used to prepare for patient self-care after hospitalization. This is to identify and plan for the sustainability needs of patients and facilitate health services from other environments. Thus, the health team has enough opportunities to carry out discharge planning (Dewi, 2021). And basically, discharge planning is a program that provides health information or education to patients about nutrition, physical activity, exercise, medications and signs of symptoms related to the disease suffered by the patient so that the patient and family know the management of

patient care after returning home as well as the dynamic health limitations and consequences. This program is designed to enable supervision of health and social services before and after recovery (Nursalam, 2014).

The purpose of discharge planning is to make patients ready to stay at home after discharge from the hospital by providing information about health (Jayanti et al., 2024). According to Ryandini (2020), the purpose of discharge planning is to find special needs in achieving the best level of health after discharge. In addition, it aims to prepare patients and families physically, psychologically, and socially, increase patient and family independence, improve ongoing care, assist patient referrals to other service systems, assist patients and families in acquiring knowledge and skills and attitudes in maintaining the patient's health status, and provide various care options between homes and communities.

Discharge *planning* can be done by utilizing information technology as well as using information technology in the form of a *website* which is used as an educational medium to increase the readiness of CHF patients to go home. This is in line with research conducted by Megasari (2022) that discharge planning that utilizes information technology can increase the readiness to go home in IMA patients. In addition, the implementation of discharge planning through technology-based health education can also have a positive impact on increasing patient knowledge related to diseases and self-care, because information can be obtained in a more convenient, attractive, easily accessible or operated way in carrying out independent care when compared to conventional education methods (Aisyah et al., 2023).

The effectiveness of discharge planning that utilizes information technology media on readiness to return home has been proven in

several studies such as Rosenkranz's (2018) research cited by Megasari (2022) that the use of information technology in discharge planning provides a number of benefits, such as increasing effectiveness, saving time and making its implementation more structured. In addition, according to Aziz et al., (2018) the use of information technology has been proven to be more effective and interactive in supporting patients' readiness to go home, as well as playing a role in efforts to prevent potential emergency conditions after discharge.

The method applied in patient discharge planning focuses on five important aspects of health education, known as IDEAL. IDEAL consists of Include, Discuss, Educate, Assess, and Listen. However, the provision of discharge planning is still in accordance with the policy of the hospital.

Include yang merupakan Melibatkan patients and families as full partners. The family in the hospital may not be the family that provides the care. What is the treatment/lifestyle like at home. Discussion is discussing with patients and families related to 5 areas of care to prevent further problems during home care such as the living environment/lifestyle at home, medications, signs and symptoms of problems/diseases suffered, results of examinations and medical examinations or follow-ups. Educate is providing education to patients and families in a simple way about information related to the patient's condition, the discharge process, the purpose and needs of the health education provided, medicine education in case of emergency/first action taken against the disease, use teach-back, show-back (reconfirm) to the patient and family with the aim of ascertaining whether the patient and family understand what is being explained and are able to re-educate. Assess is how well the doctor or nurse explains the treatment while at home and the needs of the patient at home by teaching important points

and repeating them. After that, ask the patient or family to explain it simply according to their understanding. And lastly, Listen which is listening to what patients and families complain about their concerns after returning home and respecting their goals and preferences by asking open-ended questions, scheduling discussions with patients and families and encouraging patients and families to take notes on care-related questions while at home.

## CONCLUSION

The results of this study show that there is a significant influence between *discharge planning* on the readiness to go home in CHF patients who use information technology media in the form of *websites* and the IDEAL *discharge planning method*. For future researchers, it is recommended to expand the scope of the variables studied, for example by adding other factors such as the level of family support, patient motivation or socioeconomic factors that may also affect the readiness of CHF patients. In addition, the technology media used can be varied or developed more interactively, so that it can increase the effectiveness and motivation of patients in preparing for return.

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