



## Bioscientia Medicina: Journal of Biomedicine & Translational Research

Journal Homepage: [www.bioscmed.com](http://www.bioscmed.com)

### Overview of Discharge Plan Strategies in Rural and Remote Areas: A Narrative Literature Review

Wahyu Wiryawan<sup>1</sup>, Pratama Nurmalik Adhuri<sup>2\*</sup>

<sup>1</sup>Postgraduate Student, Master of Public Health, Main Interest in Hospital Administration, Faculty of Public Health, Universitas Diponegoro, Semarang, Indonesia

<sup>2</sup>Postgraduate Student, Master of Biomedical Science, Faculty of Medicine, Universitas Diponegoro, Semarang, Indonesia

#### ARTICLE INFO

##### Keywords:

Discharge Planning  
Remote areas  
Rural

##### \*Corresponding author:

Pratama Nurmalik Adhuri

##### E-mail address:

[pratama.adhuri@gmail.com](mailto:pratama.adhuri@gmail.com)

All authors have reviewed and approved the final version of the manuscript.

<https://doi.org/10.37275/bsm.v6i8.555>

#### A B S T R A C T

Discharge planning is a systematic process that includes assessment, preparation, and coordination and involves various disciplines to provide optimal service. In Indonesia, there are 62 underdeveloped areas that have limitations in health services. Discharge planning in remote areas requires adaptation to be accepted in the community. This review aims to find an effective patient discharge strategy to be implemented in rural areas. Telepharmaceuticals and telerobots act as discharge planning interventions in remote areas. Remote monitoring, such as a pharmacological intervention in late life (PILL) program that focuses on monitoring the treatment of patients with polypharmacy. Interprofessional education and collaborative practice (IPECP) is suitable to be carried out in remote areas where limited facilities stimulate health workers to collaborate. Patient activation measure (PAM) to assess the ability and engagement of patients in maintaining their health. In addition, interventions were found in the form of making patient-centered guidelines in the form of ROADMAP (rural options at discharge - model of active planning).

#### 1. Introduction

Discharge planning or discharge planning is a dynamic and systematic process of assessment, preparation, and coordination that is carried out to provide convenience for social health services before and after the patient returns home.<sup>1</sup> This process is centered and well-coordinated by involving various disciplines to discuss problems with patients in order to obtain optimal services.<sup>2</sup> Discharge planning is a multidisciplinary approach to the continuity of patient care, where this process involves the process of identification, assessment, goal setting, planning, implementation, coordination, and evaluation.<sup>3</sup>

Discharge planning has been developed and made

into several policies and found in many studies. In policies used abroad, discharge planning includes several factors to achieve an effective, timely, safe, and patient-centered patient transition from hospital to home, namely the need for effective communication with individuals and between services, alignment of care to ensure continuity of treatment, efficient systems and processes to assist the discharge process, clear management plans, identification of discharge dates, identification of discharge coordinators, review, and a 7 day a week discharge planning system.<sup>4</sup>

One of the factors that complicate discharge planning is the lack of effective communication and

collaboration between hospitals and primary care physicians as well as primary health facilities. Therefore, several kinds of literature develop evaluations and interventions to support communication and the process of transferring information when returning patients, including the existence of structured communication facilities, instructions for the discharge planning process, discharge planning checklists, instructions for collaboration, and patient education strategies.<sup>4</sup>

Rural and remote areas have many limitations in the world of medical practice. One of them is the application of discharge planning. Patients from small towns or rural areas have complex barriers. Several factors need to be considered in patients who come or are in remote areas or remote areas, such as housing conditions, food intake, treatment, daily companion, level of patient independence, income and economic status, emotional support and counseling, health insurance, and medical bills, scheduling follow-up and rehabilitation, transportation, and lifestyle.<sup>5,6</sup>

In Indonesia alone, there are 62 regions that are designated as underdeveloped areas.<sup>7</sup> Communities in underdeveloped, archipelagic, and remote areas (DTPK-T) have limited access to health services, either due to geographical conditions or due to limited facilities, infrastructure, and the number of health workers that make it difficult to access health for people in disadvantaged areas, borders, islands. And remote DTPK-T. Therefore, people in disadvantaged areas, borders, islands, and remote areas (DTPK-T) use basic health service facilities/Puskesmas (50.5%) more than those who rely on doctors or hospitals.<sup>8</sup> Discharge planning certainly needs to make adaptations so that it can be accepted by people living in remote areas and improve the quality of health services in the regions. In this review, several discharge planning strategies that have been carried out in remote or remote areas will be presented as a reference.

### **Pharmacological intervention in late life**

The intervention used is the PILL (pharmacological

intervention in late life) program protocol which is applied to patients over 65 years of age who are sent home immediately and allow intervention to be given. Priority patients were patients with polypharmacy (> 12 kinds of drugs), patients with cognitive impairment, congestive heart failure, and aged more than 75 years.<sup>9</sup> Through this program, patients are screened every day by the pharmacy, where this team has confirmed to the relevant hospital regarding the patient's medical record. During the interview, problems such as the under-dose of the drug, misunderstanding of the regimen, and the compatibility of the drug prescribed and administered were evaluated. Pharmacists also check regimens that are contraindicated, have no indications, are duplicated, and are drugs that are not given the right dose. This call is recorded as a record in the interest of the patient. Pharmacists can directly contact the doctor who is in charge of the patient if any doubts or complaints are found from the patient. The aim of this intervention is to reduce the rate of acute care (emergency) visits, readmission rates, and mortality rates 30 and 60 days after discharge.

The obstacle faced in the pharmaceutical sector is the difficulty of contacting patients within 3-5 days from the target, where the average first call is 7.5 days after being discharged from Boston and 6 days from Togus. The time required to call each patient is 65 minutes for each patient. Almost 95% of patients had at least 1 drug change from the time of discharge, i.e., 78% required additional therapy while 37% of drugs were discontinued. In addition, it was also found that 12% took the wrong dose, 13% took drugs that were not indicated, and 18% had duplicate prescriptions. Pharmacists also found problems that required follow-up from primary care providers in 58% of Boston Hospital patients and 66.7% of Togus Hospital patients. Patients with the PILL intervention needed emergency care less frequently during the 30 days after discharge (7 of 20 patients, OR = 0.30; 95% CI: 0.12 – 0.75), while at 60 days, it was also found to be less frequent (16 of 26 patients) but not significant. Mortality outcomes 30 and 60 days after discharge

were not assessed because they were not found in both groups.

### **Best possible medication discharge plan**

The second intervention used is called a best possible medication discharge plan (BPMDP), in which a list of the most recent drugs that are most suitable for the patient is provided. It is important to ensure that the BPMDP is accurate, easy to understand, and explained to all staff treating patients to optimize treatment efficacy, prevent side effects, and reduce readmission. Identification of patients with polypharmacy who are most at risk, such as patients with heart failure, COPD, digestive diseases, arrhythmias, and pneumonia, are prioritized for inclusion in this program. The pharmacy makes a BPMDP, and after that, an interview is conducted between the patient and the pharmacy using Double Robotics in the patient's room or private room. The pharmacist explains the patient's discharge medication, counsels the patient, provides hard copies of the BPMDP to the patient, and stimulates the patient or family to ask questions about the treatment plan. Conducted 9 interviews with the results of a positive response of 80%. To do this BPMDP interview takes about 60 minutes. Some of the difficulties experienced were internet connectivity, machine operation, and notification of sudden patient discharge. The advantage of this method is that it provides access to patients in areas that have fewer staff to provide patients with pharmaceutical services with the help of robots.

### **Interprofessional education and collaborative practice**

The third intervention that can be implemented is interprofessional education and collaborative practice (IPECP), in which health workers increase collaboration among each other to improve the quality of health services.<sup>10</sup> The intervention involves health workers learning to work in an interprofessional team, conducting joint interventions between clinicians, and identifying the goals and expectations of patients and

their families. In this study, an analysis of teamwork was carried out in 5 groups, with the results of 2 groups showing good collaboration. The results found are that the IPECP application is suitable to be carried out in remote areas where limited facilities will stimulate health workers to work in teams and collaborate. IPECP in remote locations must be facilitated by governments, organizations, and communities at various levels in order to work effectively.

### **Patient activation measure**

The fourth intervention is in the form of a patient activation measure (PAM) questionnaire which aims to assess the ability and engagement of patients in maintaining their health.<sup>11</sup> Previous studies have indicated that patient activation is associated with improved health outcomes and a better healthcare experience. The vulnerable period after the patient's discharge and the long distance to health services cause high demands for patients to have the ability and confidence in their own health care at home. In this study, 248 questionnaires were completely completed. The use of the Swedish version of PAM-13 has high reliability but cannot represent a single construct conclusively. Further development and research are needed on the use of PAM-13 for its clinical use.

### **Rural options at discharge-model of active planning**

The fifth intervention is in the form of guidelines for the discharge of patients to remote areas. The ROADMAP (rural options at discharge – model of active planning) guidelines are patient-centered.<sup>12</sup> Stages involved are making a referral transition, preparing for patient discharge and transition conference, initiating local services with the help of a local community coordinator, monitoring in the form of a patient transition record, ensuring the transition of patients to become independent, and identifying the support needed. With the detailed guidelines, it is hoped that this model can be applied to remote areas to provide

holistic and applicable patient discharge services that are easily accepted in remote communities.

### **Telemedicine as a discharge planning strategy**

Finding an effective strategy for discharge plans in remote areas is a challenge because of the many factors that must be considered with various limitations.<sup>13-15</sup> The transition to discharge requires health care responsibilities to involve patients in an active role in care planning and follow-up. In addition, the most important key in the transition process from inpatients to outpatients is in the first one to two weeks. This is because the initial follow-up visit can help the doctor identify if there is a problem post-discharge hospitalization. However, patients living in remote areas are more difficult to access health facilities due to limited transportation and other factors, so they tend not to do post-follow-up care. Meanwhile, in remote areas, access to health is one of the main determinants affecting the outcome of health care and services. One solution that can be used to address the gap in access to health in populations in remote areas is the use of telehealth interventions.<sup>16-17</sup>

Telehealth is a method that can communicate health care services remotely and allows real-time communication between patients and doctors regardless of time and distance. One aspect of discharge planning in the form of follow-up care in the first 2 weeks is very important because it can reduce the risk of readmission within 30 days.<sup>18</sup> This health care service can facilitate access for follow-up of patients after treatment by using communication with related health workers via telephone or online video conferencing, which can be done from the patient's home or from the affiliated health facility closest to the patient. Limited access to health care, especially in follow-up patients, can result in worsening the patient's health if follow-up is not carried out. Therefore, the use of this method can monitor the patient's symptoms and adherence to drug consumption.<sup>18-20</sup>

Based on previous research, patients and health

workers are willing to participate and show satisfaction in the use of telemedicine. Respondents who took part in telemedicine studies gave a positive response to the use of this method in helping and facilitating access to communication with health workers. With telehealth, there is a reduction in costs, distance traveled, and time spent getting health services. Studies on the use of telemedicine for the care of discharged patients have been implemented in various countries and in several health divisions. Previous studies found positive outcomes and experiences experienced by patients in remote areas in the use of telehealth, such as higher acceptance and satisfaction, efficiency, and convenience. In addition, it reduces costs, and the number of staff increases access and increases education and training for health workers. The acceptance of telehealth during the pandemic has increased tremendously to the point where restrictions on the use of telehealth have ceased to exist.<sup>13,14</sup>

While there are many advantages to using telemedicine services in remote populations, some limitations are also unavoidable from this solution. Some of the disadvantages of this method are the provision of access to technology such as computers, telephones, smartphones, and access to the internet. In addition, communities in remote populations also lack the resources and staff to influence these health care outcomes using telemedicine solutions.<sup>13,14</sup>

### **2. Conclusion**

An effective strategy for a discharge plan in remote areas is a challenge in itself because of the many factors that need to be considered. One solution to overcome this access gap is to use telemedicine health services, which can facilitate access to health for people in remote populations. It can also shorten the time, reduce the cost of travel required to get to a health facility as well as an indirect effect on health care providers. However, this strategy still has some drawbacks where computers, telephones, smartphones, and access to the internet are still relatively unsupportive for telemedicine strategies. In

addition, people in remote populations, especially in Indonesia, also have relatively few resources and staff to carry out telemedicine as a discharge plan for patients who need follow-up.

### 3. References

1. Carpenito LJ. Nursing care plans and documentation. 2<sup>nd</sup> eds. Jakarta: EGC. 2019.
2. Flink M, Ekstedt M. Planning for discharge, not for patient self-management at home-an observational and interview study of hospital discharge. *Int J Integr Care*. 2017; 17(6): 1.
3. Leppin AL, Gionfriddo MR, Kessler M, Brito JP, Mair FS, et al. Preventing 30-Day Hospital Readmissions: A Systematic Review and Meta-analysis of Randomized Trials. *JAMA internal medicine*. 2014
4. Batalden M, Batalden P, Margolis P, Seid M, Armstrong G, et al. Coproduction of healthcare service. *BMJ quality & safety*. 2015.
5. Mitchell SE, Gardiner PM, Sadikova E, Martin JM, Jack BW, et al. Patient activation and 30-day post-discharge hospital utilization. *Journal of general internal medicine*. 2014; 29(2): 349–55.
6. Shively MJ, Gardetto NJ, Kodiath MF, Kelly A, Smith TL, et al. Effect of patient activation on self-management in patients with heart failure. *J Cardiovasc Nurs*. 2013; 28(1): 20–34.
7. Presidential Regulation number 63 of 2020 concerning the Determination of Disadvantaged Regions in 2020 – 2024.
8. Dharmarajan K, Hsieh AF, Kulkarni VT. Trajectories of risk after hospitalization for heart failure, acute myocardial infarction, or pneumonia: retrospective cohort study. *BMJ*. 2015; 350: 411.
9. Rebello KE. The Rural PILL Program: a post-discharge telepharmacy intervention for rural veterans. *J Rural Health*. National Rural Health Association. 2017.
10. Martin P. Promoting interprofessional education and collaborative practice in rural health settings: learnings from a state-wide-multi method study. *Int J Environ Res Pub Health*. 2021.
11. Amanda H. Validation of the patient activation measure in patients at discharge from hospitals and at distance from hospital care in Sweden. *BMC Pub Health*. 2019.
12. Gunter RL, Chouinard S, Fernandes-Taylor S, Wiseman JT, Clarkson S, et al. Current use of telemedicine for post-discharge surgical care: A systematic review. *J Am Coll Surgeons*. 2016; 222(5): 915–27.
13. Butzner M, Cuffee Y. Telehealth interventions and outcomes across rural communities in the United States: Narrative review. *Journal Med Internet Res*. 2021; 23(8).
14. Aryadi A, Arofiati F. The influence of electronic discharge planning in patients with heart failure. *J Aisyah*. 2021; 6(4).
15. Xu H, Granger BB, Drake CD, Peterson ED, Dupre ME. Effectiveness of telemedicine visits in reducing 30-days readmissions among patients with heart failure during the covid-19 pandemic. *JAHA*. 2022; 11: e023935.
16. Mehrotra A, Ray Kristin K, Brockmeyer DM, Barnett ML, Bender JA. Rapidly converting to “virtual practices”: outpatient care in the era of Covid-19. *NEJM Catal Innov Care Deliv*. 2020.
17. Drake C, Lian T, Cameron B, Medynskaya K, Bosworth HB, Shah K. Understanding telemedicine's “new normal”: variations in telemedicine use by specialty line and patient demographics. *Telemed E-Health*. 2021; 28: 51–59
18. Khattab M, Jimenez AR, Khattab M, Javed IN, Aston C, Mithilesh S, et al. Early Telephone appointments and home telehealth monitoring may improve 30-day readmission rates in the COVID-19 Era. *Am J Med Qual*. 2021; 36: 64–65.

19. Sammour Y, Spertus JA, Austin BA, Magalski A, Gupta SK, Shatla I, et al. Outpatient management of heart failure during the COVID-19 pandemic after adoption of a telehealth model. *JACC Heart Fail.* 2021; 9:916–924.
20. McAlister FA, Youngson E, Kaul P, Ezekowitz JA. Early follow-up after a heart failure exacerbation: the importance of continuity. *Circ Heart Fail.* 2016; 9: e003194