



## **Discharge Planning-based Information System to Improve Compliance among Preeclampsia Patients**

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**Abstract.** Complications of pre-eclampsia cause the highest Maternal Mortality Rate (MMR) in the puerperium. One of the successes lies in the success of AKI prevention care in the postpartum with promotive and preventive efforts. Promotive implemented through discharge planning when hospitalization and preventive back control of maternal postpartum preeclampsia. The study aimed to analyze the discharge planning based information system to improve compliance among preeclampsia patients. The study used a quasi-experiment, pre-test, and post-test with a non-equivalent control group design. The samples allocated into an intervention group (n=17) and control group (n=17) and conducted at Bagas Waras hospital. Interventions performed for 30 minutes and frequency 3x, discharge planning, and evaluation is done on days 7 and 14 postpartum. The results showed that there is a significant difference in the level of re-control compliance between before and after the intervention group with  $p= 0.001$  and a control group with  $p= 0.008$ . In addition, there is a significant difference in the level of re-control compliance between the intervention and control groups with  $p= 0.018$ . Whereas, there is a significant effect between models of discharge planning pre-eclampsia based on information systems of re-control compliance with  $p = 0.014$ . The discharge planning of preeclampsia based on the information systems effectively used as a tool for improving the re-control compliance of postpartum preeclampsia in the hospital

**Keyword:** discharge planning, re-control compliance reminder, prevention of eclampsia complications



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## INTRODUCTION

Based on the data from the Indonesian Health Demographic Survey (SDKI) Maternal Mortality Rate (MMR) in Indonesia in 2015 amounted to 305 per 100,000 live births (1). MMR in Central Java in 2017 amounted to 88.05 per 100,000 live births. The most death in Central Java 2017 during the postpartum period was 60%, and the highest cause of death was hypertension (preeclampsia or eclampsia) 32.97%. MMR in Klaten district in 2017 showed the highest in the postpartum was 12 cases out of 18 and in 2018 was 11 cases (2).

Indonesia established a Health Development Strategic Plan in 2015-2019 related to empowering the community to reduce the problem of MMR with the Health Development Program, which is implemented by the three main pillars of the health paradigm, strengthening health services and national health insurance. One of the Pillar of a health paradigm is through promotion and preventive and community empowerment, such as education health or discharge planning (3).

The success of the prevention of maternal mortality postpartum care because of the highest incidence of complications and MMR in the postpartum. The strategy to reduce MMR postpartum can be implemented with promotive and preventive efforts through discharge planning. Discharge planning is a patient discharge plan that applied at the hospital by involving patients and families in preparing for the needs of the patient so that the patient can perform continuity of the treatment at home (4). The purposes of the discharge planning are to improve knowledge or education about the patient's health, independence care, support for re-control, patient skills, and family to do the treatment and maintain health status during and after hospitalization, and also to improve compliance with drug consumption (5-6).

The success of postpartum care is carried out if the postpartum mothers and families have good basic knowledge about preeclampsia postpartum so postpartum mothers and families through postnatal well and have preparedness complications. Health education and re-control during the postpartum are maternal and child health programs to detect danger signs or complications of the postpartum, monitoring, handling, and provide immediate action or referral in case of complications occurred. Postpartum re-control, according to national policies, is implemented in 4 times in 6-8 hours, six days, two weeks, and six weeks postpartum. The knowledge derived from health education is an essential effect on a person's behavior changes to achieve the goal of maternal and child (7).

Limitations to delivery the discharge planning can affect the level of compliance with care and re-control after the patient is discharged from hospitalization. The inadequate information provided for patients since there is no monitoring and evaluation after conducting health education. Research from Achyar (2016) mentioned to the postpartum compliance re-control complications associated with the incidence as 77.7% of postpartum re-control in 4 times with no complications, and non-compliance (visit <4 times) the complications of 22,2% (8). Submission of discharge planning is sometimes not qualified because the information provided is not limited to basic information tailored to the needs of the patient (9).

The impact of the failure of the program will reduce the quality of health services, increasing high-risk mothers and complications, increased rates of readmissions, improving maternal and child mortality (10). Follow up is need to be implemented for the discharge planning program by using information technology media. Furthermore, family involvement also was crucial to improving compliance preeclampsia postpartum mothers' re-control in supporting maternal and child health programs.

## OBJECTIVE

The study aimed to analyze the discharge planning based information system to improve compliance among preeclampsia patients.

## **METHOD**

This research type uses a quasi-experiment research design using pre-test - post-test non-equivalent control group design. This study consisted of two groups: the experiment group received discharge planning preeclampsia based on information systems, and the control group was given standard hospital discharge planning.

The samples in this study were pre-eclampsia postpartum mothers in Bagas Waras hospital in Klaten District. The sampling using non-probability sampling methods Consecutive Sampling, the researcher selected a sample based on medical records of postpartum maternal preeclampsia population. Then, the respondents were selected according to the study inclusion criteria. The total sample is 34 respondents with the division of the experiment group (n = 17) and the control group (n = 17).

The research instruments are smartphones, laptops, and chargers. An observation sheet was used to record the compliance, blood pressure, urine protein results. Educational media such as leaflets, applications, and websites discharge planning preeclampsia postpartum also was applied in this study. Observation Sheet of the respondents characteristic, Questionnaires of promotive effort (knowledge and attitudes). Based on the validity test using the Corrected item-total Correlation value on the compliance questionnaire showed 0.827. It was indicated that the questionnaire was valid. The Cronbach's Alpha value was 0.814, which stated that it was a reliable questionnaire.

Discharge planning was given on days 1, 2, and 3 postpartum to the respondents according to criteria inclusion, gradually while in hospitalization. The pre-test was carried out before the intervention on day one, and the evaluation was carried out on day 14 by giving questionnaires and observation about the level of re-control compliance.

The research has been said to be ethical and validated and issued by the health research ethics committee of RSUD. Dr. Moewardi Surakarta with ethics number: 734 / V / HREC / 2019, which was appropriately used during the study as a guideline for health research ethics carried out in postpartum preeclampsia mothers at Bagas Waras Regional Hospital.

Descriptive data analysis uses the characteristics of respondents with variables of age, occupation, education, husband or family support (financial support, emotional support, and information), travel time to the hospital. The normality test in the bivariate analysis uses the measurement of Shapiro Wilk. Analyzing data on the level of knowledge and attitude responses before the test and after the test. The Mann Whitney test examined compliance adherence in the experiment and control group

## **RESULTS**

### **Respondents' characteristic**

Based on the result of research conducted by researchers in April-June 2019 can be seen that most of the respondents have the ideal reproductive age of 21-35 years of age by 23 (67.64%) in the intervention and control groups. The most occupation is Housewife by 20 (58.8%) respondents consisting of 10 respondents intervention group and control group. The education level is mostly in high school, with 22 (64.7%). The majority of the respondents have a high income (55.8%). Emotional support and information mostly have adequate support from families with 28 (82.3%). Based on these data shows  $p > 0.05$  because  $p > 0.05$  then shows homogeneous data or data distribution in the intervention and control groups there is no difference

Table 1. Respondents' characteristic among experiment and control group

Characteristic	Experimental Group		Control Group		<i>p-value</i> *
	N	%	N	%	
Age					
Highly Young	0	0	0	0	.130
Ideal Reproduction	11	32.3	12	35.29	
Highly Old	6	17.6	5	14.7	
Job					
Housewife	10	29.4	10	29.4	.296
Farmer / laborer	0	0	0	0	
Entrepreneur	7	20.6	7	20.6	
Government	0	0	0	0	
Employees					
Education					
Elementary School	3	8.8	2	5.9	.678
Junior High School	2	5.9	2	5.9	
Senior High School	9	26.5	13	38.2	
Diploma	1	2.9	0	0	
Master	2	5.9	0	0	
Husband and family motivation level					.190
Financial / Income Support					
1) low	0	0	0	0	
2) Medium	7	20.6	12	35.3	
3) High	10	29.4	5	14.7	
4) Very High	0	0	0	0	
Emotional and informational support					
1) less	0	0	2	5.9	.248
2) enough	2	5.9	2	5.9	
3) Fine	15	44.1	13	38.2	
Travel Time To Hospital					
1) very easy to reach	5	14.7	5	14.7	.120
2) easy to reach	11	32.4	10	29.4	
3) quite easy to reach	1	2.9	2	5.9	
4) difficult, to reach	0	0	0	0	

### Mean difference of knowledge level within the experimental group and the control group before and after receiving the intervention

Table 2 showed that the level of knowledge before and after discharge planning in the experimental group increased by an average was 26.823 (both categories), an increase of 7.529. In the control group, the level of knowledge before and after discharge planning with an average value of 17 627 (medium category), an increase of 2,706. Based on the test, paired t-test and independent t-test showed the value of  $p = 0.001$ . Because  $p < 0.05$  ha is accepted and  $h_0$  is rejected, it means there is the level of a significant difference of knowledge before and after, and there are significant differences between the level of knowledge of the experiment and control groups

Table 2. Mean difference of knowledge level within the experimental group and the control group before and after receiving the intervention

Variables	Group	Mean±SD (pre-test)	Mean±SD (post-test)	p-value
Level of knowledge	Experimental group	19.294 ± 2.845	26.823± 2.480	0.001
	Control group	14.941 ± 2.276	17.627 ± 2.956	0.001

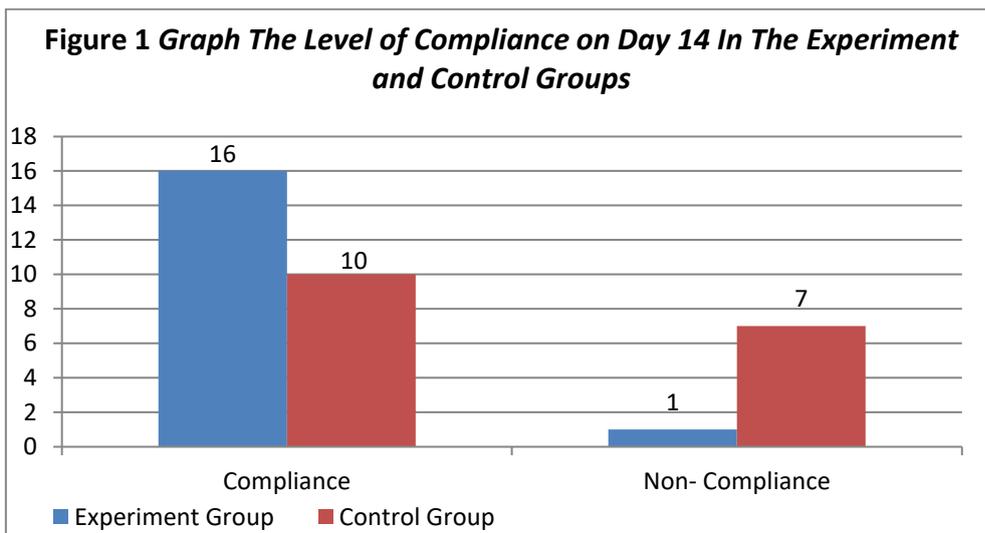
**Mean difference of compliance within the experimental group and the control group after receiving the intervention**

Table 3 showed the average differences in re-control compliance. The findings explained  $p = <0.05$ , which is indicated that there is a significant difference in compliance control before and after control, and there is a significant difference in compliance control between the experiment and control group.

**Table 3.** Mean difference of compliance within the experimental group and the control group after receiving the intervention

Variables	Group	Mean±SD (pre-test)	Mean±SD (post-test)	p-value
Compliance	Experimental group	1.82± 0.52	2.58± 0.50	0.001
	Control group	1.64 ± 0.49	2.05 ± 0.65	0,008

Figure 1 showed the level of re-controls compliance among respondents. The findings described that most of the respondents in the experiment group (94.11%) performed the re-control, and 58.82% of respondents in the control group also perform the re-control. The non-compliance response with the respondents in the experiment group was 5.88% (1 respondent), and the control group was 35.29% (7 respondents). After giving discharge planning, the respondents in the complaint category did re-control in the experiment and control groups of 26 (76.47%) respondents



**Effect of discharge planning-based information system on improving compliance among Pre-eclampsia patients**

Table 4 showed that in the first step by using multiple linear regression with  $p= 0.014$ . It was indicated that there was a significant effect between the discharge planning based information system improve compliance among preeclampsia patients. The determination coefficient ( $r$  squared) amounted to 0.173, which means discharge planning of pre-eclampsia based on information systems provide a positive influence on the compliance re-control of 17.3% and 90.9% (1 error) is influenced by other variables not examined in this study.

Table 4. Effect of discharge planning-based information system on improving compliance among Pre-eclampsia patients

Category	R	R <sup>2</sup>	beta	E	P *
Discharge Planning x compliance	0.416	0.173	0.416	0.909	0,014

\* *Multiple Linear Regression Testing*

**DISCUSSION**

**Differences Compliance Before and After in the Experiment and Control Group**

Based on research results statistically, Discharge Planning based on information systems can improve compliance with re-control after treatment with good category as much as 52.95%. Discharge Planning based on information systems is expected to be a source of information to assist the process of knowledge of health behavior. Besides the knowledge support from the husbands and families by using technology was essential to improve re-control compliance. This application system was used as a reminder system from a smartphone screen. Thus they could re-control promptly. The research from Nugroho said that technological development could be great potential in changing the attitudes of individuals in the learning process. Multimedia can also help health workers in providing information and skills to the patients.

Among the control group showed that the record of their behavior only used a control card from the hospital that has risks that are lost, damaged, and never opened. In line with the Nordmark, the study stated that it was the less effective and efficient implementation of discharge planning can be caused by the method used is not quite right (11).

Based on the results of the study, there were differences in the mean of re-control adherence between the experiment group and the control group. It showed discharge planning based on information systems more effective in improving compliance with re-control. The advantage of this information system-based discharge planning is to combine some pre-existing discharge planning methods and is packaged using an Android application that was connected to the midwife's website as data loading. In addition to the application, there is also a menu as a reminder system for re-control. It also has the purpose to optimize the discharge planning process and facilitate the patient in accessing the information needed anytime and anywhere. Based on Nordmark's research, it is stated that the application of information technology-based discharge planning can increase accessibility, safety, quality, efficiency, and reduce maintenance costs (12).

This is in line with Rhoads' research that m-health can facilitate the information needs of pre-eclampsia care higher than those who do not use m-health. Information technology utilization is crucial because it proved to be able to increase the effectiveness and efficiency of doing things, including in the health sector (13). Some obstacles in re-controlling the control group include a considerable distance from the respondent's home, the control card is lost, and the respondent feels that the condition is fine. While in the discharge planning group-based information systems control the non-compliance occurred in the second week as smartphone respondents were damaged so that the reminder on the application can not function properly and cause the respondent forgetfulness to control the schedule.

Some of these weaknesses resulted in suboptimal processes of deep learning and accessibility in obtaining the information needed. Besides, education is only carried out after an assessment might risk of the absence of deep learning so that continuity of care is not guaranteed. In line with research, Fatmawati's research stated that education using leaflets is not desirable by 85%, and the lecture method is profitable by 55%.

### **Effect of Discharge Planning Based Information System Improve Compliance among Preeclampsia Patients**

Based on the results of the research show Discharge Planning Based Information System Improve Compliance Among Preeclampsia Patients. Discharge planning implementation of preeclampsia based information systems can improve the knowledge of a good category will influence the actions of the respondent to exercise control properly. The changes in positive behavior after discharge planning can improve the ability to re-control as an effort to prevent complications. It was proven by 16 respondents who were obedient in re-controlling the information system-based discharge planning group and ten respondents in the hospital standard discharge planning group (14). Hofflander's analysis supports his research that the benefits of discharge planning that utilize information technology include being more productive, saving time, and implementing it more structured (15).

It showed that discharge planning based information systems more effective in improving compliance re-control. Excellence discharge planning based on this information system that combines several methods of discharge planning preexisting and packaged using an android application that connects to the midwife's website to enter patient data, but it is also on the existing application menu as a reminder system for back control. It also aims to optimize the discharge planning process and facilitate the patient in accessing the information needed anytime and anywhere. This is in line with research Rhoads says that m-health used postpartum maternal medication adherence showed as many as 42, 9% by re-controlling postpartum mothers in health facilities for continuity of care (health facilities during childbirth) (13).

In the control group, the lack of knowledge can influence the increase in the non-compliance incidence of postpartum preeclampsia re-control. The lack of information or knowledge causes this, weaknesses in the method used, and the effectiveness of discharge planning implementation that can influence the effectiveness of discharge planning on patient control compliance. So that non-compliance of re-control in the hospital in the hospital

discharge planning group is higher, it is seven respondents compared to the information system-based discharge planning group, which is as much as one respondent. In line with Sumiyati's research (2015), the knowledge of puerperal women about the danger signs of the puerperium in the category of less than 53.3% and lack of knowledge can lead to improper care of the puerperium (treatment, prevention of complications) by 71%, and visits puerperal does not meet the standard (<3 times) by 61% (16-17).

## CONCLUSION

In conclusion, there is a significant difference between the re-control compliance mean between before and after the intervention group and the control group,  $p < 0.05$ . There is a significant difference between the mean of the re-control adherence in the intervention group and the control group,  $p = 0.018$ . There is a significant Effect of Discharge Planning Based Information System Improve Compliance Among Preeclampsia Patients with  $p = 0.014$ . The discharge planning of preeclampsia based information systems effectively used as a tool for improving the re-control compliance of postpartum preeclampsia in the hospital.

## RECOMMENDATION

For healthcare professionals expected more intensive monitoring, the patients with preeclampsia postpartum, do cross-sector cooperation for the implementation of the control and referral. For further research is expected to develop a discharge planning application to extend the application of network systems for long-term monitoring in the pre-eclampsia postpartum through midwives, community health centers, other health services that connect with hospital websites.

## REFERENCES

- (1) Kementerian Kesehatan Republik Indonesia. Profil Kesehatan Indonesia 2017. Jakarta: Kemenkes RI; 2017.
- (2) Tengah DKPJ. Profil Kesehatan Provinsi Jawa Tengah Tahun 2017. Semarang: Dinas Kesehatan Provinsi Jawa Tengah; 2017.
- (3) nasional Kpp. Rencana Pembangunan Jangka Menengah Nasional 2015-2019: Badan Perencanaan Pembangunan Nasional; 2014.
- (4) Wahyuni A, Nurrachmah E, Gayatri D. Kesiapan Pulang Pasien Penyakit Jantung Koroner melalui Penerapan Discharge Planning. *Jurnal keperawatan indonesia*. 2012;15(3):151-8.
- (5) Iqonul Himan Pf, Suyatno H. Peran Perawat Educator Dan Pengimplementasian Discharge Planning untuk Pemenuhan Kepatuhan Kontrol Pasien. *The Sun*. 2015;2(3):10-6.
- (6) Nursalam N, Has EMMA. The Independence of Post Sectio Caesarea Mother with Discharge Planning Based on Orem's Self Care Theory. *Jurnal Ners*. 2017;7(2):177-85.
- (7) Nuryati RDYS. Efektifitas Penggunaan Media Sosial terhadap Peningkatan Pengetahuan Perawatan Nifas dan Kepatuhan Kunjungan Ulang pada Ibu Nifas di Kota Bogor. *Jurnal Bidan*. 2017;3(1).
- (8) Achyar K, Rofiqoh I. Pengaruh kunjungan Nifas Terhadap Komplikasi Masa Nifas di Wilayah Puskesmas Sokaraja 1 Kabupaten Banyumas. *MEDISAINS*. 2016;14(2).
- (9) Suplee PD, Kleppel L, Bingham D. Discharge Education On Maternal Morbidity And Mortality Provided By Nurses To Women In The Postpartum Period. *Journal of Obstetric, Gynecologic & Neonatal Nursing*. 2016;45(6):894-904.

- (10) Romalina R, Indra MR, Susmarini D. Faktor Pasien Berhubungan dengan Angka Readmission pada Pelaksanaan Discharge Planning Pasien Acute Coronary Syndrome (ACS). *Journal of Health Sciences*. 2017;10(1).
- (11) Nordmark S, Söderberg S, Skär L. Information Exchange Between Registered Nurses and District Nurses during the Discharge Planning Process: Cross-Sectional Analysis Of Survey Data. *Informatics for Health and Social Care*. 2015;40(1):23-44.
- (12) Nordmark S, Zingmark K, Lindberg I. Process Evaluation of Discharge Planning Implementation in Healthcare using Normalization Process Theory. *BMC medical informatics and decision making*. 2016;16(1):48.
- (13) Rhoads SJ, Serrano CI, Lynch CE, Ounpraseuth ST, Gauss CH, Payakachat N, et al. Exploring Implementation of M-Health Monitoring in Postpartum Women with Hypertension. *Telemedicine and e-Health*. 2017;23(10):833-41.
- (14) Yulian V, Widodo A, Sudaryanto A, Sulastri S, Ambarwati WN, Muhlisin A. Pendidikan Kesehatan dan Layanan Short Message Service (SMS) sebagai Pendekatan Pemberdayaan Komunitas untuk Meningkatkan Kesehatan Maternal. *Biomedika*. 2016;9(2):21-9.
- (15) Hofflander M. *Implementing Video Conferencing in Discharge Planning Sessions: Leadership and Organizational Culture when Designing IT Support for Everyday Work in Nursing Practice*: Blekinge Tekniska Högskola; 2015.
- (16) Sumiyati S, Latifah H. Studi Pengetahuan Ibu Nifas tentang Tanda Bahaya Selama Masa Nifas (Di Desa Pomahan Janggan Kecamatan Turi Kabupaten Lamongan 2015). *Jurnal Kebidanan*. 2015;7(2):5.
- (17) Setiawati Y. Hubungan Pengetahuan Ibu Tentang Kunjungan Nifas Paripurna dengan Tindakan Kunjungan Nifas Paripurna. *Oksitosin: Jurnal Ilmiah Kebidanan*. 2017;3(2):107-12