



Relationship between Patient Readiness for Hospital Discharge and Post-Discharge Outcomes”

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DOI: 10.22037/anm.v32i3.44485

Submitted: 24 Jan 2023

Accepted: 09 Apr 2023

Published: 15 Jul 2023

Keywords:

Hospital Discharge Readiness
Patients

Post-Discharge Outcomes

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How to cite:

Asadi N, Keshavarzi S, Kamyari N, Vatandost S. Relationship between Patient Readiness for Hospital Discharge and Post-Discharge Outcomes”. *Adv Nurs Midwifery*. 2023;32(3):1-8. doi: 10.22037/anm.v32i3.44485

Abstract

Introduction: The degree of patient readiness for discharge can be one of the important and influential factors in the outcomes of the post-discharge process. The purpose of this study is to determine the Relationship between Patient Readiness for Hospital Discharge and Post-Discharge Outcomes.

Methods: The study is descriptive-correlational. Through convenient sampling 351 hospitalized patients in general wards were selected. The data collection procedure was done by using the Readiness for Hospital Discharge Scale (RHDS), and research made post-discharge follow-up form. RHDS contain 8 items that measure 4 dimensions and in analysis mean score and standard deviation in the range of 0 to 10 reported. The post-discharge follow-up form includes 6 items with yes/no answers. There was not any restriction on the number of outcomes for each individual. These items are related to possible and unforeseen consequences of one month after the patient's discharge from the hospital. Readiness for discharge as self-reported and its related outcomes were assessed by telephone communication 30 days after discharge. Collected data were analyzed by using SPSS version 21.0 at a significance level of 0.05.

Results: The total score of readiness for hospital discharge scale (RHDS), was at a high level (7.82 ± 1.17). The mean score for readiness for hospital discharge had a significant relationship with the recovery outcomes (0.028), readmission (0.001), and death (0.005).

Conclusions: The results of the study showed to reduce the negative outcomes of hospital discharge, the patient's assessment of his condition at the time of discharge should be taken into consideration.

INTRODUCTION

Hospital discharge can be a worrisome issue for patients since they may have varying degrees of unmet needs during hospitalization and the post-discharge process. Since the quality of care and patient safety should be the

priority of the health care system, resources should be directed in such a way as to improve the transfer of care from the hospital to home because the preparation for discharge can lead to the improvement of this process

[1]. In fact, the hospital discharge is not the end point of patient care, but a stage that leads to the transfer of care from the hospital to home [2].

Studies show that readiness for hospital discharge is a multidimensional process that influenced by various factors such as the cause of hospitalization, medical treatment process, nursing care and individual factors of the patient including physical stability, sufficient support, psychological adaptation and sufficient knowledge [3, 4]. Therefore, it could be said that in hospital discharge, there is a need for a comprehensive examination and assessments of the patient, since hospital discharge in reality is considered as a transition from a supportive environment of the hospital to outside the hospital, that could lead to anxiety, the feeling of neglect from the source of support, the fear of improper care and deteriorate the patient's health state [3]. Therefore, in order to ensure that the patients are ready for discharge, it is important to examine the patient's point of view because the educational needs expressed by the patients are important; not just what is considered important by healthcare system [5]. These cases highlight the importance of examining the patient's conditions for discharge planning. Therefore, during the discharge process, in addition to the physicians, it is necessary to consult the patients as the main stakeholders in the discharge process decision-making [6, 7].

Discharge from the hospital is mostly based on the clinical condition of the patient. except for cases of discharge with personal consent, doctors are usually the ones who decide to discharge patients and there is not much consultation with the patient, While some of the necessary conditions for taking care outside the hospital, such as financial status, family support, re-access to medical centers, the level of self-care knowledge can only be checked by asking the patient, therefore the possibility of discharging a patient who does not have the right conditions increases [6, 7].

Discharging patients who are not properly prepared increases the possibility of adverse outcomes such as readmission, dissatisfaction with the treatment center, increased treatment costs, and reduced quality of life after discharge [8]. Previous studies show that patient preparation during hospital discharge can lead to a reduction of medical costs, higher quality of life and prevention of post-discharge problems [4, 9].

In a review of the related studies results, including Mehraeen et al. (2022) [8], Baksi et al. (2020) [10], Zhang et al. (2021) [9], Nurhayati et al. (2018) [11], Rahmahwati et al. (2021) [3], the score of readiness for discharge was calculated at a scale of low to average. The results of studies about outcomes after discharge showed that negative outcomes have high rates of readmission. in the meta-analysis study by Wang et al. (2019) was 12% [12], Asburn et al. (2021), reported a mortality rate of 3% after 30 days after discharge [13],

study by Ebrahimi et al. (2019) on cardiac surgery patients who reported that surgical site infection was the most common cause of readmission in this group of patients with 25.8% [14].

According to the above-mentioned points, because the patient is the main person involved with the disease and is aware of the general state of health and family life conditions at home, asking the opinion of patients to be discharged is important and affects the outcome. Considering that the patient is the main person involved with the disease and is aware of the general state of health and family life conditions at home, it can be assumed that asking the opinion of patients for discharge can be important and affect the consequences of post-discharge related to her disease. In the other hand Despite the possibility of influencing factors beyond the control of the clinical staff on the outcomes after the patient's discharge, studies have investigated the relationship between factors such as education during discharge, and the patient's readiness during discharge with the outcomes after discharge. Some studies have reported a significant relationship. However, the results are limited and in order to be more confident in this matter, more studies are needed. In order to clarify the role of readiness during discharge with subsequent outcomes with stronger documentation and provide a basis for further corrective actions .Therefore, considering the importance of the subject and the limited studies in this field, the present study was conducted with the aim of determining the relationship between Patient Readiness for Hospital Discharge scores and post-discharge outcomes.

METHODS

This descriptive- correlational study was conducted from June 22 to September 19, 2023. The population of the present study was hospitalized patients in variety of wards (internal medicine, surgery, gastroenterology, urology, neurology, cardiology, and neurosurgery) from two main and large centers selected educational healthcare centers in Sanandaj city. Quota sampling method was used. The inclusion criteria were as follows: willingness to participate, not suffering from a known mental disorder, being alert and fully aware to answer the questionnaire items, age 18 and above, and having a written doctor's discharge order. The exclusion criteria were as follows: patients whose discharge order were canceled, incomplete answers to questionnaires, lack of access to the patient or her companion to assess the outcomes.

By applying the following formula [15], 351 samples were selected as the sample size of the study with regard to the data analysis procedures of the study (Multiple Linear Regression), and reviewing the previous studies [8].

$$N = \frac{\lambda(1 - R_c^2 - R_{T|C}^2)}{R_{T|C}^2}$$

To reach this sample size, due to the lack of access to 9 of the samples to check the outcomes, new samples were replaced and a total of 360 samples were included in the study. Data were collected by using a demographic form, Readiness for Hospital Discharge Scale (RHDS) from the patient's point of view, and a researcher-made checklist to examine the outcomes one month after discharge.

The Patient Demographic Form

Patient demographics were obtained from the hospital record. It contains information about the patient, such as name, sex, marital status, with whom they live, age, education, hospitalization length, discharge-related patient instructions from a doctor, and discharge-related patient instructions from a nurse.

The Readiness for Hospital Discharge Scale (RHDS)

The Readiness for Hospital Discharge Scale (RHDS Weiss, 2006) measures patient readiness to return home from the hospital following acute care hospitalization. It is administered on the day of discharge, normally within 4 hours prior to discharge. The questions were completed in face to face and by self-report [7]. The short forms contain 8 items that measure 4 domains of discharge readiness: 1-Personal status (how the patient

feels on the day of discharge); 2-Knowledge (the patient's knowledge about self-care at home after discharge); 3-Perceived Coping Ability (how the patient will be able to cope at home after discharge); 4-Expected Support (how much help the patient will have if/when needed at home after discharge. Each domain contains 2 items. The possible range of scores is 0 (the weakest state) to 10 (the strongest state). The mean score and standard deviation for each domain and the total scores are reported in the range of 0 to 10. For its Persian version in Iran, content validity of 0.79 and Cronbach's alpha coefficient reliability of 0.83 for patients' sense of understanding of readiness for hospital discharge have been reported by Jafar Aghaei et al [8]. The reliability of the instrument in the present study was obtained with Cronbach's alpha method as 0.81.

Post-Discharge Follow-Up Checklist Form

Based on the literature review [8-12], a preliminary list of the most important outcomes after discharge was prepared. A qualitative method was used to check the content validity, so the items were given to seven members of the faculty of nursing and three special physicians (internal, neurology, cardiologist) to give their opinions. Their comments were applied and the final version was prepared. reliability was confirmed with the Kuder-Richardson test (0.79).

Table 1. Characteristics of Patients

Variables	No.(%)	
Sex		
Male	199	56.7%
Female	152	43.3%
Marital status		
Single	86	24.5%
Married	251	71.5%
Divorced	6	1.7%
Death of wife	8	2.3%
Whom do they live with?		
Single	15	4.3%
Spouse	93	26.5%
Spouse & children	124	35.3%
Children	35	10.0%
Parents	84	23.9%
Age range (years)		
≤ 25	57	16.2%
26 – 60	169	48.1%
≥ 61	125	35.6%
Education		
Illiterate	146	41.6%
Primary	82	23.4%
High school	61	17.4%
Diploma	31	8.8%
Academic	31	8.8%
Hospitalization (week)		
Less than 1 week	275	78.4%
1 – 2 weeks	51	14.5%
Above 2 weeks	25	7.1%
Training received from doctor		
Yes	254	72.4%
No	97	27.6%
Training received from the nurse		
Yes	278	79.2%
No	73	20.8%

Table 2. Readiness for Discharge

Readiness for Discharge Items	Mean $\pm$ SD
Personal status	8.26 $\pm$ 1.45
self-care knowledge	7.49 $\pm$ 1.52
Perceived coping ability	7.71 $\pm$ 1.82
Expected care	7.83 $\pm$ 1.81
Total	7.82 $\pm$ 1.17

Table 3. Outcomes one months after patient discharge

Outcomes /Response	Frequency	Percent
Recovery		
Yes	328	93.4%
No	23	6.6%
Re-admission		
Yes	103	29.3%
No	248	70.7%
Self-treatment		
Yes	101	28.8%
No	250	71.2%
Unscheduled visit for treatment		
Yes	229	65.2%
No	122	34.8%
Surgical site infection		
Yes	22	6.3%
No	329	93.7%
Death		
Yes	20	5.7%
No	331	94.3%

Table 4. Comparison of outcomes based on readiness for discharge

Outcomes / Response	Mean $\pm$ SD	P
Recovery / Yes	7.86 $\pm$ 1.17	0.028
No	7.31 $\pm$ 1.05	0.028
Re-admission		0.001
Yes	7.51 $\pm$ 1.05	
No	7.96 $\pm$ 1.19	
Self-treatment		0.071
Yes	7.89 $\pm$ 1.15	
No	7.68 $\pm$ 1.14	
Unscheduled visit for treatment		0.988
Yes	7.82 $\pm$ 1.18	
No	7.82 $\pm$ 1.14	
Surgical site infection		0.846
Yes	7.80 $\pm$.66	
No	7.83 $\pm$ 1.19	
Death		0.005
Yes	7.28 $\pm$.80	
No	7.86 $\pm$ 1.18	

In this form, information was collected through a researcher-made checklist, including 6 items with yes/no answers, including recovery, readmission, self-treatment, return for treatment, surgical site infection, and patient death. These items are related to possible and unforeseen consequences within one month after the patient's discharge from the hospital, which were completed by asking the patient or the patient's family by means of a phone call. There was not any restriction on the number of outcomes for each individual. For example, a patient could choose yes in more than one of the outcomes. Outcomes were analyzed as an overall percentage of yes or no for each item.

The data collection procedure was started by identifying patients with a doctor's order for discharge by referring to the general wards in the morning and evening shifts. The objectives of the study were explained to the

patients, and if they met the inclusion criteria and consented to participate in the study, within 4 hours prior to discharge, the tools were made available to the patients and the items were answered by the patient as a self-report way. Reading the questions for illiterate patients was done by the patient's companion or the researcher. At the end of the demographic questionnaire, two phone numbers were allocated to contact the patient and companion, and a month after discharge, the patient was contacted by phone or if the patient could not be reached through the patient's companion. The outcomes of discharge were prepared by the researcher based on the checklist items checked and documented. The data were analyzed by using SPSS version 21.0 at a significance level of $P < 0.05$.

RESULTS

The results of the study showed that most of the participants (56.7%) were male, mostly lived with their wives and children (35.3%) and were hospitalized for less than a week (78.4%). (Table 1).

The total score of readiness for hospital discharge was (7.82 ± 1.17) and respectively the highest and lowest score of the domains of readiness for hospital discharge related to personal states was (8.26 ± 1.45) and self-care knowledge was (7.49 ± 1.52). (Table 2).

Investigating the outcomes showed that although 93.4% of patients felt better one month after hospital discharge, 29.3% of patients were re-hospitalized and 65.2% had unplanned referrals for treatment problems related to their disease. (Table 3)

The comparison of the mean score of readiness for hospital discharge score between patients based on the outcomes showed that the patients who had recovered had significantly higher average discharge readiness score ($P < 0.028$). Patients who were re-hospitalized ($P < 0.001$) and patients who died had significantly lower readiness score during discharge than other patients ($P < 0.005$). (Table 4)

DISCUSSION

The findings of the study showed that the total readiness for hospital discharge score from the patients' point of view was 7.82 ± 1.17 . Considering the range of the questionnaire items, it could be said that the readiness for hospital discharge score was at a high level [16]. In the study by Mehraeen et al. (2022) [8], the total score of readiness for hospital discharge among patients was 7.82 ± 1.17 . It could be concluded that this similarity could be related to patients who are benefiting from the same Ministry of Health protocol in the process of patient education and preparation for discharge, because both studies are in the same country and under similar healthcare and healthcare policies. In other studies, such as the study by Zhang et al. (2021) [17], Nurhayati et al. (2018) [11], Rahmahwati et al. (2021) [3], the score of readiness for discharge was calculated at an average level. Reasons which are all expressed such as the effect of demographic characteristics like old age [11], insufficient education of the patient during discharge and indifference toward the patient's needs [18], insufficient social support [17], lack of care coordination among all the treatment staff, including nurses, doctors, pharmacists, and nutrition experts, are responsible for the low readiness score for discharge [3]. Examining the domains of readiness for hospital discharge showed that the lowest score was related to the knowledge of patients in self-care and comparing to other dimension it was in a lower rank. A review of the related studies results, including Mehraeen et al. (2022) [8], Baksi et al. (2020) [10], Zhang et al. (2021) [9], also indicated that the lowest score in that domain was

related to the patient's self-care during hospital discharge. Considering that the mentioned studies are from different countries, it seems that in general, in the process of discharge, sufficient knowledge is not provided to the patient by the medical staff, especially the doctors and nurses. Previous studies have considered the patient's insufficient knowledge related to the short length of hospitalization and the acuteness of the illness [19, 20], and in the present study, the average length of hospitalization of the patients was also short. However, this domain of readiness is directly related to the patient's education by the medical staff and these results indicated the lack of proper training provided to the patient during hospitalization and during discharge by the medical staff. Therefore, it is necessary to pay more attention to the patient's knowledge about self-care, especially based on the conditions of each patient, such as the length of hospitalization, the amount of previous knowledge, and the level of literacy, because without sufficient knowledge, the patient cannot be able to perform appropriate post-discharge care and the risk of negative outcomes increase.

Investigating and comparing of readiness for hospital discharge among patients was done based on the presence or absence of each of the outcomes, and in some outcomes, the readiness for hospital discharge score among the two groups had a significant difference. Investigating the outcome domain of recovery showed that 93.4% of patients reported wellness and proper recovery state. Despite the high percentage of patients who have recovered, it should be noted that the patients who had recovered had a significant higher mean readiness for hospital discharge score ($p < 0.028$). The results of the study by Meng et al. (2020) also showed that patients who had a lower readiness for hospital discharge score had a significantly lower quality of life at post-discharge [21]. This significant difference indicated that the score of patients' self-appraisal for discharge could be used as an important principle for hospital discharge. In order to increase the chances of recovery after discharge, the patient's score should be considered as a predictive factor.

Although after one month, 93.4% of patients reported expected recovery, in a time-lapse between hospital discharge and one month later, surprisingly about one-third of patients were re-hospitalized. This important statistic is in accordance in comparison with a study by Rashidi et al. (2022) in patients with the acute coronary syndrome, which reported 4.2 to 81% [22], but compared to the meta-analysis study by Wang et al. (2019) [12], which reported 12%, is an excessive number. Therefore, it is necessary to decrease the need for re-hospitalization of patients as much as possible by providing related education and related knowledge in order to avoid additional treatment costs and occupancy of beds in hospitals. Also, patients who were re-

hospitalized had a significantly lower readiness score for discharge ($P < 0.001$). This result can show that if patients are not ready to take care of themselves during discharge, they will need to be re-hospitalized due to reasons such as increasing the risk of negative consequences and complications of the disease. A review of the previous studies also shows that a lower readiness for discharge score significantly increases the risk of re-hospitalization [13, 23]. This finding also confirms the fact that, in order to reduce re-hospitalization among patients, attention should be paid to the patient's level of readiness for hospital discharge from the patient's point of view, and for patients who do not receive an appropriate readiness score, should be investigated and necessary measures should be taken to increase the patient readiness score.

The results showed that 28.8% of patients had experienced self-treatment, including the take of chemical and herbal drugs, and this rate was higher among patients who reported higher level of readiness for discharge, although there was no statistically significant difference in the readiness for discharge score ($P = 0.071$). In the study by Kosoboka et al. (2020) patients with myocardial infarction who reported a higher readiness for discharge had lower adherence to the treatment of the attending physician and self-administration of drugs ($P < 0.01$) [24]. The cause of these results could be driven by factors such as a lack of trust in the healthcare professional, being influenced by individuals other than the physician, and easy access to drugs without a doctor's prescription. Therefore, it is a necessity to pay attention to the establishment of trust between the doctor and the patient during hospitalization, and during the hospital discharge training, essential factors such as not taking medicine arbitrarily should be emphasized, and if the currently prescribed medicine is not effective, they should refer to the attending physician or another doctor to prescribe a new prescription. On the other hand, Pharmacists are required to limit dispensing of the below prescription medicines.

The results showed that 65.2% of patients returned unplanned to the emergency department or doctor's office within one month after hospital discharge, and this is a high percentage. Some studies consider inappropriate training during hospital discharge as an important factor that affected the patient's need to ask questions and refer to medical centers and offices for self-care after discharge [25, 26], however, there was no significant difference was observed in the readiness score ($P = 0.988$), while the study by Weiss et al. (2019) on internal surgery patients, the results showed that if the patient is discharged with a lower level of readiness, more re-hospitalizations and visits to the emergency departments occur within 30 days after discharge [27]. Different results can be affected by acute changes in the

person's condition after discharge and independent of readiness during discharge.

6.3% of patients reported symptoms of infection after surgery, which include pain and redness around the wound, delayed wound healing, presence of pus in the wound, foul smell, or discharge from the wound [28]; The patient or her companion was asked by the researcher over the phone call, and the patient or her companion confirmed having or not having these symptoms, and it was not checked by direct observation. However, statistical analysis did not show a significant difference in the score of readiness for discharge among patients in terms of infection after surgery. This result is in comparison with the meta-analysis study by Zhu et al. (2023) who reported infection after surgery to be 1.3% was higher, but compared with the study by Ebrahimi et al. (2019) on cardiac surgery patients who reported that surgical site infection was the most common cause of readmission in this group of patients with 25.8% (14), was lower. Considering the fact that sterile and appropriate care of the wound is one of the important factors in preventing infection at the surgical site, it could be concluded that probably the patients were not properly ready to do this care type and the chance of infection of the surgical site has increased among them. Therefore, one of the preventable factors in this issue is practical training on how to change the dressing and care for the surgical site among patients during discharge, which requires the assurance of the treatment staff that the patient is ready to perform it correctly at home.

5.6% of patients' mortality rate happened within the time frame of discharge and a month after it. This statistic is compared to the study of Asburn et al. (2021), which was similar to the present study and was conducted on patients with a different from the present study in terms of diagnosis and reason for hospitalization. It reported a mortality rate of 3% after 30 days after discharge [13], which indicates a higher mortality rate in the present study. On the other hand, the results of Dharmarajan et al.'s (2017) study, which was conducted on different reasons affected patients, reported this statistic as 8% [29]. These differences could be due to different factors such as various personal and clinical factors, as well as how the patient and her companion is done her self-care at home. A significant relationship was found between the degree of patients' readiness for hospital discharge and patients' mortality rate ($P = 0.005$), who had a lower readiness for hospital discharge score. This result highlights the importance of reviewing the hospital discharge criteria and paying attention to the patient's self-evaluation in order to be considered as a measure to decrease the mortality rate at post-discharge processes from the hospital to home.

Limitations of the Study

One of the limitations of the current study was the variety in the causes of hospitalization, which was due to

the lack of access to a sufficient number of individuals with similar conditions. Therefore, the possibility of specific comparisons with previous studies was limited. In this study, only conscious and aware patients were studied, and the only variety of samples is related to diagnoses. Considering that the majority of the main hospitals admit patients with different diagnoses, therefore, the results can be generalized. Also, the risk of error was reduced by choosing the appropriate sample size. Nevertheless, in order to better understand the research samples, the demographic characteristics and reason for the hospitalization of the patients were mentioned in the results. Also, due to the survey of the outcomes through self-reporting by the patient or caregiver, there is a possibility of not reporting complications accurately.

CONCLUSION

The results of the present study showed that during the hospital discharge, the patients were not ready in at least in one of the domains of readiness for hospital discharge, i.e., knowledge of self-care. On the other hand, the lower the level of readiness of the patients for hospital discharge, the more likely adverse outcomes will occur during the post-discharge period, including re-admission, incomplete recovery, and increased mortality rate. Therefore, in order to alleviate these consequences, in the discharge process of the patient, in addition to the physician's prescriptions, the patient's readiness from her point of view should also be investigated and taken into consideration, and the domains that need to be corrected should be improved by required measures through patient education and raising the level of awareness and care to find a better

quality of life for the patients in post-discharge processes.

ACKNOWLEDGMENTS

We are thankful of Research Deputy of the School of Nursing and Midwifery, Research and Technology Deputy of Kurdistan University of Medical Sciences, all the medical centers in which the study was carried out, and all the study participants for their cooperation.

FUNDING

This Research was financially supported by the Vice-chancellor for Research and Technology affiliated with Kurdistan University of Medical Sciences, Iran.

AUTHORS' CONTRIBUTIONS

Study design: Salam Vatandost, Naser Kamyari

Data collection: Nasim Asadi

Data analysis: Naser Kamyari

Study supervision: Salam Vaandost

Manuscript writing: Nasim Asadi and Salam Vatandost

Critical revisions for important intellectual content: Saleh Keshavarzi, Nasim Asadi, Naser Kamyari and Salam Vatandost.

ETHICAL CONSIDERATIONS

The present study was part of the M.A thesis in Medical-Surgical Nursing, approved by the Faculty of Nursing and Midwifery and the Vice-Chancellor of Research and Technology of Kurdistan University of Medical Sciences with the code IR.MUK.REC.1401.162. The objectives of the study were explained to the participants, informed consent and confidentiality of information were all observed.

CONFLICT OF INTEREST

There is no conflict of interest.

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