


# Comparison of Nurses' and Patients' Readiness for Hospital Discharge: A Multicenter Study

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## Abstract

Decision to discharge is often based solely on clinical criteria but readiness for discharge is multifactorial and perceived differently by patients, families, nurses, and physicians. This is an analytical cross-sectional study aimed to compare perceptions of readiness to discharge 452 patients and their assigned nurses on the day of hospital discharge. To compare perceptions of readiness to discharge patients and their assigned nurses on the day of hospital discharge via readiness for hospital discharge (RHD) self-reported questionnaire. The biggest difference between nurses and patients' perception scores was in the knowledge subscale. The results of linear regression model showed that patients' gender, education, occupation, ward, nurse's age, and marital status predict the difference between nurses and patients' perception of readiness. Hospitalization in ear, nose, and throat (ENT) department with increasing difference and the older age of nurses is associated with a decrease in the difference between the perception. Assessment of nurse's self-readiness can help with the development of care and education planning tailored to patients' needs before discharge.

## Keywords

discharge, hospitalization, nurse, patient teaching

## Introduction

In recent decades, many efforts have been made to reduce the cost of medical and care services, which has led to shortened lengths of hospital stay. As a result, patients are discharged from the hospital in the early stages of recovery, and those with complex care needs might be transferred home before complete recovery. Despite the importance of patients' readiness for hospital discharge (RHD), discharge preparations are often very hasty.(1) patients with low RHD may be vulnerable to risks that can delay recovery. Several factors such as age, social abdication, low income, education, and health literacy level have been identified as factors associated with the patients' RHD.(2) Clinical staff also use special protocols to assess RHD such as physical stability, sustained vital signs, and no pain that affect nurses' perception of patients' RHD.(3)

As a result, it may increase the risk of side effects during the early post-discharge period and lead to issues such as patient's medication error and lack of proper coordination between medical and care services in the community.(4) The post-discharge period is a period with a high risk of adverse events due to the possibility of errors in post-discharge care.(5)It is estimated that 20% of patients make significant

errors concerning discharge recommendations during the first three weeks after discharge. In addition, 60%–80% of patients do not pursue the recommendations for long-term treatment, which results in adverse health outcomes.(6)

Patients often feel that they do not receive the necessary information for discharge. This reduces the RHD and is accompanied by encountering problems at home, and an increase in readmission.(7)

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There are reports of patients' failure to recall discharge instructions, families' uncertainty about their ability to care for their patients, and limited access to services and resources that help patients and families with the transition from hospital to home.(8) Many factors influence a patient's perceived RHD self-reported questionnaire and the quality of discharge teaching can affect a patient's perceived readiness. On the other hand, a low perceived readiness is a strong predictor of difficulty with post-discharge coping and readmissions.(9,10) Patients' limited knowledge of symptoms leads to adverse consequences. Teaching at the time of discharge is crucial to reduce readmissions.(11) preparing patients to be able to care for themselves will reduce post-discharge complications.(4)

Studies show that poor RHD leads to readmission.(12–14) In a randomized trial study to test the effects of an intervention designed to minimize readmission, results revealed that participants in the intervention group had a lower rate of hospital readmission than those receiving usual care.(15)

Checking patients' readiness for discharge can lead the care team to have a better care plan. When patients' perceptions of readiness for discharge are low, health care team shall investigate the issues and address those that are mutable.(16) Ignoring patients' priorities and needs at the time of discharge may lead to problems in home care.(17)

The decision to discharge is often based solely on clinical criteria and does not take into account the patient's circumstances and requirements. On the other hand, nurses and patients do not have the same perceptions of readiness for discharge.(18) Patients' assessments of their readiness for discharge are purely subjective, while the nurses' assessments are more objective.(6)

Various factors affect discharge readiness. In a study, patient-reported barriers to discharge included pain, lack of understanding of the recovery plan, and activities of daily living.(19) Another study, however, showed that patient economic status had a significant effect on readiness for discharge.(20) Cognitive impairment, low satisfaction with health services, depression, low educational attainment, previous history of hospitalization, and persistent symptoms of illness or disability, affect discharge readiness.(21)

A number of features of readiness for discharge are evident in clinical articles and research reports describing preparation for discharge, clinical assessment protocols for discharge readiness, and post-discharge transfer. Physical stability is described as a common dimension that includes elements such as vital signs, intake, elimination, movement, minimal bleeding, pain control, and the absence of nausea or vomiting.

Other dimensions of hospital discharge readiness include functional ability and readiness or competence to manage self-care at home, availability of social support, access to health care systems and community resources, psychosocial factors including coping skills, and education and information. Enough about what to expect.<sup>3</sup>

In this research setting as university hospitals, the decision for discharge is only based on the physical condition and medical assessment by the physician. In all wards, nurses are responsible

for patient education at the time of discharge. They should say about using drugs and medications, activity and rest, nutrition, and the date for visit the doctor. Also, they provide some written notes for patients and families about caring at home.

Since the differences between the nurse patient's perception of readiness for discharge may be influenced by different factors, this study was designed to compare the perceptions of nurses and patients about readiness for discharge in different general and specific wards.

## Materials and Methods

The present study was a cross-sectional study that was conducted in 6 educational-remedial centers affiliated to Guilan University of Medical Sciences including 31 internal medical and surgical wards. The participant's sample size with 95% confidence and test power 80% based on the results of the pilot study to a sample size of 30 people via the following formula  $(n = \frac{(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta})^2 \cdot sd_{diff}^2}{d^2} + \frac{z_{1-\frac{\alpha}{2}}^2}{2})$ , included 452 patients admitted to different educational-remedial centers affiliated to Guilan University of Medical Sciences, and to compare nurses' and patients' perceptions of readiness for discharge, 176 nurses have participated, who were assigned to provide care to patients and who did the discharge teaching on the day of discharge. The participants were selected by stratified random sampling method. The number of samples in each ward and each hospital was calculated by the ward discharge ratio per day.

Inclusion criteria for the studied patients were patients admitted to the ward over the age of 18 years who were able to answer the questions of the questionnaire and at the time of filling out the questionnaire they were issued a discharge order and received pre-discharge training by staff. For each patient, the nurse who was in charge of patient care on the day of discharge and provided discharge training, who was willing to participate in the study and had at least a bachelor's degree, participated in the study and no samples were excluded according to the exclusion criteria (questionnaires filled out by only one patient or nurse).

Data collection tools included demographics of patients(2,22–25) and nurses,(26,27) two questionnaires of patients' perceptions of their readiness for discharge, and a questionnaire of nurses' perceptions of patients' RHD.(28)

The original author was allowed to use the questionnaires. To determine the validity of the questionnaire, first, the process of translation and retranslation of the instrument was performed. In this way, first, the questionnaires were translated into Persian by a translator familiar with the desired concept and fluent in English. The Persian version was then given to a fluent English translator to translate. The version of the translation was compared by the research team with the original version to remove the ambiguities in the text. The English translation was approved by the original author of the tool. Then, the Persian translation text was rewritten according to the translators' suggestions.

Demographic data collected on patients included age, sex, marital status, education level, household income, family type, dependence on others in terms of care, primary

**Table 1.** Demographics of Patients.

Variable		Patient RHD		Test result
		Number = 452	Mean $\pm$ SD	
Age	<40	141	9/23 $\pm$ 1/15	< 0.001 <sup>a</sup>
	40–50	62	8/80 $\pm$ 1/51	
	50–60	100	8/37 $\pm$ 1/56	
	>60	149	8/16 $\pm$ 1/47	
Sex	Male	222	8/60 $\pm$ 1/52	0.915 <sup>b</sup>
	Female	230	8/65 $\pm$ 1/43	
Marital status	Single	69	8/60 $\pm$ 1/67	0.641 <sup>b</sup>
	Married	383	8/63 $\pm$ 1/44	
Education	Illiterate	120	7/80 $\pm$ 1/52	< 0.001 <sup>a</sup>
	Primary	128	8/79 $\pm$ 1/28	
	Vocational degree	83	8/81 $\pm$ 1/57	
	Diploma	95	9/19 $\pm$ 1/13	
Income Satisfaction	Postgraduate	26	8/98 $\pm$ 1/39	0.638 <sup>b</sup>
	Yes	72	8/58 $\pm$ 1/41	
Occupation	No	380	8/64 $\pm$ 1/48	0.078 <sup>a</sup>
	Without a job	24	8/41 $\pm$ 1/25	
	Farmer/laborer	41	8/43 $\pm$ 1/28	
	Employee/retired	43	8/37 $\pm$ 1/55	
	Housewife	207	8/69 $\pm$ 1/44	
	Freelancer	82	8/83 $\pm$ 1/56	
	Other (student, soldier, people with disabilities)	24	8/50 $\pm$ 1/58	
	Single	35	7/53 $\pm$ 1/87	
Family type	With spouse	116	8/54 $\pm$ 1/24	0.001 <sup>a</sup>
	With children	38	8/26 $\pm$ 1/43	
	With spouse and children	206	8/85 $\pm$ 1/44	
	With father/mother/other relatives	57	8/93 $\pm$ 1/45	
	Without a caregiver	43	9/23 $\pm$ 1/15	
Post-discharge main caregiver	Spouse	122	8/53 $\pm$ 1/77	0.001 <sup>a</sup>
	Children	85	8/62 $\pm$ 1/29	
	Spouse and children	103	8/08 $\pm$ 1/52	
	Father/mother/other relatives	99	8/73 $\pm$ 1/53	
Dependence to others for care	Yes	174	9/04 $\pm$ 1/30	0.001 <sup>b</sup>
	No	278	7/97 $\pm$ 1/40	
Charlson comorbidities index	0	236	9/04 $\pm$ 1/36	0.001 <sup>a</sup>
	1–2	68	8/88 $\pm$ 1/33	
	3–4	93	8/67 $\pm$ 1/70	
	$\geq$ 4	55	8/43 $\pm$ 1/38	
Duration of hospitalization (days)	2–5	239	7/81 $\pm$ 1/57	0.025 <sup>a</sup>
	5–10	127	8/78 $\pm$ 1/40	
	>10	86	8/53 $\pm$ 1/57	
Hospital ward	Orthopedics	61	8/34 $\pm$ 1/47	0.001 <sup>a</sup>
	General surgery	69	8/05 $\pm$ 1/56	
	Neurology	39	8/75 $\pm$ 1/59	
	Cardiovascular	40	7/66 $\pm$ 1/06	
	Obstetrics and Gynecology	52	9/18 $\pm$ 1/15	
	Gastroenterology	15	9/50 $\pm$ 0/98	
	Skin	7	8/11 $\pm$ 2/06	
	Lung	15	8/32 $\pm$ 2/33	
	Nephrology and urology	34	7/77 $\pm$ 1/84	
	Ear, nose, and throat (ENT)	40	9/01 $\pm$ 1/00	
	Endocrinology and Rheumatology	38	8/99 $\pm$ 0/93	
	Infectious	15	8/56 $\pm$ 1/50	
	Internal	15	7/73 $\pm$ 1/84	
	Hematology	9	8/80 $\pm$ 0/86	
	Burn unit	3	9/01 $\pm$ 1/48	

Note: <sup>a</sup>Kruskal–Wallis test.

<sup>b</sup>Mann–Whitney U-test. RHD = readiness for hospital discharge.

caregiver after discharge, Charlson comorbidities index, duration of hospitalization, and the cause of hospitalization. Demographic data collected on nurses included age, sex, employment status, type of ward, and the number of patients under care in the shift under study.

We used patients version of readiness for discharge scale (PT/RHDS/SF = Patient Readiness Hospital Discharge scale – Short Form) and nurse’s version (RN-RHDS/SF = Registered Nurse Readiness Hospital Discharge Scale – Short Form) for gathering data. These two questionnaires had been developed by Weiss et al. in 2014. They reported 93% of scale variance for both versions of the scale and reliability was .75 for RN-RHDS/SF and .79 for PT/RHDS/SF.<sup>28</sup>

Both questionnaires were an 8-item questionnaire that used 10-point Likert scale scoring from 0 (no readiness) to 10 (complete readiness). Each questionnaire included four subscales of “personal status”, “knowledge”, “perceived coping ability”, and “expected care”, each of which included two questions. Scoring was done based on four categories representing very high,(9,10) high (8–8.9), moderate (7–7.9), and low (<7) levels of discharge readiness, respectively. The low readiness (<7) cut-off score was based on previous studies using a 21-item scale for each item.(28)

The reliability Cronbach’s alpha coefficient for nurses’ perceptions of patients’ RHD was 0.91 and for patients’ perceptions of their discharge readiness was 0.83.

Ethics code license number IR.GUMS.REC.1398.471 was obtained from the Research Ethics Committee of Guilan University of Medical Sciences and after stating the objectives of the study and ensuring the satisfaction of individuals to participate in the present study, information was collected in

person. Individuals were given the right to choose to participate in the research and were assured that all information obtained would remain confidential. It was also stated that if they wished to be aware of the research results, they could access it by contacting the researcher.

The questionnaire was completed through interviews following the patient’s consent. Nurses were also asked to complete the questionnaires before the discharge of the patients. Nurses may have completed more than one questionnaire. Each nurse completed the questionnaires one to five times, in wards with fewer nurses, each nurse completed questionnaires up to five times.

Collected data were analyzed using SPSS software (version 21). Demographics of the participants were examined using descriptive statistics (e.g., frequency distribution, mean, and standard deviation). Kolmogorov–Smirnov test showed that data did not have a normal distribution so data analysis was performed using Mann–Whitney, Kruskal–Wallis, Wilcoxon, Spearman, and regression statistical tests, and generalized linear model. Statistical significance was set at  $P < .05$ .

## Results

Table 1 shows the demographics of the patients. The majority of the patients were females (50.9%) with a mean age of 51.15 years, married (73.2%), housewives (45.8%) with primary education (28.3%) who were dissatisfied with their monthly income (84.1%), and the majority of them lived with their spouses and children (45.6%). The primary caregivers for the patients after discharge were spouses (27%).

**Table 2.** Demographics of Nurses.

Variable		Patient RHD		Test result
		Number = 176	Mean $\pm$ SD	
Nurse age	<30	111	9/23 $\pm$ 0/98	0.936 <sup>a</sup>
	30–40	50	9/19 $\pm$ 1/22	
	>40	15	9/26 $\pm$ 0/90	
Nurse sex	Male	3	9/61 $\pm$ 0/75	0.175 <sup>b</sup>
	Female	173	9/21 $\pm$ 1/05	
Marital status of the nurse	Single	85	9/23 $\pm$ 1/04	0.801 <sup>b</sup>
	Married	91	9/22 $\pm$ 1/04	
Nurse education level	Bachelor’s degree	175	9/23 $\pm$ 1/04	0.610 <sup>b</sup>
	Master’s degree and higher	1	9/00 $\pm$ 1/35	
Work experience (years)	>5	73	9/28 $\pm$ 0/97	0.645 <sup>a</sup>
	5–10	64	9/18 $\pm$ 1/01	
	<10	39	9/17 $\pm$ 1/14	
Employment status	Internship	102	9/30 $\pm$ 0/96	0.439 <sup>a</sup>
	Contract-based	26	9/13 $\pm$ 1/15	
	Permanent	48	9/20 $\pm$ 1/05	
Number of patients under care	1–3	111	9/31 $\pm$ 1/10	0.02 <sup>a</sup>
	3–6	50	9/25 $\pm$ 1/03	
	>6	15	8/95 $\pm$ 1/03	

Note: <sup>a</sup>Kruskal–Wallis test.

<sup>b</sup>Mann–Whitney U-test. RHD = readiness for hospital discharge.

**Table 3.** Comparison and Correlation Between Nurses' and Patients' Perceived Scores of Readiness for Discharge.

Variable statistical index	Mean and SD		Test result
	Patient	Nurse	
Subscale of personal status	8.51 ± 0.79	8.96 ± 1.32	< 0.001 <sup>a</sup> < 0.001 <sup>b</sup> r = 0.637
Subscale of knowledge	8.37 ± 3.21	9.14 ± 1.36	< 0.001 <sup>a</sup> < 0.001 <sup>b</sup> r = 0.550
Subscale of perceived coping ability	8.46 ± 2.03	8.99 ± 1.56	< 0.001 <sup>a</sup> < 0.001 <sup>b</sup> r = 0.715
Subscale of expected care	9.15 ± 2.12	9.79 ± 0.91	< 0.001 <sup>a</sup> < 0.001 <sup>b</sup> r = 0.312
Total perception of the readiness for discharge	8.62 ± 1.47	9.22 ± 1.04	< 0.001 <sup>a</sup> < 0.001 <sup>b</sup> r = 0.700

Note: <sup>a</sup>Kruskal–Wallis test.  
<sup>b</sup>Mann–Whitney U-test.

**Table 4.** Predictive Factors of the Differences in Patients' and Nurses' Perceptions Using Linear Regression Model.

Predictive factors of the differences in patients' and nurses' perceptions of discharge		Unstandardized Coefficients		Standardized Coefficients	P	CI (95%)	
		β	Std. Error			Lower Bound	Upper Bound
(Constant)		0.271	0.187		.490	0.721	−0.346
Patient sex (ref: Male)	Male	0.119	−0.259	−0.121	.030	−0.025	−0.494
Patient education (ref: Primary)	Vocational	0.127	−0.218	−0.079	.088	0.0032	−0.468
Patient occupation (ref: Farmer/laborer)	Freelancer	0.152	−0.251	−0.091	.098	0.047	−0.550
	Other	0.164	−0.403	−0.123	.014	−0.081	−0.726
Hospital ward (ref: ENT)	Orthopedics	0.160	−0.848	−0.271	.000	−0.535	−1.162
	General surgery	0.144	−0.365	−0.123	.012	−0.082	−0.648
	Neurology	0.179	−0.620	−0.163	.001	−0.269	−0.971
	Lung	0.274	−0.718	−0.120	.009	−0.179	−1.257
	Endocrinology and Rheumatology	0.182	−0.478	−0.124	.009	−0.120	−0.835
Nurse age (ref: <30)	Infectious	0.273	−0.731	−0.123	.008	−0.195	−1.268
	-	0.088	−0.181	−0.112	.039	−0.009	−0.353
Nurse marital status (ref: Married)	Married	0.116	0.209	0.098	.071	0.436	−0.018

The majority of patients were not dependent on others for care (61.5%). General surgery (15.3%) ranked the first reason for hospitalization.

Table 2 shows the demographics of nurses. As demonstrated, the majority of nurses was females (98.3%) with a mean age of 29.86 years and married (51.7%) who were completing their internships. Number of patients under care ( $P < .05$ ) was significantly associated with patients' perceptions of RHD.

Table 3 shows the scores obtained after completion of the questionnaires. The highest and lowest mean scores for patients were related to the subscales of expected care and knowledge, respectively. As for nurses, the highest and lowest mean scores were related to the subscales of expected care and personal status. The highest and lowest differences between patients' and nurses' perceptions of RHD were related to knowledge and personal status, respectively.

Table 4 shows the predictors of differences in patients' and nurses' perceptions of RHD using linear regression analysis via backward log-likelihood ratio (LHR) statistic procedure after controlling for characteristics of patients and

nurses. Sex of the patient ( $P = .03$ ); education ( $P = .08$ ), age of the nurse ( $P = .039$ ); and marital status of the nurse ( $P = 0.71$ ) were the predictors of differences in score levels between patients' and nurses' perceptions of RHD.

In linear regression analysis results, lower differences in perception scores of RHD were shown in female patients compared to male patients ( $B = -0.259$ , 95% CI:  $-0.025$  to  $-0.494$ ). The RHD score also showed a decrease between patients with vocational and those with a primary level of education ( $B = -0.218$ , 95% CI:  $-0.468$  to  $0.032$ ). The difference in perception score of RHD also decreased with an increase in nurse's age ( $B = -0.181$ , 95% CI:  $-0.009$  to  $-0.353$ ) and in married compared to unmarried nurses ( $B = 0.209$ , 95% CI =  $-0.018$  to  $0.436$ ).

## Discussion

The mean score of patients' RHD in all four subscales and the mean total score were less than the scores obtained by the nurses. The highest difference pertained to the knowledge subscale and the smallest difference pertained to the personal

status. In the study by Weiss et al., patients rated their perceptions of RHD in physical readiness and energy levels significantly lower than nurses. In contrast, the nurses rated the subscale of expected care at home higher than the patients.(28) In another study by Wise et al., The average patient and nurse perception scores on discharge readiness ranged from 7.5 to 8.9 out of 10, and nurses rated patient readiness significantly relative to the patients themselves in the overall score and areas of personal status and knowledge perception score, reported higher preparedness.(18) In Wallace et al.'s study, there was a difference in patients "and nurses" perceptions of discharge readiness in all four subscales, and nurses had higher perception scores, with the highest score being related to personal status and the lowest score being related to expected care at home.(25) In our study, it seems that although nurses provide the necessary education at the time of discharge, these educations do not exactly meet the patient's needs for self-care and therefore patients have a lower estimate of their knowledge at the time of discharge. At the same time, the patient and the nurse's assessment of the physical condition at the time of discharge is not very different and what is objective in the patient's condition is well estimated by the nurse.

The output of the regression model showed that the hospital ward, sex of the patient, education level, occupation, nurse's age, and marital status of nurses were contributing factors in the observed differences of RHD.

The difference in the RHD score was lower in patients admitted to orthopedics, general surgery, neurology, lung, endocrinology, rheumatology, and infectious ward compared to patients admitted to the ear, nose, and throat (ENT) ward. Our findings may be the result of a lower patients' appraisal of the severity of their postoperative care needs. As many of these patients needed outpatient procedures and cosmetic surgeries, they believed they were easily ready for discharge. Thus, they saw no reason to stay in the hospital at all.

The results of the regression model also showed that in female patients compared to men, the difference in perception score of readiness for discharge is reduced. Because in general, nurses had higher scores of readiness for discharge of patients, the estimation of female patient's perception was higher than their readiness. Because most women in our society are responsible for family care, a greater desire to return to the family has led to a higher estimate of readiness for discharge. On the other hand, since the largest number of nurses participating in the study was women, they may have a better understanding of the needs of women and have been more able to express the necessary training for discharge and preparation in female patients. The difference in RHD score was smaller as the nurse's age increased, which may be because of the better ability of older nurses, who had higher experience, to assess patients' needs.

The results of the study by Palonen et al. showed that the higher chance of RHD of elderly patients was significantly correlated to discharge teaching, discharge time, and the

need for additional information. And about family members, significant relationship was observed between a higher probability of RHD, teaching at discharge time, the presence of another family member to assist in patient care, and communication with the patient. Those who received some or sufficient teaching at the time of discharge had higher self-confidence before discharge than those who received no teaching.(29) Our results also are in accordance with the study of Wallace et al. which showed that in a patient-reported predictive model for Care Transitions Measure (CTM), there was significant discordance between patient- and nurse-assessed RHD.(27) The results of Zhang et al.'s study also showed that gender and underlying diseases were significantly associated with discharge readiness score.(30) In our study, the number of patients with underlying diseases was not high, which may affect the lack of significance in the regression model.

## Limitations

The most important limitation of the present study is the lack of person-to-person or case care methods in the sections we are studying. Because despite assigning several specific patients to a nurse and providing care by the same nurse, in some cases care is provided in the form of division of functions and a nurse is responsible for training during discharge to all patients who may not know much about his training and care needs. To minimize this limitation, the questionnaire was filled out by the nurse who had the most interaction with the patient and was responsible for patient care on the day of discharge and provided discharge training to have a proper knowledge of the patient's condition.

The study environment is also one of the limitations. The present study, which was conducted in six educational and medical centers, seems to you that research conducted in other public/government, private and military/hospital centers can have different results.

## Conclusion

The results showed that factors such as sex of the patient, education, occupation, hospitalized ward, nurse's age, and marital status of the nurse affect the difference between patients' and nurses' RHD. Thus, in addition to clinical criteria, the assessment of patients' readiness may help to develop a before discharge care plan tailored to the patients' needs. A better understanding of patients' needs can improve the quality of care, in-hospital training, and, if necessary, post-discharge care services.

When patients are not ready for discharge, there is a risk of experiencing post-discharge adverse consequences such as readmission, increase in health expenses, family re-involvement, and an increase in financial and psychological burden. Therefore, all efforts should be made to maximize the readiness of patients for discharge, and, if necessary, coordination should be made by the social welfare

organization and other involved organizations for patients who, for any reason, cannot afford post-discharge self-care or its related expenses.

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### Ethical Approval

IRB approval was received. All investigations and procedures of this study were approved by the Research Ethics Committee of Gilan University of Medical Sciences (IR.GUMS.REC.1398.471).

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### Statement of Human and Animal Rights

All procedures in this study were conducted in accordance with the Research Ethics Committee of Gilan University of Medical Sciences (IR.GUMS.REC.1398.471) approved protocols.

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