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ASSESSMENT OF THE READINESS OF THE PATIENTS WHO DISCHARGE AFTER MYOCARDIAL INFARCTION AT PUBLIC SECTOR HOSPITAL PESHAWAR, KHYBER PAKHTUNKHWA(KPK). A QUANTITATIVE STUDY

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Abstract:

The study assessed the patient's readiness for discharge to facilitate an uneventful shift from the hospital to home. Patient perspectives play a key role in the discharge process. since post-discharge self-care is important to prevent readmissions, emphasizing the need for supporting measures to reduce healthcare costs and reduce patient risks. Patient readiness for discharge is critical and it is not generally assessed in Pakistan. Since high prevalence of Myocardial Infarction (MI) in Pakistan highlights the need for assessing the discharge readiness. The study assessed discharge readiness and its linked factors in MI patients in a public sector hospital in Peshawar and explored demographic impact on readiness. The study employed a quantitative cross-sectional analytical approach, enrolling 360 post-MI patients using non-probability convenient sampling at a public sector hospital in Peshawar. The readiness for Hospital Discharge after the Myocardial Infarction

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Scale (RHD-MIS) was used to evaluate patient's readiness for hospital discharge after MI. The study, using descriptive and Chi square analysis, found that majority of the participants (49%, n=176) had medium readiness, (19%, n=68) had poor readiness, and (32%, n=116) had high readiness for discharge. Patients over 50 years of age with better socioeconomic backgrounds, living in a relationship with a history of previous cardiac diagnosis, comorbidity, and treatment were more ready for discharge. The study recommends that assessment of discharge readiness should be a component of the discharge process at the hospital setting. Discharge education must begin prior to discharge decision, with regular lessons taught on daily basis. This strategy could lead the way for the development of a new position for an Advanced Practitioner Nurse (APN) who specializes in the discharge process. Future research can include longitudinal studies that correlate discharge readiness to readmission rates, following the assessment of the efficacy of discharge strategies over time in both private and public hospitals.

Keywords: Readiness for discharge, Hospital discharge, Myocardial infarction.

Introduction:

Myocardial Infarction (MI) is a serious medical condition having a significant impact on individuals and the global healthcare system and is one of the highly prevalent fatal non-communicable diseases (NCD) (Neupane et al., 2020). In 2019, most deaths were attributed to NCDs accounting for 74.4% of total deaths from 7.1 million with the dietary risk involved. One of the NCDs called ischemic heart disease has played a prominent role in leading to death and disability globally (Qiao et al., 2022).

The prevalence of MI is approximately 3 million worldwide. (Wagner & Wagner, 2020). However, the study shows that the prevalence of MI cases in Pakistani lies between 30% to 45% (Ahmad et al., 2022) and according to the Pamukçu's projection, by 2030, there would be about 23.6 million deaths from CVD. (Pamukçu, 2019).

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Evidence shows that 63% of the unintentional medication discrepancies took place at the patient's hospital stay while surprisingly, 33% of unintentional medical errors occurred after the patients get discharged from the hospital and begun taking medications at home (Volpi et al., 2021). After patients are sent home, about 30% of patients have adverse effects; this rate is comparable across all ethnic categories (Costello et al., 2021).

The term readiness for hospital discharge was used by the Fenwick in 1979 (Fenwick, 1979). Assessing patient's readiness for discharge is a vital part of the discharge planning procedure. When it comes to efficiently delivering knowledge, discharge education's format, schedule, and frequency all matter (Kang et al., 2018). Improving discharge education is essential because inefficiency could lead to more hospital resources being used, which would raise expenses in the healthcare system (Stockwell-Smith et al., 2018). Discharge education is highly important for cardiac patients following myocardial infarction, as it can lower the probability of readmission, recurring attacks, and numerous hospital visits (Luhana, 2024). Another research has shown that patients who have had an MI should get education to lessen their chance of dying and developing new cardiovascular issues. (Hydzik et al., 2021). Another study done at a tertiary care setup in Pakistan emphasized the need to check poor discharge education observed by family caregivers, in order to strengthen the institution's requirement for better planning and establishing personalized counseling for a safe discharge. (Farhan et al., 2022)

Not being prepared for discharge puts patients at risk for unanticipated readmission, mortality, and other unfavorable consequences. To provide effective and efficient healthcare coverage, it is imperative to attempt to decrease unexpected readmissions, since they lead to higher health expenditures and more difficulties for patients and their families. Ensuring patients are ready for discharge is anticipated to lower the risk of unexpected readmissions (Kaya et al., 2018).

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One of the study displayed the probability of readmission reduced by 52% for every one-point rise in a nurse's readiness assessment on a 10-point scale. However, Individuals who prefer prompt medical attention and have a higher income and education tend to select private medical care, whereas those with lesser resources and education typically prefer government treatment. But for financial and safety concerns, some people continue to think about government facilities (Afzal et al., 2022).

In Pakistan additional risk factors such as overweight (69%), pre-hypertension (37%), tobacco consumption (14%), drinking alcohol (2%), high rates of hypertension (40.1%), confirmed diabetes (15%), and ischemic heart disease (17%) were seen. (Kazmi et al., 2022)

Aim of the study

To evaluate patient's level of readiness at the time of discharge and impact of demographic variables on level of readiness for discharge at a public sector hospital in Peshawar, Khyber Pakhtunkhwa (KPK).

Research Question

1. What is the Patient's level of readiness for discharge after having an MI and admitted in a tertiary care hospital of Peshawar KPK Pakistan?
2. What is the impact of demographic variables on level of readiness for discharge after having myocardial infarction?

Research Methodology

Study setting: The study was conducted at the Peshawar Institute of Cardiology (PIC)

Study design: A Quantitative cross-sectional analytical study design was used assess the level of readiness for discharge after MI.

Study population: The study covered patients aged from 18 years to 80 years (Cheema et al., 2020) who were hospitalized with the diagnosis of MI from June 2024 to August 2024 and were planned for discharge after an

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intervention i.e. (CABG and PCI). This study included adults with MI, whether it is ST Elevation Myocardial Infarction (STEMI) and Non-ST elevation MI (NSTEMI) and were treated with PCI or CABG. People over 80 years were excluded since it was expected that their rates of comorbidity and death were high, making them inappropriate to compare with younger patients (Jortveit et al., 2020).

Sample Size:

The sample size of (n:360) was used based on the latest consensus report, the Pakistani population is 245,000,000. Assuming a confidence interval of 95%, 5% level of significance (alpha error), 17.5% is the expected incidence in Pakistan (Zubair et al., 2018); nevertheless, another study reported prevalence of over 30% and up to 45%. The mean of these reported values were used to collect data (Ahmad et al., 2022).

Sampling technique: A Non probability convenient sampling technique was utilized to collect sample for this study.

Inclusion Criteria

The following patients were included in the study:

- Age between 18 to 80 years. (Cheema et al., 2020) and (Jortveit et al., 2020).
- Patients who underwent any intervention like PCI or CABG
- Patients who were hospitalized with a diagnosis of MI at PIC during the data collection phase.
- Patients who were able to comprehended English or Urdu language.
- Patients who were planned to be discharged home by the attending physician.

Exclusion Criteria

- Patients above the age of 80 years since their comorbidity and death rates were projected to be high, making them inappropriate for comparison with younger patients (Jortveit et al., 2020).
- Diagnosed with major comorbidities like cognitive impairment, mental health disorder etc.
- Had cardiovascular diseases other than MI.

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- Patients who did not provide consent.

Data Collection Procedure:

After obtaining approval from the Ethical Review Committee (ERC), Data collection was done in three months from June to August 2024 till the number of 360 patients was achieved. For each eligible participant, an easily understood overview of the study's objectives, potential benefits, and associated risks was provided. Following that informed consent was obtained and ensured that each participant read the study guidelines and was willing to participate.

To ensure participant comfort, patient data was collected using a sociodemographic form, followed by the RHD-MIS questionnaire. The procedure, which involves obtaining consent and filling out forms, takes about 15 minutes. Although the researcher entered the data, the forms were available to any participant who wished to fill them out on their own.

Data Collection Tool: In this study, a Questionnaire was used to gather information. Participants were asked about their sociodemographic profile using a checklist using closed-ended, structured questions. The questions in the checklist asked participants about their age, gender, education, marital status, socioeconomic status, language, employment status, and any prior hospitalization followed by the diagnosis and treatment received in order to collect essential sociodemographic data. This checklist was followed by the tool "Readiness for Hospital Discharge after Myocardial Infarction Scale" (RHD-MIS) designed by Ms. Aldona Kubica. The questionnaire, with an α-Cronbach value of 0.789 for the 23 items, showed a high level of reliability and consistency. However, and the instrument's overall CVI was calculated to be 0.96 for both clarity and relevance, indicating that the tool's validity for measuring the readiness for discharge.

The RHD-MIS questionnaire was divided into three subscales: (Mahmoud & Abdel-Mordy) subjective assessment, (2) objective assessment of the patient's understanding of their condition, and (3) patient

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expectations. Each of the 23 items in the RHD-MIS is scored from 0 to 3, where 0 indicates the participant did not know, and 3 indicated the participant had a clear understanding.

The questionnaire contained non-scored items concerning patient's awareness toward health condition, nutrition, exercise, treatment and follow-up, as well as preventive and emergency measures. Based on the participant's selected options final scores were recorded as total score of readiness. A cumulative RHD-MIS score of more than 57 points suggests high readiness for discharge, whereas a score of less than 44 points indicates low readiness. Scores between 44 and 57 indicate a moderate level of readiness. The previously published alpha-Cronbach coefficient of 0.789 attests to the questionnaire's good reliability and consistency (Buszko et al., 2017).

Results

As shown in the Table 1 a total of 360 patients participated in the study: Majority of them were males (63%, n=229), and rest were females (36%, n=131). Almost half (47.5%, n=171) of them were of the age between 50 to 65 years. Majority of the participants (86%, n=310) were married. More than half (54%, n=192) of the participants were unemployed while only (26%, n=92) of these patients were currently working. A quarter (31%, n=112) of these patients were smokers. Almost (45%, n=162) of the participants had history of previous MI and had a history of treatment like Coronary Artery Bypass Grafting (CABG) and Percutaneous Coronary Intervention (PCI).

During the current stay, about one third (22%, n=79) of the patients underwent CABG, while more than two-third (78%, n=281) received PCI. Socioeconomically, more than half (64%, n=233) of the participants had an average monthly income of 10,000 to 50,000 Pakistani rupees, classifying them as economically poor population. The majority of participants spoke Pashto (72%, n=259), while some (24%, n=88) spoke Urdu. Approximately half (46%, n=166) of the participants lacked formal education, and only one person had completed more than 18 years of schooling. Data demonstrates that more than half (55%,

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n=198) of the patients had previously been diagnosed with particular diseases, with (45%, n=162) having had prior interventions received.

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Table 1: Socio-demographic Findings and their significance on readiness level of discharge

Independent Variables affecting discharge Readiness among myocardial infarction patients			Chi Square results
Age of patient (in years)	**Frequency (n)**	**Percentage (%)**	**p-value**
18-33	17	4.7	**<0.001**
34-49	78	21.7	
50-65	171	47.5	
66-80	94	26.1	
Gender	**Frequency (n)**	**Percentage (%)**	**p-value**
Male	229	63.6	0.234
Female	131	36.4	
Socioeconomic Status (in Pakistani rupees)	**Frequency (n)**	**Percentage (%)**	**p-value**
less than 10,000	78	21.7	**0.020**
10,000 - 25000	123	34.2	
26000 - 50000	110	30.6	
51000 - 100,000	49	13.6	
Language of Patients	**Frequency (n)**	**Percentage (%)**	**p-value**
Urdu	88	24.4	0.186
Sindhi	1	.3	
Panjabi	5	1.4	
Pashto	259	71.9	
Balochi	2	.6	
Other (Saraiki, Hindko, and Chitrali)	5	1.4	
Education of the patient	**Frequency (n)**	**Percentage (%)**	**p-value**
No formal education	166	46.1	0.067
Classes 1 to 5	73	20.3	
Classes 6 to 12	80	22.2	
Higher education classes 14 or 18 years	40	11.1	
Above higher education	1	.3	
Current employment of the patient	**Frequency (n)**	**Percentage (%)**	**p-value**
Unemployed	192	53.3	0.111
Employed	94	26.1	
Self-employed	49	13.6	
Retired	23	6.4	
Student	2	.6	
Marital status of patient	**Frequency (n)**	**Percentage (%)**	**p-value**
Unmarried	34	9.4	**0.004**
Married	310	86.1	

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Widow	16	4.4	
Previous hospitalization for coronary artery disease (CAD)	**Frequency (n)**	**Percentage (%)**	**p-value**
Yes	198	55.0	**< 0.001**
No	162	45.0	
Previous diagnosis	**Frequency (n)**	**Percentage (%)**	**p-value**
MI (Myocardial infarction)	137	38.1	**0.003**
HTN (Hypertension)	48	13.3	
Hyperlipidemia	10	2.8	
DM (Diabetes)	3	0.8	
No any previous diagnosis	162	45.0	
Smoking Status	**Frequency (n)**	**Percentage (%)**	**p-value**
Yes	112	31.1	0.253
No	248	68.9	
Previous treatment received	**Frequency (n)**	**Percentage (%)**	**p-value**
CABG (Coronary Artery Bypass Grafting)	26	7.2	**0.001**
PCI (Percutaneous Coronary Intervention)	136	37.8	
No any previous intervention	198	55.0	

Inferential Analysis

A Chi-square test was used to determine the association between demographic factors and level of discharge readiness after an MI as proven by the Significant p-values obtained for age ($p<0.001$), socioeconomic status ($p=0.020$), marital status ($p=0.004$), past hospitalizations ($p<0.001$), having previous diagnoses ($p=0.003$), and treatments received in past ($p=0.001$) as illustrated in tables. In contrast, other characteristics, such as gender ($p=0.234$), language ($p=0.186$), education ($p=0.067$), working status ($p=0.111$), and smoking history ($p=0.253$), statistically were not significantly associated with discharge readiness.

Age was found to be statistically significantly associated with the level of readiness for discharge, with the highest association observed in the age group of 50 to 56 years. Furthermore, socioeconomic status was also found to be statistically significant in relation to the level of readiness for discharge, with the strongest influence reported in people earning between rupees 10,000 and rupees 50,000. Similarly, marital status was

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statistically significantly related to level of readiness for discharge, with married participants showing the strongest representation. In addition, history of past hospitalizations and previous medical diagnoses were found to be statistically significantly related to discharge readiness, particularly among individuals who previously had an MI. Likewise, patients who received previous interventions were statistically significantly more prepared for discharge with the highest readiness observed in those who had undergone PCI previously.

Level of Readiness

Almost half of the population, (49%, n=176), demonstrated a medium level of readiness for discharge after an MI, while about one third of them (32%, n=116) showed a high level of readiness and some (19%, n=68) fell into the low readiness category. In terms of subjective knowledge, more than half (61%, n=220 of patients reported having a high level, (23%, n=82) had a low level, and (16%, n=58) had a medium level of subjective knowledge. Conversely, most patients, (56%, n=203), had low objective knowledge, (36%, n=130) had medium, and only (8%, n=27) exhibited high objective knowledge. Additionally, (60%, n=216) of patients had high expectations which means understood the discharge education well, (32%, n=114) had medium expectations, and (8%, n=30) had low expectations, as shown in the Table 2.

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Table 2 Level of Readiness for discharge after myocardial infarction.

Dependent Variable: Subjective knowledge, Objective Knowledge, Expectations, and Readiness for discharge		
Total Subjective Knowledge score in category	Frequency (n)	Percentage (%)
0-15 Low level	82	22.8
16-18 Medium level	58	16.1
19-21 High level	220	61.1
Total objective knowledge score in category	Frequency (n)	Percentage (%)
0-12 Low level	203	56.4
13-18 Medium level	130	36.1
19-21 High level	27	7.5
Total Expectation Sore in category	Frequency (n)	Percentage (%)
0-13 Low level	30	8.3
14-22 Medium level	114	31.7
23-27 High level	216	60.0
Total Level of Readiness	Frequency (n)	Percentage (%)
0-43 Low level of readiness	68	18.9
44-57 Medium Level of Readiness	176	48.9
58-69 High level of readiness	116	32.2

Ordinal logistic Regression Multivariable Regression Analysis

The multivariable logistic regression model incorporated all statistically significant features found in the univariate analysis (Chi-square Test). The components were entered in an ascending sequence based on their p value, with the most significant first. As seen in table no: 14

Table 3: Ordinal logistic regression multivariable Regression Analysis

S. No	Factor associated with readiness for discharge	Beta Coefficient	P Value	95% Confidence Interval	
				Lower Bound	Upper Bound
1.	Age	0.308	0.022*	0.05	0.57
2.	Previous Admission	-1.354	0.089	-2.92	0.21
3.	Previous treatment	-0.031	0.898	-0.51	0.45
4.	Previous diagnosis	0.192	0.367	-0.23	0.61
5.	Marital status	0.085	0.773	-0.49	0.66
6.	Socioeconomic status	0.347	0.001*	0.14	0.56

*Level of significance set at 0.05; *= significant p-values*

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Outcome: Readiness for discharge model based on ordinal logistic regression with outcomes Low, Medium, and High readiness for discharge.

Beta Coefficient values show the strength and direction of the association between each factor and readiness for discharge, while the P-value indicates statistical significance ($P < 0.05$ is considered significant). when Beta coefficient of age converted to Odds Ratio by calculating the exponential value of beta coefficient which comes out to be 1.36 that means that as age increases 1.36 times (36%) more odds of having better readiness for discharge on MI patients compared to those of lower age. In addition to that when exponential value of socioeconomic status was calculated it results 1.41 which means that patients with high socioeconomic status having better readiness for discharge about 1.41 times (41%) than those with low socioeconomic status.

Discussion:

Level of readiness for discharge

The readiness of MI patients was assessed using the tool named: Readiness for hospital discharge after myocardial infarction scale (RHD-MIS).

Current study found low readiness in (19%, n=68) patients, medium level of readiness in (49%, n=176) and high readiness in (32%, n=116). This means half of the participants had medium level of readiness to discharge and were able to take care of themselves intermediately. Whereas 19% of the patients were poorly ready for discharge and were not ready to manage self-care at home, indicating that this population is more prone to get complications and hospital readmissions as compared to the population with high readiness for discharge (Rotvig et al., 2021; Siow et al., 2019).

Our study discovered that patient's overall readiness for discharge after experiencing an MI was at medium level. This indicates that most of the patients felt ready to some extent for moving from care hospital to self-management at home, but, there were still gaps in their readiness that needed to be addressed to obtain optimum post-discharge health outcomes. Several factors might have contributed to this medium level of readiness. Patients may have difficulty in making lifestyle changes and implementation on discharge teachings

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is challenging for many patients (Greysen et al., 2017; Weiss et al., 2017; Weiss et al., 2011). A medium level of readiness indicates that health care professionals are preparing patients well, but there is room for improvement. Personalized discharge planning, which focuses on validating patient's understanding of their condition, providing tools for managing post-discharge care, steps to continuous improvement, may help increase readiness level (Greenwald et al., 2007). Furthermore, the patients having high objective knowledge about post discharge lifestyle modifications are more likely to have a better adherence to the treatment plan (Kosobucka et al., 2022). However, the patients with the higher RHD had better adherence while those with high expectations, who either did not seek more discharge information or considered they had sufficient understanding, were more likely to discontinue treatment (Kubica & Pietrzykowski, 2021).

These findings of the current work are consistent with the results of some other studies done in the past (Buszko et al., 2017; Haridas & Mani, 2022; Kolarczyk et al., 2023; Kosobucka et al., 2018; Kosobucka et al., 2022), which also reported medium level of readiness in most of their participants having MI, However, their findings contradict with the study by Hydzik et al. (2021) which showed that half of their participants exhibited a low level of readiness for discharge.

The consistency in outcomes between past studies and the current study might be due to their geographic position. These investigations were conducted in Poland and India, with comparable sociodemographic and healthcare characteristics could be one of the reason for their similar results (Mabire et al., 2015).

In contrast, differences could arise from variations in study design, sample size, disparities in healthcare settings, differences in year of nursing experience, and ward size, and more unique problems associated to the specific patients (Mabire et al., 2019).

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Sociodemographic

Age

Age significantly affects patient's readiness for discharge following a myocardial infarction. Notably, younger patients from age 18 to 49 years exhibited lower levels of readiness than those over 50 years. This outcome is consistent with the findings of Alsaqri et al. (2020), who found that younger and middle-aged people require more information than older ones. However, these results contradict with the findings of Hydzik et al. (2021); Kaya et al. (2018) who found that younger adults were more ready for discharge, similarly Monfared et al. (2024), that older adults struggled with discharge readiness.

The reason for more readiness among older patients in our study could be that older patients may have greater experience dealing with chronic health concerns, healthcare systems, and recovery procedures, making them feel more ready for discharge. In contrast, younger individuals may lack this experience, resulting in lower readiness levels. Younger individuals may underestimate the seriousness of their disease and be less likely to follow post-discharge recommendations, whereas older adults may see their health as more insecure, forcing them to be more involved in the discharge process and post discharge self-care. Additionally inconsistencies across studies may reflect the complexities of discharge readiness, which is impacted by a variety of psychological, social, and physical aspects that differ depending on age and individual circumstances (Briesacher et al., 2008)

Socioeconomic Status

It is significantly linked with readiness for discharge after myocardial infarction in current study, demonstrating that patients with higher socioeconomic level is readier for discharge. This finding is consistent with study Shu et al. (2024), that also discovered a favorable link between socioeconomic level and discharge readiness after myocardial infarction. However, it contrasts with the findings of some other studies Kosobucka et al. (2018) and Kolarczyk et al. (2023), in which there is no significant relationship between socioeconomic level and readiness for discharge.

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The reasons for the similarity in the studies can be due to patients believing that they could afford to have private treatment, shorter follow-up visits, or paid caregivers if needed, which may have made them feel more ready for discharge. They may also be able to afford medications and rehabilitation services that will boost up their recovery (Kosobucka et al., 2018). Studies that contradict the findings, may include healthcare systems with better equality of access, where even low-income patients receive comparable care. Strong family or social support can make lower-income patients more inclined to discharge for financial reasons, leading to different results (Kaya et al., 2018).

Initially after Chi square test Age, Socioeconomic Status, Marital status, and previous history of diseases and comorbidities came out to be significant however after ordinal logistic regression only age and socioeconomic status remained insignificant and remaining all turned out to be insignificant.

Conclusion

The main findings on of current thesis is patient readiness for discharge after a myocardial infarction with the majority of patients demonstrating a medium level of readiness for discharge. Age, socioeconomic status, marital status, and previous healthcare experiences were all significantly associated with the level of readiness. In contrast, characteristics such as gender, education, language, employment status, and smoking had no significant effect on outcomes. The findings indicate that while discharge planning is generally useful, focused changes are required, particularly for younger patients, those with lower socioeconomic status, and people with little hospital experience. Future research requires a longitudinal study to assess readmission rates of patients discharged with low level of readiness and comparison with those patients discharged with high readiness and impact of emotional and psychological aspects on discharge readiness, such as anxiety and fear of post-discharge self-management.

Strengths of the Study

The following are the strengths of the study:

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- To the researcher's knowledge, this is the first study to assess the readiness for hospital discharge (RHD) among myocardial infarction (MI) patients within the Pakistani context. It highlights specific areas that should be integrated into discharge education to enhance patient readiness in similar settings as our study.

- The study's internal validity was maintained using a validated RHD-MIS tool, a pre-calculated sample size of 360 participants, and recruitment from diverse socio-cultural backgrounds.

- The findings offer valuable insights for improving discharge readiness among MI patients in similar setups across Pakistan, contributing to more effective discharge planning.

- Key demographic factors, such as age, socioeconomic status, marital status, and prior hospital experiences, were identified as significant predictors of discharge readiness, allowing for targeted interventions in future discharge protocols.

Limitations of the Study

This study had the following limitations:

- The study focused on MI patients from a single hospital in a single location in Pakistan, limiting its generalizability to the entire cardiac patients.

- The study is unable to measure the incidence and comparison of all patient's lifestyle.

- Although the study explored patient readiness for discharge more investigation on readmission rates and emotional readiness for discharge can be evaluated in further studies

- Cross sectional

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