Nurses and Physicians perception of Causes and Risk Ractors Contributing Patient Readmission to the Coronary Care Unit

Asmaa Hassanien Ahmed[1], Mogedda Mohamed Mahany[2], Tarek Abdelhamid Naguib[3] & Ghada Shalaby Khalaf[4].

[1.] Teacher at secondary nursing school in Sohag city,

[2.] Assistant Professor of Critical care and Emergency Nursing, Faculty of Nursing, Assiut University.

[3.] Lecturer of cardiology of Assiut University Hospital, Faculty of Medicine, Assiut University

[4.] Lecturer of Critical care and Emergency Nursing, Faculty of Nursing, Assiut University.

Abstract

Background: Readmission to the intensive care unit is associated with increased cost of care and worse patient outcomes **Aim :**of the study was to determine and explore nurses and physicians perception of causes and risk factors contributing patients readmission to coronary care unit. **Design:-** descriptive research design was used in this study**. Setting:** The study was conducted in coronary care units at a University Hospital. **Sample:** thirty nurses and twenty-five physicians working at the Coronary Care Unit. **Tools:** semi structured interview questionnaires**. Results:** thirty-two factors within four broad themes that could lead to readmissions were identified **(1) patient factors:** Previous comorbidities, Previous acute coronary syndrome, Bad medication compliance and Patient discharged before articulation goal of care (100%). **(2) process factors:** Unqualified staff member, Resources constraints (100%). **(3) provider factors:** Heavy workloads 90%, Unqualified staff member deal with highly demand patient (86,9). **(4) organizational factors**: Resources constraints (when patient transfer to ward)100% **Conclusion and recommendations**: intensive care unit care givers need to look at ways of increasing the knowledge and skills of ICU staff or identify more appropriate environment for managing acutely ill patients

Keywords: *Readmission, Nurses, Physicians, Perception, Risk Factor, causes.*

Interdiction

Coronary artery disease is punctuated by episodes of acute exacerbation requiring hospitalization, most commonly for acute coronary syndromes (ACS). Despite improvements in acute care and survival after ACS hospitalization, early readmissions remain common and have a significant clinical and financial impact. These readmissions are seen as undesirable events both for patients and healthcare systems. **(Danielle, 2014)**

Readmission is defined as a second admission to the coronary care unit (CCU) during the same hospitalization. Unplanned readmissions to intensive care units (CCU) impose a significant burden on patients and the health care system. Readmission is costly and places considerable pressure on a system with finite resources. it is not surprising that research indicates that patients readmitted to CCU within the same hospital stay experience poor outcomes than those not readmitted. mortality rates are 6 times higher and have lengths of stay twice as long as non-readmitted patients. They are 11 times more likely to die in a hospital. To date, only one study has examined ICU readmissions using a qualitative perspective**. (Elliot & croocks, 2011).**

Discharge plan for patients from ICU usually depends on the clinical judgment of the intensivists or on the collaboration of other members of the CCU care team. Due to the highly subjective nature of CCU discharge decisions, as well as limitations in clinical resources or an insufficient number of beds to accept all patients who need CCU care, patients can be discharged prematurely from the CCU, some of whom are inevitably readmitted. Therefore, early identification of patients at higher risk of CCU readmission would help clinicians to appropriately decide who is ready to be discharged from the CCU and prevent avoidable morbidity and mortality after discharge **(Yong, 2015).**

However non-patient factors such as patient inflow volumes, CCU occupancy and clinician decision making practices have also been suggested complex and error-prone care transitions between teams at the time of discharge from coronary care may also contribute to unplanned readmission**. (Dongy.2017).**

Proposed reasons for CCU readmission include recurrence of the initial complaint, complications arising from treatment, poor responsiveness to therapy, comorbid complications, onset of new medical conditions and failure of the receiving unit to cope with the level of care demanded by the patient It is not clear whether the decision to discharge patients from the CCU or the level of care given to these

patients on the general wards, or a combination of both, results in readmission to the CCU. Therefore, the ability to identify patients at high risk of readmission to the CCU during the same hospitalization could allow objective decisions to be made by clinicians regarding the timing of discharge from coronary care, the level of care required by patients on the ward and the need for follow up by the staff. *(Steven .A 2010)*

Significance of the study

Readmission is costly and places considerable pressure on a system with finite resources and is an important first step in reducing patient readmission is identifying patients who are most likely to be readmitted.
Number of the patient admitted to ICU are 1250 and readmitted are100 patients
 (according to the records of the coronary care unit at Assiut university hospital 2018).

Aim of the study

The present study aims to:
Identify nurses and physicians perception of causes and risk factors contributing
patient readmission to the coronary care unit .

Research question

What is nurses and physician perception of causes and risk factors contributing patient readmission to the coronary care unit ?

Subject and method

Research design
The descriptive research design was used to conduct this study.
Setting
This study was carried out in the coronary intensive care unit at Aurman Assiut University hospital that consists of 3 rooms(16 bed), 40 nurses and   30 physicians.
Sample
A convenient sample for this study was selected and includes (30) nurses and (25) physicians working in a coronary intensive care unit at a University Hospitals. The study period was 6 months from July 2018 to December 2018.
Inclusion criteria
1- Nurses and physicians who provide direct patient care at the coronary care unit.
2- Nurses and physicians who have at least one year of experience at work.

Exclusion criteria
Newly graduated nurses and physicians and less than one year of experience.
Tools of data collection
One tool was used in this study and was designed by the researcher based on a literature review for data collection (**Elliot& croocks, 2011**) .
(Semi structured interview questionnaire):-
This tool will be developed by the researcher based on review literature (Ofoma et al., 2018)
This tool aimed to assess critical care nurses and physicians perception about causes and risk factor of readmission to coronary care unit, (their awareness about risks and causes for readmission)and consists of two parts as following: .
Sociodemographic data of nurses & physicians:
(such as code, age, sex, year, marital status, educational level, unit name, year of experience)
 Nurses   and   physicians   perception   about readmission causes and risk factors   which includes: four categories
(1) **Patients related factors** are seventeen factors (age, previous comorbidities, undefined goal of care, patient discharged on his own demand, etc. ……)
(2) **Process factors are** two factors as (physician – patient communication and lack of communication between CCU staff and ward staff)
(3) **Provider factors** are eight factors (heavy work load and provider experience, etc. ….)
(4) **Organizational factors** as five are factors (resources constrain and institutional policies, etc. …)

Method

Data collection phases
The study was conducted throughout two main phases, preparatory phase and implementation phase including:
(i)development of a questionnaire about causes and risk factors of readmission (two months), (ii)pilot testing of the questionnaire (one month), (iii) implementation of the questionnaire(two months).
1-Preparatory phase
  1- Development   of   the   questionnaire;   the questionnaire was a tool for collecting self-reporting data where participants present their perception and knowledge about causes and risk factors of readmission to coronary care unit .the questionnaire was developed from international articles and publications describing all aspect of patient readmission
  2- Parts of the questionnaire
  a. Questions related to demographic data (open questions)
  b. Questions related to nurses and physicians perception regarding causes and risk factors of

readmission to coronary care unit (yes or no question)

The questionnaire was designed in English because all of nurses and physicians are bachelor and master's degree and hospital documents are in English. Moreover, the participants were able to communicate in English

  3- Piloting the questionnaire
      The questionnaire was tested once the approval of the ethical committee was received .

Pilot study

It was conducted on 3 nurses & 3 physicians to test the feasibility and applicability of the tools and to estimate the time needed to fill the interview. Based on the results of the pilot study, the necessary modification in the sheet was done.

The reliability test for a tool (knowledge assessment tool) by using Alpha Cronbach's test (R=0.679) the content validity was (0.82).

  4- The final the questionnaire
      The last edition of the questionnaire contained thirty-two items related to causes and risk factors of patient readmission. The questionnaire included: (five questions) related to personal data (age - sex – unit name- level of experience and educational level)

  5- Validity   and   Reliability
      The researcher gave the questionnaire to 6 experts in critical care nursing & medicine to review and examine the quality of the questionnaire. Cronbach's test (R=0.679) with a content validity of (0.82).

1- 1-Written consent was obtained from the health teams that participated in the study, after explaining the nature and purpose of the study.

2- Health team was assured that the data of this research will not be reused without second permission.

3- Confidentiality and anonymity were assured.

4- Health team have the right to voluntary participate or refuse participation in the study without any rationale at any time.

5- The objective of the study was explained by the researcher orally to the nurses and doctors additionally to the written explanations in the covering letter of the interview.

2- Implementation phase

Once permission was granted to proceed with the proposed study, the researcher-initiated data collection. The implementation phase involved the following:

 1- At the initial interview, the researcher introduced himself to initiate a line of communication, explain the nature and purpose of the study prior

to answering the questions to obtain consent and cooperation from nurses and physicians.

2- The researcher interviewed each nurse and doctor individually to fill out the questionnaire sheet by nurses on duty during any shift.

3- The researcher interviewed nurses and doctors during their break time and the answers were recorded immediately.

4- Data were gathered through a semi-structured one-to-one interview. to encourage participants to speak freely. Each interview was conducted in a private office in the hospital and lasted approximately 40 minutes.

5- To ensure anonymity, confidentiality, and privacy, participants' names were not used during each interview and participants were allocated a code for the study (e.g. "nurse 1b" "nurse 2 b" etc. and "physician 1a", "2a" etc.)

6- At the start of the interviews, participants were told that the interviewer would ask about their experiences of caring for patients who had been readmitted to the CCU and use further questions to explore their responses in detail. This was done to gain a thorough understanding of contributing factors from the participant's perspective. It also provided the participant with an understanding of the interviewer's role during the interview. Each interview commenced with the same statement ("tell me your experiences of caring for patients who have been readmitted to CCU"). This consistent approach to data collection helped ensure trustworthiness. Five participants were asked to provide a detailed and honest account in response to the interviewer's questions.

7- The questionnaire sheet includes socio-demographic data, patient factors organizational factors, process factors and provider factors that are contributing to patient readmission to the coronary care unit. The total number of the questions were 55 questions for coronary care nurses and physicians.

Statistical analysis

The data were tested for normality using the Anderson-Darling test and for homogeneity variances prior to further statistical analysis. Categorical variables were described by **number and percent** (N, %), where continuous variables were described by the mean and standard deviation **(Mean, SD)**. The **t-test** and **ANOVA TEST** were used to compare continuous variables**. A two-tailed $p < 0.05$** was considered statistically significant. All analyses were performed with the **IBM SPSS 20.0** software.
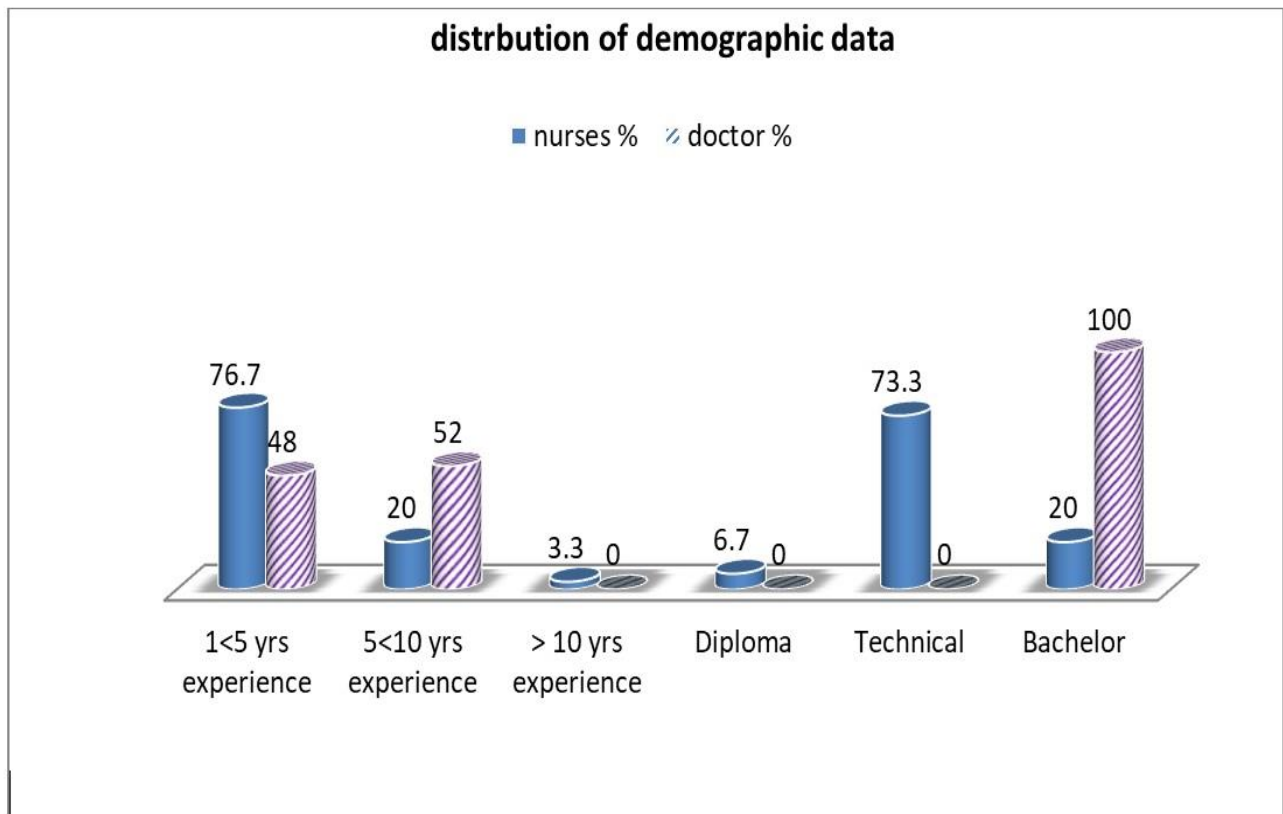
Results

Fig (1): percentage distribution of study sample in relation to of sociodemographic characteristics data for participants (physicians & nurses) n =(55)

Table (1): Comparison between the point of view for nurses and physician regarding patient.

Factors		Nurses. Yes N	%	Nurses. No N	%	physician Yes N	%	physician No N	%	P.v
Patients factors	Age	30	100.0	0	0.0	25	100.0	0	0.0	----
	Previous comorbidities(D.M- renal failure -hepatic failure)	30	100.0	0	0.0	25	100.0	0	0.0	--
	Previous ACS	30	100.0	0	0.0	25	100.0	0	0.0	--
	Male > female	30	100.0	0	0.0	25	100.0	0	0.0	--
	Bad medication compliance and post-discharge follow-up.	30	100.0	0	0.0	25	100.0	0	0.0	--
	Patient discharged on his own demand before articulation goal of care	30	100.0	0	0.0	25	100.0	0	0.0	--
	Drugs abuse (tamol ,Viagra)or others	29	96.7	1	3.3	25	100.0	0	0.0	--
	Insurance coverage (help patient to return when he feels tired)	16	53.3	14	46.7	8	32.0	17	68.0	0.09
	Stress and psychological status or any emotion-provoking situation	30	100.0	0	0.0	25	100.0	0	0.0	--
	Thyrotoxicosis- electrolyte imbalance	27	90.0	3	10.0	25	100.0	0	0.0	0.155
	Location of the hospital (near or far to patient home)	17	56.7%	13	43.3	6	24.0	19	76.0	0.01*
	Post cardiac surgery	30	100.0	0	0.0	14	56.0	11	44.0	0.00**
	Severity of illness	27	90.0	3	10.0	21	84.0	4	16.0	0.39
	Smoking and obesity	30	100.0	0	0.0	25	100.0	0	0.0	--
	Previous hospital stay >7 days	23	76.7	7	23.3	22	88.0	3	12.0	0.23
	Low acute physiology and chronic health evaluation score at time of discharge((vital signs - Serum (NA- K-creat- hco3 -glasgow	28	93.3	2	6.7	11	44.0	14	56.0	0.00**
	Exposure to cold or Eating a heavy meal	30	100.0	0	0.0	25	100.0	0	0.0	--
Organizational factors	Shortage of C.C.U beds	15	50.0	15	50.0	9	36.0	16	64.0	0.22
	Institutional policies	17	56.7%	13	43.3	16	64.0	9	36.0	0.39
	Unqualified staff member(physician ,nurse)	28	93.3	2	6.7	25	100.0	0	0.0	0.29
	Decrease hospital resources	29	96.7	1	3.3	24	96.0	1	4.0	0.70
	Resources constraints (when patient transfer to ward)	27	90.0	3	10.0	25	100.0	0	0.0	0.15
Process factors	physician - Patient relationship- Communication (doctor-doctor report, nurse- nurse report)	23	76.7	7	23.3	21	84.0	4	16.0	0.73
	Lack of communication c.cu staff and ward staff	21	70.0	9	30.0	21	84.0	4	21	0.18
Provider factors	Heavy workloads (nurse, physician)	27	90.0	3	10.0	14	56.0	11	44.0	0.005**
	Experience and comfort level physician -Increase doctor duty hours	24	80.0	6	20.0	18	72.0	7	28.0	0.35
	physician discharged patient before articulation goal of care	18	60.0	12	40.0	13	52.0	12	48.0	0.37
	Decrease doctor sleep hours	12	40.0	18	60.0	6	24.0	19	76.0	0.16
	physician mood and psychological status	10	33.3	20	66.7	3	12.0	22	88.0	0.06
	physician activities at time of discharge	11	36.7	19	63.3	7	28.0	18	72.0	0.34
	physician discharged patient at night or after shift	8	26.7	22	73.3	0	0.0	25	100.0	0.02*
	Unqualified staff member (physician, nurse) deal with highly demand patient	26	86.7	4	13.3	22	88.0	3	12.0	0.60

Chi-Squ are Tests   **= highly significance, *p≤0.01   NS= significance   , p>0.05

This Figure (1): Shows Distribution of demographic data for participant(doctors & nurses), the results revealed that the nurse participated in this research were aged 25 years old, nearly half of nurses had 1-5 years of experience with 76.7% percentage and their level of education were intermediate (Technical Institute) with 73.3 % percentage , and doctors were aged 33years old, half of the doctors had 5-10 years of experience with 52 % and all of the doctor have higher level of education(bachelor degree) with 100%percentage.

This Table (1): Showed the patient factors that Comparison between the point of view for nurses and physician regarding patient. All nurses and physician agreed (100 %) that previous comorbidities (D.M.) and ACS in patients were contributing factors. Respondents also stressed the fact that bad psychological status, or any emotion-provoking situation were of significant factors as well almost all patient were male, Bad medication compliance and post-discharge follow-up- Drugs abuse (Tamol, Viagra) or others-Stress and psychological status or any emotion-provoking situation -Thyrotoxicosis-electrolyte imbalance-Post cardiac surgery -Severity of illness- Smoking and obesity) were contributing to patient readmission to coronary care unit.

As regarding Organizational factors all nurses and physician agreed (100%) that Unqualified staff member (physician, nurse) were a risk factor of readmission .

Process factors as well, contributed to patient readmission to coronary care unit as reported by 100% of nurses and doctors in the form of (physician -Patient relationship- Communication (physician - physician report, nurse- nurse report) -Lack of communication between CCU staff and ward staff were factors for readmission .

On the other hand, **Provider factors** contributing to patient readmission to the CCU as reported by 88.0 % a majority of nurses and doctors was the presence of an unqualified staff member (physician, nurse) dealing with high demand patients

Discussion

Acutely ill patients are commonly found in general hospital units ; some of who have been recently discharged from an intensive care unit (ICU). These patients may require a higher level of care than other ward patients and, due to the acuity of their illness, are at risk of readmission to ICU **(Underwood, 2018).**

Many studies indicated that patients readmitted to ICU have mortality rates up to six times higher than those not readmitted and are eleven times more likely to die in hospital. Several studies have retrospectively examined these readmissions but,

despite this, there is still no clear indication of why ICU readmissions occur or what the common characteristics of readmitted patients are **(Falsini et al., 2018)**

The results of the present study presented as following :-

Regarding Sociodemographic characteristics

Based on the results of the present study; patients in coronary care unite (CCU) their mean age of patients were 60.03 ± 9.45 years. This agreed with **Cameron et al., (2016)** who found the mean age of CCU patients were more than 60 years old. However, **Barry, & Thompson, (2018)** found that patents mean age was 67.5 (7.38). Prior research has shown that severity of illness is more important than age on patients' prognosis, and aggressive treatment strategies are not less cost-effective when provided to older patients **(Schumacher et al., 2017). Regarding the point of view for nurses and physicians regarding factors of readmission:**

The present study classified the factors into **patients factors, Organizational factors, and process factors and Provider factors.**

Regarding patients factors

Nearly all nurses and doctors agreed that increase patients Age, Previous comorbidities(D.M- renal failure hepatic failure, Previous ACS, Male > female, Bad medication compliance and post-discharge follow-up, Patient discharged on his own demand before articulation goal of care, Drugs abuse (tamol, Viagra)or others, Stress and psychological status or any emotion-provoking situation, Thyrotoxicosis-electrolyte imbalance, Post cardiac surgery, Severity of illness, Smoking and obesity, Previous hospital stay >7 days, Low APACHE score at time of discharge((vital signs - Serum (NA- K- creat- hco3 – Glasgow, Exposure to cold or Eating a heavy meal, were the main patients factors of ICU readmission.

These findings are compatible with previous smaller studies **Pignatiello et al., (2018)** who identify the sick, elderly and chronically unwell patient, progressing slowly and in a tertiary hospital, to have greater odds of readmission. Patients with specific primary diagnoses on initial ICU admission also have greater odds of readmission.

(Ofoma, 2018) found that; the perceptions of physicians were mostly concordant with those of nursing staff, with the exception discharge decision-making, where physicians and nurses disagreed regarding the extent to which nursing opinion factored into decision-making by ICU physicians. Also, while physicians underscored the subjective nature of the discharge-making process as a cause of premature discharge from the ICU, nurses placed more emphasis on ICU occupancy pressures.

With regards, **(van Sluisveld. 2015)** mentioned that the role of undefined goals of care, physicians were more attuned than nurses, to potential barriers that were usually encountered in adequately articulating these goals. Participants in this study perceived that the severity of illness and undefined goals of care were the predominant patient factors that predisposed to intensive care readmission. It follows logically that sicker patients are more likely to be readmitted.

The severity of illness both at the time of ICU admission and discharge is an independent risk factor for readmission **(Wong et al., 2016)**.

In this respect **Wilson et al., (2018)** mentioned that; the comorbidities of a critically ill patient may not be easily modifiable. However,(**Johnson et al., 2013)** said that; decisions to limit life support are among the most important and difficult clinical decisions encountered by patients, families, and providers, with a host of factors contributing to physician variability in decisions to limit life support promptly and adequately articulate appropriate goals of care from the time of hospital admission to the time of index ICU discharge may inevitably lead to unnecessary and perhaps futile readmission to the CCU for certain categories of patients.

In a line of Process factors, the majority of the studied nurses and doctors agreed that Doctor-Patient relationship - Communication (doctor-doctor report, nurse- nurse report) and lack of communication CCU staff and ward staff. **Ofoma et al., (2018)** reported that **e**ffective communication improves clinical decision making and is essential for mitigating errors and achieving high-quality clinical outcomes. Poor communication among critical care teams is a contributing factor to adverse events including readmissions to intensive care.

The study of **Yap et al., (2017)** revealed that participants felt that a suboptimal atmosphere for efficient team communication often resulted in inadequacies and discrepancies in communicated content at times of team hand-off. Premature discharge from index ICU admission and other inefficiencies in transitioning patient care from hospital ICUs to general medical settings have been linked to unplanned ICU readmissions.

Traditionally, discharge decisions are made by attending physicians, in collaboration with other members of the ICU care team **(Hartog et al., 2015)**.

Nurses' reports of nurse-physician collaboration in decision-making at the time of been necessary .ICU discharge is positively associated with patient outcomes including ICU readmission and hospital mortality **(Woo et al., 2017)**.

Adverse events from latent failures often arise from organizational factors that determine working conditions and institutional policies. In this regard,

the present study nurses and doctors agreed that; institution lacked dedicated step-down units and participants cited this as a possible reason for readmissions that may not have

Implications Organizations may focus their efforts on modifying or improving aspects of non-patient factors that will improve outcomes for patients at risk of CCU readmission, for example by standardizing care processes and improving communication between multidisciplinary care teams. For instance, transitional care programs after discharge from intensive care have been shown to reduce the risk of ICU readmissions **(Niven et al., 2014)**. Also, formalizing multidisciplinary input may improve CCU discharge decision-making, while additional training can improve the comfort level of care providers. Engaging institutional stakeholders can also raise awareness of the possible role of organizational factors **(Stelfox et al., 2016)**.

Several risk stratification scores have been proposed as predictors of ICU readmission **(Zheng et al., 2015)**. Predominantly composed of patient-centred factors, these scoring systems have, however, shown limited predictive abilities. The impact of non-patient system factors may explain the poor to modest discrimination and the inability of these models to reduce readmissions during real-world implementation **(Badawi & Breslow, 2012)**.

Ouanes et al.,2012 mentioned that there were future researches examining intensive care readmissions approached from a systems perspective should evaluate the role of non-patient factors and their relationship to patient factors .

Conclusion
Based on the results of the present study it can be concluded that

Nurses and physician perception about readmission cause that factors related to patients like age, comorbidities, medication bad adherence, Patient discharged on his own demand, and stress. Also, another factor related to the organization as unqualified staff members (doctor and nurse) and decrease hospital resources.

Recommendations
Based on the results of this study it was recommended that:
- **For patients** :
  - ❖ Health education of the patients about factors that reduce readmission
  - ❖ Provide written information to facilitate educating patients should be available and provided to every cardiac patient.

For an organization
- ❖ Provide continuous training programs for all medical staff to improve the quality of care for all critically ill patients.
- ❖ Apply the students in CCU about how to deal with emergeny cases .
- ❖ Appropriate post-discharge follow up for complication early detection
- **For research**
  - ❖ Repeat this research on large sample size and multi centres for generalization.
  - ❖ Application of hospital-related readmission program to minimize the incidence of coronary diseases readmission rate.

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