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FACTORS ASSOCIATED WITH READMISSION EVENTS FOR BPJS HEALTH PATIENTS IN HOSPITALS

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ABSTRACT
The incidence of inpatient readmissions within 30 days is an indicator of the quality management system and service costs in the National Health Insurance (JKN) program. The high incidence of readmissions creates inefficiency and is detrimental not only to BPJS Health as the guarantor, but also to the patients themselves. Readmissions are also a sign of poor quality of health services in hospitals. Summary of JKN data from 2015 to 2019, the hospital readmission rate was 561 per 10,000 cases or 5.61%. This figure is still above the ideal figure, namely above 1%. This study aims to determine the factors associated with the incidence of BPJS Health patient readmissions in hospitals. Quantitative research method with a cross sectional research design on data collected retrospectively. The research sample was taken using a total sampling technique by taking all inpatients at Mutiara Bunda Hospital, Tulang Bawang Regency in 2023, namely 8879 patients. The research data were processed using the person chi-square correlation test. The results of the analysis showed that there was a significant relationship between gender ($p < 0.001$) and length of stay ($p = 0.046$) with the incidence of readmissions. There was no relationship between age ($p = 0.177$) and case severity ($p = 0.914$) with the incidence of readmission. Hospital management is expected to be able to improve the quality and efficiency of health services through planning the discharge of patients from the moment they are admitted to the hospital, providing education, and continuity of service by prioritizing age at risk to reduce the incidence of readmissions in hospitals.

Keywords: age; disease severity; gender; lengh of stay; readmission

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INTRODUCTION

Repeated inpatient visits (readmissions) are a marker of the quality of patient care in hospitals and a key component of the services provided (Susanto & Garmelia, 2021). In the Decree of the Minister of Health of the Republic of Indonesia Number 659 of 2009 concerning World Class Hospitals, a readmission rate of less than 1% is set as one of the criteria for evaluating hospital performance. Readmissions in patients often occur in hospitals. This can be burdensome for patients and families and also increase the cost of care (Facchinetti et al., 2020). Patient readmissions also have an impact on increasing health service costs billed to BPJS Health, which is the national health insurance established by the government for Indonesian citizens (Risczka, 2018). Studies conducted in the United States show that the readmission rate is around 20% of all patients treated (Rasyid et al., 2021).

JKN data for 2015 - 2019 shows that the admission rate for advanced inpatient services increased 2.5% from 440 in 2015 to 561 per 10,000 JKN participants in 2019. Every person who has access to health services can make admissions more than once in a year. one year (Dewan Jaminan Sosial Nasional, 2022). The National Quality Forum America states that repeat hospitalization is hospitalization of patients with health problems for < 30 days since the previous hospitalization. Apart from that, it also states that factors related to the incidence

of repeated hospitalization of JKN patients include age, gender, disease diagnosis, and disease severity (Hidayah et al., 2022). The longer the interval between discharge and the next inpatient episode, the greater the likelihood of unplanned re-hospitalization and the greater the likelihood of hospitalization via the emergency room (Sari, 2020). The number of repeat hospitalizations is one of the indicators for assessing the performance of the global budget payment system in hospitals which is currently being tested by BPJS Health (Hidayah et al., 2022).

Several studies state that the incidence of readmission of inpatients in hospital is influenced by several factors, including age, gender, length of stay (LOS), and severity of disease. Research related to the relationship between age and the risk of readmission within 30 days in patients after Percutaneous Coronary Intervention (PCI) found that older age was associated with an increased risk of readmission compared to younger people (Tripathi et al., 2017). On research Lam et al., (2019) showed that women had a higher readmission rate within 30 days after a heart attack. The patient's length of stay (LOS) was associated with an increase in 30-day readmissions, which was 15.9% for LOS < 3 days and 21.5% for LOS > 4 days. Disease with severe severity has a 1.23 times higher risk of readmission in less than 12 days compared with mild severity (Luo et al., 2021). In addition, literature review research on stroke patients found that age, gender, comorbidities, and length of stay were several factors that contributed to influencing readmission (Kurniya et al., 2020).

Mutiara Bunda Hospital, Tulang Bawang Regency is a type D private public hospital that has collaborated with BPJS Health since 2016. The number of cases in inpatient rooms has always increased in the last 3 years. A total of 5,965 cases in 2020, 6,377 cases in 2021, and 6,962 cases in 2022 (Badan Pusat Statistik Kabupaten Tulang Bawang, 2023). Preliminary study results the readmission rate at Mutiara Bunda Hospital, Tulang Bawang Regency is higher compared to hospitals of the same type in the surrounding area. In this 3 year period, the average readmission rate was still above the normal standard, namely 2.02%. Readmissions reflect the low quality of service in hospitals and increasing costs of care for patients and hospitals. Several studies were conducted looking for factors causing readmissions with results including patient demographic data, disease severity, and length of stay related to readmissions. Knowing these causal factors will make it easier for nurses to identify and provide better nursing care. Based on the description above, the aim of this research is to analyze the factors related to the incidence of BPJS Health patient readmissions at Mutiara Bunda Hospital, Tulang Bawang Regency.

METHOD

This research uses quantitative research methods with a cross-sectional research design, namely studying the relationship between variables. Researchers only observed respondents once and variable measurements were carried out at that time and no follow-up was carried out. The independent variables in this study are age, gender, length of stay, disease severity. Meanwhile, the dependent variable is readmission. The population in this study used secondary data, namely all BPJS Health patients at Mutiara Bunda Hospital, Tulang Bawang Regency, Lampung Province in 2023, namely 8879 patients. The sampling method used was the total sampling technique. The research data were processed using the person chi-square correlation test

RESULT

Table 1.
Frequency distribution of respondents based on age, gender, length of stay, complications, readmission events of BPJS Health Patients

Age	f	%
Infants (0- < 1 year old)	419	4,72
Children (1- < 10 years old)	697	7,85
Teenagers (10- < 19 years old)	404	4,55
Adults (19-44 years old)	3113	35,06
Pre-elderly (45-59 years old)	2066	23,27
Elderly (≥ 60 years old)	2180	24,55
Gender		
Male	3520	39,64
Female	5359	60,36
Length of Stay		
Short (< 6 days)	8597	96,82
Ideal (6-9 days)	242	2,73
Long (> 9 days)	40	0,45
Complications		
Level I	7715	86,89
Level II	1054	11,87
Level III	110	1,24
Readmission Events		
Readmission	7715	86,89
Not Readmission	1054	11,87

Based on table 1, it is known that the majority of respondents in this study were the adult age group (19 - 44 years), namely 3113 (35.06%) respondents. The second place is in the elderly group (≥60 years) namely 2180 (24.55%) respondents and the third place is in the pre-elderly group (45 – 59 years) namely 2066 (23.27%). Meanwhile, the age group of respondents with the least number of hospitalizations were teenagers (10-<19 years), namely 404 (4.55%) respondents. It is known that the gender of the majority of respondents was female, namely 5,359 (60.36%) and the remaining 3,520 (39.64%) respondents were male. Research shows that more women are hospitalized than men because hospitals provide special rooms for women such as obstetrics rooms, which has an impact on the number of female patients who are hospitalized. Based on, it is known that the largest number were respondents with short length of stay (LOS), namely 8,597 (96.82%). Meanwhile, the ideal length of stay is in second place, namely 242 (2.73%) respondents and the remaining 40 (0.45%) respondents have a long length of stay. It can be seen that level 1 severity level ranks first in terms of the highest number of respondents, namely 7,715 (86.89%). Second place is the case severity level 2, namely 1,054 respondents or 11.87%. The third place is occupied by case severity level 3, namely only 110 (1.24%) respondents. And than it can be seen that the respondents who experienced a readmission incident were 109 (1.23%) respondents. The remaining 8,770 or 98.77% did not experience readmissions.

Table 2.
Relationship between Age and Readmissions of BPJS Health Patients

	Readmission Events				Total		P-Value
	Yes		No				
Age	f	%	f	%	f	%	0,177
Infants (0- < 1 year old)	6	0,07	413	4,65	419	4.72	
Children (1- < 10 years old)	7	0,08	690	7,77	697	7.85	
Teenagers (10- < 19 years old)	3	0,03	401	4,52	404	4.55	
Adults (19-44 years old)	28	0,32	3085	34,74	3113	35.06	
Pre-elderly (45-59 years old)	34	0,38	2032	22,89	2066	23.27	
Elderly (≥ 60 years old)	31	0,35	2149	24,20	2180	24.55	

Based on table 2, it can be seen that in the adult age group the majority who did not experience readmission were 3085 (34.74%) respondents. Meanwhile, pre-elderly patients experienced the most readmissions, namely 34 (0.38%) respondents. The results of the person chi-square correlation test showed p = 0.177 (P. value > 0.05) so it can be interpreted that there is no significant relationship between the age of the respondent and the incidence of readmissions at Mutiara Hati Hospital.

Table 3.

Relationship between gender and patient readmissions from BPJS Health

	Readmission Events				Total		P-Value
	Yes		No				
Gender	f	%	f	%	f	%	0,000
Male	69	0,78	3451	38,87	3520	39.64	
Female	40	0,45	5319	59,91	5359	60.36	
Total	109	1,23	8770	98,77	8879	100	

Based on table 3, the results show that readmissions did not occur in the majority of female patients, namely 5319 (59.91%) respondents. Meanwhile, readmissions were mostly male patients, namely 69 (0.78%) respondents. The results of the correlation test using chi square showed a p value <0.001, which means there is a significant relationship between the gender of the respondent and the incidence of readmissions at Mutiara Hati Hospital.

Table 4.

Relationship between Length of Stay and Readmission of BPJS Health Patients

	Readmission Events				Total		P-Value
	Yes		No				
Length of Hospitalization	f	%	f	%	f	%	0,046
Short (< 6 days)	102	1,15	8495	95,68	8597	96.82	
Ideal (6-9 days)	7	0,08	235	2,65	242	2.73	
Long (> 9 days)	0	0	40	0,45	40	0.45	

Based on the results of the analysis in table 4, it was found that on short hospital days, the majority of respondents were not readmissions, namely 8,495 (95.68%) and the highest number of readmissions were also found in patients with short hospital days, namely 102 (1.15%). There were 7 (0.08%) respondents with ideal days of care experiencing readmission. Meanwhile, none of the respondents with long days of care (0%) experienced readmissions. The results of the person chi square test showed p = 0.046 (p. value < 0.05), which means there is a significant relationship between the length of stay of respondents and the incidence of readmissions at Mutiara Hati Hospital.

Table 5.

Correlation between Severity Level and Readmission of BPJS Health Patients

	Readmission Events				Total		P-Value
	Yes		No				
Severity Level	n	%	n	%	n	%	0,914
Level I	96	1.08	7619	85.81	7715	86.89	
Level II	12	0.14	1042	11.74	1054	11.87	
Level III	1	0.01	109	1.23	110	1.24	

Based on table 5, it was found that the majority of respondents with level I disease severity did not experience readmissions, namely 7619 (85.81%) patients and the highest number of readmissions were also found in respondents with level I severity, namely 96 (1.08%) patients. The results of the person chi-square correlation test showed p = 0.914 (P. value > 0.05) so it can be interpreted that there is no significant relationship between the level of severity and the incidence of readmissions at Mutiara Hati Hospital.

DISCUSSION

In previous research, it was stated that hospitalization cases sloped at the age of 0-20 years, then increased in the range 20-60, with the most cases and reached the peak number of cases in the sample aged 60 years and then began to decline after passing the age of over 60 years (Hasibuan, 2023). Another study found that the highest number of patients admitted to hospital was in the age group 30 – 54 years, followed by those aged 15 – 29 years and the third highest was in the age ≥ 55 years (Coverage, 2023). This also has an impact on the need for the highest number of beds at ages 30 – 54 years. Another study found that stroke occurred most frequently in the 36-59 year age group (Budi et al., 2015). Mutiara Bunda Hospital, Tulang Bawang Regency, in 2023, the largest number of patients experiencing hospitalization will be in the adult age group, the elderly. and pre-elderly. This is related to the age at which many patients suffer from chronic diseases so they require more hospitalization.

The results of this study show that in the adult age group, the largest group who did not experience readmission was 3085 (34.74%) respondents. Meanwhile, pre-elderly patients experienced the most readmissions, namely 34 (0.38%) respondents. The results of the person chi-square correlation test showed p = 0.177 (P. value > 0.05) so it can be interpreted that there is no significant relationship between the age of the respondent and the incidence of readmissions at Mutiara Hati Hospital. This research is in line with research conducted at KMRT Wongsonegoro Hospital in 2019 which found that age did not have a significant relationship with the incidence of readmissions (Susanto & Garmelia, 2021), although other studies conducted found that older age was an independent factor associated with the incidence of patient readmission within 30 days (Hughes & Witham, 2018). Unplanned readmissions were 5.5% higher in elderly patients (>80 years) than in younger patients (Koh et al., 2018.). A systematic review research conducted to look at the reduction or prevention of hospital readmissions from 2005 to 2018 found that the most effective interventions for avoiding inappropriate readmissions in hospital and encouraging early discharge include an integrated system between hospital and community care, providing multidisciplinary services, individualization of services, hospital-initiated discharge planning and specialist follow-up (Co et al., 2019).

The results of the relationship analysis test showed that there was no significant relationship between age and the incidence of readmissions at Mutiara Bunda Hospital, Kab. Onion Bones. In old age, the body's endurance will decrease. This condition continues to make it easier for elderly people to be attacked by various viruses and bacterial diseases so that the possibility of readmission is greater. However, interdisciplinary collaboration, discharge planning from the start of hospital admission, and continuity of service can also reduce and prevent readmissions in hospital. Apart from looking at the age factor, gender is also a factor that is looked at. The results of this study show that more women are hospitalized than men because hospitals provide special rooms for women such as obstetrics rooms, thus having an impact on the number of female patients who are hospitalized (Setiani & Megawati, 2021).

While women have a higher number of hospitalizations, this may be influenced by the reproductive cycle such as pregnancy and childbirth (Coverage, 2023). Likewise in research Brar & Markell, (2019) It was found that the prevalence of CKD was higher in women than men. In addition, osteoporosis is common in older postmenopausal women and can increase the risk of bone fractures due to estrogen deficiency, which is a major contributor to osteoporosis (Guidelines, 2022). Most of the respondents who were hospitalized at Mutiara Bunda Hospital, Tulang Bawang Regency were female. Hormonal differences between men

and women cause women to be more likely to be treated, such as during pregnancy and childbirth, as well as several diseases caused by a decrease in hormones in women. Apart from that, the number of beds provided by hospitals is greater for women because women have special treatment rooms, namely in obstetric cases. Based on the research results, the majority of patients were male, namely 69 (0.78%) respondents. The results of the correlation test using chi square showed a p value <0.001, which means there is a significant relationship between the gender of the respondent and the incidence of readmissions at Mutiara Hati Hospital. Research conducted on hospitalized diabetes patients found that approximately 50% of men and women had an ER visit or readmission within 90 days of hospital discharge (Patel et al., 2022).

Gender is one of the factors related to compliance. However, men and women are different in many ways, including: social relationships, environmental influences, living habits, biological and physiological differences. However, women and men have the same opportunity to access any information, including information about treatment. Men and women receive the same treatment program for their illnesses. Apart from that, the completion of a treatment is based on the decisions taken by each individual in undergoing treatment according to each individual's desire to recover. Therefore, if both of them follow a disciplined treatment program, they have the opportunity to recover from their illness (Febianti et al., 2022).

Efforts made by hospitals to maintain service quality are to carry out service efficiency, one of which is by controlling LOS. The higher AvLOS (average length of stay) is interpreted as lower health services in the inpatient unit or inefficient provision of health services in the hospital. On the other hand, a decreasing AvLOS indicates an increase in the quality and efficiency of services provided which will increase patient satisfaction with their health service needs (Alamsyah & Aceh, 2023). According to research, hospitals experiencing financial pressure innovate by involving hospital staff to help reduce the average length of stay (Summary, 2015)

Nurses should play an active role in helping patients to mobilize as early as 2-6 hours after undergoing laparotomy surgery, so that they can speed up the wound healing process which will shorten the length of stay after undergoing laparotomy surgery (Dini et al., 2023). Indonesian Case Base Groups (ina-cbg) guidelines in the implementation of health insurance explain that the implementation of the JKN program uses the ina-cbgs (Indonesian Case Based Groups) method as a claim fee payment system, namely this payment system is based on a fee package based on the diagnosis made by the doctor in charge patients regardless of the length of the patient's stay (Indonesian et al., 2021). If patients are treated with a short LOS, it will benefit the hospital. On the other hand, if a patient is treated with a long LOS, this has the potential to cause losses for the hospital.

Most of the respondents who were hospitalized at Mutiara Bunda Hospital, Tulang Bawang Regency had a short length of stay or less than 6 days. This is related to the hospital's efforts to improve service efficiency. The shorter the patient's treatment period, the lower the service costs incurred by the hospital. The severity of cases in inpatients in INA-CBG is divided into: 1) severity level I = mild, namely a diagnosis without complications or comorbidities, 2) severity level II = moderate, namely a diagnosis with mild complications and comorbidities, and 3) severity level III = severe namely diagnoses with major complications and comorbidities (Indonesian et al., 2021). Severity level is influenced by the presence of complications in the patient during the treatment period or comorbidities which are conditions that the patient had suffered from before the treatment period.

There has been an increase in emergency room visits in patients with colitis and abdominal pain in United States hospitals (Ding et al., 2021). In line with the research results, it was found that the most cases of patients treated during 2023 at Mutiara Bunda Hospital were patients with non-specific abdominal pain, which is level I case severity. Based on the research results, it can be seen that 109 (1.23%) respondents experienced readmission incidents. This is in accordance with findings in research on JKN data for 2015 - 2019 showing that the admission rate for advanced inpatient services (RAP) increased 2.5% from 440 in 2015 to 561 per 10,000 JKN participants in 2019 (Hidayah et al., 2022). According to research, readmissions can affect the costs of acute exacerbation COPD patients with the costs of non-medical procedures being the most influential (Rasyid et al., 2021).

The incidence of readmissions at Mutiara Bunda Hospital, Tulang Bawang Regency is still above the ideal figure which should be less than 1%. Readmissions, apart from increasing patient care costs, are also a marker of the quality of services provided. Readmissions can also occur in patients who do not complete treatment. The highest incidence of readmissions occurs in patients with short lengths of stay (not ideal), which is an indicator of the quality of service in hospitals. Research on inpatients in the BPJS Health Semarang Branch working area who experienced a readmission incident stated that the length of treatment days (LOS) had a significant relationship (Hidayah et al., 2022). Patients who are treated for more than 4 days will have a 1.33-fold risk of re-hospitalization within a period of <12 days compared to patients who have a length of stay of <4 days. Other research also found that readmission patients were related to the patient's length of stay (LOS) (Susanto & Garmelia, 2021) and (Gek et al., 2020).

Patients who have difficult conditions, both medically, such as surgical patients and social backgrounds, require longer hospital stays, so that patients with complex conditions experience a high risk of readmission. A claims payment system that applies payment packages also affects patient LOS, namely the shorter the length of time a patient is treated, the hospital will gain more financial benefits (Rachoin et al., 2020). Based on the description above, the researchers concluded that there was a significant relationship between the patient's length of stay (LOS) and the incidence of readmissions in the hospital. The results of the study also showed that the highest incidence of readmissions occurred in patients with a short length of stay, namely <6 days. This is different from the findings of other studies which state that longer length of stay increases the risk of readmission. The use of a package system to guarantee patient care costs allows hospitals to gain profits if the patient's length of stay is shorter.

Minister of Health Regulation Number 26 of 2021 describes the severity of cases in inpatients in INA-CBG divided into: 1) severity level I = mild, namely a diagnosis without complications or comorbidities, 2) severity level II = moderate, namely a diagnosis with mild complications and comorbidities, and 3) severity level III = severe, namely a diagnosis with major complications and comorbidities. The terms "mild", "moderate", and "severe" in the ina-cbg code description do not directly describe the patient's clinical condition, diagnosis or procedure, but rather describe the severity of a disease which is influenced by secondary diagnoses (complications and comorbidities).

Research states that the level of severity is related to the interval of repeated hospitalizations. Severe severity has a risk of 1.23 times compared to mild severity (Hidayah et al., 2022). Other studies still state things that are not in line with the researchers' findings, namely that the patient's chronic disease condition has a significant relationship with the incidence of

repeated hospital admissions. Patients with more chronic diseases are implicated in increasing levels of severity and the end result will be a risk of patient readmissions in hospital (Zumbrunn et al., 2022).

CONCLUSION

The results of the analysis showed that there was a significant relationship between gender ($p < 0.001$) and length of stay ($p = 0.046$) with the incidence of readmissions. There was no relationship between age ($p = 0.177$) and case severity ($p = 0.914$) with the incidence of readmission. Hospital management is expected to be able to improve the quality and efficiency of health services through planning the discharge of patients from the moment they are admitted to the hospital, providing education, and continuity of service by prioritizing age at risk to reduce the incidence of readmissions in hospitals.

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