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Correlation of Patient Visits to Dental Treatment Procedures: Case Study of Hospital X in Bontang

Atik Suhargiati[1]✉

[1]Public Health, Faculty of Public Health, Universitas Mulawarman, Samarinda, Indonesia

Abstrak

Rumah sakit memainkan peran penting dalam penyelenggaraan pelayanan kesehatan, dengan rekam medis yang sangat diperlukan untuk pengambilan keputusan yang tepat. Peningkatan kesadaran kesehatan masyarakat mengakibatkan peningkatan jumlah kunjungan pasien, terutama di departemen gigi. Penelitian ini mengkaji faktor hubungan antara kunjungan pasien dan perawatan gigi di Rumah Sakit X di Bontang dari Juli hingga September 2023, dengan fokus pada pengaruh usia dan jenis kelamin. Studi observasional kuantitatif ini melibatkan 375 pasien gigi selama periode yang ditentukan. Data tentang demografi dan prosedur perawatan gigi dikumpulkan dan dianalisis menggunakan korelasi Pearson dan uji-T. Ditemukan korelasi signifikan (r = 0,7317) antara kunjungan pasien dan kompleksitas perawatan. Pasien pria menunjukkan korelasi sebesar 0,398, sedangkan pasien wanita sebesar 0,280. Hasil uji-T mengonfirmasi signifikansi statistik. Faktor demografi mempengaruhi kompleksitas perawatan gigi secara signifikan, yang menyoroti pentingnya alokasi sumber daya yang terarah untuk meningkatkan hasil perawatan pasien.

Kata Kunci: Rumah Sakit, Kunjungan Pasien, Dokter Gigi, Prosedur, Pearson, Uji-T.

Abstract

Hospitals played a vital role in healthcare delivery, with medical records being essential for informed decision-making. Increased public health awareness resulted in a rise in patient visits, particularly in dental departments. This research examined the relationship factors between patient visits and dental treatments at Hospital X in Bontang from July to September 2023, focusing on the influences of age and gender. A quantitative observational study included all 375 dental patients during the specified period. Data on demographics and dental treatment procedures were collected and analyzed using Pearson correlation and T-tests. A significant correlation (r = 0.7317) was found between patient visits and treatment complexity. Male patients showed a correlation of 0.398, while female patients had 0.280. T-test results confirmed statistical significance. Demographic factors significantly impacted dental care complexity, highlighting the need for targeted resource allocation to enhance patient outcomes.

Keywords: *Hospital, Patient Visits, Dentist, Procedure, Pearson, T-test*

INTRODUCTION

A hospital is a complex, expert-intensive, and capital-intensive health service institution. This complexity arises from the multifaceted nature of hospital services, which encompass various functions including healthcare delivery, education, and research, as well as a myriad of associated policies. Hospital statistics are primarily sourced from medical records, which serve as vital health information utilized by healthcare practitioners, management, and medical personnel for informed decision-making (Rustiyanto, 2018).

Hospitals, as essential health service facilities, play a critical role in the healthcare system. A key supporting facility within a hospital is the department responsible for the preparation, collection, processing, and presentation of data. This department transforms data into information to facilitate decision-making processes. The data is derived from a range of activities, including the recording and documentation of examination results, treatments, procedures, and other services provided to patients by healthcare professionals, all of which are captured in medical record documents (Permana, 2015).

As the human population continues to grow and economic conditions advance, public awareness regarding health has notably increased. Understanding the factors contributing to the rise in patient visits enables hospitals to effectively prepare their facilities and equipment to enhance service delivery. According to the Ministry of Health, essential equipment in both outpatient and inpatient registration areas includes medical record documents, which must be tailored to accommodate the patient volume (Fardani et al., 2015).

One significant factor influencing patient visitation is the type of treatment provided by healthcare professionals within the hospital. This research aims to elucidate the relationship between patient visit increases and the types of dental treatments offered, utilizing data from the dental department of the hospital. The study is based on patient registration data and medical records collected from July to September 2023.

METHOD

This research is quantitative, where the aim of this research is to examine the relationship between patient visits and dentist procedures. The design of this research is observational analytic using a cross-sectional design approach. The population in this study was the number of dentist patients who visited Hospital X in Bontang, in the period July - September 2023, namely 375 patients. The sampling technique used was purposive sampling, namely sampling based on certain considerations such as population characteristics or previously known characteristics (Saryono, 2013). The entire population of 375 patients was also used as samples in this study (Hospital X in Bontang, 2023). The data that will be used in this research is patient data consisting of name, age, gender, and five categories of dentist treatment procedures along with

treatment costs. Meanwhile, the application used to process data is Microsoft Excel 2021, equipped with Data Analysis features. The data and methods used in this research have received permission from the related hospital.

To see the relationship between patient visits and dentist procedures, it is necessary to weigh the level of difficulty of the dentist's procedures first. The weighting scale is based on the categories of procedure and the cost of the procedure which has been determined by the dentist working at the hospital. Table 1 shows the weighting scale for dentist procedures.

Table 1. Classification of the Value of Dentist Procedures Based on Type of Work and Selling Value

1	2	3
IDR 0 - 60,000	**IDR 60,000 - 120,000**	**IDR 120,000 - 180,000**
New Patient Administration	Zoe Cementation	Local Anesthetic For Preparation
Old Patient Administration	Pedo/Tooth Pulp Devitalization	Alvogyl Application
Outpatient nursing assistance	Change Pedo Medication/Dental/Visit	Simple Curetage
Consultation	Change Medication per Tooth per Visit	Devitalization of Pulp per Tooth
Dentist consultation	Replace Wire / Jaws	Replace Bracket / Anterior Teeth
Pedo Temporary Patch	Preparation Sal. Pedo Roots / Sal. Roots/Tooth	Replace Bracket / Posterior Teeth
	Preparation Sal. Roots per Sal. Roots per Tooth	Pedo/Dental glass lonomer
	Root Canal Spooling	Installing Auxillaries (Power o, Power Chain)
	Temporary Fillings per Tooth	Replacing the Bow/Jaw
	Wound Toilet	Root Canal Filling per Tooth
		Rebonding/ Bracket

4	5
IDR 180,000 - 300,000	**> IDR 300,000**
Access Opening	Teeth Bleaching
Teeth/Jaw Print	Composite (LC) Class 1/lll/V
Glass lonomer Class 1/ III/ V	Composite (LC) Class 11/ IV
Extraction with Topical Anesthesia / Dental	Fixed Ortho Retainer
Pulp Capping per Tooth	Glass lonomer Class 11/ IV
Medium Scaling	Scaling Package
Slight Scaling	Bracket/Jaw Removal
	Extractions with Complications/Tooth
	Extraction with Local Anesthesia / Dental
	Polishing/Grinding per Tooth
	Multiple Scaling

Pearson correlation is used to determine whether there is a relationship between two variables, namely the independent variable and the dependent variable on an interval or ratio scale (parametric). The assumption in Pearson correlation is that the data must be normally distributed (2). Correlation can produce positive (+) and negative (-) numbers. If the correlation number is positive, it means the relationship is unidirectional. Unidirectional means that if the independent variable is large, the dependent variable is getting larger. If it produces a negative number, it means the relationship is not unidirectional. Not unidirectional means that if the value of the independent variable is large, the dependent variable becomes smaller. correlation figures range between 0-1 (Greasley, 2008).

The formula for the Pearson correlation value (r) between variable x and y with n-samples belows:

$$r = \frac{\sum xy - \frac{(\sum x)(\sum y)}{n}}{\sqrt{\left(\sum x^2 - \frac{(\sum x)^2}{n}\right)\left(\sum y^2 - \frac{(\sum y)^2}{n}\right)}}$$

The strength of the correlation relationship according to Jonathan Sarwono is as follows (Sarwono, 2015):

1. r values = 0 : No correlation
2. r values 0 - 0.25 : very weak correlation
3. r values 0.25 - 0.50 : sufficient (enough) correlation
4. r values 0.50 - 0.75 : strong correlation
5. r values 0.75 - 0.99 : very strong correlation
6. r values = 1 : perfect correlation

Meanwhile, the T-test was carried out to test the research hypothesis regarding the influence of each independent variable partially on the dependent variable. The T-test is a statistical test used to test the truth or falsity of a hypothesis which states that between two sample means taken randomly

from the same population, there is no significant difference (Sudjiono, 2010).

RESULT AND DISCUSSION

Table 2 shows the amount of correspondence data obtained from the entire sample based on age and gender. Based on Table 2, it can be seen that the respondents in this study were mostly male, namely 190 respondents (50.7%). Meanwhile, there were 185 female respondents (49.3%).

Table 2. Number of Respondent Data based on Age and Gender Criteria

Criteria	Total	%
By Age		
< 10 y.o.	57	15.2%
11 - 20 y.o.	56	14.9%
21 - 30 y.o.	46	12.3%
31 - 40 y.o.	40	10.7%
41 - 50 y.o.	37	9.9%
51 - 60 y.o.	63	16.8%
> 60 y.o.	76	20.3%
	375	*100%*
By Gender		
Men	190	50.7%
Women	185	49.3%
	375	*100%*

Table 2 also shows that the majority of respondents are over 60 years old, namely 76 respondents (20.3%). Respondents aged under 10 years were 57 respondents (15.2%). Respondents aged 11-20 years were 56 respondents (14.9%). Respondents aged 21-30 years were 46 respondents (12.3%). Respondents aged 31-40 years were 40 respondents (10.7%). Respondents aged 41-50 years were 37 respondents (9.9%). Meanwhile, respondents aged 51-60 years were 63 respondents (16.8%).

Table 3 shows the results of calculating the Pearson correlation between age and gender on the predetermined weight value of dentist procedures. It is known that the average age value of all respondents is 36.98 with Pearson correlation value of 0.336. This value shows that the relationship between the respondent's age and the total weight value of the dentist's examination procedure has sufficient correlation.

Table 3. Pearson correlation calculation results

	All Gender	*Dentist Action Weight*
Mean	*36.98*	*5.09*
Variance	*456.73*	*24.95*
Observations	*375*	*375*
Pearson Correlation	**0.336**	
	Women	*Dentist Action Weight*
Mean	*36.52*	*5.32*
Variance	*405.10*	*27.63*
Observations	*185*	*185*
Pearson Correlation	**0.280**	
	Men	*Dentist Action Weight*
Mean	*37.44*	*4.86*
Variance	*509.00*	*22.37*
Observations	*190*	*190*
Pearson Correlation	**0.398**	

Table 3 also shows that the average age value of female respondents is 36.52 with Pearson correlation value of 0.280. Meanwhile, the average age value for male respondents was 37.44 with Pearson correlation value of 0.398. These two Pearson correlation values also show that the relationship between the respondent's age and the total weight value of the dentist's examination procedure has sufficient correlation.

Table 4 shows the results of the T-test for analyzing the relationship between the determined weight values for dentist examination procedures and total patient visits. The average value of visits for each

patient is 1.859 with a variance value of 1.855. The Pearson correlation value obtained was 0.7317. This shows that the relationship between patient visits to the dentist and the weight of the dentist's examination procedures has a very strong correlation.

Table 1. T-test Results between Patient Visits and Predetermined Weight Value of Dentist Procedures

	Patient Visit	*Dentist Action Weight*
Mean	1.8587	5.0907
Variance	1.8490	24.9543
Observations	375.0000	375.0000
Pearson Correlation	0.7317	
Hypothesized Mean Difference	-	
df	374.0000	
t Stat	(15.2411)	
P(T<=t) one-tail	0.0000	
t Critical one-tail	1.6489	
P(T<=t) two-tail	0.0000	
t Critical two-tail	1.9663	

The results of the T-test shown in Table 4 show T stats is -15,241; P value two tail is approaching zero value; and T critical two-tail is 1,9663. It means that this test can be said to be valid or reject H0 (there is no influence between patient visits and dentist examinations), because the absolute value of |T stats| > T critical (T table) value and P value < α value (0.05). So, it can be concluded that the T-test shows a relationship between patient visits and dentist examination procedures. From this test, it can be seen that the more patient visits, the more numerous and complex dentist examination procedures are carried out.

This research was conducted with a sample of 375 respondents, characterized by gender and age. Among the participants, 190 were male (50.7%) and 185 were female (49.3%). The age distribution was as follows: 57 individuals (15.2%) were under 10 years old, 56 (14.9%) were between 11 and 20 years, 46 (12.3%) were aged 21 to 30 years, 40 (10.7%) were between 31 and 40 years, 37 (9.9%) were aged 41 to 50 years, 63 (16.8%) were aged 51 to 60 years, and 76 (20.3%) were over 60 years. These results indicate that individuals over the age of 50 visit the dentist more frequently than children, teenagers, or younger adults. This age-related trend aligns with findings by Alzarea et al. (2017), which highlighted significant differences in the distribution of services accessed by elderly men and women and their relationship with oral health service preferences.

The dental complaints reported by respondents included issues such as tooth loss and gum problems. The research also examines predisposing factors, particularly in relation to age. In younger populations, such as children and toddlers, dental caries was noted as a prevalent issue. Dental caries represents the most common and widespread dental and oral health problem affecting individuals across all age groups, including toddlers, children, teenagers, adults, and the elderly (Yauri and Said, 2018).

According to the results of the Pearson correlation test, a correlation coefficient of 0.336 was obtained for all genders, 0.280 for female patients, and 0.398 for male patients. These results indicate a significant relationship between age and gender and the dental treatment procedures administered. The higher correlation for male patients (0.398) compared to female patients (0.280) suggests that male patients tend to receive more complex dental procedures. This finding is consistent with research by Malvania et al. (2011), which reported that the visit rate among men is higher than that of women, who may prefer home remedies. This trend could be attributed to the fact that men experience more oral health issues than women, leading them to seek dental care more frequently. Conversely, women generally exhibit greater concern for their dental health, resulting in longer intervals between dental visits.

Table 4 shows the results of the Pearson correlation test and T-test. The results of the Pearson correlation test

showed a value of 0.7317, which indicates an indication of a strong relationship between patient visits and patient care procedures. With repeated visits (average value of visits is 1.859) and the weighted average value of dentist's treatment procedures is 5.091, it shows that patient repeat visits are caused by the number of complex dentist's treatment procedures. This result is also supported by the results of T-test where the T-stats is -15.241; the P-value two-tail is approaching zero value; and the T-crit two-tail is 1.9663. The absolute value of the T-stats which is greater than the T-table value and the P-value which is much lower than 0.05 strengthens the relationship that exists between patient visits and the complexity of the dentist's treatment procedures.

The findings of Bommireddy et al. (2020) indicate that the majority of participants reported receiving dental care primarily at private dental clinics, in addition to consulting with medical professionals and traditional healers in their local areas regarding dental and oral health issues. Key barriers to accessing dental services included the high cost of care, lack of time, additional expenses, and the belief that toothache would resolve on its own over time. This research investigates the reinforcing factors that influence individuals' behaviors in utilizing health services, particularly in relation to their perceived need for care.

These findings align with research conducted by Salunke et al. (2019), which identified dental caries accompanied by pain and discomfort as the primary motivations for seeking dental care. Additionally, Shekhwat et al. (2019) found that the main reasons for the last visit to the dentist were related to tooth decay, followed by toothache. Pain serves as a significant motivator for seeking dental health services, often arising from conditions such as pulp disease, periodontal disease, or other dental issues.

Furthermore, Chambisha et al. (2017) noted that the most common reasons for visiting dental service centers included the need to relieve toothache, routine preventive visits, and concerns over bleeding gums. Respondents who perceived their condition as mild were less likely to seek treatment, while those who recognized the severity of their issues were more inclined to pursue care.

CONCLUSION

In conclusion, this study found a strong relationship between patient visits and the complexity of dental procedures at Hospital X in Bontang. As the number of visits increased, so did the complexity of the treatments, with a significant correlation observed between patient visits and treatment types. Male patients, particularly those over 50, tended to visit more often and received more complex treatments than female patients, a trend consistent with previous research on dental care utilization.

Based on these findings, it is recommended that Hospital X optimize resource allocation to accommodate the increasing demand for more complex dental procedures, particularly from older patients. Future research should explore additional factors, such as socio-economic status or regional healthcare access, which were not addressed in this study. Researchers could examine these variables in more diverse patient samples to gain a deeper understanding of patient behaviors, which would help improve dental care planning and delivery.

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