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THE EFFECT OF DRUG INFORMATION SERVICES ON ANTIBIOTIC ADHERENCE AMONG OUTPATIENT PNEUMONIA PATIENTS AT SINJAI REGIONAL GENERAL HOSPITAL

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Abstract

Background: Antibiotic resistance is a serious threat to public health. One of the main causes of resistance is non-adherence to appropriate antibiotic use. Drug Information Services (DIS) provided by pharmacists are an effort to improve patient adherence.
Objective: This study aims to determine the relationship between patient characteristics and adherence, and to analyze the effect of DIS on antibiotic adherence among outpatient pneumonia patients at Sinjai Regional General Hospital.
Methods: This quantitative study used a static group comparison design with the MARS-5 questionnaire as an instrument. Analysis was conducted using Paired T-Test and Chi-Square Test.
Results: There was a significant increase in adherence after the provision of DIS ($p<0.05$). Age and education were also associated with patient adherence.
Conclusion: Drug Information Services are effective in increasing antibiotic adherence in outpatient pneumonia patients. Patient age and education level are factors influencing adherence.

Keywords: Antiobiotics, Pneumonia, Adherence, DIS, MARS-5.

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Introduction

Penggunaan Irrational antibiotic use has become a serious global health issue, contributing to increased antibiotic resistance worldwide. The World Health Organization (WHO) reported that antibiotic resistance directly caused more than 1.2 million deaths in 2019 and is projected to reach 10 million deaths per year by 2050 if not addressed (Jonathan, 2019). In Indonesia, antibiotic resistance is a complex and worsening problem, listed among the top ten health issues (Gunawan, 2020). A key cause of this resistance is the lack of public knowledge regarding antibiotics and their misuse (Ginanjar et al., 2022).

Pneumonia, an acute respiratory infection affecting the lungs, is commonly treated with antibiotics (PDPI, 2020). However, irrational antibiotic use in pneumonia patients can result in higher morbidity and mortality, increased side effects, and drug wastage (Kemenkes, 2018). At Sinjai Regional General Hospital (RSUD), pneumonia ranks among the top 10 most prevalent diseases. Adherence to antibiotic therapy is essential, particularly in referral hospitals like RSUD Sinjai. Despite the hospital's commitment to quality care, issues such as non-adherence still arise, affecting therapeutic outcomes and increasing resistance risk.

Several studies have shown that pharmacist-led Drug Information Services can improve antibiotic adherence (Zulfa & Handayani, 2020). Accurate education on usage, dosage, duration, and side effects is crucial. This study evaluates the impact of DIS on outpatient

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pneumonia patients' adherence to antibiotic use and examines patient characteristics associated with adherence.

Method

Design

This research employed a quantitative approach using a static group comparison design to compare adherence levels between an intervention group (receiving DIS) and a control group (not receiving DIS).

Population and Sample

The population included all outpatient pneumonia patients at RSUD Sinjai. The sample consisted of 130 adult pneumonia patients (aged 19–65 years) undergoing antibiotic therapy, divided equally into 65 intervention and 65 control subjects.

Instrument

The study utilized the MARS-5 (Medication Adherence Report Scale-5) questionnaire, comprising five items on a Likert scale (1–5). The questionnaire was validated in Indonesian with a Cronbach's alpha of 0.803 (Fitriah & Putri, 2021).

Analysis

Data were analyzed using SPSS. Chi-Square Test was used to determine associations between patient characteristics (age, gender, education) and adherence. Paired T-Test was used to assess adherence before and after intervention in the intervention group. A significance level of $p<0.05$ was used.

Results

Table. 1 Patient Characteristics

Characteristics	Patient Interventions	Patient Control
Age (Years)	**Amount (%)**	**Amount (%)**
19-29 Years	16 (24,61%)	13 (18,46%)
30-49 Years	30 (46,15%)	20 (32,30%)
50-69 Years	19 (29,23%)	32 (49,23%)
Total	**65 (100%)**	**65 (100%)**
Gender	**Amount (%)**	**Amount (%)**
Male	39 (60%)	36 (55,38%)
Female	26 (40%)	29 (44,61%)
Total	**65 (100%)**	**65 (100%)**
Education	**Amount (%)**	**Amount (%)**
SD	7 (10,76)	13 (20%)
SMP	3 (4,61%)	3 (4,61%)
SMA	31 (47,69%)	30 (46,15%)
DIPLOMA	8 (12,30%)	7 (10,76%)
STRATA	16 (24,61%)	12 (18,46%)
Total	**65 (100%)**	**65 (100%)**

Based on Table 1, of the 130 patients, the intervention group (65 patients) was predominantly aged 30–49 years (46.15%), while the control group (65 patients) was mostly aged 50–69 years (49.23%). This is consistent with findings that individuals aged 60 and above are at higher risk for pneumonia (PDPI, 2003; Fima, 2020). Male patients were more affected by

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pneumonia (60% in the intervention group, 55.38% in the control group) than female patients, which may be due to higher rates of smoking and alcohol consumption among men (Lestari et al., 2019). The education level of patients was predominantly senior high school or equivalent (47.69% in the intervention group, 46.15% in the control group), indicating that higher education levels tend to correlate with better patient adherence (Erin, 2019).

Table. 2 Compliance categories of outpatient pneumonia patients at Sinjai Regional Hospital.

Compliance Factors	Chi Square Test	Category
Age	0,008	Significant
Gender	0,455	No Significant
Education	0,006	Significant

Based on Table 2, the Chi-Square test results for age showed an Asymp. Sig. value of 0.008 ($p < 0.05$), indicating a significant relationship between patient age and adherence to antibiotic use. The Chi-Square test for gender showed a value of 0.445 ($p > 0.05$), meaning gender did not have a significant effect on adherence. This suggests that drug information services were provided equally regardless of gender. Meanwhile, the education variable had an Asymp. Sig. value of 0.006 ($p < 0.05$), indicating a significant relationship between education level and adherence. The higher the patient's education level, the better their understanding of the importance of antibiotic information.

Table. 3 Pre-Intervention Questionnaire

Questions (P)	Number Of Patients	% Intervention	Number Of Patients	% Control
P1	5	7.69%	10	15.3%
P2	8	12.31%	12	18.46%
P3	3	4.62%	19	29.23%
P4	6	9.23%	5	7.69%
P5	15	23.08%	13	20.00%

Table 3 shows that prior to the provision of Drug Information Services (DIS), patient adherence to antibiotic use in both the intervention and control groups was generally low. In the intervention group, only 7.69% of patients adhered to the antibiotic dosing schedule (P1), which was lower than the control group at 15.38%. This indicates that many patients in the intervention group frequently forgot to take antibiotics at the prescribed times. Additionally, adherence to the restriction against altering antibiotic doses without consultation (P2) was also low, with 12.31% in the intervention group and 18.46% in the control group, suggesting a tendency among patients to adjust dosages based on personal judgment rather than medical advice.

Adherence to the recommendation to complete the full course of antibiotics (P3) showed a stark contrast, with the control group exhibiting much higher adherence (29.23%) compared to the intervention group (4.62%). This is particularly concerning, as stopping antibiotics prematurely can contribute to resistance. For question P4, which assessed adherence to the prescribed dosage, the intervention group showed slightly higher adherence (9.23%) compared to the control group (7.69%), although both remained low. Meanwhile, adherence to taking antibiotics according to the recommended dosage and timing (P5) had the highest scores among all questions, with 23.08% in the intervention group and 20.00% in the control group, yet still did not reflect optimal results.

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Overall, these findings confirm that prior to the DIS intervention, most patients lacked sufficient understanding or awareness regarding the importance of adherence in antibiotic use. This highlights the critical need for drug information services to improve adherence, reduce risky behaviors that contribute to antibiotic resistance, and promote the rational use of antibiotics.

Table. 4 Post-Intervention Questionnaire

Questions (P)	Number Of Patient	% Intervention	Number Of Patient	% Control
P1	19	29.23%	10	15.3%
P2	35	53.85%	12	18.46%
P3	21	32.31%	19	29.23%
P4	23	35.38%	5	7.69%
P5	38	58.46%	13	20.00%

Based on Table 4, the questionnaire results after the provision of Drug Information Services (DIS) show a significant improvement in patient adherence to antibiotic use, particularly in the intervention group. For P1, which assesses adherence to the antibiotic schedule, the intervention group demonstrated an adherence rate of 29.23%, considerably higher than the control group at 15.38%. For P2, regarding the prohibition of changing antibiotic doses without consulting a doctor, adherence in the intervention group increased dramatically to 53.85%, compared to only 18.46% in the control group. For P3, which concerns stopping antibiotics before completing the prescription due to feeling better, the intervention group reached an adherence rate of 32.31%, slightly higher than the control group's 29.23%.

Regarding P4, adherence to the prescribed dosage, the intervention group showed a substantial adherence rate of 35.38%, in stark contrast to the control group at 7.69%. P5 showed the highest adherence level among all aspects, with 58.46% in the intervention group and 20.00% in the control group. This high level of adherence reflects the success of the DIS in improving patients' understanding.

Overall, the data indicate that after receiving Drug Information Services, the intervention group's adherence level increased significantly compared to the control group. This reinforces the notion that educational interventions play a crucial role in promoting proper antibiotic use, preventing resistance, and improving the quality of patient therapy.

Based on the Paired T-Test results for the intervention group, a significant effect was found, with a significance value of 0.00 < 0.05. Thus, it can be concluded that there was a significant increase in adherence after the intervention. This demonstrates that the intervention was effective in improving patient adherence.

Conclusion

Based on the results of the study, it can be concluded that patient characteristics that influence adherence to antibiotic use are age and education level. The level of adherence to antibiotic use among pneumonia patients at Sinjai Regional General Hospital before and after receiving Drug Information Services showed a significant difference, with a p-value of 0.00 < 0.05. This indicates a significant relationship between the intervention group and the level of adherence.

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